



One Day Interdisciplinary

# NATIONAL SEMINAR

on

## “TRENDS IN GEOGRAPHY, COMMERCE, IT AND SUSTAINABLE DEVELOPMENT”

29<sup>th</sup> Feb. 2020.

**Organized by**

**Department of Geography**

**Sahajeevan Shikshan Sanstha**

**ICS College, Khed (Dist. Ratnagiri)**

**MAHARASHTRA- 415 709**

(NAAC Re-Accredited with B++ 2.83 Grade)

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**ISSN : 2349-638x**

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**Special Issue No.77 Published by:**

**Aayushi International Interdisciplinary Research Journal (AIIRJ)**

Peer Review and Indexed Journal

Impact Factor 6.293

Website : [www.aiirjournal.com](http://www.aiirjournal.com)

Chief Editor – Pramod P. Tandale

## Message



I am glad to share my views on the occasion of publication of seminar papers; which were presented by academicians and research scholars in a **Multidisciplinary National Seminar**. It was a great experience to host such a seminar under the dynamic leadership of our president and under guidance of our respected members of the college governing council. and guidance of our president and governing council members of the college. I hope said research journal will prove a valuable source of knowledge and findings as an outcome of hard and sincere study of concerned researchers.

It is my assurance that the journal will be value-added for all the stakeholders and to the learners as a reference text in their further study. We have been a As a team we are working as a team since working sincerely since 1989 and during this journey we have set numerus milestones including present seminar as well as said research journal. I am thankful to all authors and their parent organisatiосn to spare their valuable time and their finding from the platform of my college. As a best college of Mumbai University in the rural category we always appreciate and encourage research and innovations with a proactive stand.

I am once again thankful to the Teachers of department of GEOGRAPHY, department of COMMERCE and Teachers of our IT, BCS & BMS for their wholehearted involvement in the successful organisation of present national level multidisciplinary seminar.

**Dr. Gopinath Sarang**  
Principal  
ICS College, Khed

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## Message

It is a great pleasure for me as an editor to present the seminar papers in the form of said research journal. It was a great experience during the entire phase of organisation of seminar and up to publication of the journal. This research journal consists of 73 papers which were evaluated in advance and presented on the national platform of a multi-disciplinary seminar in front of expert jury members. As per statement of authors said papers are part of their own research work and due care have been taken to ensure all scientific parameters of research proceedings.

The papers which are included in this journal have represented four parts as per theme of the seminar. Such as papers concerning Geography, Commerce and IT as well as fourth part made separately for the papers which have been presented in Marathi medium. Due care has been taken to publish the paper as it was submitted and presented. Said journal has been published in the form of a special issue as it is the part of seminar proceedings which was organized at ICS College of Arts, Commerce & Science, Khed.

I am thankful to authors for their time to time response in the process of necessary corrections and compliance. I am thankful to the entire team of Aayushi Publication for their passions and valuable support.

**Dr. Chandrashekhar Salunkhe**  
Associate Professor  
Editor

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## History of Forest Management in India with Special Reference to Konkan Region of Maharashtra

Dr. Prakash Dongre, Associate Professor &  
Suresh K. Shetkar, Associate Professor

### Introduction

While studying forest and spatio-temporal changes especially with reference to its causes, it is essential to look in to the role of the state and the people. India is committed to genuine and meaningful partnerships with the local communities and other sections of the society. For this, we have created and are still improving upon a sound policy, institutional and legal framework. This allows decentralization of management, control regimes and empowers the communities to take decisions on management issues and also for benefit sharing. The concept of forest management in India has been broadened to include economic, environmental, social, and cultural dimensions, in line with the National Forest Policy. Forestry is directly linked to overall land use. Hence, forest policy and legislations flow from, and constitute a part of, the national land use and legislative framework for natural resource management and use.

**1.1. Forest management in Ancient Time:** *Puranas*, *Vedic* texts and epics give instances of forest and human relationships. *Vedas* provide description about the uses and management of forests. Ancient Hindu culture is said to have evolved in *Aranyas*. Forest was a place of learning life. In ancient India, several plants were considered sacred because of their natural, aesthetic and medicinal qualities. *Vedic* traditions confirm that every single village comes under three main categories namely *Mahavan*, *Tapovan* and *Shrivan*. *Vrikshayurveda* is an ancient text on the science of plant life, which discusses various topics related to plants.

The earliest indication of forestry administration in India is found in 300 BC. It was during the reign of Chandragupta Maurya. He appointed a Superintendent of Forests to look after the forests and wildlife. Later Ashoka continued the process. Much importance was given to planting trees along roadsides and camping sites (India Net Zone, 2011).

**1.2. Forest management in Medieval Period:** The *bhakti* movement of medieval period also emphasized respect for nature shown by inhabitants. Sant Tukaram in his *Abhangas* mentioned love and affection towards plants and vines. While the planting of trees was performed largely by individuals, conservation efforts were also undertaken at community level. Sacred groves are such examples of community conservation. Majority of the scared groves are protected and maintained by people around temples, sources of water such as springs and lakes.

The *Mughal* policy on forests was one of indifference. Neither did they seem to pay much attention to the forests nor did they have any religious scruples to destroy them. Mohammed bin Tughlaq in the Delhi Sultanate (1325-51 A.D), gave rewards to the farmers who cleared forests for agriculture. The *Mughal* looked upon forests as game reserves. They were interested in trees for gardening.

**1.3. Forest management during Maratha Rulers:** The importance of trees for political and defensive purposes was also evident. Chatrapati Shivaji emphasized large-scale afforestation in and around his forts. He said that forests would provide defense and safety to the fort. During emergency this forest can be used as timber and fuel wood. He gave a written order to respect forests and interests of owners of the forests. He used the forests as an integral part of warfare against his opponents (Ambre-Rao, 2008).

*Peshwas* and other *Maratha* rulers imposed restrictions on harvesting of teakwood from the village common lands. They also controlled the use of some pastures and levied tax on wood. In certain cases, people were fined if they cut wood from government pastures. Kanhoji Angre, a *Maratha* Naval chief, ordered the villagers to sow seeds to raise timber for his cruises. As a result, there were good teak plantations near the coast in present Raigad district. Angre protected Bandh-Tivare forest reserves in Dapoli taluka. The *Marathas* who had ship building yards at Malwan, Vijaydurg, and Bankot showed a prudent regard for forest preservation. The teak forests of Bankot, Nagothane, Goregaon and Nizampure were of very superior quality. Most of the wood required for shipbuilding was available from the local forests of Konkan. There is hardly any

evidence of conflict between agriculture and forests during the pre-British times, as land was more than adequate for a sparse population in Konkan.

**1.4. Forest management during British Raj:** The coastal areas of Bombay Presidency were thickly forested before the arrival of British. However after the transfer of Ratnagiri district from the *Peshwas* in 1818 to the British, deforestation took place on a large scale. Massive exploitation of Indian forests land had taken place, during the early years of British *Raj*. The teak forests along the coast of Malabar were exploited to cater to the requirement of the British Royal Navy. Guha and Gadgil mention that by 1860 Britain had emerged as the "world leader" in deforestation, destroying not only its own forests, but also those in Ireland, South Africa, India and some parts of the northeastern United States in order to provide timber for ship-building, iron-smelting, railways and land for farming.

The British governor started making plans for forest conservation in the 19<sup>th</sup> century. Captain Watson was appointed as the first Conservator of Forests in 1806. In 1849, demarcation of forest boundaries was started under Dr. Gibson in the Bombay Presidency. This was basically to manage timber supply from the West Coast of India to Europe. The first teak plantation was raised in Kerala in 1842. In 1855, the Government of India issued a memorandum outlining the rules for the conservation of forests for the whole country (Gazetteer of Bombay Presidency, 1908). Following Forest Acts were implemented during the British rule in India:

**1.4.1. Indian Forest Act, 1878:** Dr. Dietrich Brandis was appointed as the first Inspector General of forests in 1864. The British began extending their control over forests in India after passing the Forest Acts of 1865 and 1878. The forests administration was codified for the first time in 1865, when the Indian Forest Act (VII of 1865) was placed on the statute book. Subsequently, this was replaced by the Indian Forest Act (VII of 1878) which was further amended in the year 1890, 1901, 1918, 1919 and 1927. For the first time forests were classified into two categories - Reserved and Protected forests. During the initial stages, protection and consolidation was the primary task since the forests were considered as no man's area. The Forest Act of 1878 ensured that the reservation of forests did not affect the existing rights of individuals or communities. The Act became operational in most of the provinces in India including Bombay Presidency.

Imperial Forest Research Institute was established in 1906 in Dehradun. The training for the upper class forest staff also started at Dehradun. Board of Forestry was created at national level in 1910 which was chaired by Inspector General of Forests. National Character of forest administration was considerably diluted in 1921. With political changes in 1921, forest administration came to the Provincial Governments (Eco-info India, 2011).

**1.4.2. The Indian Forest Act, 1927:** The Indian Forest Act-1927 was for the purpose of consolidating the law relating to forests, the transit of forest produce and the duty to be levied on timber and other forest products. It also defines the procedure to be followed for declaring an area as a Reserved Forest (RF), a Protected Forest (PF) or a Village Forest. This Act defines forest offence, prohibited activities inside a RF, and penalties on violation of the provisions of the Act. This Act also mentions moral duties of the citizen to help Forest Officers and Police Officers in carrying out their duties within the purview of the Act.

Under Indian Forest Act, 1927 section 26 (1), kindling in or setting fire, trespassing and pasturing of cattle, felling or damage to the trees, quarrying stone or removing any forest produce, encroachment and poaching are the main acts prohibited in the RF. Similar activities are prohibited in the PF if a notification under section 30 or Rules made under section 32 are contravened. In addition to the tolls, vehicles used in committing such offences are liable to seizure and may be confiscated (Eco-info India, 2011).

Gains from the forest policy administration and conservation got a severe setback during the two World Wars. During this time there was massive deforestation in Konkan region for fuel and timber. Charcoal production was increased for supply to run army trucks. After the wars, forest based industries cropped up in great numbers. Forests never got a chance to recuperate and the exploitation continued unabated.

**1.4.3. Bombay Forest Rules, 1942:** In this Act, rules are made to regulate the felling of trees in private forest. As per the section 2 (F) of this Act, there are 16 scheduled trees which require felling permission in Maharashtra. These trees are *Hirda*, Teak, *Mahua*, Tamarind, Mango, Jackfruit, *Khair*, Sandal, *Bija*, *Haldu*, *Tiwas*, *Ain*, *Kinjal*, *Anjan*, *Jambul* and Mangrove. In Sindhudurg district, in addition to above, eight other trees

also require felling permission. They are *Shisam, Shivan, Nana, Behada, Kazra, Bhedus, Pandhra Ain and Kajoo*. The "Tree Officer" has the authority to grant the felling permission, who also happens to be a Range Forest Officer. The District Collector is the Appellate Authority.

Transportation of any forest produce requires a transit pass from the officer or any person duly authorized under rule 67 of the Bombay Forest Rules, 1942. However, the following trees have been exempted by the State Government vide notification dated 5<sup>th</sup> March 1990. These trees are *Nilgiri, Babul, Subabul, Prosopis, Ashok, Shewaga, Sindi, Orange, Chickoo, Bhendi, Acacia* and Poplar.

**1.5. Forestry Post-Independence:** During the post-independence period, the task of consolidation of forests, unification of forest laws and extension of scientific management on a reasonably uniform basis was the most important task of the forest administration. In early 1950's most of the States enacted new legislation affecting land tenure systems. Large areas of privately owned forests came to rest with the FD of the states.

Following important Policies and Acts were formed and implemented in India for the protection and conservation of forest resources:

**1.5.1. Forest Policy of 1952:** It was the first policy of independent India. Freedom of thought given to the people through earlier policies was strictly wiped out. A probable reason for the same could be making the country industrially productive and reviving the economy, accepting several compromises which were thought inevitable. An independent and democratic India saw a lot of new political initiatives. Large forest areas of princely states and *Zamindars* were acquired by the government. The Policy adopted a recommendation that 33% of the total land area of the country should be brought under forest or tree cover. It provided detailed guidelines for management and protection of forests and wildlife. The policy also suggested functional classification of forests as Protection Forest, National Forest, Village Forest and Tree-Land (Maslekar, 2008). Sawantwadi acceded to the Dominion of India on 15 August 1947, becoming part of Bombay State in 1948. State owned forest became part of forest department.

**1.5.2. Wildlife Protection Act, 1972:** According to the Wildlife Protection Act, 1972 "wildlife" includes any animal, bees, butterflies, crab, fish and moths as well as aquatic or land vegetation, which forms the part of any habitat. In accordance with Wildlife (Protection) Amendment Act, 2002 "no alteration of boundaries / National Park / Sanctuary shall be made by the State Govt. except on recommendation of the National Board for Wildlife (NBWL)".

Further, in terms of the Supreme Court Order dated 13<sup>th</sup> November 2000, the State Governments have to seek prior permission from the Supreme Court before submitting any proposal for the diversion of forest land in National Park and Sanctuaries. Whenever, any part of Wildlife Sanctuary / National Park is getting affected by a hydro-project, the proposal in respect to such project is entertained by the Ministry of Environment and Forest (MoEF), Government of India (GOI). The MOEF gives the initial permission for de-reservation or denotification of Wildlife Sanctuary /National Park. Then after the recommendation of the Standing Committee of NBWL, the proposal of dereservation or de-notification goes to the Honorable Supreme Court for ratification.

Konkan has one National Park and four Wildlife Sanctuaries, a Marine Wildlife Sanctuary and an Eco-Sensitive Zone (Table-01). Although the Marine sanctuary has been designated; it exists only on paper, as the regulations have not been implemented. Total area under the Mumbai Wildlife Circle is 1451 kms<sup>2</sup>. This area is further divided into Thane, Borivali, Pune, and Kolhapur Wildlife Divisions. The area of Thane and Borivali Wildlife Divisions is mainly in Konkan:

**Table -01: Notified Protected Areas in Konkan**

Sr. No.	District	Name of Protected area	Notification Year	Area in kms <sup>2</sup>
1.	Mumbai/ Thane	Sanjay Gandhi National Park	1983	86.96
2.	Thane	Tansa Wildlife Sanctuary	1970	304.81
3.	Thane	Tungreshwar Wildlife Sanctuary	2003	85.00
4.	Raigad	Karnala Wildlife Sanctuary	1968	4.48
5.	Raigad	Phansad Wildlife Sanctuary	1986	69.79
6.	Sindhudurg	Malvan Marine Wildlife Sanctuary	1987	29.12
7.	Thane/ Raigad	Matheran Eco-Sensitive zone	2002	214.73

Source: Maharashtra Forest Department, 2010

**1.5.3. The Maharashtra Private Forest (Acquisition) Act, 1975:** This Act was implemented in Maharashtra from 30<sup>th</sup> August 1975 to control degradation of the private forest land. The Act was implemented with an objective to promote systematic and scientific management and to maintain the ecological balance. Another objective of this Act was improving the socio- economic conditions of the rural population, particularly of the *adivasis* and other backward communities who live in forest. Those private land owners were having forest land more than 12 ha, it was acquired by this Act. Government paid compensation to forest owners as sum equal to twenty times the assessment value of the trees of forest land. By the end of year 2010, the area of private forest brought under the possession of the FD was 560 kms<sup>2</sup>. (Maharashtra State FD, Report 2009-10). This Act was amended in 1978, where the land was returned to owners whose holding stood less than 12 ha.

By this Act 319 kms<sup>2</sup> was acquired in Konkan by the end of the year 2010 (Table- 02). The maximum private forest acquisition of 144 kms<sup>2</sup> was in Sawantwadi Division. In Alibag, Roha and Jawhar forest Divisions too substantial area of private forests was acquired. Very small area of private forest was acquired in Chiplun, Shahapur, Thane, and Dahanu forest Divisions. This may be due to the small size of land holdings per owner. Comparatively, these forest divisions have a high density of population. Large number of cases related to the acquisition of private forests are still pending in various courts.

**Table -02: Private Forest brought under possession of FD (Area in Kms<sup>2</sup>)**

District	Private Forest land area notified as on 30 <sup>th</sup> August 1975	Area brought under FD as on 31 <sup>st</sup> March 2010	% of acquired forest to notified area
Thane	805.27	75.29	9.34
Gr. Mumbai	19.59	5.64	28.79
Raigad	625.27	125.24	20.03
Ratnagiri	1.63	1.63	100.0
Sindhudurg	380.12	145.25	38.21
Maharashtra	3036.57	559.83	18.44

**Source:** Maharashtra State FD, Annual Administrative Report -2009-10

In 1975, this Act came into force, bringing with it a whopping 3.03 lakh ha of private land under the fold of RF area. The implementation of this Act was very slow and in the due course a number of private forest owners sold their land to third parties. There was poor coordination between the FD and Revenue Department to implement this Act. Although forests have been shrinking rapidly, land records for over three lakh ha are still to be updated for more than 30 years after the Acquisition Act came into effect. Callous and corrupt practices have led to the depletion of private forest land.

**1.5.4. Forest Conservation Act – 1980:** This Act deals with the conservation of forests and related aspects. This Act covers all aspects of forests including RF, PF or any forest land irrespective of its ownership. This Act deals with the conservation of forests and matters related to the protection of trees from illegal felling and destruction. There are five main clauses in this Act which guide through the use of forest resources and limit the harm to forest reserves. The salient features of this Act are:

1. No part of a RF can be used for non-forest purpose by the State Government without prior approval from the Central Government.
2. State Government cannot lease forest land or its portions to any private person or to any authority, corporation, agency or organization which are not managed or controlled by government.
3. A forest land can be cleared of trees only when this land is to be used for reforestation.
4. The Central Government may constitute an advisory committee that can guide the government for matters concerned with the conservation of forests.
5. If a person, authority or department is found guilty of committing an offence under the Forest Conservation Act, he shall be liable to be proceeded against and punished accordingly as per the rules and act. The head of department or an authority or any other person cannot be rendered to any punishment if he proves that the offence was committed without his knowledge or he exercised his full power to stop the offence from being committed.

As per this Act, wherever more than one hectare of the forest land has to be used for non-forestry purposes, permission from MoEF is compulsory. Also, under this Act compensatory afforestation in proportion to the loss of forest land is mandatory. In the land records, the ownership of the land remains with the FD.

From 1980 to 2010, in Maharashtra 57,594 ha of forest land was diverted for non-forest use in 1354 proposals. In Konkan, due to the urban influence and infrastructural development, more than 10,000 ha of forest land was diverted for non-forest utilities. Maximum diversion of land was in Thane district followed by Raigad. Most of the land diversions were for irrigation projects, drinking water projects, road construction, quarries, mines, electricity transmission towers, etc.

As per the NGO - Campaign for Survival and Dignity, "the forest clearance for non-forestry use under the Forest Conservation Act 1980, is decided by the Central MoEF, on the basis of the report of Forest Advisory Committee. None of those members involved are in any way accountable to the people and in particular to the most directly affected forest dwellers. In 2008, Parliamentary Standing Committee observed that in the process of forest land transfer - forest dwellers are "neither informed, nor consulted, nor compensated" (Minutes of Lok Sabha - 22<sup>nd</sup> October, 2008).

**1.5.5. Forest Policy 1988:** The role of forestry in the national economy and in ecology was further stressed in this Policy, which was an alert call to ensure environmental stability, restore ecological balance, and preserve the remaining forests in India. Other objectives of the policy were to meet the need for fuel wood, fodder, and small timber for rural and tribal people while distinguishing the need to actively involve native people in the management of forest resources. Also in 1988, the Forest Conservation Act of 1980 was amended to assist more firm conservation measures. The policy proposed that 60% of the land in the hills, 20% in the plains and in all 33% of the total geographical area should be under forest cover. This policy also envisaged community involvement in the protection and regeneration of forests. It accorded highest priority to sustainable management of the forest resources. The basic objectives of the 1988 National Forest Policy are:

1. To maintain environmental stability through preservation and restoration of the ecological balance.
2. To conserve the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna.
3. To check soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts.
4. To increase substantially the forest/tree cover in the country through massive afforestation and social forestry programmes.
5. To meet the requirements of fuel wood, fodder, minor forest produce and small timber of the rural and tribal population.
6. To increase the productivity of forests to meet essential national needs.
7. To encouraging efficient utilization of forest produce and maximizing substitution of wood.
8. To create a massive peoples movement with the involvement of women, for achieving these objectives and to minimize the pressure on existing forests.

**1.5.6. The Biological Diversity Act, 2002:** The Ministry of Environment and Forests has enacted the Biological Diversity Act, 2002 under the United Nations Convention on Biological Diversity signed at Rio de Janeiro on 5<sup>th</sup> June 1992. This Act is to "provide for the conservation of biological diversity, sustainable use of its components, fair and equitable sharing of the benefits arising out of the sale of biological resources, knowledge and for matters connected therewith or incidental thereto." As per the provision of the Act certain areas, which are rich in biodiversity and encompass unique and representative ecosystems are identified and designated as Biosphere Reserve to facilitate their conservation. All restrictions applicable to protected areas like National Park and Sanctuaries are also applicable to these Reserves. Western Ghats is one of the biodiversity hot spot and in 2012, 39 sites of the Western Ghats are declared as UNISCO World Heritage sites. Dr. Madav Gadgil Commission (March, 2010) and later on Kasturirangan Committees (2012) were appointed by the government to demark boundary and to give recommendations for the conservation of biodiversity of Western Ghat.

**1.5.7. Recognition of Forest Rights Act 2006:** India's forests are home to millions of people, including many Scheduled Tribes, who live in or near the forest areas form many centuries. Forests provide sustenance in the form of minor forest produce, water, grazing grounds and habitat for shifting cultivation. Moreover, vast areas of land that may or may not be forests are classified as "forest" under India's forest laws, and those cultivating these lands are technically cultivating "forest land".

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, was passed in India on 18<sup>th</sup> December 2006. The law concerns the rights of forest-dwelling communities to land and other resources, denied to them over decades as a result of the continuance of colonial forest laws in

India. Under these laws, the rights of people living in or depending on the area to be declared as a forest or a protected area are to be "settled" by a "forest settlement officer." The Act are summarized as:

- 1. Title rights:** Title rights of ownership - to land that is being cultivated by tribes or forest dwellers as on 13<sup>th</sup> December 2005, subject to a maximum of 4 hectares (Ten acres); ownership is only for land that is actually being cultivated by the concerned family as on that date.
- 2. Use rights:** Use rights to minor forest produce (also including ownership), to grazing areas, pastoralist routes, etc.
- 3. Relief and development rights:** Relief and development rights to rehabilitation in case of illegal eviction or forced displacement and to basic amenities, subject to restrictions for forest protection.
- 4. Forest management rights:** Forest management rights to protect forests and wildlife.

Eligibility to get rights under the Act is confined to those who "primarily reside in forests" and who depend on forests and forest land for a livelihood. Further, either the claimant must be a member of the Scheduled Tribes living in that area or must have been residing in the forest for 75 years.

Supporters of the Act claim that it will redress the "historical injustice" committed against forest dwellers, while including provisions for making conservation more effective and more transparent. Opponents of the law claim that it will lead to massive forest destruction and should be repealed. It has been observed that there is wide interstate variation in implementation of this Act. This Act has reached a fairly advanced stage. However, high rate of rejection of claims and very low receipt of community claims were matters of serious concerns.

As on 31<sup>st</sup> July 2011, in Maharashtra 3, 39,689 claims were received under this Act. Out of these claims 1, 04,767 claimants received the land title and 2, 21,795 claims were rejected. 13, 127 claims are pending with various level committees. About 2, 45,305 acres of forest land have been distributed to the forest dwellers. 65% claims have been rejected at various levels in the state.

In Konkan distribution of scheduled tribe population is very uneven. Population of scheduled tribes declines from north towards south. As per Census 2011, 14.42% population of the Thane district belongs to ST. In Thane district Jawhar, Vikramgad, Makhada, Dahanu and Talasari *talukas* have more than 50% tribal population. As per Census 2011, in Raigad district scheduled tribes population is 12.18%. In this district scheduled tribes are mainly found in Karjat, Sudhagad, Murud and Alibaug *talukas*. Here the tribal concentration is around 20% in each of these *talukas*. In Ratnagiri and Sindhudurg district tribal population is negligible (less than 1%). In Konkan more than 71,000 claims were received at the Gramsabha level. No claims under this Act were received from Ratnagiri and Sindhudurg districts. Nearly 70% claims were rejected at Gramsabha and Sub-divisional level on various grounds. Still the process of implementation of these Act is going on in Konkan.

#### Conclusion:

Forest is an important natural resources from ecology and economy point of view. To protect this resource along with effective policies and Act there is need of public awareness. Konkan is a hilly region and so there is need to maintained good forest cover. At present only 20% area of Konkan is under government forest cover. Large tracks of land in Sothern Konkan are under private forests. By effective policy/act there is need to protect these forests tracks. In Northern part of Konkan there is concentration forest dwelling tribal groups such as Katkari, Thakkar and Warli. By the effective policies there need to up lift socio-economic conditions of the tribal groups. It is essay to form policies but difficult to implement, and it is very difficult to bring desired changes with the policy.

#### References:

1. Ghate R.S., (1992): Forest Policy and Tribal Development, a Study of Maharashtra, Concept Publishing Co. New Delhi.
2. Government of Maharashtra (1908) - Gazetteer of Bombay Presidency.
3. Government of Maharashtra, (2009-10 and 2010-11): Annual Administrative Report of Forest Department of Maharashtra.
4. Govt. of Maharashtra, (1991, 2001, 2011) : District Census Handbook of Thane, Raigad, Ratnagiri and Sindhudurg.
5. India Net Zone, (2011): History of Indian forest, <http://www.indianetzone> Accessed in June
6. Maslekar A.R., (2008): Management of Forest of India: New Opportunities, Bishen S.M.P.S. Dehradun India.
7. Neena Ambre Rao, (2008) : Forest Ecology in India, Foundation Books, India

## Water Scarcity in Mumbai: Need For an Efficient Solution

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### 1) Introduction:-

**Water use has grown at more than twice the rate of the human population over the last century which account for 70 per cent of global freshwater use.** India has 4 % of the world's freshwater which has to cater to 17 % of the world's population. As per NITI Aayog Report released in June 2019, India is facing the worst-ever water crisis in history. Approximately 600 million people or roughly around 45 % of the population in India is facing high to severe water stress. As per the report, 21 Indian cities will run out of their main source of water i.e. groundwater by 2020. The report also says that nearly 40 % of the population will have absolutely no access to drinking water by 2030 and 6 % of India's GDP will be lost by 2050 due to the water crisis.

World Water Day is held annually on March 22 to focus attention on the importance of fresh water and advocate sustainable management of this precious resource. Each year this day highlights a special aspect of freshwater. The theme of 2019 was about tackling the water crisis by addressing the marginalized groups – women, children, refugees, indigenous peoples, and disabled people for safe access to water. Human population is growing continuously, which means there is less water for everyone to satisfy the need for a healthy life. Agriculture accounts for 70% of freshwater withdrawal and the rest for industrial, domestic, energy, fisheries and environment related consumptions. The last 50 years have witnessed a rapid acceleration in water resource development. Coping with population growth and ensuring access for all related to water requirements poses an all-time challenge to India and the world.

Life does not exist without water and it is essential not only for the existence of the living flora & fauna but also human life. It is also essential for our happiness, peace and prosperity. Today water scarcity is emerging as a major issue confronting the world. This could soon be true in India as most of the cities face a water crisis. Rapid urban and industrial growth together with unprecedented demands for water is taking a toll on our economy. Mumbai ranks among the top 20 global cities in terms of municipal water demand in the next one decade followed by Delhi. The other Indian cities are Kolkata, Pune, Indore, Hyderabad and others [McKinsey Global Institute Report, 2017]. Since the last 2 years the problem of water crisis and water shortage has increased manifold. All of us are responsible for this crisis and all of us have a duty to overcome the problem.

Water scarcity indicates insufficient freshwater resources to meet the human and environmental demands of a given area. Adequate access to safe drinking water is a priority for global development. However, given the challenges of population growth, unfiltered use, changes in weather patterns due to global warming, many countries, both wealthy and poor are facing water scarcity in the 21st century.

### 2. The research questions which arises here is that:-

1. What is the real problem of water crisis in a megacity like Mumbai
2. What can be the causes to the problem?
3. Can we think of some effective and efficient solutions to the water crisis?

### 3. About The Study Area

Mumbai (previously known as Bombay) is the capital city of Maharashtra located on the West coast of India. Mumbai is also a leading commercial, financial and industrial Megacity. It has the highest GDP (Gross Domestic Product) in the South, West and Central Asian regions. The greater Mumbai metropolitan area – comprising of "Mumbai suburban district" as well as the cities of Navi Mumbai, Thane, Bhiwandi, and Kalyan – will soon be a home for 27.7 million people by 2030. (UN World Urbanization Prospects).

Table 1



Megacity Mumbai is a major contributor to State and National economy which accounts for slightly more than 6.16% of India's economy contributing 10% of factory employment, 30% of income tax collections, 60% of customs duty collections, 20% of central excise tax collections, 40% of foreign trade and rupees 40,000 crores (US\$10 billion) in corporate taxes to the Indian economy. (TOI, February 2017). People of Mumbai deserve a better level of basic public services which is a major challenge for city planners today. It is predicted by environmentalists that Mumbai is likely to see a serious water shortage with poor monsoon rains rapidly bringing down water levels in the six lakes that feed the city.

**4. Water Supply Of Mumbai:-**

Mumbai's water supply is totally handled by Municipal Corporation of Greater Mumbai whose mission statement is to provide all users in the city with continuous, uninterrupted, reliable, good quality clean water which is cost effective. The primary sources of water for cities like Mumbai are lakes created by dams across rivers near the city. Mumbai's water supply comes from seven lakes – Tansa, ModakSagar, Bhatsa, Vaitarna, Tulsi, Vihar and Powai. The monsoon precipitation is collected in these lakes and supplied to the city throughout the year. The system is made up of reservoirs, storage tanks, pipes and taps. Map 1 indicates the sources of the lakes which provide water to the megacity Mumbai. Table 2 indicates the year of completion of the dams and quantity of water supply along with the cumulative supply by all the schemes together.

Map 1

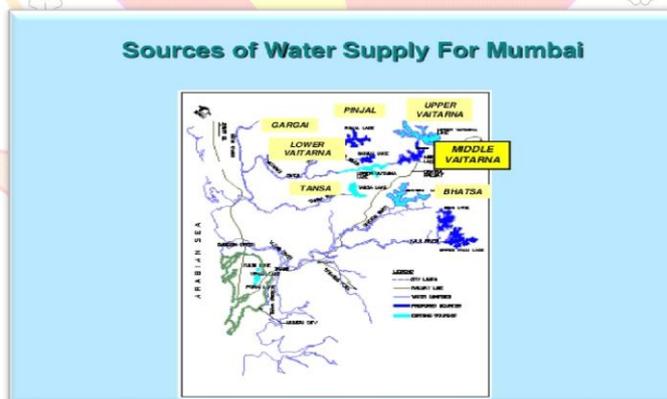


Table 2

Sr. No.	Name of the Source	Year of Completion	Qty of Water Supply (MLD)	Total Qty of Water Supply (MLD)(Cumulative)
1	Vihar Lake	1860	110	110
2	Tulsi Lake	1879	18	128
3	Tansa Lake	1892 to 1925	485	613
4	Modak sagar & Upper Vaitarna	1957	1142	1755
6	Bhatsa (3 SCHEMES TOGETHER)	1974 to 2007	1700	3455
	Middle Vaitrna	2014	455	3910

Inclusive of 120MLD En-Route Supply

Source: MCGM

Presently MCGM [Municipal Corporation of Greater Mumbai] supplies 3470 MLD of water from the seven main water sources, out of which 120 MLD is supplied to Thane and its neighboring rural areas. The water distribution in Mumbai is very old. Water is supplied to the city after lake water is treated and stored in 23 service reservoirs. The service reservoirs are mainly situated on hills like Malabar Hill, Worli Hill, Raoli, Pali Hill, Malad, Powai and Bhandup. 80% of the water connection owned by BMC is metered. Currently BMC earns about Rs 4.5 billion or 450 crores annually. (Department of Water Data, MCGM) The total water demand for the city of Mumbai is 4250 MLD and the total water drawn by MCGM is 3470 MLD leading to a demand – supply gap of 780 MLD. Demand for the mega city is expected to rise to 5400 MLD in 2021 [Chitale Commission Report, 2006] which may worsen the situation and make it an emerging issue with the increasing population.

#### 4. Water Woes And Challenges:-

Mumbai gets its water supply from conventional sources of water example lakes, dams, reservoirs, etc. However with the growing administrative limits of the megacity and increasing population, these sources of water are being proved inadequate creating a crisis – like situation. Recommendations of Chitale Committee, March 2006, is being looked into seriously as the two dams, Gargai-Pinjaland Daman dam are going to take care of the water supply requirements of the megacity Mumbai in next five to seven years. However the question arises that how much could one depend on rainwater, when monsoons are getting delayed every year? Many areas of Mumbai receive only 30 minutes of water supply every day, like Malabar Hills, Cuffe Parade, Bandra, Versova, Mahim, Andheri, Kandivali and so on.

**Mumbai's requirement of water resources has been well thought and planned and the water supply systems have been well designed to meet the increasing demands of the growing population. This deficit like situation in Mumbai, there is due to lack of proper management of water resources,**

#### Situation Analysis:-

The following features are being reflected in the status of water resources in Mumbai:

- Out of the gross available water supply of 3,740 MLD, the losses through leakages and other sources make the net available water supply to 2,320 MLD, which also includes 600 MLD water supply for non-domestic purposes i.e., industry and commerce. There is a shortfall of about 900 MLD between the water supply and demand in Mumbai.
- The losses arising from leakage through water supply distribution system amount to almost 25% and above (with the inclusion of theft and pilferage, it may even rise up to 30%), which is very high in spite of the MCGM attempts to reduce it to 15%.
- The entire range of functions of water supply and sewerage are concentrated with the single entity MCGM, which is responsible for wide range of functions. Concentration of all services in the hands of one large organization has led to inefficiency in the service delivery and promoted corruption at various levels.
- The spatial, temporal and sectoral coverage of water is still missing i.e., some parts of the city do not receive water; some of them receive it intermittently; and some sectors have more privilege in accessing it more than others. Moreover, water supply is not quite reliable option to some areas which are off from the main trunk line of the distribution system.
- Even though water has the characteristics of public good MCGM should identify the threshold point of necessity and levy higher water tariff for greater amount of unit water consumption.
- Some areas are facing low pressure water supply as they are located at an elevation and few at the end of the pipelines.
- Corporators also agree that the worst affected areas are Kurla, Mankhurd, Chembur, Mohammed Ali Road, etc. [Observer Research Foundation, Mumbai].
- Pipelines network are old in the city thereby repair and replacement becomes difficult. There is acute shortage of experienced staffs in MCGM making the scenario gruesome.
- The Hindustan Times undertook a survey on the problems faced by Mumbaikars. Almost 75% of people are concerned with water shortages. 40% of residents say that their water supply situation has deteriorated and only 13% residents think optimistically that this condition will improve.

#### 5. In Search Of Efficient Solutions :-

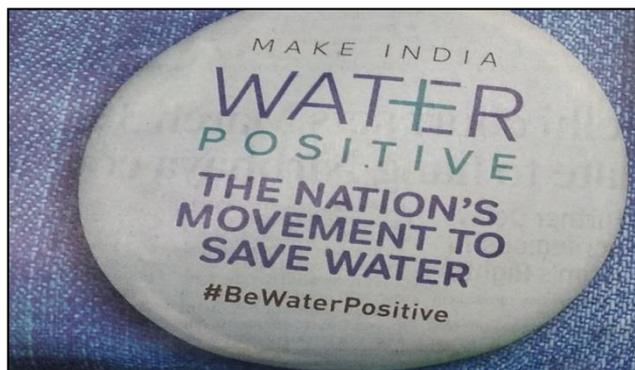
MCGM has initiated some bold steps to improve water supply system in the city by strengthening the supply –demand management. Some suggested solutions taken up can make the situation better. They are as follows –

- a) **Invent new water conservation technologies-** In areas where aquifers are drying up and rainwater is increasingly unpredictable, innovation is needed. There is a need to explore multiple options and not completely depend on rainwater when monsoons are delayed. For this, recycling is one of the options that were thought over. Desalination is another option as Mumbai has a vast sea water reserves. Cost is an important issue but if technology is available, desalination plants can gradually procure water, decreasing the cost in the long run. Public- Private Partnership can make such initiatives which in the long run turn out to be a very fruitful association managing water in big cities.
- b) **Recycle Waste Water-** World Water Day celebrated in March panelists, are trying to recycle water to become more self-sufficient. The scientists are trying to develop advanced technology that cleanses wastewater for other uses. In Mumbai big builders have joined hands e.g. Hiranandani, Lodha. Godrej etc. and have taken initiatives to recycle waste water for their esteemed project as a CSR initiative.
- c) **Rain Water Harvesting :** Another solution which is being emphasized by the government is rainwater harvesting. Lots of co-operative societies in Mumbai are implementing this method to save water. In this process extra water during rainfall (monsoon season) is collected in underground tanks and preserved. This can be used for gardening, washing, toilets etc. during parched seasons. Rainwater harvesting requires little space and less cost. It needs a rooftop or ground pipelines, a row of soak pits or a tank concealed below the ground. Rooftops or grounds can be used as the catchment area. Sealine Housing Society in Khar, Mumbai has no shortage of water, despite varied rainfall as they have installed a rainwater harvesting system in their buildings. It took 6 lakhs rupees for setting up Rainwater Harvesting, but the residents saw it not as a cost but an investment for the future. In these times of scarcity, Sealine Society, Khar could set an example for other societies. In the corporate world, Asian Paints, India's largest paint company has taken a huge stride to promote water conservation by setting up a Total Water Management (TWM) Centre at Bhandup. It showcases live working models on rainwater harvesting and water conservation. It provides free expertise to citizens free of cost to implement such concepts.
- d) **Appropriately price water:** Water pricing go hand in hand, with consumers behavior and use of the precious resource. Water tax is so low in Mumbai that common man do not acknowledge the importance of it. If the water tax is raised people will automatically change their behavior and will not waste water or add to pollution.
- e) **Stop Leakages Immediately-** Some immediate steps should be taken up which includes plugging of leaks in our existing water supply lines, zone wise water cut once a week, 30% water cut for commercial consumers, no new connections to high rise buildings, penalizing water wastage, etc. can also bring in a sea – change in the scenario of water crisis.
- f) **Social Networking-** The Brihanmumbai Municipal Corporation (BMC) will have its profile on social networking sites like Orkut and Facebook and post information on issues like water conservation methods and causes of water problems in Mumbai. The BMC is the first municipal corporation in the country to join the online networking community. The profiles will have information on water harvesting, desalination, conservation and success stories.
- g) **Sensitization Programmes-** Mass educational campaigns should be taken up by the government and NGOs to encourage every citizen for some behavioral change towards saving water. Campaigns should sensitize and provide incentives for water conservation. Politicians, residential groups, schools, industries, hotels, hospitals and big institutions like TIFR; TISS & B.A.R.C should actively participate in checking water deficit.

## 6) Conclusion:-

To conclude, there should be a long term sustainable solution. Administrative efficiency should be beefed up, backed by strong political will and citizen's support. There should be appropriate emphasis on raising water literacy and promoting proper management of water resources. It is well said that water must have a price. Anything that is for free won't be used prudently. Therefore every resident's mission should be to save water to save Mumbai. Students volunteering with the civic body can be considered a project work for them. The need for demand management has also been implied through the need for changes in pricing strategy and technological solutions for water conservation. However, more than that there is an immediate need for undertaking various institutional and sectoral reforms for improving the water resources management, which will lead to enhanced water supply services both quality and quantity. In fact, in order to cope with future water scarcity, it is necessary to radically reform all forms of consumption, from individual use to the supply chains of large companies.

**SOURCE: TOP'S INITIATIVE TO BRING CHANGE. (19th February 2020)**



**Selected References:-**

1. Christin. Ann ; Water Business: Corporations Versus People, Book for change, Bangalore, 2005.
2. Rogers, P and AW. Hall ; Effective Water Governance, Elanders Norum, Sweden, 2003.
3. Sivaramkrishnan, K.C, Amitabh Kundu & B.N Singh; Handbook of Urbanization in India; an Analysis of Trend and Processes, Oxford University Press, New Delhi, 2005.
4. Ghosh.,Ashish; Natural Resource Conservation and Environment Management, APH Publishing, New Delhi, 2003.
5. Iyer, Rangaswamy & R, Water: Perspective, Issues and Concerns, Sage Publications, New Delhi, 2003.
6. Prakash, Gyan; 'The Urban Turn', in the Cities of Everyday Life, Sarai Reader, New Delhi, 2002
7. Agarwal, Anil and Sunita Narain (Ed); Dying Wisdom: Rise, fall and Potential of India's Traditional Water Harvesting Systems, CSE, New Delhi, 1997.
8. Diddee Jayamala and Vimala Rangaswamy (Ed); Urbanisation : Trends, Perspectives and Challenges, Rawat Publications, Jaipur, 1993.
9. Singh, Chhatrapati ; Water Law in India, The Indian Law Institute, Bombay, 1992
10. Chitale Committee Report: March 2006.
11. MC Kinsey Global Institute Report 2010.
12. JP Morgan, Chase Greg, Clark and Others; Mumbai: India's global city: A case study for the Global Cities Initiative December 2014.
13. Ramakrishna Nallathiga,; Mumbai s water resources: The need for reforms in their management, Research Gate, December 2003.
14. <http://ww.dewindia.org/html/water-supply-history.asp>, Bombay water supply history
15. [http://www.maharashtra.gov.in/english/gazetter/greater\\_bombay/otherdepartments.html](http://www.maharashtra.gov.in/english/gazetter/greater_bombay/otherdepartments.html) Maharashtra State Gazeteers
16. [http://en.wikipedia.org/w/index.php?title=Vihar\\_Lake&oldid=516292226](http://en.wikipedia.org/w/index.php?title=Vihar_Lake&oldid=516292226)
17. <http://www.observerindia.com>
18. Lewis, Clara; "[Delhi, not Mumbai, India's economic capital – Times of India](#)". [The Times of India](#). Archived from the original on 14 February 2017. Retrieved 24 February 2017.

## Potential of New Tourism Types in Konkan- A Geographical Study

Dr. Anita Awati,  
 Associate Professor

### Introduction

Tourism is known as multidimensional and multifaceted activity in world with diverse social, cultural and economic impacts. It has evolved as one of the largest and most significant industry. Tourism has been recognized as a major force in global economy and a key driver for socioeconomic progress. Tourism cannot be considered as just an economic activity but now has described as a social phenomenon. It is now accepted that tourism is bridging the gap between 'Haves' and 'Haves-not'.

India has been a spiritual and cultural destination for tourists from all over the globe from time immemorial. India's physical and cultural diversity, religion, languages, Music, art, historical monuments have attracted millions of tourists from all over the world. Since ancient times, the rulers of various kingdoms in India have built luxurious palaces, marvelous temples, grand forts, tombs and memorials shows the rich cultural heritage of our land. Still today India has immense potential for all types of tourists across the world. According to Max Muller (the world famous Orientalist) "If we look over the world to find out the country most endowed with all the wealth, power and beauty that nature can bestow- in some parts, a veritable paradise on earth – I should point to India. (Muller, 1882)

Being the most dynamic economic activity in the world, tourism is witnessing the emergence of new tourism forms and trends every day. People were travelling for specific purposes from before few years ago, i.e. religious, meeting relatives, pleasure, but now the motives of tourists are changing very vastly.

### Objectives of the Study –

1. To study the development of tourism in Konkan,
2. To identify the potential places for development of new types of tourism,
3. To know the problems related to the development of new types of tourism and suggest the remedies for sustainable tourism development of Konkan.

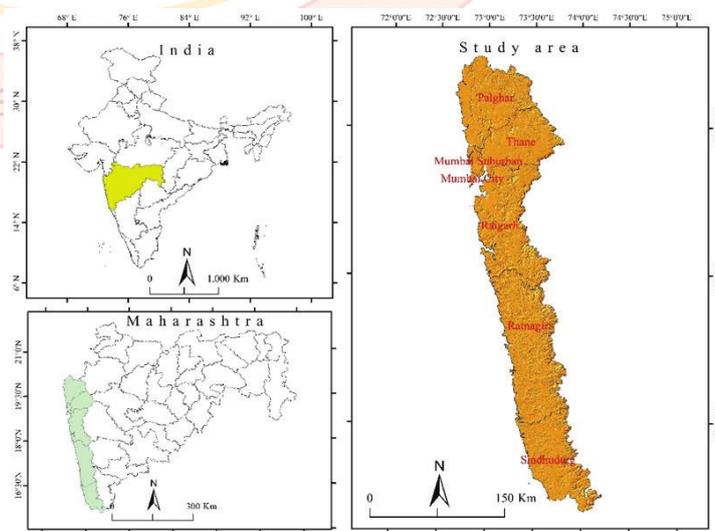
### Research Methodology –

Primary and secondary data is used to study the new trends of tourism in Ratnagiri district. Primary data is collected by field visit through proper questionnaires. Secondary data is collected through various government departments, local NGOs, newspapers and websites.

### Study Area -

Konkan is an important region of Maharashtra state which has its own identity since historical period. Konkan is a 720 km long coastal strip occupies the entire west coast of Maharashtra which extends from Dahanu in the north up to Goa in south and surrounded by the Sayhadry hills on the east and the Arabian Sea on the west. The Konkan includes the districts of Palghar, Thane, Raigad, Ratnagiri and Sindhudurg. Konkan's greenery, coconut trees, beautiful virgin beaches, waterfalls, mountains and lush green valleys will definitely provide a rich and pleasant experience for the traveller.

Konkan which is famous for golden-brown sand, sea forts and the mesmerizing blue sea, has tremendous advantage to develop as a tourism destination due to its connectivity with entire state & nation. Konkan is well known for its natural beauty and that's the reason the region is referred as naturally gifted.



Konkan is truly a heaven on earth for nature lovers who wish to relax in beaches, adventure to the top of hills and enjoy the beautiful waterfalls and sport in the clean backwaters. Konkan is well known for its natural beauty and that's the reason the region is referred as naturally gifted. Most of the district area is covered by dense rain forest, and are suitable for habitant of wild animals.

Generally the climate of Konkan region is hot and humid. The region witness all climatic seasonal changes i.e. monsoon, winter and summer. Most of the district area is covered by dense rain forest, and are suitable for habitant of wild animals.

Historically, Konkan has been the land with dense forest cover, waterfalls, mountains and lush green valleys with beautiful beaches, picturesque hamlets, paddy fields, coconut groves and mango orchards. Konkan is blessed with many unspotted & virgin natural beaches which is the major attraction of tourists. Government of Maharashtra has announced many tourism development plans but in reality this region has yet to be developed as heart of coastal India. There is wide scope to develop coastal Maharashtra / Konkan as a tourism destination by converting challenges into opportunities.

#### **Analysis of Data**

Konkan region is known for its natural beauty and cultural diversity. Tourism has developed in various districts of Konkan, but is not developed evenly everywhere. Few places like Alibag, Ganpatipule, Malvan-Tarkarli, Devbag are developed on large scale, while other places are very less developed. As per the potential of tourist resources in Konkan region following new trends of tourism can be developed in coming years –

#### **Adventure Tourism :-**

As a kind of tourism in India, adventure tourism has recently grown in India. It involves exploration of remote areas and locals and engaging in various activities for adventure tourism in India, generally tourists prefer to go for trekking to places like Ladakh, Himachal Pradesh, Uttarakand, and North Eastern Himalaya. The various kinds of adventure tourism activities in India are Rock climbing, Skiing, Camel safari, Paragliding, Mountaineering, Rafting , Trekking . Konkan is also having the great potentiality of Adventure tourism in various areas. Coastal areas of Konkan can become favourite hot spot sites for snorkelling, scooba diving, paragliding, parasailing and other water sports. In some creeks and coastal areas dolphins are seen frequently, so here development of Dolphin tourism can easily started on commercial level with proper training.

As another type of adventure tourism, rock climbing is also has tremendous potential in Western Ghat of Maharashtra, whereas ,Kanheri Caves,Manori Rocks , are popular sites , but Karnala and many more sights near Mahad, Ratnagiri are still waiting for development. Bicycle rides/ bike rides also can be developed in Ghat sections of Sahyadri mountain.The jungle treks of Andharban forest, Kalavantin Durg trek near Panvel, Makrandgad – Mahipatgad – Sumargad – Rasalgad trek , Nageshwar trek, Chakdev trek and Mahimatgad trek near Devrukh of Ratnagiri have great potential to attract adventure tourists.

Adventure tourism in India has recorded a steady growth in recent years. For the continuous growth , efforts are taken by the government of India. Similarly in Konkan also planning and policies should be implemented for the development of adventure tourism by state government and local authorities.

#### **Wild Life Tourism :-**

India has a rich forest cover which has exotic species of wildlife in world, out of which some are even endangered and very rare. This has boosted wildlife tourism in India. Almost 40% of Konkan is covered with green forest and home to a rich variety of flora and fauna. The Konkan is home to many endangered and rare species of plants and animals along with 367 species of marine flora and fauna. Most of the area covered by dense rain forest, Amboli hill station area is most suitable habitat for wild animals like leopard, wild cats, rabbits, wild hen and wild buffalo also appears in winter season.

Konkan is home of various migratory birds after rainy season. Flamingos', Painted stork,Sea-gulls and so many different species of birds are seen every year in various parts of Konkan, this can be a great opportunity to introduce Bird tourism as a new type of tourism. Karnala Bird Sanctuary and Sanjay Gandhi

National Park, Borivali are popular tourist places. Similarly, crocodile safaris in rivers/ creeks, butterflies and vultures in Phansad sanctuary, coastal sites of birds, and Olive Reedley turtle sites on entire Konkan coast can attract tourists from all category which will promote sustainable and eco-tourism in Konkan.

#### **Ecotourism :-**

Ecotourism, a environment friendly type of tourism has developed in India recently, but it can be developed in most of the parts of Konkan. Konkan is known for its lush green forest, paddy fields, coconut groves and mango orchard which has already great potential and have all the things to develop Eco tourism. Ecotourism means traveling to places known for their natural beauty and social culture, while making sure that not to damage the ecological balance of the place.

Ecotourism means conscious and responsible effort to preserve the diversity of a naturally endowed region and sustaining its beauty and local culture. Konkani people have been known since ages to worship and conserve nature in the form of Devrai or Sacred Grooves. Most of the rare species are seen here; because this forest is not cut by local people from so many years. They keep forest on the name of god, which is a good indicator of preservation of forest. These sites can be used for ecotourism. Matheran is famous eco tourist place in Maharashtra, but other places like Machal in Lanja tehsil, Amba Ghat and other such areas can be developed as eco tourist sites as per the demands.

There are few beautiful lakes and water bodies in the region of Konkan, Dhamapur Lake and Moti Talav are two most famous among them. Dhamapur Lake is a natural and one of the largest lakes of Konkan, an ideal picnic spot can be utilised up to its natural potential for various nature related activities.

#### **Cultural Tourism :-**

India has been considered the land of ancient history, heritage, and culture from time immemorial. The rich Indian cultural heritage is one reason why tourists in all over world come to India to experience it. The various fairs and festivals that tourists can visit in India are the Pushkar Mela, Kumbhmela, Taj festival, as well as Ganpati festival, Pune and Elephanta festivals, etc. Various rulers who ruled on India since historical periods have made impact on Indian culture. This impact has seen on various forms of dances, paintings, music, art, architecture, traditional customs, languages and food. The "Incredible India campaign" started by Indian Government has given successful identity to India at world level and this has led to the growth of culture tourism in India.

Konkan is known for its historical monuments, ancient caves and beautiful temples also. The rulers like Chalukya, Vakatah, Marathas, Portugij, and British etc. have spread their rich culture from historical period. The major forts of Maharashtra are situated along with the Konkan coastline; which includes the sea forts of Sindhudurg Fort, Janjira Fort and Vijaydurg Fort Suvarndurg Fort. Other most famous forts of Konkan are the Raigad Fort, Bhagavati fort, Kille Nivati and the Jaigad, Purnagad Fort, Rasalgad, Mahipatgad forts. These amazing forts can attract tourists as one of the most important trekking destinations to understand the glorious history of past and it will also bring tourists close to colourful facets of Konkan traditions and architecture..

The Konkani People are festive by nature. Their love for celebration is deeply rooted in their culture and it discovers its expression through the different celebrations celebrated throughout the year. A few of the Main Festivals celebrated in the Konkan region are: Ganesh Chaturthi, Holi, Diwali, Dassera, Gudhi Padwa, Narali Pournima and Makar Sankranti.

#### **Cuisine Tourism :-**

Cuisine / Food tourism, the new type of tourism has tremendous potential as India has diverse culture of traditions, customs. Every state has its unique identity of variety food .Maharashtra being a large state has known for different food culture according to the regions.

Konkanis are a very diverse group of people. The diversity is reflected in the religion and also in their food dietary. Good sign of Konkan region is that Konkani food and cuisines are famous for its mouth-watering delicious. Malvani cuisine means famous and spicy dishes of sea-food dishes, Malvani Mutton Curry and Kombdi Vade along with local Solkadhi one of the popular local drink of the Konkan region Ukadiche Modak and many dishes of Konkanaस्था Brahmin. All these food variety have potential to attract many more tourists from all over Maharashtra.

### Wellness Tourism :-

Wellness tourism is one of the fastest growing forms of international and domestic tourism in India. This form of tourism involves people who travel to the different places for the maintaining of personal health and wellness. Wellness tourism include Naturopathy, massages, body treatments, facial treatments, exercise facilities & programs, weight loss programs, nutrition programs, Spa treatments and mind/body programs. In Konkan also Madhvbag near Khopoli is known for panchacarma, Pachal for naturopathy. Some other places have the potential for the development of such wellness tourism. Massage centres, mind/ body peace programmes, Vipassana centres Yoga centres can be easily started for the tourists who come for rest / refreshing / peaceful stay. The tourist places like Dapoli, Guhager, Ganpatipule, Ratnagiri, Malvan Tarkarli, Alibag etc. which are already attracting thousands of tourists can be developed as centres of Wellness tourism related activities.

### Heritage Tourism :-

Heritage tourism is a travel to experience the places and activities that authentically represent the stories and people of the past and present, which include historic, cultural and natural attractions. India is known for its rich heritage and culture since the past and has recorded immense growth in the last few years in heritage tourism. Heritage tourism has two types i.e. Natural Heritage and Cultural heritage. Natural Heritage means the areas of rich biodiversity. Cultural heritage can be seen in many forms including buildings, dance, food, dress, events, values, lifestyles and handicrafts. India's rich heritage is reflected in the various temples, palaces, monuments, and forts . Similarly Maharashtra and Konkan has also potential of heritage tourism. The rock sculptures which have recently found in many villages of Ratnagiri district has a great potential to attract not only Indian but foreign researchers, tourists also.

Famous Wooden toys of Sawantwadi, Dashavtar art form of Sindhudurg, Pinguli art and paintings, Warli art and paintings , Balya dance, Koli dance form and various other folk dances are the assets of Konkan.

Pinguli or Chitrakathi -- As a traditional art form of the Konkan region, Chitrakathi is quite unique and unlike any other because it engages the audience with nothing but mythological fables narrated with the visual help of pictures drawn on paper. This form of art was a speciality of the Thakar community and practised with vigour and passion when it had royal patron Chitrakathi is the art of storytelling with the help of pictures painted on cardboard pieces and cut to proper size. These tales are mostly based on the Puranas and popular epics such as the Ramayana and Mahabharata. The pictures are pasted on the top of a wooden strip and these are held by the artist and displayed in front while he narrates the story from behind.

### Rock Art / Petroglyph in Ratnagiri District :-

A petroglyph is usually a prehistoric **carving** in a **rock**. Prehistory refers to the period of time before civilization and writing. Petroglyphs which are carved into the flat open **rock** surface gives them a scale and look that is unique. The recent discovery of 1,000 rock carvings on Maharashtra's Konkan coast is expected to provide new insights into the early history of the region. Jayant Sriram reports on the archaeological significance of these petroglyphs, which are estimated to be 12,000 years old. This carving is one of the over 1,000 such petroglyphs that have been discovered in and around the Ratnagiri and Rajapur districts over the last two or three years, making them one of the most significant archaeological finds of recent times. The carvings cover over 52 sites across the region.

India is famous for ancient caves and 80% of caves are found in Maharashtra. Konkan is also having lot of caves sites in various places. Elephanta caves are popular among tourists but there are some other sites where tourists can visit easily if these sites can be developed as tourist places. Panhale kazi caves, Gandhar Pale caves near Mahad, Kondana caves near Karjat- Raigad are few examples of such caves





### **Agro Tourism :-**

This form of tourism has enormous potential in India due to its agro-based economy and more rural population. Various states of India have agriculture problems, so in such situation if Agro tourism has to be promoted by Government/ local authority. Maharashtra a famous state in agriculture, but facing various issues of agriculture will be great advantage if Agro tourism is developed. A large numbers of migrations have taken place to Mumbai and other large cities after Independence. Today Konkan region is ideal for the development of Agro tourism to reduce unemployment and out migration. The warm and humid climatic conditions are quite favourable for Horticulture, e.g. Mangoes, Kokam, Cashew Nuts, Coconuts, Beetlenuts, Chikoo and many fruits are cultivated. Even Rubber Plantation is also successfully practiced in some areas. Konkani people depend mainly upon fishing and farming for their income and nowadays some are making their living with the assistance of growing Tourism in the area. The areas of Devgad, Dapoli , Khed and Ratnagiri are well-known for its Alphonso mangoes. The Coconut, Mango Orchids can attract thousands of tourists from all over India as like Goa and Kerala. Still now few Agro tourism sites are well known and popular among the tourists. Entire Konkan coast has large potential for agri tourism sites, because of clean, calm beaches are close to agricultural fields. Agro tourism will be beneficiary to local people fot stopping of out migration and to increase the local people income.

### **Coastal /Beach Tourism :-**

India having the 7500 km. coast line which has not utilised still up to it's potential. Coastal / beach tourism related various activities have not given that much importance as this can promote India as world famous tourist destination. The states like Goa and Kerala have been attracted large number of tourists from all over world. Maharashtra being a coastal state have 720 km. long coastline which has virgin and pristine beaches. Most of these beaches are untouched, unspoiled having white and golden sand, but proper plans should be implemented for development of these coast. Snorkelling, scuba diving and water sports related games are the attractions here. Similarly Malvan- Tarkarli, Devbaug, Ganpatipule, Alibag- Murud-Janjira etc. few beaches are well developed but rest of all beaches and all the coastal villages can be focused as new tourist sites.

Sea world project at Malvan is pending from last 10 years, while Angria Bank which is rich in corals will be one the great attractions in future. This area has been declared as Marine park of India. Velas, Anjarle, Dabhol, Guhager and many sites are known for Olive Reedley turtles nesting sites can be developed as ecotourism hubs of Konkan. Dolphins cab be seen in most of the coastal areas and creeks, these places will be introduced as Ecotourism and sustainable tourist destinations of Konkan.

### **Cruise Tourism :-**

It is fast emerging new marketable product in world and India. Konkan with its vast and beautiful coastline, virgin beaches can attract tourists for development of cruise tourism. Before independence cruise transportation was an only mode of transportation, but due to development of road and railway network it was neglected. Cruise tourism can be better option to attract tourists on large scale. Cruise can be run in creeks, or sea as per the available demands, for example Mumbai to Goa such cruise is started before few months ago and getting good response from tourists. Various creeks like, Karli, Jaigad, Dabhol , Thane creeks has potential to start such cruise tourism. It will helpful for local fishermen also to increase their income.

### Conclusion and Recommendations :-

Tourism is emerged as an important instrument for sustainable human development including poverty alleviation, employment generation, environmental regeneration and development of remote areas and advancement of women and other disadvantaged groups in the region.

Historically, Konkan has been the land with dense forest cover, waterfalls, mountains and lush green valleys with beautiful beaches, picturesque hamlets, paddy fields, coconut groves and mango orchards. Konkan is blessed with many unspotted & virgin natural beaches which is the major attraction of tourists. The right policy at right place, will ensure growth of tourism industry in Konkan and Maharashtra.

Konkan region is naturally endowed region of variety tourist resources. Out migration after independence has affected lot of on the local development and economy. People were not accepting big projects like Sterlite, Enron, Nanar, Jaitapur etc. at one side and employment opportunities were lacking other side . Konkan is a must visit travel destination that you can enjoy with your entire family. To develop the new types of tourism in Konkan region following are the few recommendations --

1. Attract the private sectors/ investors to come forward for the investment in tourism infrastructure.
2. Through PPP investment, development should be in both tourism and civic infrastructure. Efforts towards development of overall transport infrastructure in the form of good quality roads, rail network, airports, helipads, availability of tourist vehicles etc. may also be strengthened in order to improve the overall infrastructure.
3. There should be provision of way side amenities, such as drinking water, well maintained and clean waiting rooms and toilets, first aid ,Bank and ATM facilities, Petrol pump information, etc., tourist information centres and websites for providing requisite tourist information.
4. Access and connectivity should be developed within tourist places, specially the rural potential sites or new types of tourism sites.
5. Aggressive and catchy advertisement campaigns on the tourist destinations should be made to attract more and more tourists.
6. To fulfil the tourist demands well trained manpower or workforce is required, hence local people should be trained skills and mannerism of hospitality industry.
7. Audio-visual shows should be arranged to tell the past and present features of history and life of the eminent people of the region.
8. Focus should be remained on different segments of tourism i.e. newly married couple, Family, school/ College students, Retired persons/ senior citizens and foreigners.
9. Plan for sustainable growth of rural tourism and balance of economics with people, culture and environment can be prepared for protecting natural resources, local heritage and lifestyles.
10. Promotion of local traditional tourism products for long-term growth and prosperity.

### References:

1. Awati, A.(2009), Tourism Potential in South Konkan. Unpublished thesisSNDT Univ.,Pune
2. Dileep M.R.(2018), Tourism-Concepts, Theory & Practice, IK Int. Publ. N.Delhi
3. Roberts, L & Hall, D.(2001) 'Rural Tourism &Recreation',Oxford;Wallingford
4. Salunkhe,C.(2015), Socia-Economic Impact of Tourism in Ratnagiri Dist. Unpublished thesisTMV, Pune.
5. <https://mtdcrs.maharashtratourism.gov.in/>

## Morphometric And Land Use Land Cover Analysis For Prioritization Of Watershed In Kalu River Basin.

Vilonia Durai , Dr. B. B. Sonule

### 1. Introduction:

Watershed management plays a significant role in conservation of water and soil resources and their sustainable development. Adoption of better watershed management practices overcomes issues of drought, flood, excessive runoff, poor infiltration, soil erosion, human health, and low productive yield.

River basins comprise a distinct morphologic region and have special relevance to drainage pattern and geomorphology (Doornkamp and Cuchlaine, 1971; Strahler, 1957). Morphometry is an essential means in geomorphic analysis of an area. Horton (1945) for the first time, proposed quantitative methods for the analysis of morphometric characteristics of fluvially originated drainage basin. Morphometry is defined as the measurement and mathematical analysis of the configuration of the earth's surface and of the shape and dimension of its landforms (Clarke, 1966). Morphometric studies involve evaluation of streams through the measurement of stream properties with the analysis of various drainage parameters namely ordering of streams, basin area, and perimeter of basin, length of drainage channels, drainage density, stream frequency, bifurcation ratio, texture ratio and circulatory ratio. Morphometric studies involve area, altitude, shape, size, slope and profiles of watershed. (Singh S. 2000).

Morphometric properties of a drainage basin are quantitative attributes of the landscape that are derived from the terrain or elevation surface and drainage network within a drainage basin (Goudie, AS, 2004). According to Gardiner, 1982, the morphometry is potentially a most important approach to geomorphology, since it affords quantitative information on large scale fluvial landforms, which make-up the vast majority of the earth configuration. Morphometry has two distinct branches viz. i) Relief Morphometry and ii) Fluvial morphometry. Relief morphometry includes the analysis of terrain characteristics through hypsometric curves, clinographic curves, percentage hypsometric curves, area- height curves, altimetric frequency histogram and curves, superimposed, projected and composite profiles, which assist in dealing with different aspects of landform characteristics of a drainage basin or of any geomorphic unit. Fluvial morphometry includes the consideration of linear, areal and relief aspects of a fluvially originated drainage basin. The linear aspect deals with the hierarchical orders of streams, numbers and lengths of segments and various relationships among them, morphometric laws e.g. law of stream numbers and stream lengths. The quantitative analysis of drainage system is an important aspect of watershed characteristics.

Land use/land cover analysis is an important indicator for the environmental degradation including a watershed. Integration of LULC analysis in micro-watershed prioritization has been tested and applied by several researchers (Malik and Bhat 2014; Sujatha et al. 2014). Remote Sensing (RS) and Geographical Information Systems (GIS) techniques has been applied for prioritizing Kalu river basin, which is a basic requirement to prepare management schemes by the planners and policy makers to implement a selective approach considering the immensity of the watershed area (Javed et al. 2011).

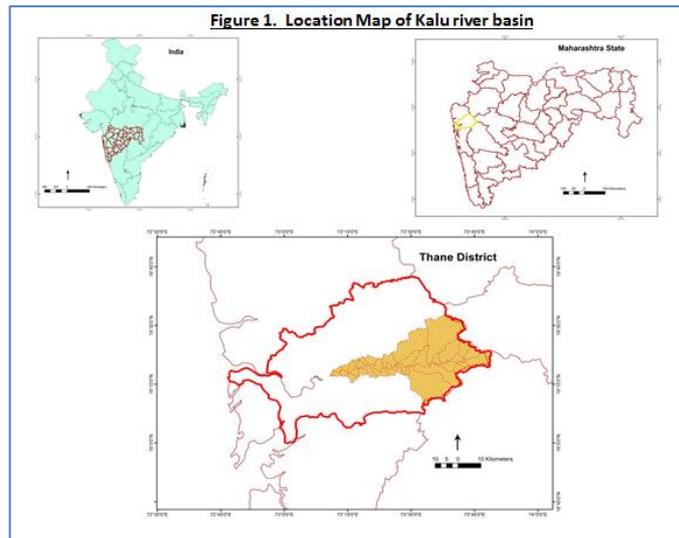
The main objective of the present study is to assess the morphometric as well as Land Use Land Cover parameters of Kalu river basin to prioritize the sub-watershed for resource management and conservation.

### 2. Materials and methods

#### 2.1. Description of study area

The study area encompasses the Kalu river basins, which is the sub-basin of the Ulhas River in the Thane district. The Kalu River lies between 19°18'8" to 73°11'17" North Latitude to 19°20'68" to 73°30'15" East Longitude. It flows from east to west. This river after flowing westward in its downstream receives a small river Bhatsa and later meets the Ulhas river near Kalyan, an industrial suburb of Mumbai. The total length of the Kalu River is nearly 110 km.

The annual precipitation in this region is about 2500mm and the post-monsoon availability of water is plentiful. However, owing to the higher slopes and scarps of the western limb of the Sahayadris (Western Ghats) flanking the eastern parts of the basin, the surface runoff is quite high.



## 2.2. Data-sets used

The toposheets were collected from Survey of India of scale of 1:50000. The topographical maps were geo referenced in ArcGIS software. The Shuttle Radar Topography Mission (SRTM Arcnovoid) data were used to derive the DEM. The boundary and 39 sub-basins of Kalu river basin was delineated using both toposheets and DEM. For the convenience of Land Use Land Cover analysis, LANDSAT-8 (30m resolution) was used for the present study.

## 2.3. Methodology

The Survey of India toposheets and SRTM Arcnovoid DEM was used for estimation of morphometric parameter of Kalu river basin such as: Bifurcation ratio ( $R_b$ ), Drainage density ( $D_d$ ), Stream frequency ( $F_s$ ), Stream length ratio ( $R_l$ ), Mean stream length ( $L_\mu$ ), Form factor ( $F_f$ ), Elongation ratio ( $R_e$ ), Circulatory ratio ( $R_c$ ), Length of overland flow ( $L_o$ ) etc. The detailed adopted methodology is expressed through flowchart (Figure 2). Table 1 explains the formulae used for quantitative determination of morphometric parameters. The delineation of the thirty nine sub basins were demarcated manually rest all other analysis was performed in the Geographical Information System environment with the aid of ArcGIS software.

LANDSAT-8 (30m resolution) for the year 2019 as used for LULC analysis. The image was processed in Arc-GIS software. Supervised classification was adopted and its verification was done with Google earth image for prioritizing the Kalu river basin (Figure 2). The sub-basin was demarcated into five classes, i.e. Agricultural land, Forest, Barren land, Water body and Settlement.

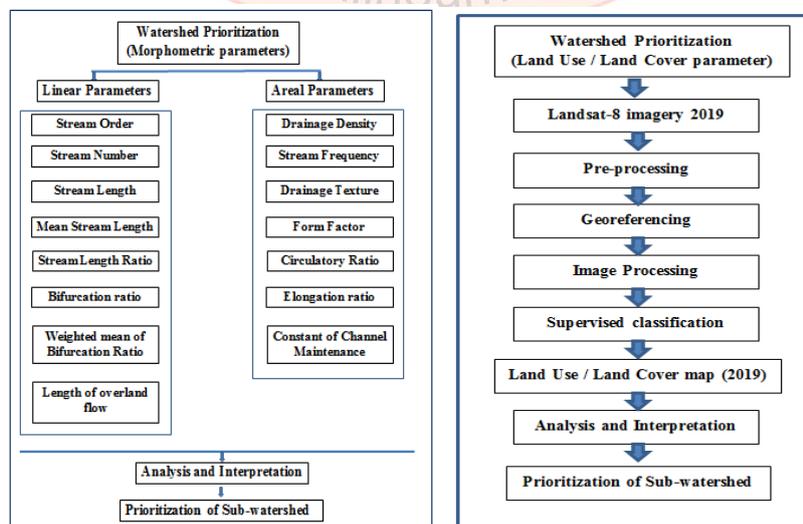


Figure 2. Flowchart of methodology.

Table 1 Formulas incorporated for the computation of morphometric parameters

Morphometric Parameters	Formulas	References
Stream Order	Hierarchical rank (Strahler Scheme)	Strahler (1964)
Stream Length	Length of the stream	Strahler (1964)
Stream Length Ratio	$R_L = \frac{L_u}{L_{u-1}}$ ; $R_L$ is the stream length ratio, $L_u$ = the mean stream length of order $u$ and $L_{u-1}$ = the mean stream length of the next lower order.	Horton (1945)
Bifurcation ratio	$R_b = \frac{N_u}{N_{u+1}}$ ; $R_b$ = the bifurcation ratio, $N_u$ = the number of streams of given order $u$ , $N_{u+1}$ = the number of streams of the next higher order.	Schumm (1956)
Weighted Mean Bifurcation Ratio	$R_{bwm} = \frac{R_{b1} * n_1 + R_{b2} * n_2 + \dots}{n_1 + n_2 + \dots}$ $R_{bwm}$ = the weighted mean bifurcation ratio, $R_{b1}$ = the bifurcation ratio between 1st and 2nd order streams, $n_1$ = the total number of stream segments involved in calculation, and so on.	Schumm (1956)
Length of overland flow	$L_o = \frac{1}{2D_d}$ ; $L_o$ = Length of overland flow, $D_d$ = Drainage density	Horton (1945)
Drainage density (Dd) (km/km <sup>2</sup> )	$D_d = \frac{\sum L}{A}$ ; $\sum L$ = the total length of streams in unit area and A = a unit area	Horton (1945)
Stream frequency ( $F_s$ ) (Per km)	$F_s = \frac{\sum N}{A}$ ; $F_s$ = the number of stream per unit of area (stream frequency), $\sum N$ = total number of streams segments of all orders within the given basin. A is the area of that basin in square meter.	Horton (1945)
Drainage density (Dd) (km/km <sup>2</sup> )	$D_d = \frac{\sum L}{A}$ ; $\sum L$ = the total length of streams in unit area and A = a unit area	Horton (1945)
Stream frequency ( $F_s$ ) (Per km)	$F_s = \frac{\sum N}{A}$ ; $F_s$ = the number of stream per unit of area (stream frequency), $\sum N$ = total number of streams segments of all orders within the given basin. A is the area of that basin in square meter.	Horton (1945)
Drainage texture ( $R_t$ )	$R_t = \frac{N_u}{P}$ ; $R_t$ = drainage texture, $N_u$ = total number of streams in all order, P = Perimeter of the basin.	Horton (1945)
Form factor ( $R_f$ )	$R_f = \frac{A_u}{L_b^2}$ ; $R_f$ is form factor, $A_u$ is basin area and $L_b$ is the basin length	Strahler (1964)
Circulatory ratio ( $R_c$ )	$R_c = 4 * A * \frac{\pi}{P^2}$ ; $R_c$ = circulatory ratio, $\pi = 3.142$ , A = area of the basin and P = perimeter of the basin	Strahler (1964)
Elongation ratio ( $R_e$ )	$R_e = \frac{2}{L_b} * \sqrt{\frac{A}{\pi}}$ ; Where, $R_e$ = elongation ratio, A = area of the basin (km <sup>2</sup> ), $\pi = 3.142$ and $L_b$ = the maximum basin length parallel to the principle drainage line.	Schumm (1956)
Constant of Channel Maintenance (C) (Km <sup>2</sup> /km)	$C = \frac{1}{D_d}$ ; C = constant of channel maintenance, $D_d$ = the drainage density.	Schumm (1956)

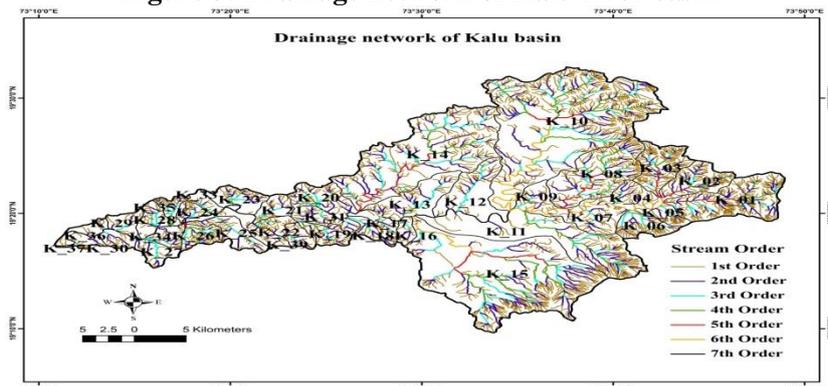
### 3. Results and discussions

#### 3.1. Estimation of linear parameters

**3.1.1. Stream order :** The stream order is a measure of the position of a stream in the hierarchy of the tributaries. In the present study, stream ordering has been carried out using Strahler's scheme of stream ordering. It is evident from the map that Kalu is a seventh order stream.

**3.1.2. Stream number :** The count of stream channels in each order is known as stream number. It is evident from table that the number of streams decreased with increasing order of the streams in Kalu river basin. The attribute data have been generated in GIS environment for counting the stream number for the entire Kalu river basin. Table 2 reveals a decrease in number of stream segments with an increase in the order of stream in Kalu river basin.

Figure 3: Drainage network of Kalu river basin



Stream Order	No. of stream	Stream Length (Kilo meters)
1	2815	1622.52
2	649	521.42
3	156	300.27
4	33	121.98
5	10	67.77
6	3	60.59
7	1	73.37
Total	3667	2767.92

Table 3 Kalu river basin: Morphometric parameters

Sub Basin	Basic parameters			Stream analysis	
	Area (sqkm)	Perimeter (km)	Basin Length (km)	Total Number of Stream order	Total Number of Stream Length
K_01	52.486827	33.903023	12.44	311	195.25
K_02	24.135316	22.344299	8	147	87.55
K_03	26.887357	27.518849	8.51	172	107.44
K_04	17.786445	28.539376	6.73	46	36.75
K_05	9.883243	16.700287	4.82	34	28.68
K_06	16.065457	18.340126	6.35	68	56.1
K_07	22.670862	29.410795	7.72	63	44.82
K_08	56.513673	35.065312	12.98	228	163.68
K_09	12.19354	19.296788	5.43	28	21.9
K_10	206.630588	75.754711	27.1	650	503.89
K_11	83.278244	61.453006	16.17	171	155.34
K_12	35.395395	35.87066	9.95	58	48.46
K_13	30.635433	30.127633	9.16	73	51.21
K_14	127.402951	60.968991	20.59	323	261.12
K_15	181.501158	68.251042	25.18	356	364
K_16	6.136273	11.217412	3.68	26	13.51
K_17	8.899595	17.605363	4.54	43	20.63
K_18	7.540412	16.406893	4.13	28	20.54
K_19	11.579687	16.049107	5.27	64	36.28
K_20	25.691729	26.914333	8.29	123	69.6
K_21	10.303146	14.899314	4.94	34	21.04
K_22	12.009708	21.725233	5.38	34	19.91
K_23	16.370285	18.689812	6.42	56	28.88
K_24	7.837038	11.849021	4.22	35	18.01
K_25	16.268278	25.378919	6.4	56	35.75
K_26	11.210099	15.541368	5.18	87	43.53
K_27	10.838337	15.265292	5.08	20	20.54
K_28	10.880603	15.68038	5.09	36	24.11
K_29	9.46067	15.029157	4.7	16	15.85
K_30	7.135957	11.165453	4.01	25	16.56
K_31	4.418328	10.311692	3.05	25	10.46
K_32	4.148048	9.489896	2.94	21	10.57
K_33	5.938444	11.804525	3.61	18	10.71
K_34	8.594366	12.851932	4.45	35	21.93
K_35	7.177143	16.387533	4.02	41	24.83
K_36	7.602138	17.930188	4.15	13	9.65
K_37	6.313336	15.268913	3.74	20	11.62
K_38	6.713033	12.305845	3.87	42	18.83
K_39	8.133277	12.578551	4.31	39	21.82
Total	<b>1134.66</b>	<b>935.89103</b>	<b>292.62</b>	<b>3665</b>	2671.36
Sub	Linear parameters			Shape parameters	

Basin	Mean stream length	Bifurcation ratio	Weighted Bifurcation ratio	Length of overland flow	Drainage density	Stream Frequency	Drainage texture	Form factor	Circularity ratio	Elongation Ratio	Constant of channel maintenance
K_01	13.27	7.94	4.18	0.13	3.72	5.93	0.63	0.34	0.57	0.66	0.27
K_02	7.65	6.78	3.92	0.14	3.63	6.09	0.60	0.38	0.61	0.69	0.28
K_03	9.1	7.14	4.55	0.13	4	6.4	0.63	0.37	0.45	0.69	0.25
K_04	4.25	6.5	4.89	0.24	2.07	2.59	0.80	0.39	0.27	0.71	0.48
K_05	4.31	5.63	6.65	0.17	2.9	3.44	0.84	0.43	0.45	0.74	0.34
K_06	5.21	5.74	4.3	0.14	3.49	4.23	0.83	0.4	0.6	0.71	0.29
K_07	4.7	8.08	5.59	0.25	1.98	2.78	0.71	0.38	0.33	0.7	0.51
K_08	15.87	7.79	4.71	0.17	2.9	4.03	0.72	0.34	0.58	0.65	0.34
K_09	4.79	5.5	7.18	0.28	1.8	2.3	0.78	0.41	0.41	0.73	0.56
K_10	39.86	9.11	4.55	0.21	2.44	3.15	0.77	0.28	0.45	0.6	0.41
K_11	17.25	8.29	4.18	0.27	1.87	2.05	0.91	0.32	0.28	0.64	0.53
K_12	11.17	8.19	5.48	0.37	1.37	1.64	0.84	0.36	0.35	0.67	0.73
K_13	7.57	6.5	4.47	0.3	1.67	2.38	0.70	0.36	0.42	0.68	0.60
K_14	27.8	8.57	4.29	0.24	2.05	2.54	0.81	0.3	0.43	0.62	0.49
K_15	25.81	7.85	3.6	0.25	2.01	1.96	1.03	0.29	0.49	0.6	0.50
K_16	3.24	4.5	4.04	0.23	2.2	4.24	0.52	0.45	0.61	0.76	0.45
K_17	4.54	6.33	4.7	0.22	2.32	4.83	0.48	0.43	0.36	0.74	0.43
K_18	5.62	4.88	5.29	0.18	2.72	3.71	0.73	0.44	0.35	0.75	0.37
K_19	6.07	6.05	4.91	0.16	3.13	5.53	0.57	0.42	0.56	0.73	0.32
K_20	4.73	7.19	4.16	0.18	2.71	4.79	0.57	0.37	0.45	0.69	0.37
K_21	4.91	5.3	5.35	0.24	2.04	3.3	0.62	0.42	0.58	0.73	0.49
K_22	1.72	5.3	5.35	0.3	1.66	2.83	0.59	0.41	0.32	0.73	0.60
K_23	3.99	5.27	3.91	0.28	1.76	3.42	0.51	0.4	0.59	0.71	0.57
K_24	3.42	5.43	4.38	0.22	2.3	4.47	0.51	0.44	0.7	0.75	0.43
K_25	7.13	7.06	5.64	0.23	2.2	3.44	0.64	0.4	0.32	0.71	0.45
K_26	5.43	5.77	3.45	0.13	3.88	7.76	0.50	0.42	0.58	0.73	0.26
K_27	7.08	3.88	3.61	0.26	1.89	1.85	1.02	0.42	0.58	0.73	0.53
K_28	4.46	4.75	3.99	0.23	2.22	3.31	0.67	0.42	0.56	0.73	0.45
K_29	4.13	3.5	3.56	0.3	1.68	1.69	0.99	0.43	0.53	0.74	0.60
K_30	3.75	6.5	9.84	0.22	2.32	3.5	0.66	0.44	0.72	0.75	0.43
K_31	2.31	4.4	3.89	0.21	2.37	5.66	0.42	0.47	0.52	0.78	0.42
K_32	2.55	4	3.33	0.2	2.55	5.06	0.50	0.48	0.58	0.78	0.39
K_33	3.56	3.83	4.13	0.28	1.8	3.03	0.59	0.46	0.54	0.76	0.56
K_34	4.56	5.43	4.38	0.2	2.55	4.07	0.63	0.43	0.65	0.74	0.39
K_35	5.85	4.88	3.62	0.14	3.46	5.71	0.61	0.44	0.34	0.75	0.29
K_36	1.6	3	2.77	0.39	1.27	1.71	0.74	0.44	0.3	0.75	0.79
K_37	2.09	4.17	4.72	0.27	1.84	3.17	0.58	0.45	0.34	0.76	0.54
K_38	3.3	6.1	6.77	0.18	2.81	6.26	0.45	0.45	0.56	0.76	0.36
K_39	2.99	5.71	4.78	0.19	2.68	4.8	0.56	0.44	0.65	0.75	0.37

### 3.1.2. Stream length

Stream length is measured from the farthest drainage divide to the mouth of a river. Generally the total length of stream segments is the maximum in first-order streams and decreases with an increase in the stream order. As far as the whole basin of the Kalu river is concerned, the total length of stream segments is maximum in case of first order streams. It is observed that the total length of the stream segments is comparatively lesser in case of higher order stream i.e. 67.77 km and 60.59km in fifth and sixth order streams respectively in the study area. Moreover, the total length of seventh order stream is 73.37 km, which is greater than the sixth order stream i.e. 60.59km. Hence, the stream segment of various orders doesn't make a geometric series. It might be attributed to stream courses traversing areas of high altitude, moderately steep slopes and varying lithological conditions.

### 3.1.3. Mean stream length ( $L_{\mu}$ )

The mean stream length is a dimensional property, revealing the characteristic size of the components of drainage network and its contributing surface (Strahler A N, 1964). This general tendencies are observed in most of the sub basins except in K\_02, K\_06, K\_10, K\_13, K\_23, K\_26, K\_28, K\_30, K\_35, and K\_36 where there is a deviation from the general observation. This deviation might be due to the variation in the slope and topography (Vittala (2004), Chopra (2005) and Rudraiah (2008)).

### 3.1.4. Stream length ratio ( $R_l$ )

Stream length ratio is the ratio of the mean length of the one order to the next order of the stream segments (Horton R. E., 1945). Highest stream length ratio can be spotted at sub basins K\_17 and K\_11 with 8.50 and 8.32 respectively, whereas, lowest stream length ratio can be seen in sub basins K\_28 and K\_30 with 0.38 and 0.35 respectively. The increasing trend in the stream length ratio could be attributed to early mature geomorphic stages of the watershed. However the sudden decrease of stream length ratio in higher order stream segment might be due to mature topographic impression of the basin.

### 3.1.5. Bifurcation ratio ( $R_b$ )

The term bifurcation ratio refers to the ratio between the total number of streams of one order to that of next higher order (Schumm, 1956). The  $R_b$  in the sub basins of the study area ranges from 3.00 to 9.11. Higher  $R_b$  values with more than 5.00 are found in the 28 sub-basins of Kalu river. This indicates strong structural control on the drainage pattern and low permeability of the sub surface strata. Whereas the lower  $R_b$  values with less than 5.00, found in the remaining 11 sub-basins are attributed to the characteristics of less structural disturbances which in turn has not distorted the drainage pattern.

### 3.1.7. Weighted Mean of Bifurcation Ratio

The weighted mean bifurcation ratio ( $R_{bwm}$ ) may be defined as the average of bifurcation ratios of all orders. In the present study,  $R_{bwm}$  varies between 2.77 to 9.84. Sub-basin K\_05, K\_07, K\_09, K\_18, K\_21, K\_22, K\_25, K\_30 and K\_38 indicates a strong structural control on the drainage pattern and rest of the sub-basins fall under normal basin category.

### 3.1.8. Length of overland flow ( $L_o$ )

Horton R. E. (1945) defined length of overland flow ( $L_o$ ) as length of flow over the ground surface before the runoff becomes concentrated in definite stream channels. The values obtained in the study area vary from 0.13 to 0.39 km. The minimum  $L_o$  values found in sub-basins K\_1, K\_3 and K\_26 indicates shorter flow paths, high relief or steep slopes and the rainwater will enter the stream quickly which results into high runoff. Whereas the maximum  $L_o$  values found in sub-basin K\_36 indicates longer flow paths, low relief or gentler slopes and the rainwater had to travel relatively longer distance before getting concerted into stream channels.

## 3.2. Estimation of areal parameters

### 3.1.6. Drainage density ( $D_d$ )

The drainage density ( $D_d$ ) is the ratio of the total channel segment length ( $L$ ), computed for all orders within a sub-basin to the basin area. The average drainage density in Kalu river basin is 2.35. It ranges from minimum 1.37km/sqkm in K\_12 to maximum 4.00 km/km<sup>2</sup> in K\_03 sub basin. It is observed that low drainage density found in regions of highly resistant or permeable soil material under vegetative cover and low relief. In contrast, high drainage density is found in the regions of weak and impermeable sub- surface material, sparse vegetation and mountainous relief (Nag, 1998).

### 3.2.8. Drainage frequency ( $F_s$ )

Stream frequency may be defined as the number of streams per unit area. In the study area, it is noted that the value of  $F_s$  vary from 1.64 to 7.76. It's been classified into very low, low, moderate and high stream frequency zones. Overall sub basins are dominated by moderate stream frequency. The variation is due to rainfall, relief, infiltration rate and initial resistivity of that terrain to erosion.

### 3.1.7. Texture ratio (T)

Texture ratio refers to the the relative spacing of drainage lines. Horton (1945) defined drainage texture as number of stream per unit area. In the present study, classification given by Smith (1950) has been adopted, i.e. very coarse (<2) and coarse (2-4) texture can be seen at the central and western region of Kalu basin, moderate texture (4-6) are found in K-14, K\_15 and K\_20, fine (6-8) and very fine (>8) drainage texture are found in the northern and eastern region of the study area.

### 3.2.3. Form factor ( $F_f$ )

The ratio of basin area to the square of basin length is called the form factor (Horton,1932). The shape of a basin is identified by form factor (Rf). The Rf value '0' confirms highly elongated shape and '1.0' indicates circular shape of the basin. Low form factor ratio will be for basin of flatter peak flow for longer duration with less side flow for shorter duration and high main flow for longer duration and vice-verse (Biswas S, et. al.,1999 and Reddy, G.P.O., et. al., 2002). In the present study, form factor ranges from 0.29 to 0.48. It reveal that, almost all the sub-basins have low  $R_f$  indicating elongated shape and suggested that hydrograph peak for long duration. Flood flows of such elongated basins are easier to manage than those of the circular basin.

### 3.2.1. Circulatory ratio ( $R_c$ )

It is defined as the ratio of basin area to the area of a circle having the same perimeter as the basin. The circulatory ratio is influenced by the length and the frequency of stream, geological structure, vegetation cover, climate, relief and slope of the basin. In the study area, the  $R_c$  values range from 0.27 to 0.72. The sub basins K\_02, K\_16, K\_24, K\_30, K\_34 and K\_39 have the highest  $R_c$  values (more than 0.60), which indicates that watershed shapes are like circular. These sub-basins have higher peak flow as compared to elongated basins. Almost all the sub basins falls under elongated shape as their values are below 0.5. The exceptions are K\_30, K\_24, K\_34, K\_29, where it is less elongated in shape. Here, the watershed shapes are like circular as a result it gets scope for uniform infiltration and takes long time to reach access water at basin outlet, which is further subjected to existing geology, slope and land cover (Reddy O.G.P, 2009).

### 3.2.2. Elongation ratio ( $R_e$ )

It is the ratio of diameter of a circle having the same area as the basin and the maximum basin length. The values of elongation ratio generally range from 0.6 to 1.0 over a wide variety of climatic and geologic types (Schumm S. A. 1956). The values close to 1.0 are typical of a region of very low relief, whereas values close to 0.6 are generally associated with high relief and steep ground slope ( Strahler, A.N., 1964 quoted in Singh 2000). In Kalu river basin the elongation ratio values range from 0.60 to 0.78. The sub-basins K\_01, K\_02, K\_03, K\_08, K\_10, K\_11, K\_12, K\_13, K\_14, K\_15 and K\_20 falls under elongated category and the remaining other sub basins falls under less elongated category

### 3.2.6. Constant of channel maintenance (C)

The constant of channel maintenance indicates the minimum area required for the development and maintenance of a channel; that is, the ratio represents the amount of basin area needed to maintain one linear unit of channel length (Ritter D.F., 1978). It is the area required to maintain one linear kilometer of stream channel. . Generally a higher constant of channel maintenance of a basin indicates higher permeability of the rock of that basin and vice-versa. In the study area, the value of C ranges from 0.26 to 0.79. Except for the sub basins K\_12, K\_22, K\_36, rest other sub basins falls under low to moderate constant of channel maintenance. It indicates that these sub basins are under the influence of high structural disturbance, low permeability, steep slopes and high surface run off.

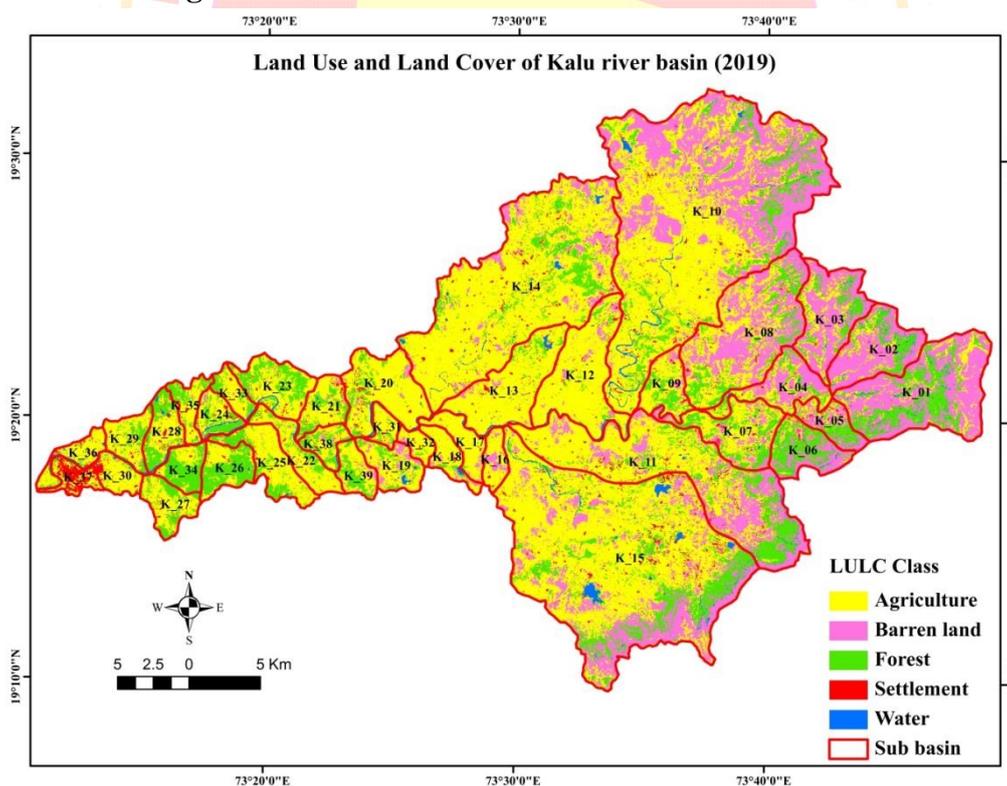
### 3.3 Land Use/Land Cover analysis

The modification of landscape done by human being has a profound effect on the natural setting of the environment. The influence of human being in the changing pattern of the land use at present is the main

environmental concern. "Knowledge about land use/land cover has become important to overcome the problem of biogeochemical cycles, loss of productive ecosystems, biodiversity, deterioration of environmental quality, loss of agricultural lands, destruction of wetlands, and loss of fish and wildlife habitat." (Mallupattu & Sreenivasula Reddy, 2013). On the basis of the interpretation of the remote sensing imagery, the study area is been classified into five categories. Out of the total area of Kalu river basin (1134 km<sup>2</sup>), around 626.79 km<sup>2</sup> area comprises of agricultural land, 188.98 km<sup>2</sup> area falls under forest, 270.97 km<sup>2</sup> under barren land, 21.91km<sup>2</sup> comprises of water body and 25.85 km<sup>2</sup> occupied by settlement (Table 4). Figure 4 shows that agriculture is the predominant occupation in the study region. Areas under forest are comparatively less than the barren land. Chances of bringing more barren land under cultivation is possible in near future. There should be a proper planning for the barren land to convert into forest area.

Sr.no	Class	Area (sqkm)
1	Agricultural land	626.79
2	Forest	188.98
3	Barren land	270.97
4	Water	21.91
5	Settlement	25.85
<b>Total</b>		<b>1134.5</b>

**Figure 4 Land Use/ Land Cover of Kalu river basin.**



**4. Prioritization of Sub-watershed** The morphometric parameters like drainage density, bifurcation ratio, stream frequency, elongation ratio, form factor, circularity ratio and compactness constant can be termed as erosion risk assessment parameters and have been used to prioritize watershed. (Biswas, et al. 1999). The analyses of morphometric parameters are significant in identifying and determining the zones of areas of high erosion risk (Yadav et al., 2016). Prioritization of thirty nine sub-watersheds has been done to identify the zone having high soil erosion activity so that proper conservation measures can be taken to check the soil erosion of that particular area. The sub-watersheds have been classified into five priority zones according to their

compound value as Very high, High, Medium, Low and Very low. The watershed wise prioritization ranks are given in table 5 and the final prioritized map of the study area is shown in figure 5.

As far as the morphometric parameter are concerned, very high priority zone consist of six watershed, highest priority zone consists of nine watersheds, medium priority of six, low priority of eight watersheds and very low priority of ten watershed. Land Use/Land Cover classes are categorized as agricultural land, Forest, Barren land, water body and settlement at the sub-basin level. It is observed that very high priority zone consist of seven watersheds; highest priority zone consists of eleven watersheds, medium priority of thirteen, low priority of six watersheds and very low priority of two watersheds. Thus, environmental management and conservation to be applied first to K\_10,K\_11,K\_12 and K\_14 sub-watersheds followed by other sub-watersheds.

**Table 5 Prioritization of Kalu river basin (Morphometric parameters)**

Sub Basin	R b	R bw	Dd	Fs	T	Lo	Rf	Rc	Re	Cc	Compound Factor	Prioritized Rank	Interpretation
K_01	6	24	3	5	20	37	5	26	6	38	17	2	High
K_02	12	30	4	4	25	34	11	34	9	39	20.2	3	Medium
K_03	10	17	1	2	22	38	9	15	10	37	16.1	1	Very high
K_04	13	12	24	30	9	14	13	1	13	36	16.5	2	High
K_05	21	4	8	20	5	31	24	16	24	35	18.8	2	High
K_06	20	22	5	15	7	35	14	33	14	34	19.9	3	Medium
K_07	5	6	28	29	15	12	12	6	12	33	15.8	1	Very high
K_08	8	15	9	17	14	32	6	27	5	32	16.5	2	High
K_09	22	2	32	33	10	6	17	12	17	29	18	2	High
K_10	1	18	16	26	11	23	1	17	1	30	14.4	1	Very high
K_11	3	25	30	34	4	9	4	2	4	31	14.6	1	Very high
K_12	4	7	38	39	6	2	7	9	7	28	14.7	1	Very high
K_13	14	19	36	32	16	3	8	13	8	24	17.3	2	High
K_14	2	23	25	31	8	15	3	14	3	25	14.9	1	Very high
K_15	7	35	27	35	1	13	2	19	2	26	16.7	2	High
K_16	31	28	22	14	32	17	34	35	34	27	27.4	5	Very low
K_17	16	16	18	10	37	20	25	11	25	17	19.5	3	Medium
K_18	28	10	11	18	13	28	28	10	28	18	19.2	3	Medium
K_19	18	11	7	8	29	33	19	23	18	19	18.5	3	Medium
K_20	9	26	12	12	30	29	10	18	11	20	17.7	2	High
K_21	25	8	26	24	23	16	20	28	19	21	21	4	Low
K_22	26	9	37	28	27	4	18	4	20	22	19.5	3	Medium
K_23	27	31	34	22	33	7	15	32	15	23	23.9	4	Low
K_24	23	20	20	13	34	21	29	38	29	13	24	5	Very low
K_25	11	5	23	21	19	18	16	5	16	14	14.8	2	High
K_26	19	37	2	1	36	39	21	29	21	15	22	4	Low
K_27	35	34	29	36	2	11	22	30	22	16	23.7	5	Very low
K_28	30	29	21	23	17	19	23	24	23	7	21.6	4	Low
K_29	37	36	35	38	3	5	26	21	26	8	23.5	5	Very low
K_30	15	1	19	19	18	22	30	39	30	9	20.2	4	Low
K_31	32	32	17	7	39	24	38	20	38	10	25.7	5	Very low
K_32	34	38	14	9	35	25	39	31	39	11	27.5	5	Very low

K_33	36	27	33	27	26	8	37	22	35	12	26.3	5	Very low
K_34	24	21	15	16	21	26	27	36	27	3	21.6	4	Low
K_35	29	33	6	6	24	36	31	7	31	4	20.7	4	Low
K_36	38	39	39	37	12	1	32	3	32	5	23.8	5	Very low
K_37	33	14	31	25	28	10	35	8	36	6	22.6	5	Very low
K_38	17	3	10	3	38	30	36	25	37	1	20	4	Low
K_39	39	13	13	11	31	27	33	37	33	2	23.9	5	Very low

Table 6 Prioritization of Kalu river basin (Land Use/Land Cover parameters)

Sub Basin	Agriculture	Forest	Barren land	Water	Settlement	Total	Compound factor	Prioritized Rank	Interpretation
K_01	19	37	3	4	28	91	18.2	2	High
K_02	34	28	7	11	29	109	21.8	3	Medium
K_03	23	27	6	18	26	100	20	3	Medium
K_04	20	22	9	10	18	79	15.8	2	High
K_05	38	23	12	23	17	113	22.6	3	Medium
K_06	39	33	10	20	23	125	25	3	Medium
K_07	10	31	11	21	12	85	17	2	High
K_08	7	34	4	30	7	82	16.4	2	High
K_09	14	21	15	26	21	97	19.4	2	High
K_10	2	38	1	2	4	47	9.4	1	Very High
K_11	4	36	5	6	5	56	11.2	1	Very High
K_12	5	10	13	9	11	48	9.6	1	Very High
K_13	6	11	18	5	8	48	9.6	1	Very High
K_14	3	35	8	3	3	52	10.4	1	Very High
K_15	1	39	2	1	1	44	8.8	1	Very High
K_16	26	1	16	39	36	118	23.6	3	Medium
K_17	13	2	21	19	33	88	17.6	2	High
K_18	21	7	20	28	35	111	22.2	3	Medium
K_19	15	12	14	25	27	93	18.6	2	High
K_20	8	20	17	8	6	59	11.8	1	Very High
K_21	16	18	23	34	14	105	21	3	Medium
K_22	12	14	26	15	25	92	18.4	2	High
K_23	11	30	27	17	16	101	20.2	3	Medium
K_24	29	16	24	13	15	97	19.4	2	High
K_25	9	25	29	32	19	114	22.8	3	Medium
K_26	31	32	33	36	30	162	32.4	5	Very Low
K_27	17	24	35	35	20	131	26.2	4	Low
K_28	25	26	28	12	10	101	20.2	3	Medium
K_29	18	13	32	22	22	107	21.4	3	Medium
K_30	24	5	36	16	9	90	18	2	High
K_31	35	8	31	27	34	135	27	4	Low
K_32	33	3	22	33	39	130	26	4	Low
K_33	30	9	34	29	31	133	26.6	4	Low
K_34	37	29	37	37	38	178	35.6	5	Very Low

K_35	28	17	30	31	32	138	27.6	4	Low
K_36	22	6	38	7	13	86	17.2	2	High
K_37	36	4	39	24	2	105	21	3	Medium
K_38	32	15	25	14	24	110	22	3	Medium
K_39	27	19	19	38	37	140	28	4	Low

Figure 5: Prioritization of Kalu river basin (Morphometric parameters)

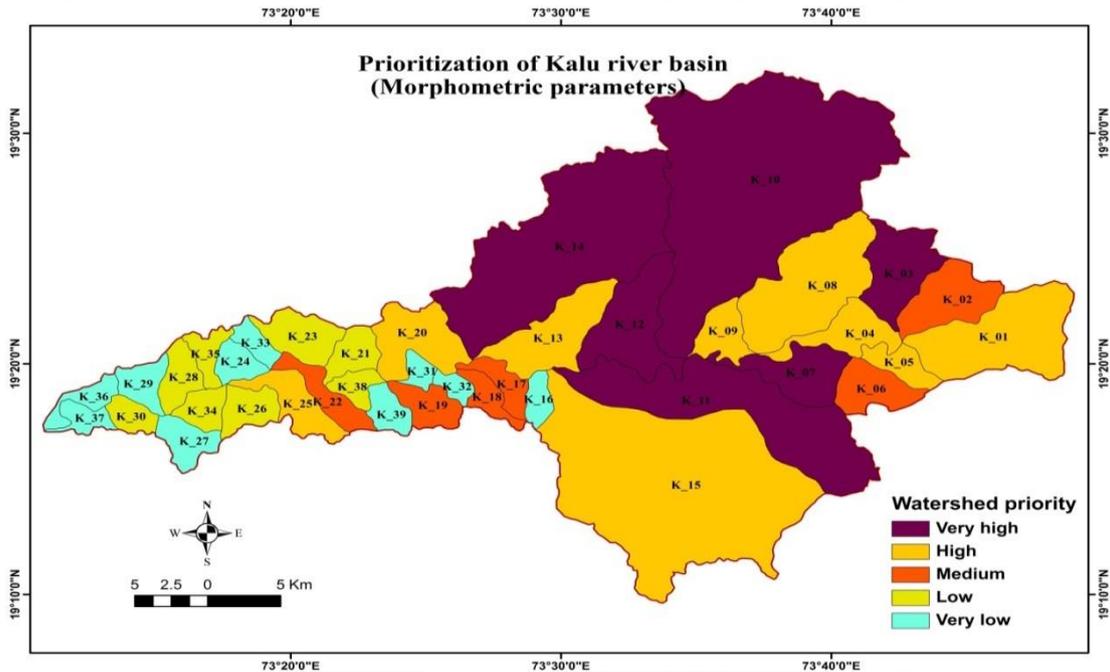
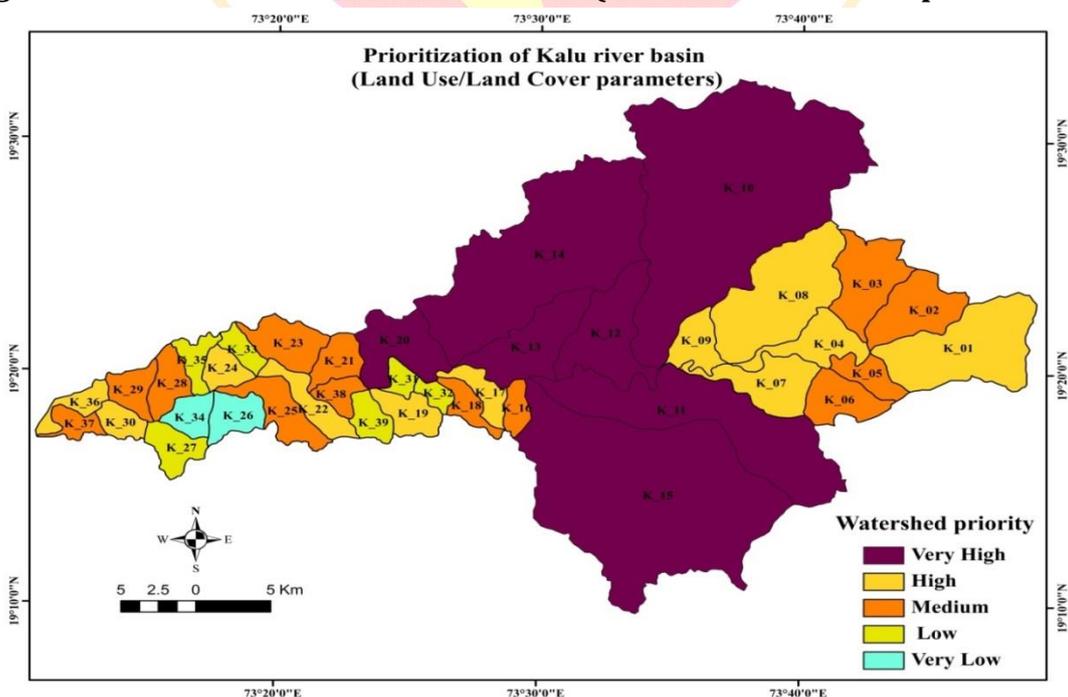


Figure 6: Prioritization of Kalu river basin (Land Use Land Cover parameters)



## 5. Conclusion:

Morphometric and Land Use /Land Cover analysis is an important tool to evaluate the soil erosion and watershed management of the Kalu river basin. In the present study, morphometric analyses were carried out through measurement of linear and areal aspects of the watershed. Lowest drainage density is found in the middle course of Kalu river basin where the subsoil is highly resistant permeable under dense vegetation and low relief. High drainage density are found in the rugged region towards east, indicates impermeable rocks. Average drainage density is 2.41 which indicate moderate permeability and better vegetation cover. The bifurcation ratio indicates strong structural control on the drainage basin. The value of circularity ratio and form factor suggests that the sub watersheds are more or less elongated in shape. The flood flows of such an elongated basin are easier to manage than those of the circular. In the Kalu river basin, the value of elongation ratio for all sub watersheds indicates high relief and steep ground slope.

Watershed prioritization is one of the most important aspects of planning for implementation of its development and management programs. The result of prioritization of sub-watersheds as per morphometry shows that, sub basins K\_3, K\_7, K\_10, K\_11, K\_12 and K\_14 falls under high priority category. As per Land Use /Land Cover analysis, sub-basins K\_10, K\_11, K\_12, K\_13, K\_14 and K\_20 falls under high priority. Comparative analysis of both Morphometric and LU/LC analysis gives us similar results, where the priority class more or less overlaps in the same category. High priority sub basins are having greater degree risk of soil erosion and environmental degradation. Therefore, immediate attention towards soil and water conservation measures is required in these watersheds to preserve the land from further erosion.

## References

1. Biswas, S., Sudhakar, S. and Desai, V. (1999). Prioritisation of subwatersheds based on morphometric analysis of drainage basin: a remote sensing and gis approach. *Journal of the Indian Society of Remote Sensing*, 27(3), pp.155-166.
2. Choudhari, P. P., Nigam, G. K., Singh, S. K., & Thakur, S. (2018). Morphometric based prioritization of watershed for groundwater potential of Mula river basin, Maharashtra, India. *Geology, Ecology, and Landscapes*, 2(4), pp. 256-267.
3. Clarke, J. I. (1966). Morphometry from maps. *Essays in geomorphology*, 235-274.
4. Doornkamp, J. C., & King, C. A. (1971). *Numerical analysis in geomorphology: an introduction*. Hodder Education.
5. Horton, R. (1932). Drainage-basin characteristics. *Transactions, American Geophysical Union*, 13(1), pp.350-361.
6. Kale, V. S., & Gupta, A. (2001). *Introduction to geomorphology*. Orient Longman.
7. Mallupattu, P., & Sreenivasula Reddy, J. (2013). Analysis of Land Use/Land Cover Changes Using Remote Sensing Data and GIS at an Urban Area, Tirupati, India. *The Scientific World Journal*, 2013, 1-6.
8. Miller, V. C. (1953). Quantitative geomorphic study of drainage basin characteristics in the Clinch Mountain area, Virginia and Tennessee. *Technical report (Columbia University. Department of Geology); no. 3*.
9. Nag, S. (1998). Morphometric analysis using remote sensing techniques in the Chaka sub-basin, Purulia district, West Bengal. *Journal of the Indian Society of Remote Sensing*, 26(1-2), pp.69-76.
10. Reddy, G.P.O. (2009). GIS applications in morphometric analysis at watershed scales. *ISRS-Nagpur pre-symposium tutorial notes-I*, 2, pp.38-53.
11. Schumm, S. A. (1956). Evolution of drainage systems and slopes in badlands at Perth Amboy, New Jersey.
12. Smith, K.G. (1950). Standards for grading texture of erosional topography. *American Journal of Science*. 248. pp. 655-668
13. Strahler, A. N. (1964). Part II. Quantitative geomorphology of drainage basins and channel networks. *Handbook of Applied Hydrology*. McGraw-Hill, New York, pp. 4-39.
14. Vittala, S. S., Govindaiah, S., & Gowda, H. H. (2004). Morphometric analysis of sub-watersheds in the Pavagada area of Tumkur district, South India using remote sensing and GIS techniques. *Journal of the Indian Society of Remote Sensing*, 32(4), pp. 351.

## Potentials for Tourism Development in Konkan

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### 1. Introduction

Konkan, a region endowed with natural beauty and rich in ancient cultural heritage has a great potential for developing as a leading tourism destination in India. Potential for tourism development in Konkan is put forth here with reference to Potentials for development of Tourism types.

### Potentials for development of Tourism types

Konkan region is endowed with natural beauty and historical structures that are still underutilised for attracting the tourism segment to this region. Therefore promoting different tourism types would provide a great momentum to tourism business in the region. These are:

#### Beach Tourism:

Konkan is gifted with long coastline of 720 kms. It has number of peaceful and clean beaches waiting for the tourists. Beaches from Raigad district like Alibag, Kihim, Revdanda, Kashid, and the beaches from Ratnagiri like Anjarle, Ganpatipule are visited by more tourists. Sindhudurg district has become famous for Devbag and Tarkarli beaches. But apart from this there are beaches which are awaiting for the tourism development like Bordi, Devgad, Mochemad, Mithbav and Tondavli.

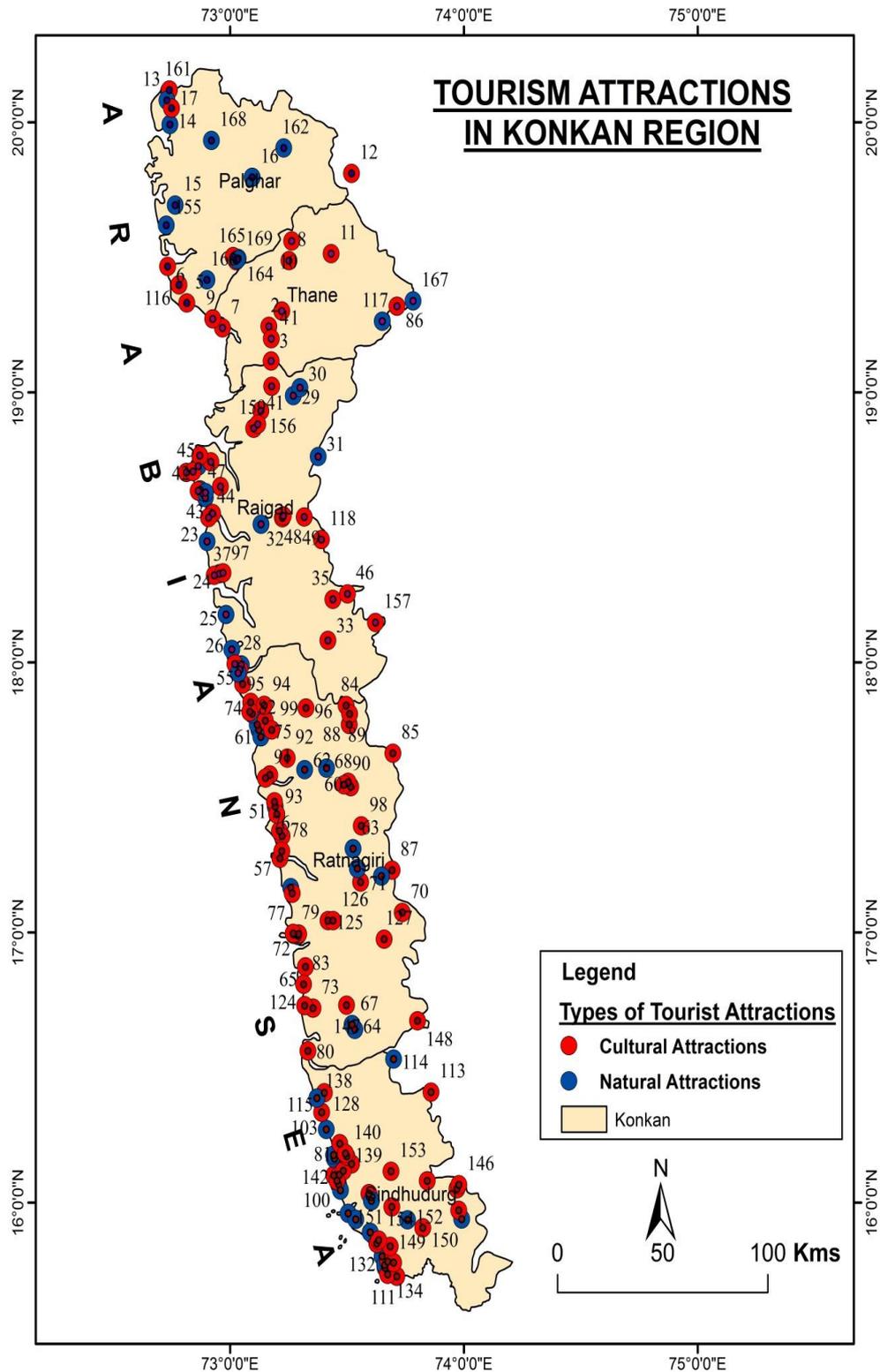
#### Cruise Tourism:

India and UAE have agreed to boost maritime transport so as to increase the people and people contact and increase tourism, especially cruise tourism. India is also looking at visa exemptions for official and special passport holders, which can benefit Maharashtra, especially Konkan region.

#### Ecotourism:

Ecotourism is a form of tourism involving visiting fragile, pristine, and relatively undisturbed natural areas, intended as a low-impact and often small-scale alternative to standard commercial mass tourism. It means responsible travel to natural areas, conserving the environment, and improving the well-being of the local people. Its purpose may be to educate the traveller, to provide funds for ecological conservation, to directly benefit the economic development and political empowerment of local communities, or to foster respect for different cultures and for human rights.

Map 1: Tourism Attractions in Konkan Region



Key: Tourism Attractions in Konkan region

ID	NAME	ID	NAME	ID	NAME	ID	NAME
1	Shridhon	41	Mahad	81	Adivare	121	Napne
2	Shivthargal	42	Kankeshwar	82	Anjarle	122	Kunkeshwar
3	Shantivan	43	Raigad fort	83	Asud Keshavraj	123	Nirmal
4	Tara	44	Bankot fort	84	Vyadeshwar Mandir	124	Palu
5	Jawhar	45	Janjira	85	Ratnagiri fort	125	Bhira

6	Vajreshwari	46	Alibag fort	86	Jaigad	126	Chandepatti
7	Alkoli	47	Khanderi	87	Ratnadurga	127	Avas
8	Ganeshpuri	48	Sagargad	88	Vijaydurg	128	Rajwadi
9	Tungareshwar	49	Karnala	89	Sindhudurg	129	Diva island
10	Malshej Ghat	50	Kolaba	90	Suvarnadurg	130	Tivare
11	Mahalaxmi	51	Revdanda fort	91	Purnagad	131	Kankaditya
12	Vajreshwari kund	52	Korlai	92	Mahipatgad	132	Nivli Petroglyphs
13	Titwale	53	Underi	93	Vasota	133	Gavadewadi Petroglyphs
14	Shahad	54	Lingana	94	Bhairavgad	134	Medhe
15	Malang gad	55	Akshi_1	95	Prachitgad	135	Vimleshwar
16	Ambarnath	56	Sarasgad	96	Rasalgad	136	Dhamapur
17	Vasai fort	57	Sudhagad	97	Sumargad	137	Achara
18	Thane	58	Ratnagiri	98	Govalkot	138	Anganewadi
19	Mahuli	59	Guhaghar	99	Gopalgad	139	Sagareshwar
20	Ghodbunder	60	Karde	100	Panhalikaji caves	140	Ozar
21	Tansa	61	Murud	101	Palshet	141	Aravali
22	Bhatsa	62	Harne	102	Chikhali	142	Rameshwar
23	Vaitarna	63	Kelshi	103	Velas	143	Ajgaon
24	Palghar	64	Dabhol	104	Palgad	144	Devgad
25	Vikramgad	65	Nandivade	105	Murud town	145	Bharatgad
26	Alibag	66	Malgund	106	Derwan	146	Bhagwantgad
27	Akshi	67	Ganpatipule	107	Dapoli Agricultural University	147	Valaval
28	Nagaon	68	Chiplun	108	Malvan	148	Sarjekot
29	Revdanda	69	Ladghar	109	Tarkarli	149	Mahadevgad
30	Kihim	70	Unhavare	110	Mochemad	150	Manohar Manasantoshgad
31	Kashid	71	Aravali	111	Mithbav	151	Ranganagad
32	Murud	72	Unhale	112	Tondavali	152	Shivapur
33	Diveagar	73	Pawas	113	Bhogave	153	Kunkeshwar
34	Shrivardhan	74	Hedavi	114	Nivati	154	Ainari
35	Bagmandla	75	Rajapur	115	Kondura	155	Khajandevi
36	Harihareshwar	76	Parshuram	116	Shiroda	156	Sawantwadi
37	Matheran	77	Velneswar	117	Vayangani	157	Pinguli
38	Tapalwadi waterfall	78	Marleshwar	118	Velaghar	158	Akeri
39	Zenith	79	Karneshwar	119	Amboli	159	Sindhudurg nagari
40	Pali	80	Dhutpapeshwar	120	Dajipur	160	Vengurla

Velas has come up as important eco-tourism centre. Mahuli fort and Tansa wild life sanctuary is another important eco-tourism centre. Malvan marine Natural Park is yet another avenue. But apart from it there are number of opportunities for eco-tourism. Alibaug-Murud-Janjira is the coastal belt which attracts large number of migratory birds. It is also rich in local bird species. Mhasala creek is the ideal location for migratory birds like crab-plover, oyster catcher, plovers, sand pipers, godwit and alike birds. Hornbill, Woodpecker, Golden orca and birds of heaven are commonly seen here. The coastal belt between Dighi to Harihareshwar (Raigad District) is also very rich in bird life. Turnstones migrate from Europe and Siberia and land here. Reef herons, Green herons, Black headed and Brown headed Gulls, Shank, Lesser crested tern, Rosy tern, and Eagles are found here. Phansad bird sanctuary near Alibag in Raigad district is rich in biodiversity. Currently it is visited only by trekkers and bird lovers. It has potential to attract more tourist in different parts of the year. Mauli Lake near Paat-Parule near Kudal supports great variety of water lilies, lotus and various

other aquatic plants. It also attracts variety of migratory birds especially during winter season. Such sites can be explored for eco-tourism. Tradition of 'devrai' (sacred grooves) is found in some villages of Konkan. These areas can also be used for eco-tourism.

#### **Geo Tourism:**

It seeks to provide tourists with relevant information on the formation of a place's geology and geomorphology. Apart from these, geo tourism is also involved in encouraging both the local community and the tourists to work together in maintaining the quality of each geological site by following the preservation guidelines that are already in place.

Hot water springs, steep slopes of Sanhyadri, waterfalls, caves, valleys, sea cliffs, features of erosion and weathering and sea wave cut landforms are found in different parts of Konkan. Such places can be selected for the promotion of Geo tourism.

Brahman ghal located in Ratnagiri district has outstanding potential. A small gorge is situated near the beach. At the time of high tide, sea waves rush into this gorge and collide on rocks and a water column of about 15-20 meters rises from this gorge.

#### **Rural Tourism:**

To showcase rural life, art, culture and heritage at rural locations in villages and to benefit the local community economically and socially as well as to enable interaction between tourists and local population for a mutually enriching experience, rural tourism can be promoted. Rural tourism focuses on actively participating in a rural lifestyle. It can be a variant of ecotourism. There is a segment of the urban population that is interested in visiting the rural areas and understanding the lifestyle. Agro tourism is one form which can be promoted in Konkan. It is helpful to both farmers and urban people. It provides additional income source and job opportunities to the farmers and nearby youth. Development of agro tourism has started in Konkan. But it is very limited. Awareness about government schemes and training facilities are provided by some NGO's like Konkan Pratishtan. It is helping the farmers to start this activity.

#### **Heritage Tourism:**

Konkan has treasure of tangible and intangible heritage resources. It has an enormous capacity to support and inspire the development of the region. Many of the region's innumerable cultural jewels are threatened, in some cases by overuse, in others by neglect, and in many simply by the pressures of economic development and striving toward a better future. The presence of these highly valuable cultural endowments in the region opens up major opportunities for development, providing a major source of employment, and thereby contributing to the reduction of poverty and the decrease of chronic joblessness.

#### **Heritage resources of Konkan**

##### **Petroglyphs:**

Petroglyphs, the sculptures which are beautifully carved on the open and vast lateritic plateaus in Ratnagiri and Rajapur talukas are the unique tourist attractions. As of January 2019, there have been 52 confirmed and explored sites and over 1000 petroglyphs discovered. Still the explorations are in progress at 16 more sites. These magnificent rock carvings are made in hard lateritic rock during Mesolithic and Neolithic period, almost 10,000 BC. Even though these sculptures which are made of various animals, birds and geometrical structures are very mysterious, yet they are a beautiful man-made invention. Two researchers namely Sudhir Rishbud and Dhananjay Marathe, from Ratnagiri have thoroughly studied these sculptures and made a classified list of them. Tejas Garge, Director of state Archaeological department has estimated that these petroglyphs date back to be between 10,000 BC and 2,000 BC.

In many places, the size of the carvings of elephants and tigers are as big as the actual animals. The carvings of a crocodile, tortoise, fishes, and snakes can also be seen. But in all the sculptures; human figure carvings are more common. Geometrical shapes were excavated in the square of Gawadewadi and Nivaliphata. The purpose of this carving is yet undiscovered. Many of the sculptures are unfinished but most of them have been carved clearly and beautifully. In Maharashtra's cultural records, there is no evidence of any art being practiced until about 3,000 BCE, which is when the first mention of painted pots and clay figurines are found.

In this context petroglyphs are a significant find for a better understanding of the history of this region and its artistic traditions.

There are depictions of wild animals including pythons, leopards and wild boars, birds such as the peacock and aquatic creatures such as sharks and stingrays. The petroglyphs also depict the gamut from sea turtle to a bird known as "elephant bird" that's not local to Konkan.

The State government has set aside ₹ 24 crore for further research on these sites. A lot of administrative work still needs to be done to showcase these petroglyphs as tourist attractions for the region.

This would involve a system of viewing galleries and refreshment facilities a small fee and possibly sell tea and snacks. The Maharashtra Tourism Development Corporation has planned to develop some of these sites and to incorporate them into the tourist circuit of a region.

#### **Historical forts:**

There are two varieties of forts in Konkan namely land forts and sea forts. Every district of Konkan is characterised by existence of historical forts. Palghar district has – Two forts namely Vasai and Arnala. Thane district have three forts. Raigad district has got its name from the fort Raigad. It has one beautiful sea fort namely Janjira and four land forts. Ratnagiri district is the richest district in this respect It has twelve major forts. Sindhudurg district also has got its name from the sea-fort of Sindhudurg. It also has four major forts. Most of these forts are visited only by hikers or trekkers except Raigad, Sindhudurg, Janjira, Vasai, Arnala and Vijaydurg. These forts can be made more accessible to the tourists by providing required infrastructure.

#### **Archaeological Sites:**

Existence of ancient civilisation in Konkan is proved by numerous archaeological sites in different districts. Elephanta caves, Panhalekaji caves, Ainari caves, Akshi, Kunkeshwar, Palshet, Waghbil and petroglyphs are the examples.

#### **Warli Art:**

Warli painting is a style of indigenous art mostly created by the tribal people from the North Sahyadri Range in India. This range encompasses cities such as Dahanu, Talasari, Jawhar, Palghar, Mokhada, and Vikramgad of Palghar district. The tribal style of art is thought to date back as early as 10th century A.D. The Warli culture is centred on the concept of Mother Nature and elements of nature are often focal points depicted in Warli painting. Farming is their main way of life and a large source of food for the tribe. They greatly respect nature and wildlife for the resources that they provide for life. Warli artists use their clay huts as the backdrop for their paintings, similar to how ancient people used cave walls as their canvases.

These wall paintings use a set of basic geometric shapes: a circle, a triangle, and a square. These shapes are symbolic of different elements of nature. The circle and the triangle come from their observation of nature. The circle represents the sun and the moon, while the triangle is derived from mountains and pointed trees. In contrast, the square appears to be a human invention, indicating a sacred enclosure or a piece of land. The central motif in each ritual painting is the square, known as the "chauk" or "chaukat", mostly of two types known as Devchauk and Lagnachauk. Inside a Devchauk is usually a depiction of Palaghata, the mother goddess, symbolizing fertility.

The central motif in the ritual painting is surrounded by scenes portraying hunting, fishing, and farming, and trees and animals. Festivals and dances are common scenes depicted in the ritual paintings. People and animals are represented by two inverse triangles joined at their tips: the upper triangle depicts the torso and the lower triangle the pelvis. Their precarious equilibrium symbolizes the balance of the universe. The representation also has the practical and amusing advantage of animating the bodies. Another main theme of Warli art is the denotation of a triangle that is larger at the top, representing a man; and a triangle which is wider at the bottom, representing a woman. The ritual paintings are usually created on the inside walls of village huts. The walls are made of a mixture of branches, earth and red brick that make a red ochre background for the paintings. The Warli only paint with a white pigment made from a mixture of rice paste and water, with gum as a binder. A bamboo stick is chewed at the end to give it the texture of a paintbrush. Walls are painted only to mark special occasions such as weddings or harvests. These art forms are now painted on papers and canvas and other mediums are also used. The art has become world famous. But the places where it originated can attract tourists by organising workshops and exhibitions and festivals.

**Chitrakathi:**

This is ancient folk tradition and a unique style of painting dating back to 17<sup>th</sup> century. It is practised in Pinguli, a small village near Kudal, in the district of Sindhudurg by Thakar community. It involves story telling with the help of pictures. 'Chitra' means picture and 'Katha' means story. Together, the term was originally used to describe storytellers who narrated stories using visual aids accompanied by music. It is also known as Paithani art.

Broadly speaking, Chitra Katha is identified in four forms:

- ❖ **Leather Shadow Puppets:** These two-dimensional profiles of mythological people cast haunting, colourful and vibrant shadows on a screen of thin cloth. The performance is usually at night, back-lit by huge oil lamp, with the complement of reading instrument and singing. The puppets are made out of leather beaten thin paper and painted by Natural dyes cut and perforated.
- ❖ **Stringed Wooden Puppets (Kalsutri):** The string puppets of wood of about 1.5ft in size are used by the artists. The puppets are colourfully clothed. Their faces are painted representing mythological heroes, queens, demons & humble servants. The nimble fingers of artist along with the singers and drum players create three-dimensional drama.
- ❖ **Picture Stories (known as Chitrakathi):** The Thakar community claim to possess a series of paintings depicting traditional stories for over 300 years. The stories belong to Ramayana, Mahabharata and Nandi Puran. By showing painting and singing alongside the artist builds vivid narratives. The paintings are usually 12"x18" and the paints are from natural sources. The sutradhar (narrator) unfolds the tale in the form of songs supported by the music of the vina, Taal and the huduk.
- ❖ **Bullock Art Show:** These sacred bulls along with his master, the drum beater, roam around from house to house and village to village, blessing people and receiving alms. The bull is draped and ornamented with interpret embroidery bells and peacock feathers.

Many individuals from this tribe were craftsmen of one type of the other. The main occupation was to move from village to village and entertain people. Many of them used to work as spies of rulers and especially during the reign of Maratha Kings, they were very active. Under the pretext of narrating episodes from the Ramayana and the Mahabharata through pictures, puppets and other visual aids they used to establish closer contact with the people, to extract political secrets and to furnish such information to the village heads.

The government of Maharashtra and other cultural organizations are coming forward to encourage this art form. One museum and art gallery has been set up by Parshuram Gangavane at Pinguli to revitalise this art. But tourists should be informed about it through various platforms and that can really help in promotion of this art.

**Religious Tourism**

- ❖ **Temples:** Konkan has temples built in local architectural styles and locally available building material. These temples are situated in scenic natural settings. Most of the temples are of lord Shiva and are situated near sea coast or on the hills. Every temple has its own history and tradition of fairs and festivals. These traditions are still followed by the local people. One of the ancient temples is located at Ambarnath. It can be promoted as religious and historical heritage site, by implementing better management plan.
- ❖ **Fairs and festivals:** Almost all temples and villages of Konkan have tradition of fairs and festivals. These are celebrated in most traditional manner. Most of the fairs start after the agricultural operations is over i.e. from the month of October. The fairs attract local producers and artisans. Such fairs can become tourist attraction for the urban tourists. There is example of Bharadidevi Yatra (Angnewadi Yatra), at Masure near Malvan.

Ganpati festival is celebrated in most sustainable manner in Konkan. The Ganpati idol is made of shadu clay and the decoration is done with locally available flowers and fruits. "Matoli" is the beautiful example of eco-friendly Ganpati decoration. Dahi kala, Balya dance, Bohada, Holi or Shimga Celebration can become added tourist attractions. Devdiwali is celebrated in Konkan in very traditional manner. During the Diwali festival farmers of Konkan are busy in agricultural operations. Therefore they celebrate Devdiwali which come in month of Margashish (November/December). They worship their livestock (Cows and bullocks) first. It is to show gratitude. They also worship 'baliraja' who is considered to be the god of farmers.

Designs from rice or rice bran are drawn and other local products like arecanuts and beetle leaves are used for the worship.

Deepotsav is celebrated at most of the temples in Konkan in which patterns of earthen lamps are made by the local women. Such traditions can be brought in limelight.

#### **Culinary Tourism:**

Culinary tourism has emerged as a central facet to any tourist experience. It encompasses cultural practices, the landscape, the sea, local history, values and cultural heritage. Food serves to connect us with the land, our heritage and the people around us. It is a diverse and dynamic channel for sharing stories, forming relationships and building communities. By combining travel with these edible experiences, food tourism offers both locals and tourists alike an authentic "taste of place".

Being a coastal area Konkan has tradition of variety of fish preparation and various vegetarian dishes made with coconut and other local ingredients. Raigad district has tradition of 'Popati', Ratnagiri district is known for its vegetarian recipes like Modak, Pangi and Sindhudurg district is known for Malvani cuisine. Malvani cuisine is the standard cuisine of the South Konkan region of Maharashtra and Goa. Although Malvani cuisine is predominantly non-vegetarian, there are many vegetarian dishes which are becoming famous.

In Malvani cuisine coconut is used liberally in various forms such as grated, dry-grated, fried, coconut paste and coconut milk. Many masalas have dried red chillies and other spices like coriander seeds, peppercorns, cumin, cardamom, ginger and garlic. All these ingredients are locally produced. Kokum, tamarind, and raw mango (kairi) are used to add to the taste. Solkadhi is a pink-coloured drink made from the kokam fruit (*Garcinia indica*) and coconut milk. It is used as appetizer.

#### **Film Tourism:**

It is estimated that film tourism has a scope to generate \$3 billion by 2022 in India as there is a potential for up to 1 million film tourists to visit the country by 2022. Konkan with its natural beauty and heritage resources can be promoted for this type of tourism. Marathi film industry has paved its way in Konkan. Locations like Mochamad, Mithbaw, Bhogawe and Nivati have become famous recently amongst the film makers. Alibag, Kihim, and other beaches from Raigad district have been used by Hindi film industry due to its proximity to Mumbai. Other beaches and scenic places from Ratnagiri and Sindhudurg districts can be also developed for this purpose. Film tourism provides direct benefits like employment and revenue generation apart from building brand image of the area.

#### **Destination wedding tourism:**

There is increasing trend of destination weddings in India. States of Gujrat and Rajasthan have exploited this avenue of tourism. Similarly tourism product of Konkan can be used for this purpose. Unpolluted beaches, rural setups, historical and archaeological sites can be used for this purpose. Sea-fort of Janjira is largely used for pre-wedding shooting by the people from Mumbai and Pune. Other forts of Konkan like Sindhudurg, Raigad, Vijaydurg, Jaigad, Devgad can be used for this purpose. Revenue collected from such use can be used for conservation of these heritage resources. Private hotel owners at Anjarle beach are providing facilities for destination wedding. Such facilities can be provided by hotel owners or government agencies at different beaches of Konkan.

## **2. Conclusion**

Potential for tourism lies in its natural and cultural attractions. Types of tourism that can be promoted here are beach tourism, eco-tourism, geo tourism, rural tourism, heritage tourism, religious tourism, culinary tourism, film tourism, destination wedding tourism and cruise tourism.

Konkan receives majority of tourist from the cities of Maharashtra like Mumbai, Pune, Kolhapur and Nashik. These cities have the service sector which creates employment opportunities continuously. There is continuous addition of aspirants in these cities. This employed section can be a target sector for the stake holders of tourism industry. Similarly other non-coastal districts of Maharashtra can be tapped to attract tourists. Konkan attracts tourists from middle income group. This segment of population is continuously increasing in the country. Dynamic use of social media can help in attracting more number of tourists.

In terms of domestic tourist visits Maharashtra ranks fifth. This position can be upgraded by following the footsteps of Kerala, which is achieving sustainable development with the help of tourism. Strengths and opportunities of Konkan in terms of tourism development are in the form of its natural beauty and patrimony resources. The planners can focus on various steps like plan for disaster management, tourist information centers for domestic and international tourists, signage system and provision of human resource development centers.

### 3. References

1. Chakravarti, S. (2001). "God's Acre, India Today", Retrieved from- <http://www.india-today.com/itoday/20010129/cover.shtml>
2. Parayil, G. (ed) (2000). "Kerala-The Development Experience", Reflections on Sustainability and Replicability, Zed Books, London.
3. Heller, P. (1996). "Social capital as a product of class mobilization and state intervention: Industrial workers in Kerala", India, World Development, 24(6), pp. 1055-1071.
4. Heller, P., Harilal, K., N., Choudhuri, S. (2007). "Building Local Democracy: Evaluating the Impact of Decentralization in Kerala", India, World Development, 35 (4), pp. 626-648.
5. Kokkranikal, J., Chettiparamb, A. (2012). "Responsible Tourism and Sustainability – the Case of Kumarakom", Kerala, India, Journal of Policy Research in Tourism Leisure and Events. 4. Pp. 302-326, Retrieved from-
6. [https://www.researchgate.net/publication/259828431\\_Responsible\\_Tourism\\_and\\_Sustainability\\_-\\_the\\_Case\\_of\\_Kumarakom\\_Kerala\\_India](https://www.researchgate.net/publication/259828431_Responsible_Tourism_and_Sustainability_-_the_Case_of_Kumarakom_Kerala_India)
7. [https://en.wikipedia.org/wiki/Malvani\\_cuisine](https://en.wikipedia.org/wiki/Malvani_cuisine)



## Roll of Weekly Market in Sustainable Development of Rural Area: A Case Study of Kherdi Weekly Market

Dr. Madhura Vardam

### Introduction:

A weekly market is a gathering of buyers & sellers at an appointed place & time, usually between mornings to evening. These markets attract large number of buyers & sellers. The present study is based on spatial interaction between these two participants & their role in the rural development.

### Objectives:

Role of weekly market in rural development is studied with respect of following objectives:

1. To study the sellers & buyers of Kherdi weekly market.
2. To assess the role of Kherdi weekly market in sustainable development of rural area.

### Data Collection:

Data collected mainly from primary & secondary sources.

- i. Primary data collected from Interviews of 70 sellers & 175 buyers of Kherdi weekly market,
- ii. 49 Sellers of daily Kherdi market, interview of Grampanchayat members & Observations.
- iii. Secondary data collected from Gram Panchayat office of Kherdi, Ratnagiri District Census Handbook, 2011 & GIS software.

### Research Methodology:

Entire research work is based on primary data & to some extent secondary data. To analyze the available data some cartographic technique like simple bar graphs & divided circles used at appropriate places & some data was analyzed in tabulation form in this work.

**Hypothesis:** Kherdi weekly market helps for rural development.

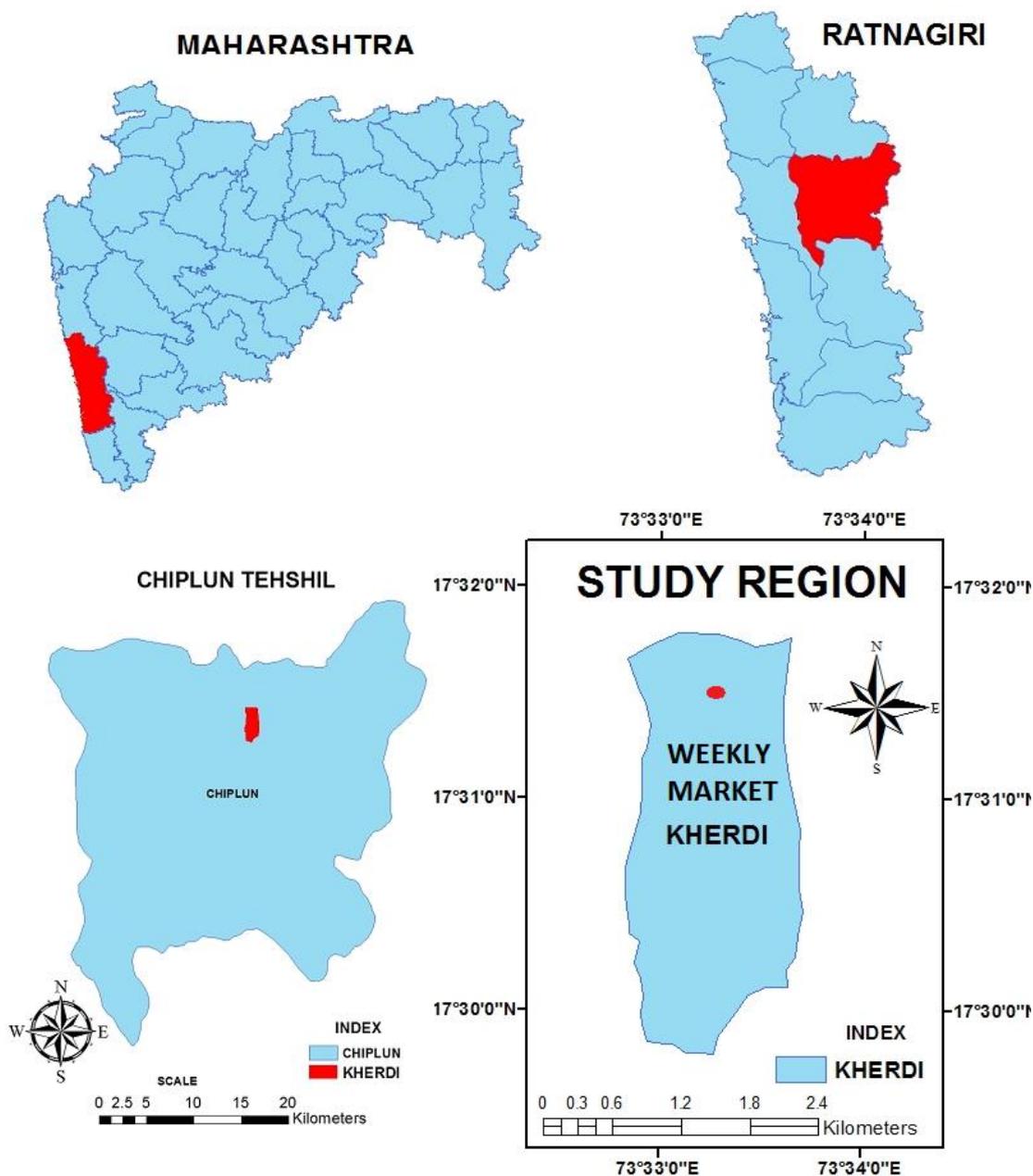
### Study Region:

A Kherdi weekly market is located at the centre /heart of the village in open space of the Kherdi village with access roads & adjoining the Grampanchayat office. Kherdi is in vicinity of Chiplun city and Wednesday is the day of weekly market. This weekly market is started since 1994. Total area of Kherdi is 6.6 sq. km and area of weekly market is 1.75 acres. Location of Kherdi weekly market is on Vijapur - Karad - Chiplun High Way (Proposed NH No. 78). Mumbai - Goa High way is two km. away from the market.

### Study of Kherdi Weekly Market:

2011 census estimates that 69 per cent of the country's population living in villages. Maharashtra is the most urbanized state in the country but Ratnagiri district is one of the most rural district in the state. Kherdi weekly market in Chiplun tehsil of Ratnagiri district holds the major share of sellers & buyers of its rural part which helps sustainable development of surrounding rural area.

## LOCATION MAP OF STUDY REGION



### Sellers o

Sellers who are interviewed at Kherdi Weekly market were 70 and they are from Chiplun and Guhagar tehsils are maximum (40 sellers) and remaining (30 sellers) from Patan, Karad and Satara etc. districts. (Tab. No.1). It means that the majority of the sellers were coming from the Chiplun and Guhagar tehsils of Ratnagiri district. While sellers from remaining places are also the nearby districts of Chiplun namely Patan, Karad and Satara districts (Tab. No.1).

**Table No. 1 Places wise No. of Seller**

Places/Villages	No. of Sellers	Villages	No. of Sellers
<b>Chiplun</b>	18	Patan	11
<b>Kherdi</b>	11	Karad	09
<b>sa herdi Sawarde</b>	02	Umbraj	04
<b>Kalawande, Terav, Kanhe Pimpli, Tinvad, Talsar</b>	05	Satara	02

<b>Guhagar</b>	04	Nilanga, Morgiri, Pandarpur, Shiral	04
<b>Total – 17 Places other than Kherdi</b>	<b>40</b>	-	<b>30</b>
<b>Total Sellers</b>	<b>70</b>		

(Source: Field work, 2019)

From the study of rural market, it is found that there are various types of sellers and these are:

### Types of sellers

**Tab. No. 2 A**  
**1) Full time & Part time Sellers**

Full Time	In Percent	Part Time	In Percent
67	96	03	04

(Source: Field work, 2019)

There are 96% of sellers in weekly market who sell for Full time in market (Tab. No. 2 A)

**2) Regular & Irregular Sellers**  
**Table No. 2 B**  
**Regular & Irregular Sellers**

Regular	In Percent	Irregular	In Percent
64	91	06	09

91% of sellers visit regularly in the weekly market (Tab. No. 2 B).

**Table No. 2 C**  
**Local & Outside Sellers**

Local Sellers	In Percent	Out side Sellers	In Percent
40	57	30	43

(Source: Field work, 2019)

57% of sellers are local sellers. This shows that Kherdi weekly market provide source of employment to local people (Tab. No. 2 C).

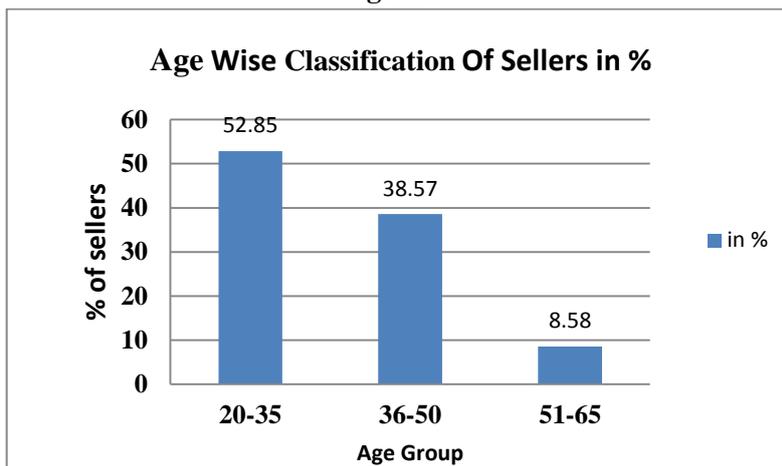
**Tab. No. 3**  
**Classification based on Startng Year of Selling**

Starting year	No. of sellers	In Percent
1994-2000	28	40.00
2001-2006	13	18.57
2007-2013	14	20.00
After 2014	15	21.45
<b>Total</b>	<b>70</b>	<b>100.00</b>

(Source: Field work, 2019)

Every five - six years; number of sellers is increasing in the market due to increasing their sale of goods. Number of sellers always increased in the market from starting period it indicates growth of the weekly market.

**Fig. No. 1**



(Source: Field work, 2019)

There are predominantly 52.85% & 38.57 of Sellers between age group of 20-35 & 36-50 which is the impressive figure because of participation in sell of young & adult people (Fig. No.1).

**Tab. No. 4**

**Based on Modes of Transport of Sellers**

Modes of Transport	No. of Sellers	Percentage
Tempo	45	64.29
Pick up/Truck	08	11.42
Rickshaw and tam-tam	09	12.85
Other	08	11.42
<b>Total</b>	<b>70</b>	<b>100.00</b>

(Source: Field work, 2019)

The table shows that maximum sellers come & bring their goods by tempo (64.29%) & Pick up/trucks (11.42%). They bring their goods in partnership. It reduces the individual transportation expenses of sellers.

**Tab. No. 5**

**Share of Annual Income of Sellers from Kherdi Weekly Market**

Amount in Rs.	No. of Sellers	Percentage
Less than 100000	45	64.28
100001-200000	18	25.73
200001-300000	05	07.14
More than 300001	02	02.85
<b>Total</b>	<b>70</b>	<b>100.00</b>

(Source: Field work, 2019)

There are 64% of sellers who have share of Kherdi weekly market in their annual income up to 100000 Rs. While 3% of sellers are having share of annual income more than 300000 Rs. It shows income of the sellers from a single weekly market in the Kherdi market.

**Tab. No. 6**

**Sellers Selling in Other Weekly Markets**

Other Weekly Markets	Percentage of sellers
One	27.16
Five	17.14
Ten	31.42
More than ten	24.28
<b>Total</b>	<b>100.00</b>

(Source: Field work, 2019)

79% of sellers go in other nearby weekly markets, especially in Savarda, Tali, Lote, etc to sell the goods in a week. 21% of sellers come in only Kherdi weekly market in a week.

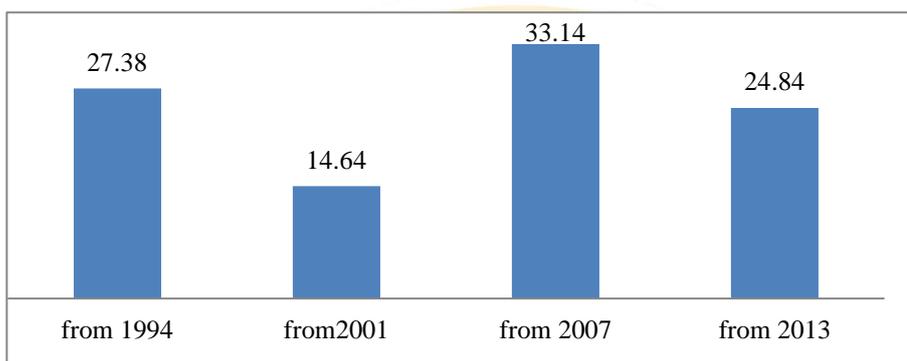
**Problems of sellers :** Besides this sellers said the problems which they are facing daily.

1. There is no permanent shed and platforms in the market.
2. Number of toilets are very less and they are much uncleaned.
3. There is a big open drainage which creates unhygienic surroundings in the market.

**Buyers of weekly market:**

Survey was also related with buyers of weekly market. Total 157 buyers were surveyed on the field work & it is found that:

**Fig. No. 2**  
**Classification Based on Year of Coming to Buy**



(Source: Field work, 2019)

Many buyers always come to market from the starting year of the market. Figure (Fig. No. 2) indicates that from 1994 number of buyers is always increasing. That creates opportunities to unemployed youth.

**Fig. No. 3**  
**Local and Outside buyers**



(Source: Field work, 2019)

78.98% buyers are from outside of the Kherdi. It means majority of outside buyers visited the weekly market. So there is a great scope for sellers to sell the goods.

**Tab. No. 6**  
**Total Expenditure of Buyers on goods**

Expenditure in Rs.	No. of Buyers	In Percent
100-500	90	57.33
501-1000	67	42.67
<b>Total</b>	<b>157</b>	<b>100.00</b>

(Source: Field work, 2019)

57.33% of people do expenditure in weekly market between 100-500 Rs. & 42.67% buyers have spent 501 to 1000 Rs in a single day. It increase the income of the sellers.

**Table No. 7**  
**Means of Transport**

Modes of Transport	No. of Buyers	In %
<b>Walking, Bicycles &amp; Two Wheelers</b>	105	66.88
<b>ST, Auto ,Tam-Tam</b>	52	33.12

(Source: Field work, 2019)

The mobility of buyers depends on available transport facilities for buying. Very little buyers come from S. T. Buses. It shows the necessity of S. T. Buses in the day of weekly market.

**Problem of buyers:**

Besides, buyers said daily problems while they come in the market. These are:

1. There are no lanes for waking in the market.
2. Fish shops are middle part in the market.
3. Cattles are wondering here and there in the market.
4. There is too much dust in the market.

**Kherdi Market Local Daily Sellers:**

**Fig. No. 4**

**Local sellers and outside sellers in Kherdi Daily Market**



(Source: Field work, 2019)

Figure (Fig. No. 4) indicates that dominance of local sellers (88%) in the market. Very few are from the outside of Kherdi.

**Fig. No.5**



Total 49 local sellers were surveyed. Sellers in Local market is in between age groups of 20 – 35 & 36 – 50 years respectively i. e. the efficient working age group (Fig. No.5).

**Tab. No. 8**  
**Selling of Goods Increased on the Day of Kherdi Weekly Market**

Times	Twice	Thrice	4 times	None
<b>No of Local Sellers</b>	27	04	03	15
<b>In Percent</b>	55.10	8.16	6.12	30.62

(Source: Field work, 2019)

Majority of the sellers said that Kherdi weekly market had a positive impact upon the selling of goods on day of weekly market. Their share increased by two to four times on a weekly market day (Tab. No. 8).

### Conclusions:

#### From the survey of sellers of weekly market, it is concluded that:

- Participation of young & adults is more in selling.
- Sellers come from local areas near Kherdi weekly market. It provides source of earning to many peoples.
- Full time sellers are more than part time sellers in market.
- 91.42% sellers are regular while very few sellers are irregular.
- Number of sellers always increased in the market from starting period, it indicates growth of the weekly market.
- Sellers bring their goods by pick up & tempo with partnership. It reduces the individual expenditure of sellers.
- 90.10% sellers have income up to 2 lakh from a single Kherdi Weekly market.

#### From surveyed buyers, it is found that:

- From the beginning, number of buyers is increasing. Many buyers always come to market from the starting year of the market. That creates opportunities to the unemployed youth.
- 78.98% buyers are from outside the Kherdi. It means majority of outside buyers visit the weekly market. So there is a great scope for sellers to sell the goods.
- 57.33% of people do expenditure in weekly market between 100-500 Rs. & 42.67% buyers have spent 501 to 1000 Rs.
- Very less buyers come from S. T. Buses. It shows the necessity of S. T. Buses in the day of weekly market.

#### From survey of Local Daily Sellers Kherdi Market it is concluded that:

- Dominance of young & adults in Local market.
- Large no. (88%) of people in local market are from Kherdi itself.

From this conclusion, it is concluded that Kherdi Weekly Market is benefited for sellers, buyers & local daily sellers which help for the rural development.

### Suggestions:

- Begin weekly market centers in big villages, so that youngsters can involve in this activity.
- S. T. Bus service should be increased, so the people from other villages can come for selling & buying.
- Grampanchayat should construct platforms & sheds for shops and lanes for walking.
- Fish shops should be in separate place instead of main place.
- Grampanchayat should take benefits of government schemes like Maharashtra Agriculture Competitive Project for weekly markets.
- Increase number of toilets and they keep clean.
- Drainage should be covered.

All these have boosted to weekly market for sustainable development in rural areas.

### Reference:

1. Census Handbook: Ratnagiri District, 2011
2. Tisha Dey & Dr. A. K. Phate, 2016 (10SR- JHSS), Vol 22.
3. Website: www.macp.gov.in

## Circle Wise Spatial Distribution of Population in Surgana Tehsil in Nashik District of Maharashtra

**Ramesh H. Gavit B. B. Sonule<sup>2</sup>**

### I) Introduction:

Demography is the scientific study of human populations, primarily with respect to their size, structure and development from quantitative point of view. Population dynamics is the study of size and age composition of populations as dynamical systems and biological and environmental processes driving them such as birth and death rates (Alex de Sherbinin, et.al. (2007).

There are several means of describing the spatial distribution of population and many devices have been developed to portray population distribution and population density. Geographers, demographers, sociologists, statistician all have made their contributions in developing the means to describe population distribution and concentration. One of the simplest ways of measuring population distribution has been percentage distribution whereby the percentage of people living in the geographic areas of a given class has been computed.

The geographers have also shown some interest in calculating sort of an average point for population distribution within a country or an area. The geographers have been making more frequent use of the concept of density of population. It is a simple concept of relating population size to the land area with a view to assessing crudely the pressure of population upon the resources of the area.

Thus, it is a measure of incidence of population concentration and is generally expressed in terms persons per square kilometer or per square mile of land area. The numerator in this calculation is population and the denominator is area.

Denko (1970) recognizes that land and people constitute the two significant elements of an area and, therefore, the ratio between the two is of fundamental interest to all scholars concerned with population analysis.

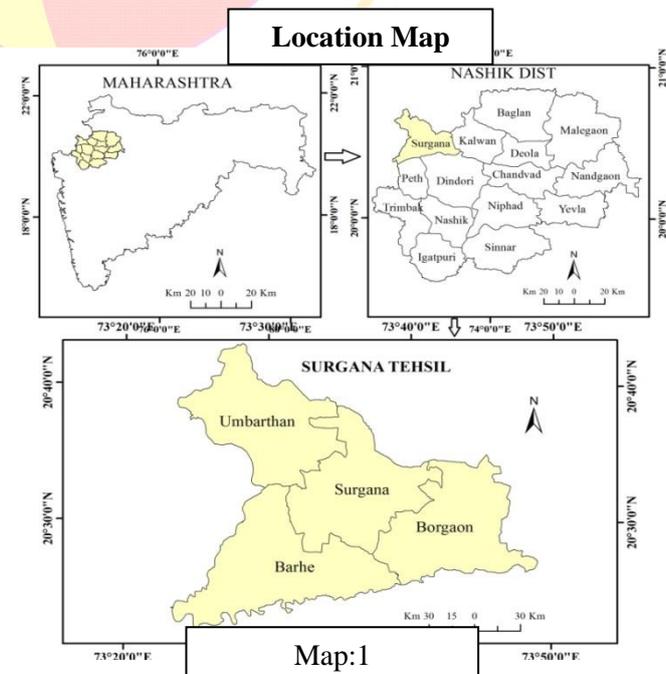
Geographers have made frequent use of the three types of densities suggested by Trewartha, although general dentistry or arithmetic density had found more favour in comparison to physiological and agricultural densities.

Therefore, study of the population has a very wide range of analysis and the resulting inferences provide necessary inputs to policy makers, social scientists, and various agencies of the government. The projections of future requirements of food, water, education, medical facilities and energy are all based on population studies. Ultimately population studies help the planners in successful implementation of plans.

### II) Study Area:

Surgana teshil lies between 20° 21' 28" N to 20° 43' 17" N latitudes and 72° 22' 41" E to 73° 48' 65" E longitude (Map 1).

Surgana tehsil is situated on western slope and partly in the east of the Sahyadri mountain range in the north of the Nashik district. The tehsil has bounded Dangs district and Dharampur tehsil of the Gujarat state in the north and west respectively. Kalwan tahsil on the east, Penth and Dindori tahsil of Nashik district in the south. It has 190 inhabited villages and is covered 843.76 square km. area. The total population observed 1.75 laks from which 87 thousands are male and 87 thounds are female. Density of population was 172 and 208 per sq.km as per census 2001 and 2011 respectively.



**III) Objective:** An objective of the present study is as follows:

1. To study spatial distribution of population, sex ratio, density of population, and growth of population in Surgana tehsil.
2. To study some physiographical determinants of density of population in the study area.

**Hypothesis: 1.**

H<sub>0</sub>: There is no association between density of population and elevation.

H<sub>1</sub>: There is some association between density of population and elevation.

**IV) Methods and Materials:**

Secondary data has been used to study circle wise spatial distribution of population in surgana tehsil in nashik district of Maharashtra. The present study is based on the village level data obtained from 2001 to 2011 census. The analysis of data has been carried out using statistical techniques. For the representation of spatial distribution of population ArcGIS software has been used to cartographic representation of data. Microsoft office, Excel and SPSS is also used to processes data in form of correlation matrix and graph.

The study of circle wise spatial distribution of population, sex ratio and growth of population has been carried out by applying following equations.

$$i) \quad \text{Population Density} = \frac{\text{Number of People in an Area}}{\text{Size of Area (Km}^2\text{)}}$$

$$ii) \quad \text{Sex ratio} = \frac{P_f}{P_m} \times 1000$$

$$iii) \quad \text{Decadal Population Growth} \quad R = \frac{P_n - P_o}{P_o} \times 100$$

**V) Discussion:**

**1. Distribution of Population:**

Distribution of population is the prime component to know population at micro level in the region. The distribution refers to the way people are spaced over the surface of the Earth. In the other words, it emphasises the pattern of actual place location of a population. The distribution may be linear, dispersed or agglomerated (Ghosh,1985).

The distribution of population mainly depends on physical features, climatic conditions, means of communication, development of agriculture and industries etc. Distribution of population is measured by the degree of population concentrated or dispersion. Several methods like percentage distribution of population, listings the geographical areas of a given class into rank order which enables comparison of ranking from census to census, dot map techniques is used for depicting the spatial distribution of population. This provides changes in population trends over time and the point of maximum population potential.

Surgana tehsil has four revenue circle. i.e. Umbarthan, Surgana, Barhe and Borgaon. There are total 190 villages and one city. Distribution of population is shown by dot map method, one dot represent 50 persons . (map no.2). It shows that the villages in each circle are Umbarthan 44, Surgana 50, Barhe 66 and Borgaon 32.

The distribution of population map shows variations in number of persons resides in each circle of the Surgana tehsil (Table 1). From the total persons in each villages of particular circle, less than 400 persons was

observed in villages are Gondune, Songir, Mohupada, ranvihir, Krisnanagar and Amzar in Umbarthan circle. Vijaynagar, Navapur, Patli, Umbarde, Chinchapada, Deola and Merdand in Surgana circle. Chirai and Roti in Borgaon circle. The villages in Barhe are Sule, Waghadi, Bendval, Sarmal, Alivpada, Wanganpada, Biurpada, Mahismal, Rongane, Nadagdari and Tapupada.

The greater number i.e. more than 2000 persons are observed in various circle are Umbarthan and Kathipada in Umbarthan circle. Alangun, Palsan, Khoblamani & Surgana (CT) in Surgana circle. Hatgad, Shribhuvan, and Shinde in Borgaon circle. Mankhed and Thangaon in Mankhed circle.

**Table: 1**  
**Distribution of Population (2001 and 2011)**

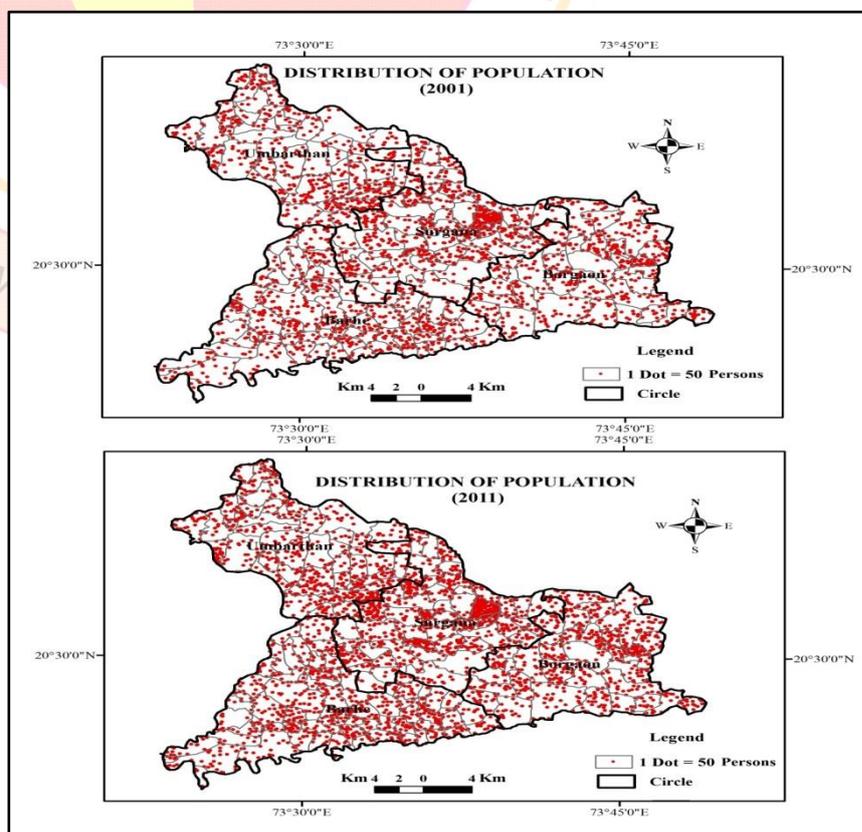
Sr. No	Circle	Year	Class				Total
			< 200	201 - 400	401 - 600	> 601	
1.	Umbarthan	2001	0	8	13	23	44
		2011	0	6	8	30	44
2.	Surgana	2001	3	10	10	27	50
		2011	1	7	7	35	50
3.	Barhe	2001	3	22	37	4	66
		2011	7	6	20	33	66
4.	Borgaon	2001	0	2	3	27	32
		2011	0	2	2	28	32

Source: Compile by Researcher

## 2. Density of Population:

The density of population is usually computed as population per square kilometer (Km<sup>2</sup>) of land area excluding area occupied by water. Different scholars have devised different types of densities for utilization in different situations with the aim to arrive at a better indicator for the population resource relationship

The present study is based on the circle wise density data obtained from 2001 to 2011 census. In this chapter the analysis of population density has been confined to the ratio of population of a given geographical or administrative unit to the area occupied by that unit. Population distribution describes the way that people are spread out across the earth's surface.



Map : 2

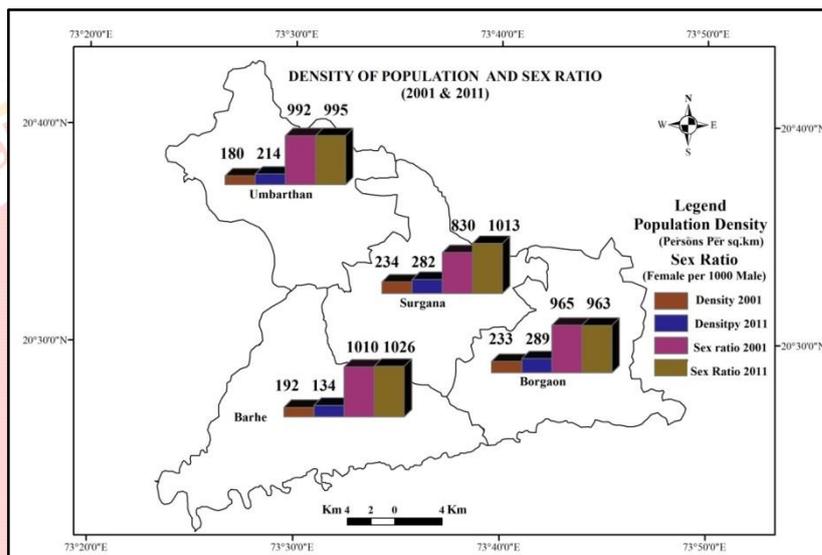
**Table:2**  
**Circle Wise Density of Population**

Sr.No.	Circle	Density of Population		Sex Ratio	
		Year 2001	Year 2011	Year 2001	Year 2011
1.	Umbarthan	180	214	992	995
2.	Surgana	234	282	830	1013
3.	Borgaon	233	289	965	963
4.	Barhe	192	234	1010	1026

Source: Data Compile by Researcher

**2.1 Circle Wise Density of Population:**

As per census 2001 and 2011, circle wise density of populations (persons per sq.km.) are identified that are i) Umbarthan 180, 214 ii) Surgana 234, 282 iii) Borgaon 233, 289 iv) Barhe 192 and 234 respectively (Table 2 and Map 3).



**Map:3**

**3. Growth of population:**

Population growth refers to the change in the number of persons residing in a territory during a specified period of time. The growth or change may be positive or negative. The analysis of population growth in study region enables understanding of its demographic structure. It is fundamental processes of demography which all demographic attributes are directly or indirectly associated with population growth. Population growth determines density, distribution and composition of population (Hridas Pisal, 2007).

The phenomenon of population growth during two decades serves as one of the indices of a region's development in relation to its resources. There geographical study of population growth is an importance to know its dynamism and planning at regional and local level. No planning can be success unless the planners are aware of the population growth rates and the areas in which population is much more rapidly growing than the others. (Chopra. G.2006). There are many responsible factors for the natural growth of population. The influencing factors are demographic, social, economic and geographic.

Decadal growth of population has been computed by using following formula.

$$R = \frac{P_n - P_o}{P_o} \times 100$$

Where, R= Growth Rate of Population

PG= Population Growth

Pn= Population in later year

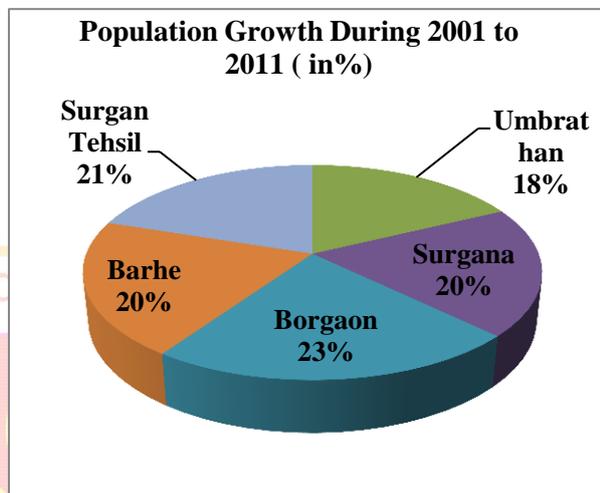
Po= Population in earlier year

### 3.1 Growth of population since 2001 to 2011:

Circle wise growth population during 2001 and 2011 has been given in table 3 and fig.1. It shows that the population growth of each circle observed varies i.e. 18.84, 20.55, 23.69 and 21.59 in Umbarthan, Surgana, Borgaon and Barhe respectively.

**Table:3 Growth of population**

Circle/ Tehsil	Pop 2011	Pop 2001	Pop Growth (%)
Umbrathan	38848	32690	18.84
Surgana	51604	42807	20.55
Borgaon	39169	31668	23.69
Barhe	47071	38712	21.59
Surgan Tehsil	176692	145877	21.12



**Fig.1**

### 4. Hypothesis Testing:

Landforms influence the distributional pattern of population both macro and micro scales. The most striking evidence of the influence of landforms upon population distribution at macro level has been observed between mountain lands and plains. The factors like attitude, slope, and drainage subsoil water table have been affecting population distribution more dearly at local level.

The areas characterized by difficult terrain have conspicuously sparse population. Ever since the earliest civilization, valleys have been the chief attraction, while slopes and hilltops have scrupulously been avoided. Wherever the landform is hospitable, population have tended to cluster. By comparison, the rugged terrain has repelled human settlement largely because of limited cultivable land, high cost of agricultural operations and inaccessibility.

To rectify second objective, how geophysical factors i.e. elevation determines on distribution of population in various circles of Surgana tehsil has been tested through correlation matrix using Pearson correlation coefficient in SPSS software. The density of population and elevation is given in the table no. 4.

**Table: 4.**

#### Density of Population and terrain height

Sr. No.	Circle	Area (sq,km)	Population (2011)	Density of Population (2011)	Elevation (in mts)
1	Umbarthan	181.61	38848	214	727
2	Surgana	183.23	51604	282	892
3	Borgaon	135.75	39169	289	1175
4	Barhe	201.40	47071	234	710

Source: Compile by researcher

**Table: 5 Correlations Matrix**

		Area_sq_k m	Pop_2011	Elev_mts	Den_2011
Area_sq_k m	Pearson Correlation	1	-.632	-.934	-.632
	Sig. (2-tailed)		.368	.066	.368
	N	4	4	4	4
Pop_2011	Pearson Correlation	-.632	1	<b>.859</b>	1.000(**)
	Sig. (2-tailed)	.368		.141	.000
	N	4	4	4	4
Elev_mts	Pearson Correlation	-.934	.859	1	.859
	Sig. (2-tailed)	.066	.141		.141
	N	4	4	4	4
Den_2011	Pearson Correlation	-.632	1.000(**)	<b>.859</b>	1
	Sig. (2-tailed)	.368	.000	.141	
	N	4	4	4	4

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Analysis:**

As per correlation matrix given in table 5, Pearson correlation (r) is .859 and no of observation are 4. The Pearson correlation shows that there is moderately strong positive relationship between density of population and elevation of the four circle area of Surgana tehsil. Hence, it is fail to reject H<sub>0</sub>, but there is no such evidence at 0.01 level of significant to state the concrete association between two variables.

**Inferences:**

It can be inferred from the above correlation matrix (Table 5) that there exists moderately strong positive association between density of population and elevation in all four circles of Surgana tehsil.

**VI) Conclusion:**

More population concentrated in revenue centre and city area and low population observed in the areas of inadequate resources. Density of population observed 214 to 234 in 2011, it has quietly increases from the year 2001. Overall population growth in Surgana teshil during 2001 to 2011 was 21.12 percent. According to census 2011, sex ratios of region are 995, 1013, 963 and 1026 in circle of Umbarthan, Surgana, Borgaon and Barhe respectively. It is quite increase in 2011as compare to 2001 except Borgaon circle. The correlation matrix indicates that there is moderately strong positive association between density of population and elevation in the all four circles of Surgana tehsil.

**VII) References:**

1. Manoj Kumar (2015), 2015 IJLTEMAS, 'A Study of Population Distribution', Volume IV, Issue III, pp.24-28. ISSN 2278 - 2540
2. District census handbook Nashik 2001 and 2011.
3. Govt. Of India Ministry of Water Resource Central Ground Water Board.Ground water information Nashik District.
4. <http://www.dictionay.com>
5. <https://earthexplorer.usgs.gov/>
6. <https://www.un.org/en/sections/issues-depth/population/index.html>
7. <http://www.mahaagri.gov.in/>

## Sustaining Agriculture in The Era of Climate Change in India

Dr. Shaikh A.G.

### Introduction

This position paper, while agreeing in principle with India's international stand in climate negotiations that agriculture-related Green House Gas emissions cannot be equated in any manner with lifestyle-related GHG emissions and appreciates the 'common but differentiated action' demand, takes a stand that if sustainable agriculture is promoted and established even for adaptation reasons, it will result in mitigation of GHGs too. Sustainable Agriculture practices in farming are therefore a win-win option where mitigation cannot be interpreted as coming in the way of equitable and just growth of the nation. These practices as the following sections show, contribute to increased food and nutritional security, contribute to sustainability of productive resources and improvements in rural livelihoods. They also lead to mitigation of GHG emissions from farming.

The Indian government has no reason to shy away from understanding and stating the negative impacts of GHG-inducing intensive models that have been promoted so far. It is time that fundamental shifts are made in the agricultural technologies that are promoted in the country, to address the imperative of climate change (amongst other imperatives).

### Climate Change & Agriculture In India

India is a large country with 15 agro-climatic zones, with diverse seasons, crops and farming systems. For a majority of people in India, to this day, agriculture is the main source of livelihood. Agriculture is the most vulnerable sector to CC as it is inherently sensitive to climate variability and CC will leave its impacts on Indian agriculture in various direct and indirect ways. This obviously means an impact on the lives and livelihoods of millions of Indians.

For instance, it is reported that about two-thirds of the sown area in the country is drought-prone and around 40 million hectares is flood-prone. The poorest people are likely to be hardest hit by the impacts of climate variability and change because they rely heavily on climate-sensitive sectors such as rainfed agriculture and fisheries. They also tend to be located geographically in more exposed or marginal areas, such as flood plains or nutrient-poor soils. The poor also are less able to respond due to limited human, institutional and financial capacity and have very limited ability to cope with climate impacts and to adapt to a changing hazard burden.

### Impacts of CC on agriculture

Climate change is manifesting itself in many ways across the country. Among the indicators, while long term rainfall data analysis shows no clear trend of change, regional variations as well as increased rainfall during summer and reduced number of rainy days can be noticed. In the case of temperature, there is a 0.6°C rise in the last 100 years and it is projected to rise by 3.5-5°C by 2100. The carbon dioxide concentration is increasing by 1.9 ppm each year and is expected to reach 550 ppm by 2050 and 700 ppm by 2100. Extreme events like frequency of heat and cold waves, droughts and floods have been observed in the last decade. The sea level has risen by 2.5mm every year since 1950 while the Himalayan glaciers are retreating. These are all symptomatic of climate change.

Available research indicates that climate change-induced rise in temperature is going to affect rainfall patterns – farming in India depends on monsoons and there is a close link between climate and water resources.

The organic carbon levels and moisture in the soil will go down while the incidence of runoff erosion will increase. The quality of the crop will also undergo change with lower levels of nitrogen and protein and an increased level of amylase content. In paddy, zinc and iron content will go down which will impact reproductive health of animals. Insect lifecycles will increase which in turn will raise the incidence of pest attacks and virulence. Other likely impacts are change in farm ecology viz. bird-insect relations, and an increase in the sea levels which will cause salinity ingress and submergence.

It is projected that due to climate change, kharif rainfall is going to increase and this might be positive for kharif crops. Further, for *kharif* crops, a one-degree rise in temperature may not have big implications for productivity. However, temperature rise in rabi season will impact production of wheat, a critical food-grain crop.

The surface air temperatures will increase by 2 to 4°C by 2070-2100. As mentioned earlier, the *rabi* crop will be impacted seriously and every 1°C increase in temperature reduces wheat production by 4-5 million tons, as per a study by IARI. This loss can be reduced to 1-2 million tons only if farmers change to timely planting. Increased climatic extremes like droughts and floods are likely to increase production variability. Productivity of most cereals would decrease due to increase in temperature and decrease in water availability, especially in Indo-Gangetic plains. The loss in crop production is projected at 10-40% by 2100, depending upon the modeling technique applied.

The impacts of climate change are already visible. A network of 15 centres of ICAR working on studying climate change has reported that apple production is declining in Himachal Pradesh due to inadequate chilling. This is also causing a shift in the growing zone to higher elevations. Similarly, in the case of marine fisheries, it has been observed that Sardines are shifting from the Arabian Sea to the Bay of Bengal, which is not their normal habitat. In fact, fisheries are the most vulnerable sector to climate change. Crops have the ability to adapt to extreme climate variability even up to, say, 4°C while fishes and animals do not. It has also been recorded that the pest ecology of certain crops is changing due to climate change.

Extreme weather conditions resulting in disasters will obviously have their own socio-economic impacts, especially on the poor. Further, changes in crop productivity will have implications on farmers' incomes. Changes in agronomic practices etc., will

### Impacts Of Agriculture On Climate Change

While climate change affects Indian farming and farmers' livelihoods adversely, the converse is also true – Indian agriculture, even if not in the same degree as the developed world's agriculture, does contribute to Climate Change.

Capital depletion and massive additions of external inputs in a 'linear' model (as opposed to cyclical systems in ecological farming models) are characteristic features of intensive, industrialized models of agriculture. In this model, a farm is treated like a factory with inputs and outputs calculated in a monocropped situation with grain yield given the highest importance compared to any other parameter and often, the externalized costs are ignored.

Amongst various GHGs that contribute to global warming, carbon dioxide is released through agriculture by way of burning of fossil fuel; methane is emitted through agricultural practices like inundated paddy fields, for example; nitrous oxide through fertilizers, combustion of fossil fuels etc. Nitrous oxide has a global warming potential 296 times greater than CO<sub>2</sub>. In India, it is estimated that 28% of the GHG emissions are from agriculture; about 78% of methane and nitrous oxide emissions are also estimated to be from agriculture.

As per the Intergovernmental Panel on Climate Change (IPCC), every quintal of nitrogen applied in farming emits 1.25 kg of nitrous oxide and globally half of the nitrogen applied to crops is lost to the environment. The greenhouse gas emissions from fertiliser manufacture and use in India reached nearly 50 million tonnes of CO<sub>2</sub>-equivalent in 2006/07, which represents about 3 percent of total Indian greenhouse gas emissions.

Another major contributor of GHGs is the burning of crop residues. In Punjab, wheat crop residue from 5,500 square kilometers and paddy crop residues from 12,685 square kilometers are burnt each year. Every 4 tons of rice or wheat grain produces about 6 tons of straw. Emission Factors for wheat residue burning are estimated as: CO- 34.66g/Kg, NO<sub>x</sub> – 2.63g/Kg, CH<sub>4</sub> – 0.41g/Km, PM<sub>10</sub> – 3.99g/Kg, PM<sub>2.5</sub> – 3.76g/Kg.

Burning of crop residues also impacts the soil (fertility). Heat from burning straw penetrates into the soil up to 1 cm, elevating the temperature as high as 33.8–42.2°C. Bacterial and fungal populations are decreased immediately and substantially in the top 2.5 cm of the soil upon burning. Repeated burning in the field permanently diminishes the bacterial population by more than 50%. The economic loss due to the burning

of crop residues is colossal. Each year 19.6 million tonnes of straw of rice and wheat, worth crores of rupees are burnt. Used as recycled biomass, this potentially translates into 38.5 lakh tonnes of organic carbon, 59,000 tonnes of nitrogen, 2,000 tonnes of phosphorous and 34,000 tonnes of potassium every year.

Another potent GHG is methane which is emitted in copious amounts through inundated paddy cultivation. In India, of a total area of 99.5 Mha under cereal cultivation, 42.3 Mha (or 42.5%) is under rice cultivation. It is grown under flooded conditions and the seedbed preparation involves puddling or plowing when the soil is wet to destroy aggregates and reduce the infiltration rate of water. Such anaerobic conditions lead to emission of methane and possibly nitrous oxide through inefficient fertilizer use. Emission of methane from rice paddies in India is estimated at 2.4 to 6 Teragram (Tg) out of the world total emission of 25.4 to 54 Tg from all sources and 16 to 34 Tg from rice cultivation. The average methane flux from rice paddies ranges from 9 to 46 g/m<sup>2</sup> over a 120- to 150-day growing season.

Another indirect contribution of agriculture to GHG emissions comes in the form of large dams. Large dams contribute 18.7% of emissions in India as per an estimate. Total methane emissions from India's large dams could be 33.5 million tonnes (MT) per annum, including emissions from reservoirs (1.1 MT), spillways (13.2 MT) and turbines of hydropower dams (19.2 MT).

The livestock sector is another major contributor to production of GHGs. For the year 1997, livestock contributed 9.0 Tg methane and 1 Gg nitrous oxide which in terms of CO equivalent it is around 190 Tg. Shift to stall-fed systems of livestock rearing creates problems with the dung while shift from fodder to feed, concentrates etc. carries higher ecological foot prints.

There is also the issue of more energy use in intensive farming models in the form of fossil fuels for machinery like tractors, harvesters and so on, pumps for irrigation etc.

### **Potential Of Sustainable Agriculture As Low-Ghg, Resilient Farming Systems**

Sustainable Agriculture can be defined as an integrated farming system (with crops, trees, livestock etc.) which is based on locally adapted agro-diverse cropping patterns and use of local resources (natural resources and natural processes), based on local knowledge, skills and innovations. This Position Paper would also like to highlight the potential of sustainable agriculture, in terms of mitigation of GHG emissions as well as adaptation to climate change. Further, sustainable agriculture holds great potential for meeting global and national food security requirements even as it leads to improvement of farmers' livelihoods through enhancing their net incomes and improving the productivity of their resources in the long run.

**Food security:** A question that is often posed with regard to sustainable agriculture or organic farming is whether it will be able to feed the growing population. We respond by saying that sustainable agriculture does not imply lowered yields, as experience of successful farmers bears out on the ground. This is reinforced by an FAO report (2007) which says that "conversion of global agriculture to organic management, without converting wild lands to agriculture and without using N-fertilisers would result in a global agricultural supply of 2640 to 4380 Kcal/person/day". Sustainable intensification in developing countries through organic practices would increase production by 56 per cent. A meta-analysis of 133 scientific papers concluded that organic agriculture was particularly competitive under lower yield environments, a feature that is common in developing countries. Organic yields on average are comparable to conventional yields although yields do decline initially when converting from high-input systems and almost double when converting from low-input systems. In India, it should be remembered that a majority of land is rainfed and continues to be low-input by default.

**Improvement in rural livelihoods:** While macro-level food production and availability levels are likely to increase through sustainable agriculture, at the individual and community level too, there are bound to be improvements. As FAO notes again, access to food will increase by livelihood improvement both for farmers and agricultural workers through organic farming. Organic agriculture improves food access by increasing productivity, diversity and conservation of natural resources, by raising incomes, improving employment and by reducing risks. It has been recorded that shift to sustainable agriculture practices can reduce the outward migration from rural areas.

**Reduction in GHG emissions:** Changes in farming models and practices towards sustainable agriculture offer a significant opportunity at reducing GHG emissions. Organic farms use on an average 33 to 56 per cent less energy per hectare, as per FAO (2007).

Organic farming reduces its fossil fuel dependence in many ways. For instance, for soil productivity management, internal inputs and practices are used rather than chemical fertilizers – for instance, creating the micro-climate required for increased soil (beneficial) microbial activity. This is done by returning bio-mass to the soil. Legume production, crop rotation, mixed cropping etc., are other ways of achieving this. Pest management also does not depend on chemical pesticides but a variety of local resources and practices.

IFOAM notes that avoidance of methane emission is also possible through organic agriculture – through the promotion of aerobic micro-organisms and high biological activity in soils, oxidation of methane can be increased. Through practices like System of Rice Intensification, which is mostly based on principles of ecological farming, flooding in rice paddies can be reduced and thereby, methane emissions.

Nitrous oxide, result of overdoses and losses on nitrogen, can be effectively minimized through sustainable agriculture practices. While production of chemical fertilizers is an energy-intensive process that emits carbondioxide and nitrous oxide, application of nitrogen fertilizers makes the soil emit nitrous oxide. These can be avoided through organic farming.

Sustainable agriculture also increases the Soil Organic Carbon (SOC) by incorporating organic materials into the soil. Soil can be a major source of storage of carbon, about twice as much carbon as in the atmosphere. Fertiliser use replaces soil organic matter in intensive systems, which reduces potential sequestration. Crop, tree and livestock integration with a systematic recycling of organic wastes is an integral part of sustainable agriculture. Long term studies have shown that compost application and cover crops in rotation were particularly adept at increasing soil organic matter even in comparison to no-tillage techniques. While conservation tillage is promoted elsewhere as a way of sequestration of carbondioxide, this is often done by the use of chemical herbicides and GMOs which have their own ecological implications. In sustainable agriculture however, mitigation of climate change can be addressed both carbon sequestration and minimized emissions of GHGs. Agro-forestry is also a desired principle of organic farming which further adds to the potential of SA in carbon sequestration.

### **Creation of resilient systems leading to better adaptation:**

Extreme and unpredictable weather conditions are part of the reality of climate change even as temperature rise and changes in rainfall, changes in pest and disease incidence etc., will also be the stark reality for farmers. What the situation then requires are resilient and adaptive farming systems with the least amount of loss to the productive resources, production and the farmer.

One of the most important requirements for adaptation would be farmers' knowledge, in negotiating complex agro-ecosystems. As a philosophical approach, organic farming has always laid thrust on farmers' skills, knowledge, innovation, horizontal sharing, observations and intuition etc. Several large organic farming projects across the world have built successful institutional models for systematic support for farmers' knowledge and innovation and constant enhancement. This forms a key part of the adaptation potential of sustainable agriculture.

To address extreme weather conditions, organic farms will be better suited. The better drainage and water holding capacity of organic soils reduces the risk of drought and soil erosion, for instance. Organic farming practices are in a good position to maintain productivity in the event of drought, irregular rainfall events and rising temperatures, notes a recent technical paper from International Trade Center (WTO) and FiBL. This paper notes that soils under organic management retain significantly more rainwater thanks to the "sponge properties" of organic matter. Water percolation is 15-20% more in organic systems. Water capture in organic plots was twice as high as conventional plots during torrential rains, which in turn reduces the risk of floods.

The most important component of organic systems - diversity - contributes a lot to the resilience of organic farms. Enhanced biodiversity of organic farms have several positive ecological implications – pest prevention, and similar effects on diseases, better utilization of soil nutrients and water etc.

Organic farming is also associated with decreased irrigation needs by about 30-50%. This becomes an important part of adaptation in drought conditions.

Given the mitigation and adaptation potential of organic systems, as well as the potential to increase food security, it becomes imperative to shift agriculture towards more ecological farming models which are sustainable.

### **Potential of Organic Farming beyond purely agricultural technologies**

Organic farming often also focuses on consumer behaviour and encourages lower ecological footprints through localized food production and consumption and reducing food miles too. Responsible consumer behaviour also goes a long way in mitigating emissions since it is found that a significant contribution to GHG emissions is also from long food miles and any plans for addressing CC should focus on the entire chain from farm to plate.

This paper would like to reinforce that such farming, even though farmers adopting it are at a disadvantage due to lack of support systems in the form of extension, marketing, grassroots institutions etc., is already being practiced successfully in lakhs of acres all over the country. In large government-supported sustainable agriculture projects like Community Managed Sustainable Agriculture (CMSA) in Andhra Pradesh, where women farmers are taking a lead in implementing a large ecological farming project on more than ten lakh acres, it has been found that it is possible to scale up organic farming onto large areas, with sensitive support systems built along with people's institutions at the village level. The CMSA programme, being implemented since 2005, has shown that farmers do tend to adopt and spread ecological practices at a rapid pace provided they are collectivized into village-level institutions and provided that appropriate extension support is provided from the village upwards. In this programme, available data shows that there has been no fall in yields for farmers shifting to organic farming. Data shows that the village economy stands to gain a lot due to savings on expenditure on external inputs and net incomes of individual farmers rise.

### **India's National Action Plan On Climate Change (NAPCC)**

India has announced a National Action Plan on Climate Change in August 2008. The NAPCC's formulation processes were found to be very top-down and non-participatory by many analysts.

The NAPCC proposes to address climate change-related issues in India through the setting up of eight inter-connected Missions: National Solar Mission; National Mission for Enhanced Energy Efficiency; National Mission on Sustainable Habitat; National Water Mission; National Mission for Sustaining the Himalayan Ecosystem; National Mission for a "Green India"; National Mission for Sustainable Agriculture and National Mission on Strategic Knowledge for Climate Change.

### **The following are some of the key points of (NAPCC) proposal**

- **Definition required:** Sustainable Agriculture is a misnomer for what has been proposed in the NAPCC, under the name of Sustainable Agriculture and therefore, a correct, common understanding of the term is required. The current set of proposals would not lead to improving the soil health, central to sustainable agriculture, nor to cyclical models of farming, internalizing farm inputs (including crop waste) into farming systems, which define sustainable agriculture. On the contrary, the existing suggestions would continue the conventional linear, intensive models that further the existing dependency of farmers on external agencies for everything, including for knowledge. That is one of the reasons for the current day crisis in agriculture.
- **Creating the imperative for the paradigm shift:** The NAPCC makes no mention and assessment of Green Revolution-induced climate change in India. Shying away from stating the issues with the current model of agriculture will not create the imperative for a shift to sustainable agriculture, which is a requirement both for mitigation as well as adaptation. The NAPCC should clearly specify incentives to farmers for shifting to organic farming and sustainable agriculture practices. The government should realize that the imperative to shift to sustainable agriculture is larger than climate change.

The NAPCC, especially in the sections related to agriculture, does not bring up mitigation possibilities at all – while that could be a posture adopted at the international level, for common but differentiated responses, it is interesting to note that the only place where mitigation is mentioned is to make the entry of Genetically Engineered crops a possibility. Further, the NAPCC should expressly acknowledge the potential that exists of mitigating GHG emissions from farming through a shift to organic farming.

- **Policy approach:** Strategies should be evolved for a time-bound phasing out of climate change-inducing practices towards sustainable agriculture with clear targets and financial outlays. This includes a focus on the role of pasture lands, fisheries, animal husbandry (rather than the bias on crop husbandry that is present in the NAPCC) and seed banks governed by farmers' bodies as major thrust areas for adaptation. Or, when plans are made about access to information, the emphasis should not be just on information packages to farmers in a top-down manner about geo-spatial impacts of climate change, but also data on conventional vs. organic practices so that informed choices can be made by farmers.
- **Biotechnology:** On the use of biotechnology, especially genetic engineering, as part of the NAPCC, it is felt strongly that the government should focus on reducing the present subsidies to GHG-emitting practices like fertilizers rather than come up with GE seed varieties which are supposed to reduce GHGs. In fact, an assessment of the stress (in)tolerance of GE crops should be an important part of understanding the implications of Genetic Engineering as an agricultural technology in the era of climate change. There is no one GM commercial plant available throughout the world that has the characteristics described on p.37, although this has been claimed for advertising for the last ten years. Even on the biotech company basis ([www.isaaa.org](http://www.isaaa.org)), the GM plants include in 2009 63% herbicide tolerant plants that can grow only with the herbicide company's treatment, 15% of new insecticide producing plant making a kg/ha of pesticide, and 22% of both combined characters (or 2 herbicide tolerances + 1 or 2 insecticide production in the plant). The more complex characters such as stress responses are driven by almost 50 genes that are not even cloned all today. There will be no agronomical truth behind that. Then once obtained maybe, it will take another 10-15 years to develop these crops on a worldwide basis, since today's crops have been developed 15 years ago.
- **'Land to lab' programmatic interventions:** The NAPCC focuses too much on setting a research agenda for the NARS (National Agricultural Research System), following the old model of 'lab to land' research and not so much about programmes to be implemented immediately at the farmers' level. In the context of climate change and adaptation, there is hardly any time to be lost and farmers' need for resilient systems cannot wait for more research in the old paradigm to be taken up. The need is for solutions discovered from the farms, assessed and validated and spread to others, especially in terms of adaptation. There is a strong opinion that there is enough evidence of time-tested practices and experiences from the ground of certain sustainable agriculture principles and practices creating resilient farming systems. Further, civil society organizations also have enormous experience with creating effective people's institutions at the ground level which will allow for the delivery of programmes in an effective fashion. Therefore, the overwhelming need is for immediate programmatic interventions drawing on the strength of traditional knowledge and resources, farmers' innovations and experiences with the civil society.  
Alternative, horizontal extension systems with farmers' organizations at the centre are an important part of information-centred addressal of climate change.

As part of the NAPCC, capacity building of agriculture scientists and extension workers on organic farming should be taken up so that they are equipped to take the message to farmers.

- **Traditional knowledge & resources:** The National Action Plan does not give adequate prominence to traditional resources and knowledge, which need to be made a cornerstone for interventions on sustainable agriculture. It was felt that popularization of traditional knowledge in addition to ever-evolving innovations in the fields of practicing organic farmers should be considered to be an important component of adaptation to climate change in agriculture. Such farmers should be identified and lessons learnt and disseminated through the extension system.  
There should be an emphasis on falling back on indigenous resources (seeds, animal breeds etc.), which have proven track record of adaptation to stress conditions. The Plan should also make Seeds, as replicable resources in the hands of farmers institutionalised the form of seed banks, as a major thrust and strategy for adaptation. As part of the NAPCC, there should be a mechanism evolved to track and monitor genetic erosion for all of the country due to climate change.
- **Centre-State relations:** State governments should be involved in consultations and planning right from the beginning – it is not enough that centrally-evolved plans are imposed upon them. In fact, it is ultimately the departments of agriculture and the extension and delivery mechanisms at the state level which will directly take everything to farmers and support them to bear the consequences of climate change. For instance, seed rolling plans need to be evolved by each state, with an emphasis on revival and restoration of open-pollinated, traditional and locally-adapted varieties.
- **'Public-People' Partnership:** Similarly, it was felt that civil society and its institutions should also be involved in planning and implementation related to the NAPCC. For instance, alternative, horizontal extension systems with farmers' organizations at the centre are an important part of information dissemination and learning for adaptation to climate change. The stress should be on public-people partnership in the Plan. There should be recognition that only market-driven technologies are not the answer in the era of climate change. There is a need for renewed thrust on public research in partnership with communities.
- **Risk management:** When it comes to Risk Management, it should be acknowledged first that the existing risk management strategies and mechanisms have failed farmers badly. There is a need for complete recasting of the

existing models and mechanisms. We need new mechanisms to assess damage and loss and better ways to deliver support - including weather insurance, livestock insurance and effective crop insurance.

- **Clear convergence:** The Plan should clearly spell out how it converges with other plans and missions both within the NAPCC as well as in other agencies like the Planning Commission.
- **Social safety nets:** As part of adaptation strategies, strong social security nets should be put in place for the rural households, including with a provision of minimal incomes, pension, insurance etc., with special emphasis on the agriculture workers.

### Sustainable Agriculture In The Era Of Climate Change

Sustainable Agriculture (ecological farming/organic farming/LEISA/Non Pesticidal Management/SRI etc) approaches are now acknowledged for the wide set of ecological and economic benefits that accrue to the practitioners as well as consumers of agricultural products. These approaches which are based on low external inputs are also low energy intensive and less polluting hence mitigate and help in adapting to the climate change. However, the promotion of sustainable agriculture on a large scale is often confronted about its potential as well as its practical limitations. In the last five years two large scale initiatives, NPM scaling up (Community Managed Sustainable Agriculture-CMSA) in Andhra Pradesh and SRI promotion in states of Tripura Orissa and Tamil Nadu have brought in new learnings and broken the earlier apprehensions on scaling up such practices and their relevance on a large scale.

These successful experiences had three elements in common. First, all have made use of locally adapted resource conserving technologies. Second, in all there has been coordinated action by groups or communities at local level. Third, there have been supportive external (or non-local) government and/or non-governmental institutions working in partnership with farmers. Almost every one of the successes has been achieved despite existing policy environments which still strongly favor 'modern and established' approaches (technology and support systems) to agricultural development. Now the challenge is to create a policy environment to scale up across the nation. This needs a newer approach in terms of capacity building, horizontal learning, newer institutional systems and newer forms of financial support to be put in place.

The programmatic support to agriculture today favour only high external input based agriculture. As a result, none of the mainstream programs provide any support for promotion of these models. This needs the recasting of program guidelines or initiating newer program to provide support to more sustainable models in agriculture which can be easily accessible to small and marginal farmers. The mission on sustainable agriculture can initiate a programmatic support to scale up sustainable agriculture with the objectives to

- reduce the risks and vulnerabilities with uncertain weather conditions and degraded and limited natural resources in these regions, by adopting suitable cropping patterns and production practices
- diversify the assets and income sources to sustain the livelihoods by integrating livestock and horticulture into agriculture and promoting on-farm and off-farm employment opportunities,
- conserve and efficiently use the available natural resources like soil and water, and promote biomass generation, organise farmers into institutions which can help them to have better planning, greater control over their production, help to access resources and support, improve food security and move up in the value chain,
- build livelihood security systems to cope up with the natural disasters like drought, floods and other climate uncertainties

**1. Sustainable agriculture:** Sustainable Agriculture can be defined as an integrated farming system which is based on locally adapted cropping patterns and local resource (natural resources and natural processes) use based on local knowledge, skills and innovations.

The capacity of a farming system to adapt to changing climate and weather conditions is based on its natural resource endowment and associated economic, social, cultural and conditions. The viability of these elements also constitutes the basis for sustainable agriculture, understood as agricultural production that: ensures adequacy of food production; does not harm the resource base; is economically viable; and enhances quality of life. Many climate and weather risk management strategies fit squarely into sustainable agriculture practices and can, therefore, be promoted with several of the programs and policies targeting environmentally responsible production.

### Strategies to be adopted

- a. Changes cropping patterns and cropping systems to suit the local resource and weather conditions. Multiple/mixed cropping, intercropping systems with legume components etc.
- b. Ecological farming practices which can maximise the local resource use. Many of these practices are based on indigenous knowledge and focus on building soil biological productivity. Non Pesticidal Management, Organic Soil Management, Community Seed Banks, System of Rice Intensification, soil moisture management etc have already proven to be useful.
- c. Locally adopted crop varieties specially in saline and flood prone areas, drought prone areas, making suitable selections adopting Participatory Plant Breeding and Participatory Varietal Selection.
- d. Developing suitable farming systems integrating agriculture, horticulture and livestock.

**2. Farmers' Institutions:** Organized communities have proven to be more effective in planning and managing their resources and livelihoods, lobbying for a policy change and securing their entitlements. Appropriate institutional systems for each of the purposes need be established.

### Strategy to be adopted

- a. The farmers would be organised into common interest groups federated into producer collectives. Existing institutions like Women SHGs etc would be used to initially anchoring the program.
- b. These institutions would take the roles of planning, mobilising resources, organising production, and take up post harvest management and marketing activities.
- c. The producer collectives will improve the collective bargaining power of the farmers, will internalize market activities like bulking, primary and secondary processing which improve the village economy.

**3). Food and livelihood Security:** Shift to sustainable agriculture is often seen as a compromise on food security. This is mainly because food is understood as only wheat and rice, few pulses, oilseeds and vegetables. The food basket can be increased if we can expand the scope to include millets, coarse cereals, dryland fruits, uncultivated greens etc which can also bring in nutrition security. Data from National Centre for Organic Farming (NCOF), ICRISAT and CMSA have proven that crop productivity can also be maintained with organic/ecological farming. Going beyond the current food security systems like PDS and mid-day meal schemes, systems need to be established to improve livelihood security in terms of sustaining food production in the village, improving income generation opportunities to the small farmers and agriculture labor is important in the rural areas especially in rainfed regions. The frequent monsoon failures results in droughts and support systems needs to be build to help the farm families and livestock to tide over.

- Building house hold food security systems by adopting suitable cropping patterns
- Village level management systems for alternative models like grain banks would be appropriate and attempted.
- Suitable off-farm and non-farm employment opportunities would be identified and promoted.

**4) Financial Support Systems:** Currently all the financial support systems to agriculture are given only for external inputs. We need to create proper support systems for farm internalized inputs, community based infrastructure, knowledge and skill building and sharing etc.

- a. Direct Subsidies to farmers rather than input subsidies
- b. Integrating NREGA with sustainable agriculture so that each farmer gets 100 labor days for farming can provide ample scope in this direction.
- c. Explore tools like Direct Income Support which exist in many developed/developing countries need to be explored as decent living income cannot be explored only through pricing mechanism.

### 5) Partnerships:

At the district level we need build partnerships between various governmental and non governmental agencies to implement the program. At the national level we need to build an alliance of Public sector research organisations, extension agencies, departments dealing with rural livelihoods and NGOs which are working on sustainable agriculture/ organic/ natural/ ecological farming.

## Conclusions

Indian farming is at a cross-roads and climate change is one more factor adding to the existing agrarian and agriculture crisis in the country, that requires a decisive direction shift at the policy level;

Fundamental changes have to come from the acknowledgement and realization that unilateral, top-down, prescriptive "knowledge generation and transmission" models of agriculture development adopted in the country so far have in fact resulted in an ecological, economic and social crisis in the farming sector of the country within 40 years of adoption and that climate change is one more imperative for drastic change to address the situation.

Climate change is already a reality for Indian farmers and that conventional models of agricultural research and extension will fail to address the need of the hour unless some fundamental recasting is done. The immediate need for interventionist action precludes traditional models of research and support systems and requires alternative but urgent programmatic interventions, led by farmers' institutions and their local resources, knowledge and innovations.

Existing mainstream models of farming are GHG-inducing and are not conducive to adaptation either given their high external-input dependency – models which increase the risk of vulnerable farmers. Sustainable agriculture, on the other hand, holds immense mitigation and adaptation potential, specifically in the context of climate change even as it improves rural livelihoods and addresses the ecological crisis in Indian farming (genetic erosion, land degradation, water depletion and contamination etc.)

As the International Assessment of Agricultural Science & Technology for Development (IAASTD) concluded, business as usual is not an option any more. In fact, this paper concludes that there are no options in front of the Indian government and Indian farmers but to establish, promote and adopt sustainable agriculture for all of India.

## References

1. Agriculture Geography, Majid Husain, Anmol publication New Delhi.
2. *Climate Change and Natural Disasters:Scientific evidence of a possible relation between recent natural disasters and climate change*, Jason Anderson, IIEPCamilla Bausch, Ecologic.
3. *Climate change and human health Risks And Responses*. (Edit.)A.J. McMichael The Australian National University, Canberra, Australia D.H. Campbell-Lendrum London School of Hygiene and Tropical Medicine, London, United Kingdom.
4. *Natural disasters, climate change and mental health considerations for rural Australia* Shirley A. Morrissey and Joseph P. Reser, School of Psychology, Griffith University, Gold Coast, Queensland, Australia
5. *Impacts, vulnerabilities And adaptation In developing countries*, Climate Change Secretariat (UNFCCC) Martin-Luther-King-Strasse 853175 Bonn, Germany

## Internet

1. [cafs.cgiar.org/commission](http://cafs.cgiar.org/commission)
2. [www.iari.res.in](http://www.iari.res.in)
3. [www.iisc.ernet.in/insa](http://www.iisc.ernet.in/insa)
4. [www.unfccc.int](http://www.unfccc.int)

## Municipal Solid Waste Management in Emerging Mega Cities: A Case Study of Pune City

**Ithape Vijay Chandrakant**

### Introduction

Rapid industrialization and population explosion in India has led to the migration of people from villages to the cities, which generate thousands of tons of MSW. The MSW amount is expected to increase significantly in the near future as the country strives to attain an industrialized nation status by the year 2020. Poor collection and inadequate transportation are responsible for the accumulation of MSW at every nook and corner. The management of MSW is through a critical phase, due to the unavailability of suitable facilities to treat and dispose of the large amount of MSW generated daily in the metropolitan cities. Unscientific disposal causes an adverse impact on all components of the environment and human health. Generally, MSW is disposed of in low-lying areas without taking any precautions or operational controls. Therefore MSWM is one of the major environmental problem of Indian mega cities. It involves activities associated with generation, storage, collection, transfer, and transport, processing and disposal of the solid waste. But, in most of the MSWM system comprises of only four activities, i.e. waste generation, collection, transportation and disposal. The management MSW requires proper infrastructure, maintenance and up gradation of all activities. This becomes increasingly expensive and complex due to continuous and unplanned growth of urban areas. The difficulties in providing the desired level of public service in the urban areas are often attributed to the financial status of the municipal corporations in the city.

The city of Pune is a historical city and well known for its educational importance. Today the city is also an IT Hub. The area of Pune city today is 244 sq. km. with a vast population of 35 lakhs. It is still developing and expanding by lips and bound and by 2015 the population will rise up to 50 lakhs, and by 2025 it is expected to go upto 65 lakhs.

In the present study an attempt has been made to provide comprehensive review of the MSWM of Pune city in Maharashtra that happens to be one of the largest emerging mega city in India.

### Characteristics of MSW

There are many categories of MSW such as food waste, rubbish, commercial waste, institutional waste, street sweeping waste, industrial waste, construction and demolition waste and sanitation waste. MSW contains recyclable (paper, plastic, glass and metal etc), toxic substances (paints, pesticides, used batteries, medicines etc.) compostable organic matter (fruit and vegetable peels, food waste) soiled waste (blood stained cotton, sanitary napkins, disposable syringes).

The quantity of MSW generated depends on a number of factors such as food habits, standard of living, degree of commercial activities and seasons. Data on the quantity variation and generation are useful in planning for collection and disposal systems. With increasing urbanization and changing lifestyles, Indian cities, now generate eight times more solid waste than they did in 1947. Presently about 90 million tons of solid waste are generated annually as byproducts of industrial, mining, municipal, agricultural and other processes. The amount of solid waste generated per capita is estimated to increase at a rate of 1 -1.33% annually. Many researchers have reported that MSW generation rates in small towns are lower than those of metro cities, and per capita generation rate of MSW in Indian cities ranges from 0.2 to 0.5 kg/ day. It is also estimated that the total MSW generated by 217 million people living in urban areas was 23.86 million ton/yr in the year1991 and 39 million ton/yr in the year 2001. The quantity of MSW is as shown in Table 1.

**Table 1 : The Quantify of MSW**

Sr. No.	Name of the State	No. of Cities	Municipal Population	Municipal Solid Waste (t/day)	Pre capita generated (kg/day)
1.	Andhra Pradesh	32	1,08,45,907	3973	0.364

2.	Assam	4	8,78,310	196	0.223
3.	Bihar	17	52,78,361	1479	0.280
4.	Gujrat	21	84,43,962	3805	0.451
5.	Haryana	12	22,54,353	623	0.276
6.	Himachal Pradesh	1	82,054	35	0.427
7.	Karnataka	21	82,83,498	3118	0.376
8.	Kerala	146	31,07,358	1220	0.393
9.	Madhya Pradesh	23	72,25,833	2286	0.316
10.	Maharashtra	27	2,27,27,186	8589	0.378
11.	Manipur	1	1,98,535	40	0.201
12.	Meghalaya	1	2,23,366	35	0.157
13.	Mizoram	1	1,55,240	46	0.296
14.	Orissa	7	17,66,021	646	0.366
15.	Punjab	10	32,09,903	1001	0.312
16.	Rajasthan	14	49,79,301	1768	0.355
17.	Tamil Nadu	25	1,07,45,773	5021	0.467
18.	Tripura	1	1,57,358	33	0.210
19.	Uttar Pradesh	41	1,44,80,479	5515	0.467
20.	West Bengal	23	1,39,43,445	4475	0.321
21.	Chandigarh	1	5,04,094	200	0.397
22.	Delhi	1	84,19,084	400	0.475
23.	Pondichery	1	2,03,065	60	0.295
		<b>299</b>	<b>12,81,13,865</b>	<b>48,134</b>	<b>0.376</b>

Source: Status of MSW generation, collection, treatment and disposal in class-I cities ([CPCB, 2000] AND [CPCB, 2000])

Currently Pune city is generating around 1100 metric tones of solid waste per day, which is collected, transported and disposed at a sanitary landfill site which is about 20 km away from Pune, viz at Devachi Uruli. The total cost for collection, transportation and disposal is about used at the sanitary landfill site.

The composition and the quantity of Municipal solid waste generated form the basis on which the management system needs to be planned, designed and operated. In India MSW largely with respect to the composition and hazardous nature is compared to MSW in the western countries. The composition of MSW at generation sources and collection points in Pune city is as follows:

1. Organic fraction (40-60%),
2. C/N ratio - 20 and 30
3. Lower calorific value - 800 and 1000 kcal/kg.
4. Paper - 5% by weight
5. Plastic - 5% by weight
6. Glass - 10% by weight
7. Ash and fine earth - 15% by weight

Also the ward wise generation of solid waste as shown in Table 2

60 crores per year and nearly about Rs. 20 - 25 crores are spent on transportation and equipment

**Table 2 : Ward Wise Generation of Solid Waste**

Sr. No.	Ward Office	Waste Generated Per Day in TONS
1	Aundh	70
2	Karve Road	NA
3	Ghole Road	90
4	Warje-Karvenagar	NA
5	Yerawada	NA
6	Dhole Patil Road	65
7	Hadapsar	60
8	Sangamwadi	NA
9	Vishrambaug Wada	70
10	Bhawani Peth	NA
11	Tilak Road	NA
12	Sahakar Nagar	NA
13	Bibwewadi	55

### Waste Segregation

Segregation at source (garbage generating point) is the most important step in waste management and is done in two major categories: dry waste and wet garbage. The recyclable material that is separated and sent for recycling, thus preserving loss of natural resources, energy and labour which goes into its manufacturing. It also makes the job of rag pickers easy, besides providing them employment. The wet garbage is composed through vermiculture.

Wet waste means biodegradable waste and it includes household waste of all kinds, cooked and uncooked, including vegetable waste, egg shells, and bones, hairballs, flower and fruit waste including juice peels, soiled paper, disposable diapers, house plant waste, house sweeping and waste from slaughter house, meat and fish markets, fruits and vegetable markets and ashes etc. 1<sup>st</sup> July 2005 was the last date to the residents for non-segregation waste collection; from here onwards corporation has started collection of only segregated waste and residents are forced to segregate the dry and wet waste. Pune Municipal Corporation has done ground trothing in 14 wards regarding solid waste segregation practice in eight categorized places namely Societies, Bungalows, Slums and Chawls, Hotels, Restaurants, Juice Bars, Wedding Halls, Hostels, Slaughter Houses and Shops. Aundh ward has maximum segregation of waste in slums. There is no segregation of waste in Warje Karvenagar Slum Area. Hotels in Karve Road, Ghole Road, Dhole Patil Road, Hadapsar, Yerwada and Bhavani Peth ward area segregate all the waste. 50 % of the wards segregate hotel waste as dry and wet waste. Solid waste is not segregated in slaughterhouses of Warje Karve Nagar and Sahakar Nagar.

The income from the sale of scrap collected from the ghantagadis is their earnings. As a matter of fact in these wards they have free paid municipal labour that have been redeployed for road sweeping and other works. It is also possible to introduce registered rag pickers on all ghanta trucks and ghantagadis at no cost to PMC.

### Waste Collection and Transportation

PMC is playing a positive role in door-to-door collection of waste by deploying vehicular fleet as follows:

1. Nearly 450 cycle rickshaws are operating in various parts.
2. 65 Ghanta Trucks have reached 60% properties in doorstep services.
3. Separate system for collection hotel waste with the help of 20 trucks.

Due to augmented doorstep collection services, PMC could achieve in making container free areas by reducing more than 300 containers of 3.8 cu.mt. capacity and similar number of compact buckets. Dhole Patil ward office has reduced 162 containers followed by Yerwada by 157 containers. Lowest of 15 containers removal was observed in Vishrambag wada and Warje Karvenagar ward offices. Total reduction in container was from 2555 to 1520 numbers in the year 2005-2006. For waste collection and transportation, PMC has set up six different ramps at strategic locations in the Pune city. The solid waste from each collection point is brought to these ramps, by dumper placers or other transportation equipment. Before sending entire waste to disposal site at Devachi Urali, the entire waste is sent to transfer stations for weighing, and a computerized record is maintained. In all the 14 Administrative ward offices the collection route map is prepared and waste is collected accordingly. The total number of vehicles used in this regard is as shown in Table 3

**Table 3 : Total Number Of Vehicles Used**

Sr. No.	Type	Number of Vehicles
1.	Open body truck	18
2.	Tipper truck	11
3.	Dumper placer	33
4.	Compactor vehicle	18
5.	Tricycle	356
6.	Community bin container (3.8 cu.mt.)	530
7.	Community bin container (1.5 cu.mt.)	150

### Chakachak Toli

Clean and beautiful city is a dream of every citizen of Pune. For this purpose the PMC has taken special efforts through various SWM programmes. Mechanization of process, increasing human resource or privatization are the easy alternatives but they are expensive. PMC has adopted the system of public awareness and active participation in reduction and disposal of solid waste. This approach even though time consuming has proved to be effective for efficient implementation of the programme. All audio-visual aids are used in awareness programme. The help of students, senior citizens, community group, institutions, consultants, NGOs is found to be effective in achieving the goals. Chakachak offices are opened in all zonal offices. Computers and telephone facilities are made available to the team members and citizens.

### Treatment and Disposal

All the waste generated in the PMC area is collected and transported to the landfill sites. There the waste is either dumped or treated properly. The compost is sold to the farmers. The landfill sites are closed scientifically.

### Forthcoming Projects

As per the present rate of waste generation i.e. 400 gm/capita/day, the total amount of waste generation in Pune city will be as follows:

Year	Expected <b>population</b> growth	Waste <b>generation</b>
2011	45 lakhs	1800 MTD
2021	60 lakhs	2400 MTD
2025	65 lakhs	2600 MTD

In order to take care of expected population growth following projects may help to solve the problems of MSW.

1. Setting up biogas plants on BOT basis with a capacity of 50 MTD of **wet** waste in decentralized manner.
2. 50 MTD of vermin-culture plant and 500 MTD of mechanical composting plant.
3. Compost plant on 1 acre land.

## Conclusion

The segregation of waste at source and promotion of recycling or reuse of segregated materials reduces the quantity of waste and the burden on landfills, and provides raw materials for manufacturers. The composition of MSW shows mostly organic matter, so composting is a good method for treatment and production of soil amendment. The rapid increase in the quantities of MSW and the inability to provide daily collection services may cause a nuisance and health hazard. In PMC area such situation rarely arises because of efficient and scientific MSW practices implemented. The decentralized biogas plants based on solid waste will be the ideal solution. It will also to generate the electricity, which will be the additional advantage.

## References:

1. Ahsan, 1999 N. Ahsan, Solid waste management plan for Indian mega cities, *Indian Journal of Environment Protection* 19 (2) (1999), pp. 90-95
2. Bhide and Shekdar, 1998 A. D. Bhide and A. V. Shekdar, Solid waste management in Indian urban centers, *International Solid Waste Association Times (ISWA)* (1) (1998), pp 26-28
3. CPCB, 2000 CPCB, 2000, Status of Solid Waste Generation, Collection, Treatment and Disposal in Class 1 cities, series: ADSORBS/31/1999-2000.
4. Chakrabarty et al., 1995 P Chakrabarty, V. V. Srivastava and S. N. Chakrabarti, Solid waste disposal and the environment- a review, *Indian Journal of Environmental Protection* 15 (1) (1995), pp. 3943.
5. Dayal, 1994 G. Dayal, Solid wastes: sources, implications and management, *Indian Journal of Environmental Protection* 14 (9) (1994), pp. 669-677.
6. Gupta et al., 1998 S. Gupta, M. Krishna, R. K. Prasad, S. Gupta and A. Kansal, Solid waste management in India: options and opportunities, *Resource, Conservation and Recycling* 24 (1998), pp, 137-154. Summary Plus I Full Text + Links I PDF (254 K) I View Record in Scopus I Cited By in Scopus (13)
7. Jha et al., 2003 M. K Jha, OAK. Sondhi and M. Pansare, Solid waste management - a case study, *Indian Journal of Environmental Protection* 23 (10) (2003), pp. 1153-1160. View Record in Scopus I Cited By in Scopus (2)
13. Fol, 1995 Gol, Urban solid waste management in India, Report of the High Power Committee, Planning Commission, Government of India (1995).
14. Environmental Status Report 2006-07 of Pune Municipal Corporation
15. UNEP, 2001 UNEP, India: state of the environment 2001, United Nations Environment Programme, Regional Resource Centre for Asia and the Pacific (UNEP RRC\*AP), Asian Institute of Technology, Thailand (2001).



## Geographical Study of Hydrogeomorphological Characteristics of Jamwa Ramgarh Sub Catchment Area

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### Introduction

Rivers and dams are the major sources of fresh water for drinking and irrigation. Over exploitation of natural resources are getting degraded over a period of time. The conservation of water resources is an urgent need to overcome a problem of water shortage in any region especially the urban areas. River catchment factors are topography, soil type, and land use affects the surface water runoff and underground water level. Catchment topography affects the time for rain to reach the river, while soil type and development determine the amount of water to reach the river. Hydro geomorphology describes scientifically and evaluates the physical environment through the water circulates. Quantitative and qualitative investigation of drainage basin provides the foundation for the variation in hydrogeomorphic response of a river basin. The present investigation is measuring the description of linear aspect of channel network, areal aspect of drainage basin, relief aspect of channel system and basin form. In this view hydrogeomorphology is science that deals with occurrences of water with respect to landform or hydrogeomorphology. The river catchment is a function of rainfall, surface and subsurface topography, drainage basin morphology and runoff etc.

The area selected for the study is Jamwa Ramgarh sub-catchment located near Jaipur (Rajasthan) and one of the oldest man-made lakes in western India. In recent years there has been increasingly greater concern for inland freshwater resources which are affected in different ways by all kinds of human activities. The Jamwa Ramgarh sub-catchment was the only and important source of water supply to Jaipur city from 1904. The reservoir and groundwater of sub-basin was used to meets the domestic and agricultural demands of Jaipur and the nearby areas. The human intervention in catchment area is now deficient in water availability and not able to supply any water to Jaipur city after 2007. The increasing population and increasing water demand is the major cause for the depletion of surface and groundwater.

The surface water flow takes place when the rate of rainfall is higher than the rate of infiltration. After fulfilment of infiltration and percolation water starts flowing towards low lands, depressions or downslope by the gravitation pool. As the water moves forms a stream and network of streams collect the water of a region is called a river catchment. The quantity of water moves tangentially to join the streams below is called subsurface flow (Pareta, K. 2005). Perfect estimation of surface runoff and its volume from the catchment of river basin is becoming difficult for hydrogeomorphologist. But the analysis and findings of such researches are used for several purposes e.g. river flood forecasting, water conservation, hydropower generation and many other applications (Sherwani, A. et al, 2014).

Nag (1998) carried out a study in the Chaka sub-basin of Purulia district in West Bengal and mentioned that the surface water and groundwater occurrence at any place on the earth is not a matter of chance but generally consequences of the interactions of climatic, geomorphic, geologic factors intensively. To understand the surface and sub-surface inherent characteristics of the catchment, it is necessary to understand the morphometric properties of the area (Gaur *et al.*, 2011 and also mentioned that the morphometric characteristics such as slope and drainage analysis along with weather and soil characteristics have been calculated to estimate the surface and the sub-surface runoff.

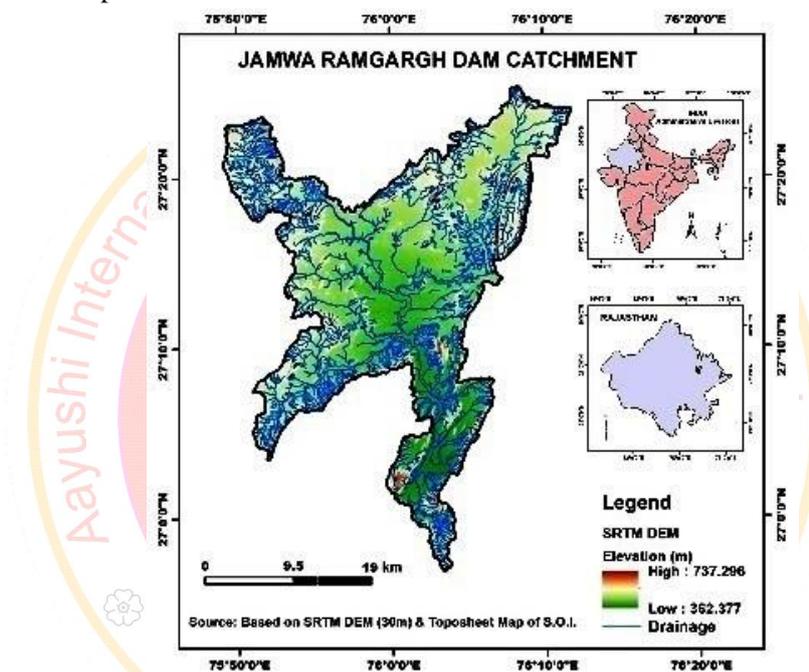
Jamwa Ramgarh reservoir near Jaipur in Rajasthan is one of the oldest man-made lake. The spatial and temporal variation in rainfall distribution and its extreme conditions studied in detail of the catchment area (Gopalet. *al.*, 1981). Soil parameters determined through use of remote sensing data for the estimation of runoff (Bohneret. *al.*, 2006). Preta and Preta (2016) summarized the forms of the Ramgarh hill structure along with the several geological structures i.e. dips, floods, faults, joints, and lineaments in every direction. Sreevedi *et al.* (2013) in their study used SRTM DEM analyzed by GIS techniques which provides with precision, fast and inexpensive way for calculating morphometric analysis. Remote sensing data provides accurate, timely and real-time information on various aspects of river basin such as size and shape of the watershed, land use,

physiography, soil distribution, drainage characteristics and identification of existing or potential erosion-prone areas and provides inputs to many of the soil erosion, sediment yield and runoff models (Suresh, 2004) which are very useful for flood estimation, soil analysis and watershed management. Bohner *et al.* (2006) in their study used the combined hydrological and meteorological model for the catchment and was being tested by simulating historical flood events of known magnitude of the river catchment.

Thus the hydrogeomorphological study decided in present investigation is very useful for identify the geomorphological characteristics which are helpful for watershed management, water harvesting systems, irrigation planning etc.

### Location of Jamwa Ramgarh sub-basin

Jamwa Ramgarh is a sub-basin of the Banganga River. The part of river sub-basin are lying between 26°57' N to 27° 25' N latitude and 75°49' E to 76°12'E longitude covers the part of Bairath, Amber, Jamwa-Ramgarh and Shapura of Jaipur district.



The sub-catchment area is like a four-faced star. The maximum length of sub-catchment area is 53 km from north to south and east–west stretch is 37 km and the total area is approximately 831 sq. km. The basin has a semi-arid type of subtropical monsoon type of climate with dry-hot summers, low monsoon rain and a cool winter season. Precipitation data from Global Weather shows that the average yearly rainfall is 56 cm. Most of the rainfall occurs during the monsoon months (June to September) with lowest record of rainfall is 52 cm and highest record of rainfall with 60 cm in a span of last many years.

### Aims and objectives :

Geographical study of hydro-geomorphic characteristics of Jamwa Ramgarh sub catchment:

1. To study the hydrogeomorphic characteristics of Jamwa Ramgarh sub catchment.
2. To find out the reasons for the water deficiency in sub-catchment area.

### Significance of study:

The Jamwa Ramgarh dam is constructed and completed in 1904 to provide water to Jaipur city. The dam was important because it provided water for domestic, industry and irrigation purposes. Domestic use includes everyday activities such as water for drinking, cooking, bathing, washing and gardening. Over a period of time excessive use of water from the Jamwa Ramgarh dam with increase of population, water for irrigation and encroachment in river basin as well as deficiency of rainfall cause the water shortage. Poor water management and exploitation of groundwater with extensive tube-well systems threatens the underground water level drastically. Water is very much important thus there is urgent need of scientific study of water sources, safe drinking water supply and problem related to water. Thus the study of river and dams as source of

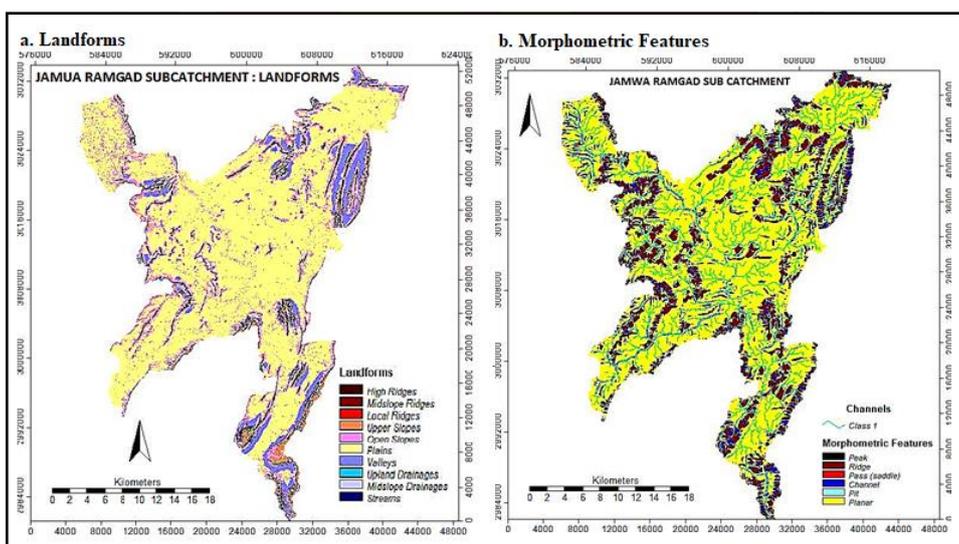
water supply has been considered in the geographical study of hydrogeomorphological characteristics of Jamwa Ramgarh carried out accurately with precision by deploying the GIS and RS technology.

**Methodology**

The area for the geographical study is decided the Jamwa Ramgarh sub-catchment. The SRTM (30 m) is satellite data used for geomorphological analysis such as landforms, slope, aspect, flow accumulation, drainage density, stream ordering etc. To identify the suitable catchment area for water with the help of Stranger's Method was assessed by using soil texture, rainfall distribution, and land use land cover from different data sources websites such as rainfall data has been used from the Global Weather data web portal similarly soil data from Global Soil Grid data. Slope map prepared from SRTM DEM downloaded from USGS web portal and Land Use Land Cover layer has been procured from the Bhuvan website. The average values is ranged to find out the magnitude of a yield to the total are calculated to find out the good, average and bad catchments which has been applied to estimate the potentiality of each sub-catchment. Geomorphologic characteristics verification carried out from the topomaps and field observation. The wise interpretation is supported by secondary information from available books and research articles.

**A. Terrain and drainage analysis**

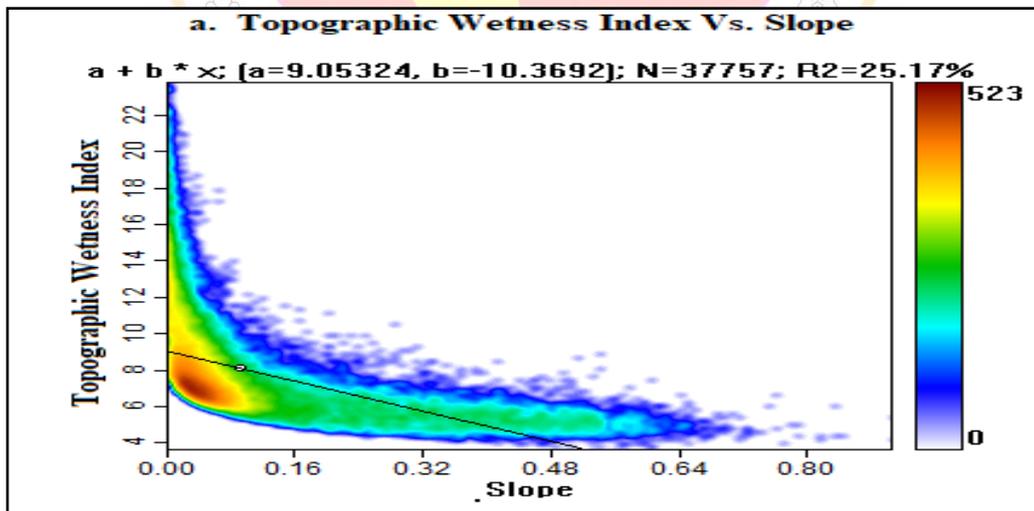
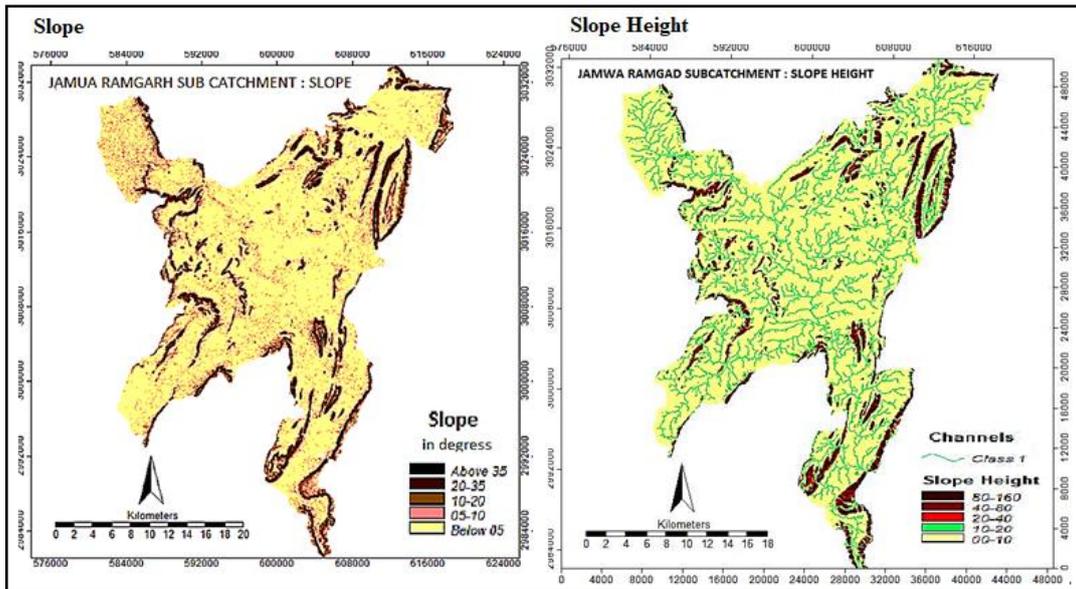
Terrain includes the geomorphic and surface features. 65% region is plain and 13 % area is slope land. Only 4% area is under the high ridges. Therefore, the whole study area is plain land with some dissected ridges and hills.



Slope of the land is essentially the gradient or incline of the land. It is observed that more than 80% area having gentle slope in study area. Only 7% of the area comes under the steep slope. Aspect measures the direction of steepest slope for a location on the surface.

Landforms		
Landforms	Area (Sq km)	% Area
Streams	15.18	1.80
Mid slope Drainages	49.17	5.92
Upland Drainages	6.77	0.81
Valleys	40.93	4.93
Plains	544.69	65.55
Open Slopes	85.00	10.23
Upper Slopes	25.44	3.06
Local Ridges	0.76	0.09
Mid slope Ridges	22.99	2.77
High Ridges	40.33	4.85
<b>Sum</b>	<b>831</b>	<b>100</b>

Morphometric features		
Feature	Area	% Area
Planar	512.91	68.66
Pit	0.26	0.03
Channel	93.97	12.58
Pass (saddle)	2.96	0.40
Ridge	136.41	18.26
Peak	1.36	0.18
Sum	831.26	100.12



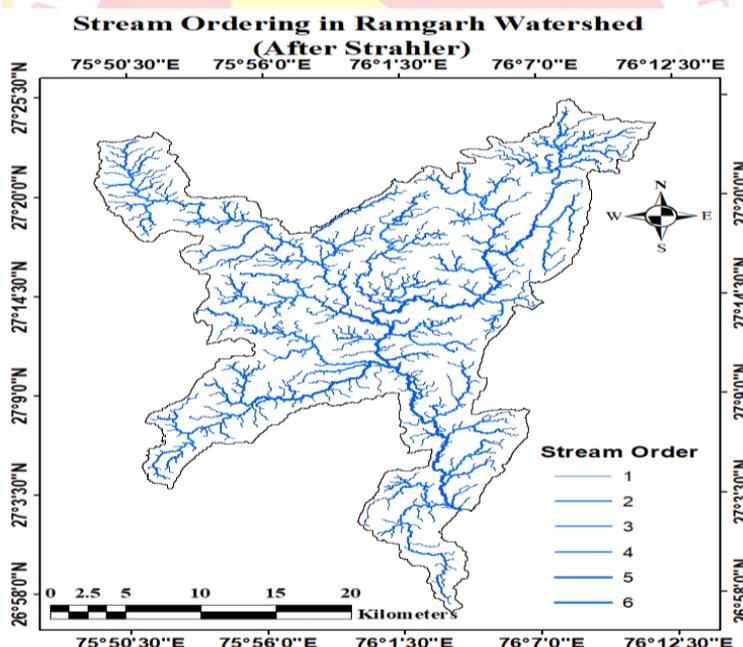
Slope		
Slope in Degrees	Area (Sq. Km)	% Area
Gentle slope (00-10)	702.84	84.52
Mod. slope (10-15)	68.49	8.24
Steep Slope (20-35)	59.94	7.21
Sum	831.27	100

Vertical distance to channel network is very much high to the 1<sup>st</sup> order stream area where undulation is very much high and found vice a versa in later order streams. The topographic wetness index (TWI), also known as the compound topographic index (CTI), is a steady state wetness index. Almost 80 % area in river basin is semi dry and having topographic wetness index in high elevated area because of the coarse soil texture and less rainfall.

Topographic Wetness Index		
Wetness Index	Area	% Area
Almost Dry	362.32	43.60
Very Low	302.38	36.39
Low	95.06	11.44
Moderate	60.19	7.24
Wet	11.19	1.35
<b>Sum</b>	<b>831.14</b>	<b>100.02</b>

The relationship between topographic wetness and slope is negative in Jamwa Ramgarh basin which indicates that the high elevation having low wetness and low elevation having high wetness.

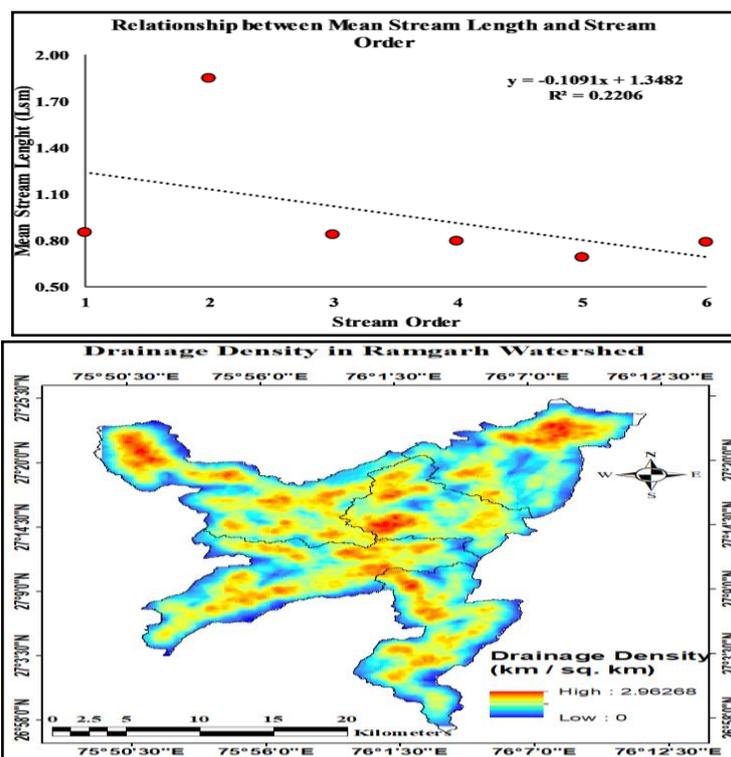
It is observed that Ramgarh basin has 6<sup>th</sup> highest order stream. The maximum frequency of streams found in 1<sup>st</sup> order on the hilly rugged terrain and the number of streams decreases significantly in the study area with the higher order.



Stream order (u)	Stream number (Nu)	Stream Length (Lu) (km)	Mean stream length (Lsm) (km)	Stream length ratio (RL)	Bifurcation ration (Rb)	Mean bifurcation ratio (Rbm)
I	627	531.66	0.85	-	-	1.76
II	288	531.62	1.85	2.18	2.18	
III	137	114.61	0.84	0.45	2.10	
IV	97	76.75	0.79	0.95	1.41	
V	63	43.36	0.69	0.87	1.54	
VI	39	30.73	0.79	1.14	1.62	

Stream length ratio (RL) can be defined as the ratio of the mean length of the one order to the next order of streams. For the 2<sup>nd</sup> and 6<sup>th</sup> order stream, it is highest 2.18 and 1.14 respectively and for, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup>

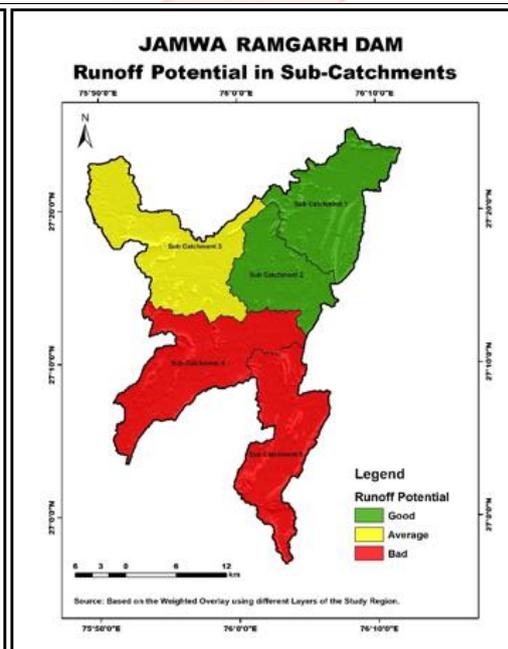
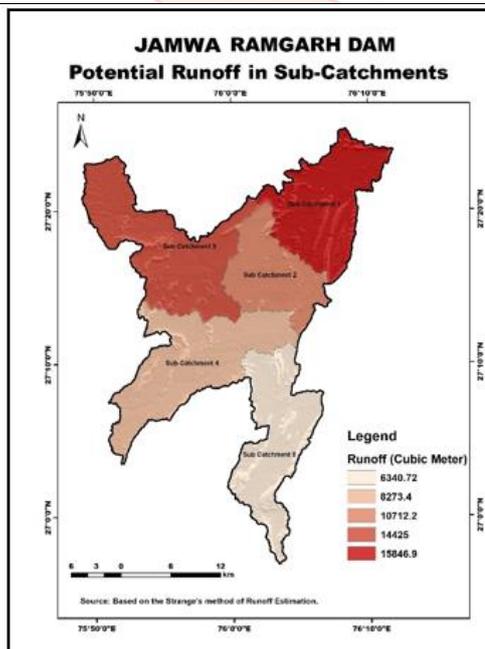
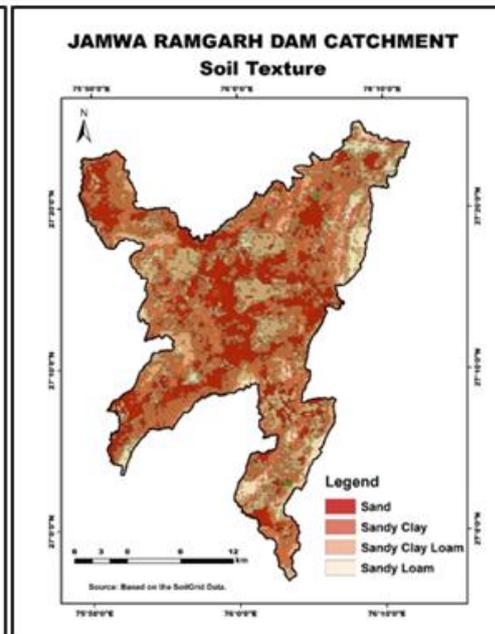
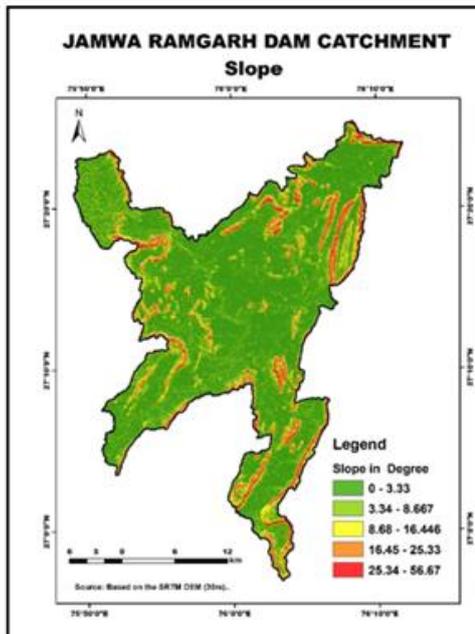
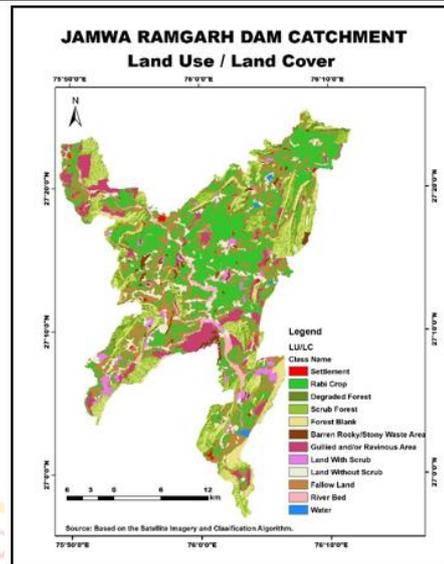
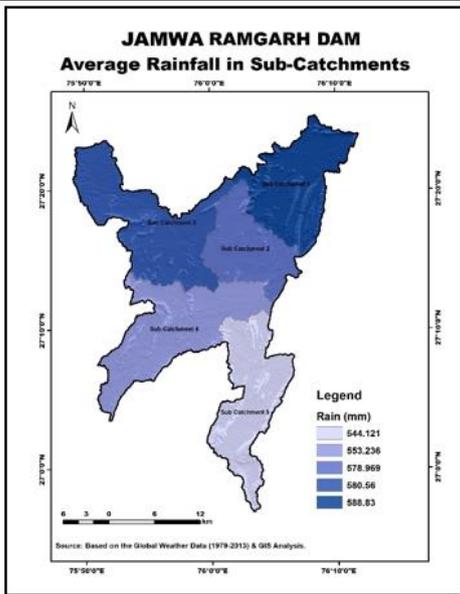
order; it remains low due to the less variation of the topography in the basin area. The mean bifurcation ratio of the Ramgarh basin is 1.76.

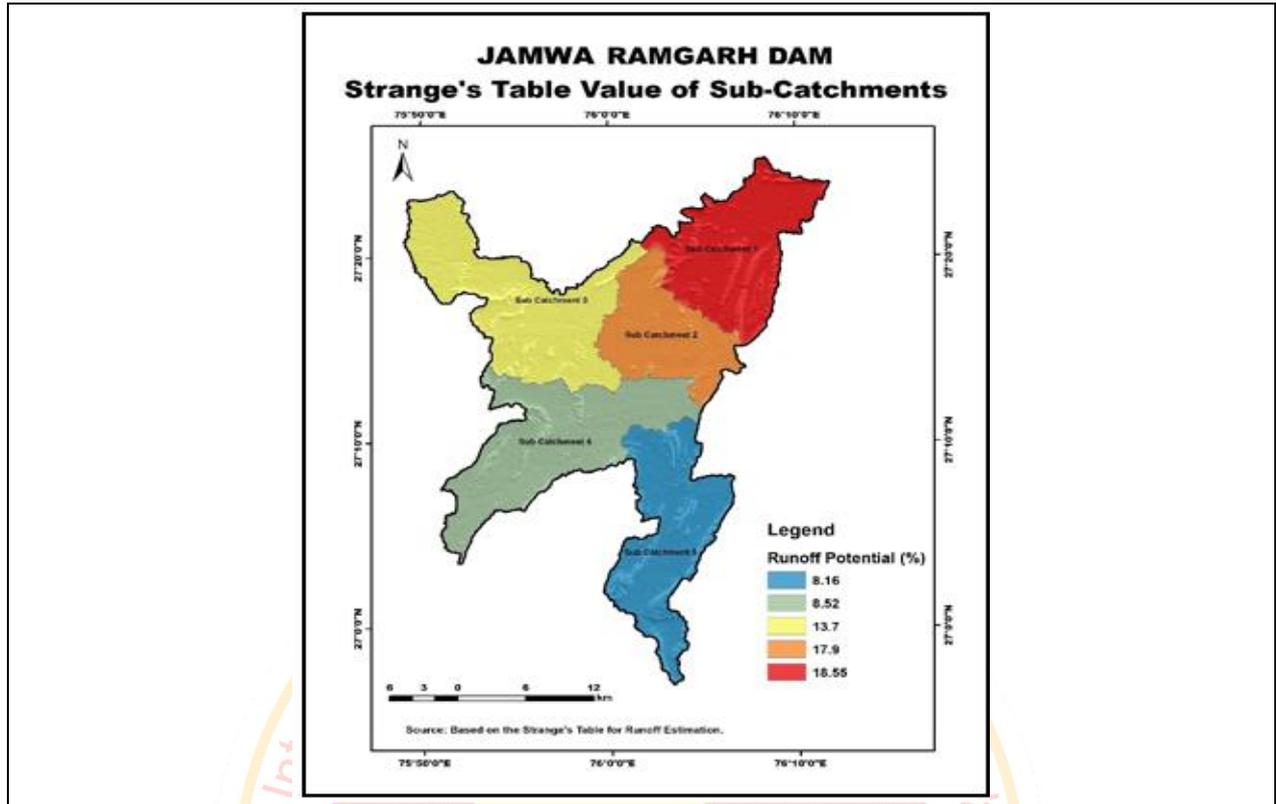


Drainage density of Ramgarh basins ranging from 0 to 2.96 km per sq. km with average of 1.36 km per sq. km which indicates that river basins are consisting homogeneous lithology which is controlling the drainage density.

The soil texture of the region is characterized by the coarse-grained sandy soil spreading in the entire sub-catchment area. Rainfall is controlled by monsoon winds. The precipitation is high in north east and low in south west part of the sub-catchment. Land use /Land cover characteristics of this region is emphasized that rabi crop is predominant in this region followed by the fallow land. The scrub land and degraded forest is spreading on the sloping grounds of the hills. The sub-basin region is relatively plain and gentle slope except small scattered hills.

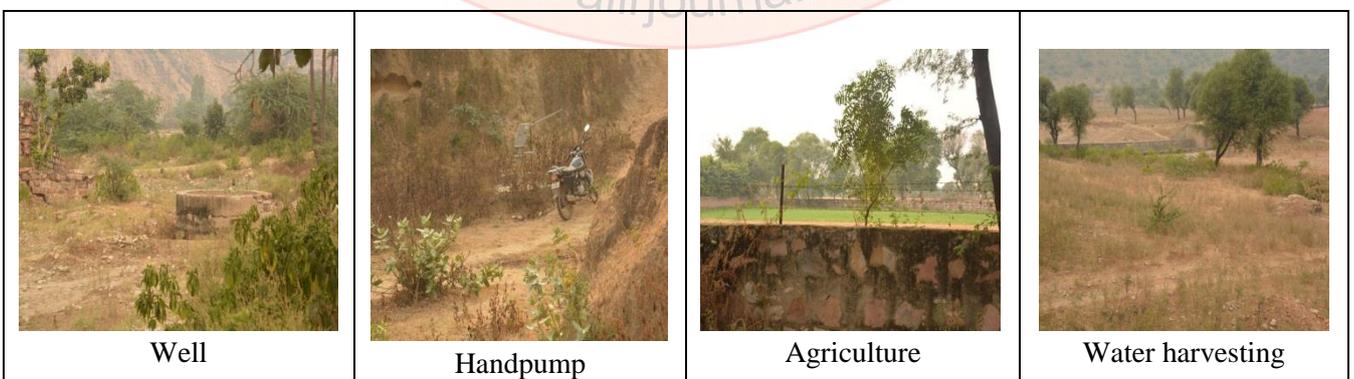
Soil Type	Area (%)	Land use Type	Area (%)
<b>Sandy Clay</b>	42.92	Settlement	0.53
<b>Sandy Clay Loam</b>	23.65	Rabi Crop	25.37
<b>Sandy Loam</b>	6.18	Degraded Forest	4.84
<b>Sand</b>	27.25	Scrub Forest	14.07
Slope	Area (%)	Rainfall (mm)	Area (%)
<b>0.00</b>	11.81	523-542	16.41
<b>3—5</b>	62.51	542.1-559	15.24
<b>5—15</b>	15.26	559.1-574	19.50
<b>15-25</b>	6.51	574.1-585	27.27
<b>&gt;25</b>	3.92	585.1-601	21.58





The catchment area is classified in three categories that are good, average and bad by weighted score using Krigging method and the sub-catchment is divided in five sub divisions. The subcatchment 1 shows high potential runoff whereas subcatchment 2 and 3 shows an average potential of surface runoff and 5 are not suitable catchment for surface runoff. The average rainfall observed of about 588.83 mm and subcatchment 4 and 5 is showing the least runoff among the sub catchments thus the sufficient rainwater is not reaching up to the storage place of the Ramgarh dam.

The major reasons for the water deficiency in subcatchment 4 and 5 (lower subcatchment) is water harvesting structures which have been constructed under the different watershed management programs of the state and central government. Dam water storage area is dry due to the excess use of water at upper catchment area for agriculture and other purposes through the wells and tube wells. The encroachment of settlements in the river bed also may be reason to reduce the subsurface and underground water level. Thus, dam is dry since 2007 and even underground water is also over exploited through tube wells.



### Conclusion

- Physiological study of Jamwa Ramgarh sub-catchment reveals that the majority of area is under the plain terrain with few dissected hills and ridge topography.

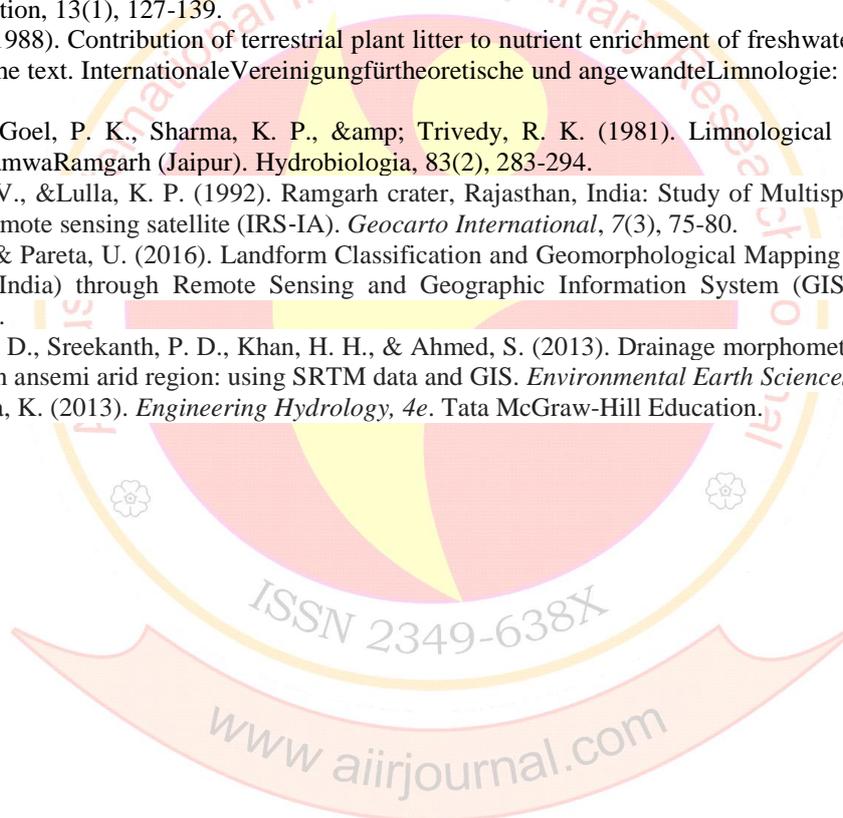
- The major cause for the deficiency of water in the catchment area is growth and encroachment of settlements in river bed, excessive use of surface and underground water for irrigation through the installation of water harvesting systems.

### Suggestions

Water is indeed an essential resource for life on earth and it must be conserved. In fact, historically, humans had learned to conserve the available water resource by building dams. The Jamwa Ramgarh is an example of source of water to Jaipur city which is dried up due to unwise management. So we all people in the country need to be aware about and need proper utilize of water and effective utilization of geospatial technology for watershed management.

### References

1. Böhner, J., McCloy, K. R., & Strobl, J. (2006). *SAGA: analysis and modelling applications* (No. 115). Goltze.
2. Gaur, S., Chahar, B. R., & Graillot, D. (2011). Combined use of groundwater modelling and potential zone analysis for management of groundwater. *International Journal of Applied Earth Observation and Geoinformation*, 13(1), 127-139.
3. Gopal, B. (1988). Contribution of terrestrial plant litter to nutrient enrichment of freshwaters: With 2 figures and 2 tables in the text. *Internationale Vereinigung für theoretische und angewandte Limnologie: Verhandlungen*, 23(3), 1367-1371.
4. Gopal, B., Goel, P. K., Sharma, K. P., & Trivedy, R. K. (1981). Limnological study of a freshwater reservoir, Jamwa Ramgarh (Jaipur). *Hydrobiologia*, 83(2), 283-294.
5. Murali, A. V., & Lulla, K. P. (1992). Ramgarh crater, Rajasthan, India: Study of Multispectral images obtained by Indian remote sensing satellite (IRS-IA). *Geocarto International*, 7(3), 75-80.
6. Pareta, K., & Pareta, U. (2016). Landform Classification and Geomorphological Mapping of Ramgarh Structure, Rajasthan (India) through Remote Sensing and Geographic Information System (GIS). *J. Hydrol. Environ. Res*, 4, 1-17.
7. Sreedevi, P. D., Sreekanth, P. D., Khan, H. H., & Ahmed, S. (2013). Drainage morphometry and its influence on hydrology in an semi arid region: using SRTM data and GIS. *Environmental Earth Sciences*, 70(2), 839-848.
8. Subramanya, K. (2013). *Engineering Hydrology*, 4e. Tata McGraw-Hill Education.



## A Comparative Study of Rainfall in Drought Affected Districts in Maharashtra

Mr. Rajendra M. Shingate

### Introduction:

Drought has been major problem in India as well as Maharashtra. It is an unpredictable climatic condition and occurs due to failure of one or more monsoons. Drought prone region of Maharashtra faces the various problems i.e. low agricultural productivity, agricultural instability, Drinking water, migration, farmer suicide etc. This is a result of erratic rainfall and lack of sufficient irrigation facilities. The Maharashtra state and Government of India have made many efforts to overcome the problems created by the drought in 1972 and 2012. Drought is an extended period of months or years when a region notes a deficiency in its water supply whether surface or underground water. Generally, this occurs when a region receives consistently below average precipitation. MH state is affected by severe droughts in the year 1972, 2003, and 2012. In Maharashtra Solapur, Ahmednagar, Sangli, Pune, Satara, Beed, Nasik, Latur, Akola, Osmanabad, Nanded, Aurangabad, Jalna, Jalgaon, Parabhani, Buldhana and Dhule these 17 districts were affected by this famine. Therefore, it becomes necessary to study the rainfall in drought-affected districts in Maharashtra.

### Objectives:

- To study the normal rainfall in the drought affected districts in MH in the year 1972 and 2012.
- To study the actual rainfall in the drought affected districts in MH in the year 1972 and 2012.
- To compare the rainfall in the drought affected districts in MH in the year 1972 and 2012.

### Study Area:

The region selected for the study is the drought-affected districts in Maharashtra state. Maharashtra State has a geographical area of 3,07,713 sq. km and is bounded by North latitude 15°40' and 22°00' and East Longitudes 72°30' and 80°30'. The State has 35 districts and 353 talukas. Out of these 35 districts 17 districts were drought affected. Those districts are Solapur, Ahmednagar, Sangli, Pune, Satara, Beed, Nashik, Latur, Akola, Osmanabad, Nanded, Aurangabad, Jalna, Jalgaon, Parabhani, Buldhana and Dhule.

### Data Base And Methodology:

Data has collected by referring different statistical abstracts, district gazetteers, agricultural statistical information of Agriculture Department of Maharashtra, Pune. The Secondary data was also collected from various Government offices, Institutions, and Maharashtra Economic survey -2012-2013. The collected data was processed, edited and analyzed by applying different statistical methods and is presented through tables, maps and diagrams.

### Drought Definitions:

Drought is an occasion when the rainfall for a week is half of the normal or less, when the normal weekly rainfall is 5 mm or more. Drought is a period of drier-than-normal conditions that results in water-related problems. An extended period of dry weather, creating extreme dryness due to lack of rain.

A **drought year** is defined as a year in which the total rainfall received is less than 75 % of the normal.

Maharashtra was facing its worst drought in four decades with over 115 talukas and 7064 villages in the state being declared drought affected. The Maharashtra government was declared areas which have received less than 75% rainfall and sowing as drought affected. According to this criteria 17 districts in Maharashtra was drought affected.

### Rainfall In Drought Affected District In Mh:

**Table \_1 Total Rainfall in drought affected districts in 1972 and 2012 (in mm)**

	Districts	Normal	1972	2012	1972 as % of normal	2012 as % of Normal
1	Ahmednagar	497.1	319.9	383.3	64.3	77.1
2	Pune	830.1	661.1	676.6	79.6	81.5
3	Solapur	559.7	251.1	412.0	44.8	73.6
4	Satara	922.1	980.4	917.8	106.3	99.5
5	<b>Sangli</b>	<b>551.6</b>	<b>665.2</b>	407.9	<b>120.9</b>	73.9
6	Aurangabad	675.3	289.8	368.8	42.9	54.6
7	<b>Jalna</b>	<b>688.1</b>	<b>336.4</b>	324.0	48.8	<b>47.1</b>
8	Beed	668.5	271.1	434.9	40.5	65.1
9	Latur	788.6	325.9	760.0	41.3	96.4
10	<b>Osmanabad</b>	<b>741.7</b>	<b>257.4</b>	390.6	<b>34.7</b>	52.7
11	Nanded	943.7	382.3	660.7	40.5	70.0
12	<b>Akola</b>	<b>734.9</b>	<b>567.5</b>	<b>828.1</b>	77.2	<b>112.7</b>
13	Nashik	1073.9	643.1	863.4	59.8	80.4
14	Dhule	566.4	538.0	405.7	94.9	71.6
15	Jalgaon	702.9	379.6	404.6	54.0	57.6
16	Parbhani	776.6	342.6	637.1	44.1	82.0
17	Buldhana	713.0	453.2	612.2	63.5	85.9

In table number 1 the figures show normal and actual rainfall in drought affected 17 districts in Maharashtra state in the drought year 1972 and 2012. While comparing the actual rainfall of 1972 and 2012 it is clear that in 8 districts which is Solapur, Aurangabad, Jalna, Beed, Latur, Osmanabad, nanded and Parnhani the actual rainfall was less than half the normal in 1972 while it is only in Jalna district in 2012.

In 1972 Osmanabad district had lowest rainfall 257.4mm which is 34.7 % of normal rainfall 741.7mm while it is in Jalna district 324mm which is 47.1 % of the normal in 2012.

The highest rainfall in drought affected district in 1972 is in Sangli district 665.2mm which is 120.9 % of normal rainfall 551.6 mm while it is in Akola district 567.5 mm which is 112.7 % of the normal 734.9 mm in 2012.

The normal rainfall in Ahmednagar district is 497.1mm. But in 1972 the actual rainfall in the district was 319.9 mm which is 64.3 % of the normal while in 2012 the actual rainfall is 383.3 mm which is 77.1 % of the normal. Like this in 1972 the actual rainfall and percentage of the normal in drought affected districts Solapur 251.1 mm, (44.8%), Sangli 665.2 mm, (120.9%) , Pune 661.1 mm,(79.6%), Satara 980.4 mm (106.3%), Beed 271.1 mm,,(40.5%), Nashik 643.1 mm, (59.8%), Latur 352.9 mm (41.3%), Akola 567.5 mm, (77.2%), Osmanabad 257.4 mm, (34.7%), Nanded 382.3 mm, (40.5%), Aurangabad 289.8 mm, (42.9%), Jalna 336.4 mm, (48.8%), Jalgaon 379.6 mm, (54.0%), Parabhani 342.6 mm, (44.1%), Buldhana 453.2 mm (63.5%), and Dhule 538.0 mm, (94.9%) while in 2012 the actual rainfall and percentage of the normal in drought affected districts Solapur 412.0 mm, (73.6%), Sangli 407.9 mm, (73.9%), Pune 676.6 mm (81.5%), Satara 917.8 mm, (99.5%), Beed 434.9 mm, (65.1%), Nashik 863.4 mm, (80.4%), Latur 760.0 mm, (96.4%), Akola 828.1mm, (112.7%), Osmanabad 390.6 mm, (52.7%), Nanded 660.7 mm, (70.0%) , Aurangabad 368.8 mm, (54.6%), Jalna 324.0 mm, (47.1%), Jalgaon 404.6 mm, (57.6%), Parabhani 637.1 mm, (82.0%), Buldhana 612.2 mm, (85.9%) and Dhule 405.7 mm, (71.6%).

**Rainfall Table\_ 2**

Sr.no	% of normal	1972	2012
1	Less than 50%	Solapur, Auragabad, jalna, Beed, Latur, Osmanabad, Nanded, parbhani	Jalna
2	50% to 60%	Nasik, Jalgaon	Auragabad , Jalgaon, Osmanabad
3	60% to 70%	Ahmednagar, Buldhana	Beed
4	70% to 80%	Pune, Akola	Ahmednagar, Solapur, Sangli, Naded, Dhule

5	80% to 90%	-	Pune, Nasik, Parbhani, Bhuldhana
6	90% to 100%	Dhule	Satara, Latur
7	More than 100%	Satara, Sangali	Akola

In Solapur, Aurangabad, Jalna, Beed, Latur, Osmanabad, Nanded, and Parbhani district the actual rainfall is less than 50% of the normal in 1972 where as Jalna is only one district where the actual rainfall is less than half the normal. 50% to 60% rainfall of the normal is in Nasik and Jalgaon district in 1972 while in Aurangabad, Jalgaon and Osmanabad district in 2012. In Ahmednagar and Buldhana district the rainfall is 60% to 70% of the normal in 1972 where as in 2012 is in Beed district. In 1972 the actual rainfall in Pune and Akole district is 70% to 80% while in Ahmednagar, Solapur, Sangli, Nanded and Dhule district in 2012. 80% to 90% rainfall is not in 1972 but in Pune, Nasik, Parbhani and Buldhana district it is in 2012. In Dhule district 90% to 100% rainfall of the normal is in 1972 while it is Satara and Latur in 2012. The actual rainfall in Satara and Sangli district is more than normal in 1972 where as in Akola district in 2012.

**Most drought affected district in 1972 & 2012 (rainfall) Table 3**

Sr. No	District	1972	2012
1	Solapur	44.8%	73.6%
2	Aurangabad	42.9%	54.6%
3	Jalna	48.8%	47.1%
4	Beed	40.5%	65.1%
5	Osmanabad	34.7%	52.7%
6	Jalgaon	54.0%	57.6%
7	Nanded	40.5%	70.0%

Among the 17 droughted affected district Solapur, Aurangabad, Jalna, Beed, Osmanabad, Jalgaon and Nanded are the maximum affected district in Maharashtra in 1972 and 2012.

Let us look the figure of the rainfall in both drought year we see that Aurangabad, Jalna, and Osmanabad district were the most affected district in both drought year.

### Conclusion:

In 1972 in Satara and Sangli district the actual rainfall is more than normal but they were drought affected districts because the rainfall was maximum in June and July in both district but the distribution of rainfall was not equal in the whole district.

Akola district has more than 100% rainfall in 2012 but it was also drought affected because the maximum rainfall is in June, July and September but it was not equal distributed in the whole district.

While comparing the study of drought affected district in Maharashtra in 1972 and 2012 drought it is concluded that Maharashtra's worst drought is 1972 because there is 17 districts which is more than half in Maharashtra was affected by drought. Among those 17 districts 8 districts which had very poor rainfall which is less than half the normal. But the drought in 2012 was not as severe as compare to 1972. The drought of 1972 was a natural calamity but the drought of 2012 is disaster of water management accompanied by corruption, extremely water intensive cropping pattern unsuitable for drought prone areas, absence of responsive disaster management system and absence of long-term view to manage drought.

### References:

1. <http://en.wikipedia.org>
2. <http://sandrp.wordpress.com>
3. 1972 Rainfall Data: [http://indiawaterportal.org/met\\_data/](http://indiawaterportal.org/met_data/)
4. Normal and 2012 Rainfall Data: <http://www.mahaagri.gov.in/rainfall/index.as>
5. Maharashtra Economic Survey 2012-13
6. Tiwari R.C. (2005): Geography of India, Prayag Pustak bhavan, Allahabad.

## Landuse and Land Cover Changes in Mira- Bhayander Municipal Corporation and Its Impact on Environmental Quality

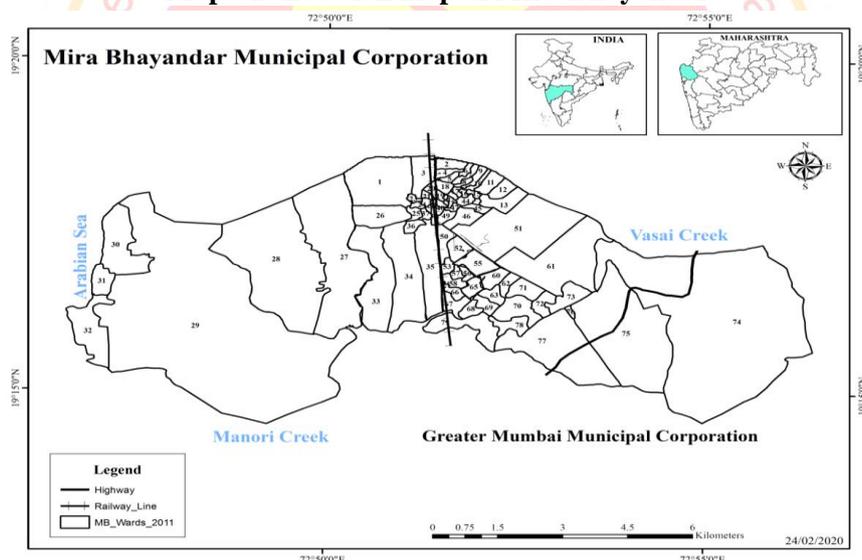
Miss. Kirti N. Ranjane, Miss. Yamini B. Mewada, Dr. Prakash Dongre,

### Introduction

Mira-Bhayandar Municipal Corporation is located in Thane district of the state Maharashtra. This city shares a border with Mumbai. In 2011 Mira-Bhayandar had 814,655 population (Census- 2011). This city has rich historic and geographic significance. Bhayandar was an important port and has been approached by various historic legends. On 12<sup>th</sup> June 1985, five villages naming Bhayandar, Kashi, Mira, Navghar and Ghodbunder were integrated to form Mira Bhayandar Municipal Council. In 1990 the Council got extended by including four other villages naming Chena, Varsova, Rai – Murdha, Dongri – Uttan. Today it is an important residential and industrial city in vicinity of Mumbai. Post 1991 onwards population in Mira-Bhayandar increased due to migration of people mainly from Mumbai due to improvement in suburban railways. Due to this land use in city started getting change at rapid rate. These changes in land use started affecting urban environment.

### Study Area:

**Map-01: Location map of Mira-Bhayandar**



Map 01 shows the location of city Mira-Bhayandar. Almost entire Mira-Bhayandar is located on coastal plain. It is located on the coast of Arabian Sea and on left bank of Vasai Creek. Western part of Mira-Bhayandar i.e. Uttan and Dongri has low hills with elevation ranging between 20 mtr to 80 mtr. Eastern part of Mira-Bhayandar is under protected area of Sanjay Gandhi National Park. Here also there is presence of low hills and eastern part of Ghodbunder has an elevation of about 200mtr. The latitudinal extension of Mira-Bhayandar is between 19°15'25" to 19°19'01" north of equator and longitudinal extend is from 72°46'45" to 72°54'16" east of prime meridian. As per census geographical area of Mira-Bhayandar is 79 sq.km and is the smallest city by area in Thane district. City has population of density 10194 persons per sq. km in 2011. Majority of the city's population depends up on Mumbai city for employment and other needs including educational institutes. The present study focuses on the investigation of spatio-temporal land use and land cover changes in the Mira- Bhayandar by using geospatial technology.

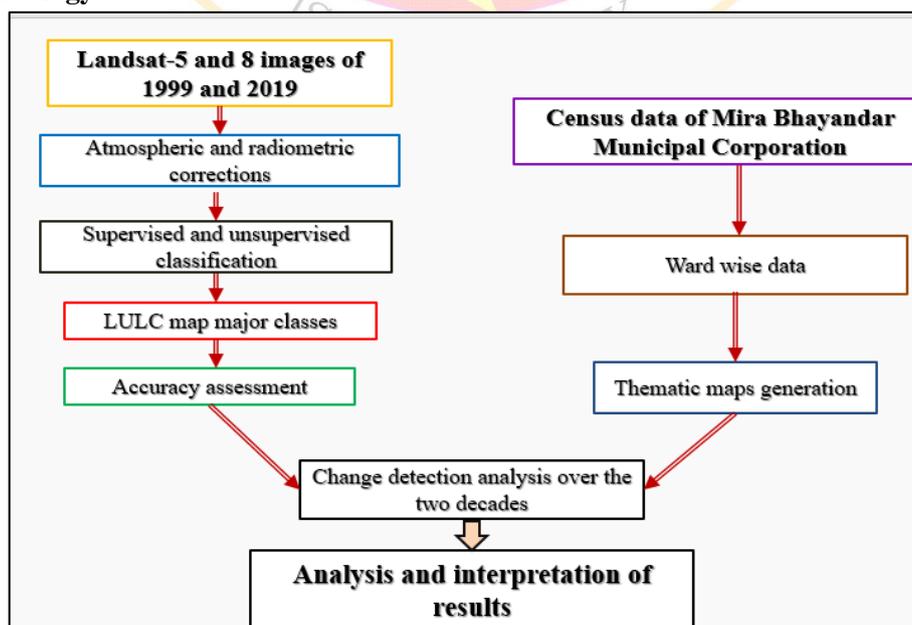
### Aims and Objectives of Study:

- To study the demography of Mira Bhayandar.
- To make land use land cover map of Mira Bhayandar for the year 1999 and 2019
- To understand and interpret land use and land cover changes.
- To give suggestions for better land use in the city.

### Literature review

Land use and land cover are the two different aspects. Land cover is the physical features of the Earth. It includes forest, vegetation, and water body. Land use is the manmade features used for various purposes. It includes built ups, commercial, industries. Remote sensing is said to be as studying the earth surfaces without coming into its physical contact. It is one of the best methods used in analysis of land use land cover change. A study was conducted in Chhattisgarh, India for in understanding the LULC change and its impact on ground water using the LANDSAT images. The ground water pollution has increased mainly due to LULC change (Khan & Jhariya, 2018). Another study was done in Islamabad, Pakistan; the researchers had carried out quantification of spatial and temporal LULC changes in Islamabad between 1992 to 2012. Researchers had used the supervised classification algorithm and post-classification change detection technique (Hassan et al., 2016). A study was conducted in the Dubai to study the trends in urbanization using the LANSAT images. Researchers had prepared the LULC maps using the image segmentation and extraction methods (Aldogom et al., 2019). Bianet K.A and Taniguchi M, in 2009, presented a paper which synthesizes on the issues of subsurface resources and assesses the factors that contribute to its degradation. The findings of the study says that the economic growth has led to rapid urbanization and population growth in Asia, this is beneficial to the Asian cities as it has become the center of production but also created various environmental problems, manifested deterioration of air and water quality, pressure on various resources, insufficient sanitation facilities, traffic congestion and increasing solid waste etc. It mainly emphasizes on subsurface and its role in urban development and states that urban waste water, oil and sewer leakages, fertilizer residuals and effluents from mining activity deposited in the ground and reached the acquirers have the potential to generate contaminants and pollute the ground water quality. Chandra M, in 2015 presented a paper, the main objective of the paper was to study the reasons behind the low environmental quality in India, despite of various powerful environmental laws. The study was conducted to gain knowledge about various environmental pollution, their reasons and their impact on the mankind. Paper also reveals about various laws formulated by the government of India in interests of environment protection. The findings derived from the study was that there is rapid economic growth is experienced by India resulting in adverse and harmful environmental conditions. The existing environmental laws cover a wide spectrum of environmental concerns, but they are ineffective due to lack of enforcement.

### Research methodology



For the present study researchers had used two satellite images one for the year 1999 and other 2019. The study area was clipped for the land use land cover classification based on supervised and unsupervised classification technique. First level LULC classification for both the years land use categories are made as water bodies, saltpans, mangroves, vegetation, open/barren and built-up. The classification was done using

Erdas Imagine and Arc Map software. The change detection analysis was done for the two time period using the Idrisi Selva software. The Land change modeler of Idrisi Selva software, helped in better understanding the landuse landcover change over the two decades.

The thematic maps were prepared using the Arc Map software. For the interpretation and demographic understanding District Census Handbook Data were collected from 1981 to 2011. The analysis and interpretation of results was done by visual interpretation method.

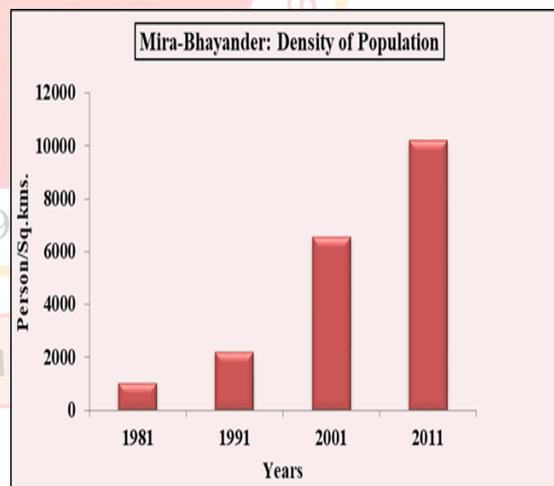
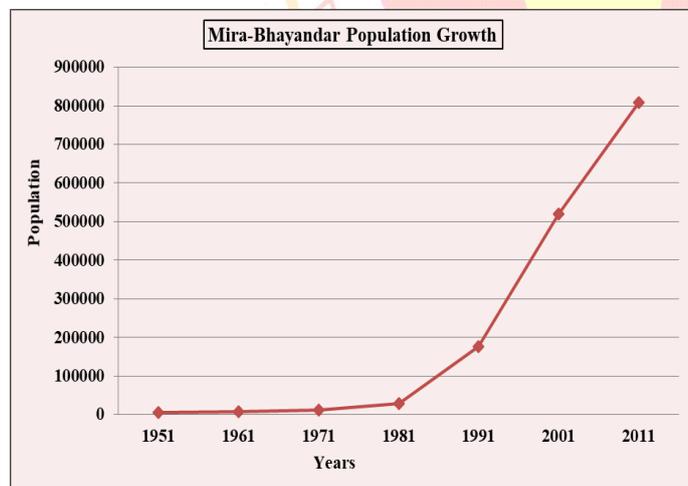
**Results and analysis - A. Demographic changes in Mira-Bhayandar:**

**1. Population Growth:** Diagram -01, represents population growth in Mira-Bhayandar from the year 1951 to 2011. Population of city was just 6327 in 1951 and it increased to 809378 in 2011. It shows that growth of population is increasing in Mira-Bhayandar. There is a sharp population growth from the year 1991 to 2011 (10% -50%). Before 1991 Mira and Bhayandar was different, former was village and later was industrial town, so population was low. Western part of Mira Road was covered with salt pans and eastern part of Bhayandar mainly have industries. In fact, the neighboring city Mumbai saw a negative population growth rate (-0.55) in the past decade indicating a huge demographic shift towards the periphery of the metro region that is expected to continue. The main reasons behind it is unaffordable housing in Mumbai. Saturation of Mumbai and availability of cheap housing at the periphery are the two major factors behind the population shift towards Mira-Bhayandar.

Due to the policy of Mira-Bhayandar Municipal Corporation (MBMC) population began growing and has gradually increased over the last twenty years. City enjoys all the facilities similarly provided by the Brihan Mumbai Municipal Corporation (BMC) in Mumbai city including power from BSES, telecom facilities from MTNL and transportation from BEST. These factors have been instrumental in people choosing to live in Mira- Bhayandar. Builders providing all the modern amenities to residents, Mira- Bhayandar is fast becoming a place where the common man’s dream of owning a flat is becoming a reality.

**Diagram: 01: Population growth in Mira-Bhayandar**

**Diagram: 2: Density of population**



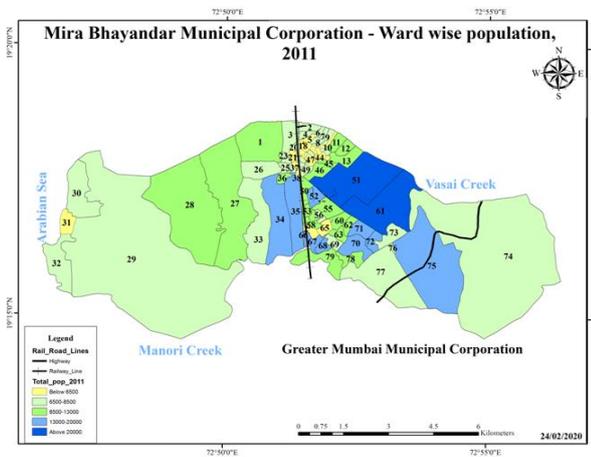
Source: Census 1951 to 2011

**2. Density of population:** Diagram -02 represents density of population/sq. kms. In 1981 density of population was 1049 and increased to 10194 persons per sq. kms in 2011. Density of population has been increased rapidly from 1981 to 2011 by 10 times. Density of population has increased mainly due to conversion of village with town as well as people were migrating from Mumbai and Thane for better living facility. Also Mira-Bhayandar is in outskirts of Mumbai so it has better opportunities for development. Population density is highest near railway stations and it decreases as distance increases from the station. Near railway stations one can see number of multistoried buildings. Second high density area is located along with national highway.

**3. Ward wise distribution of population-2011:** Map -2 represents ward wise population in the Mira-Bhayandar for the year 2011. Population is not uniformly distributed in Mira-Bhayandar. Very high concentration of population found near the railway stations of Mira Road and Bhayandar. Other area with high

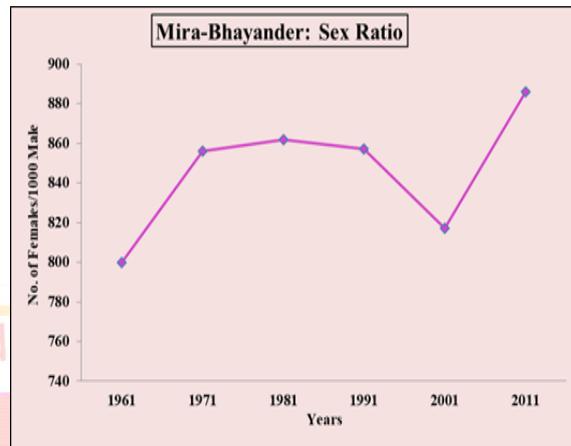
population is near National Highway. Since last decade population concentration is increasing with development of multistory buildings. Wards away from railway stations are with low population size.

**Map -2: Ward wise distribution of population – 2011**



Source: Census data 2011

**Dia-03: Mira Bhayandar - Sex Ratio**



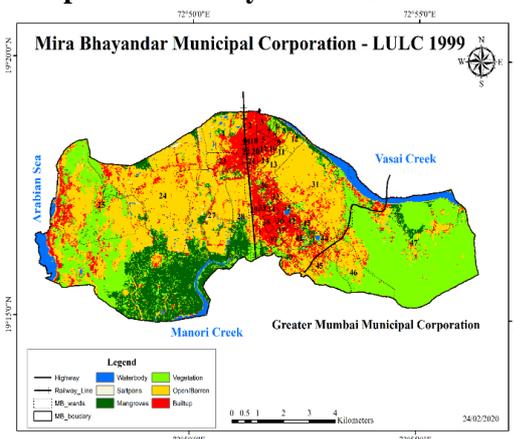
Source: Census 1961 to 2011

- Sex ratio:** Sex ratio is increasing from the year 1961-1991 (800 - 857) (Dia. -3). This is because in the past importance was given to females. And also new technology of sex determination of female fetocides, abortion were not innovated hence sex ratio was increasing. But it is diminishing from the year 1991-2001 (857-817). This was because at that time sex determination of child in the mother womb was done through songraphy and if child was girl than abortion was take place. But it has grown again in the year 2011 from 817-886 due to ban on sex determination in hospitals and awareness program by government to show importance of girl child in society.

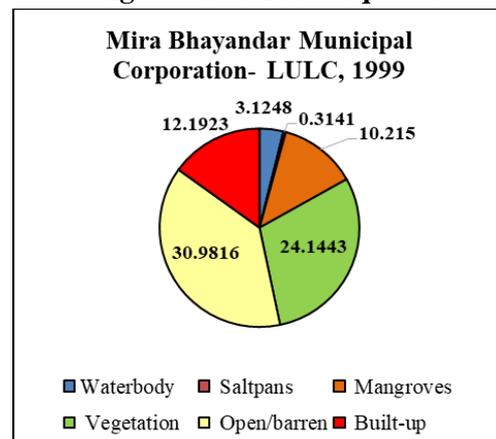
**Results and analysis – 1. Land Use Changes:**

The processed data reveals various changes in the land use and land cover in the study area over a period of 20 years. The following are the results derived from the recent study. Map -4 and diagram- 4 represents land use land cover in year 1999 where it is observed that the maximum area in this region was under open/ barren land (31%) followed by vegetation cover (24%), built-up, salt pans and water bodies. Substantial open area was due to fallow land and open grounds. Vegetation cover was good in eastern part due to Sanjay Gandhi National Park. Area near the creek was either covered with mangroves or salt pans. Settlement or built-up area (12%) was only seen near railway stations and national highway. It clearly indicates that in 1999 there was initiation stage of urbanization process in the city.

**Map-3: Mira-Bhayandar LULC -1999**



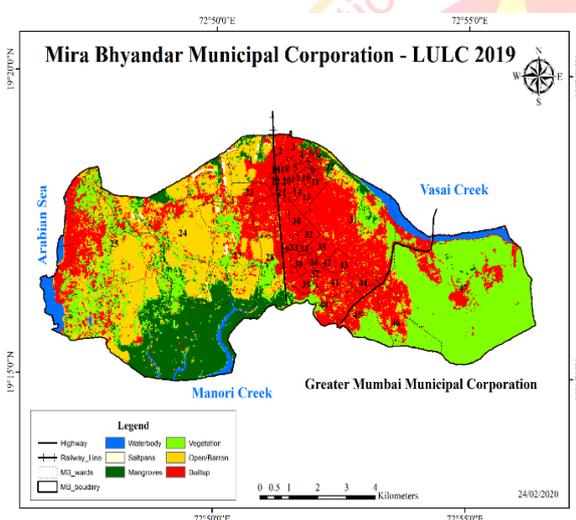
**Diag-4 : Land Use in sq. Kms**



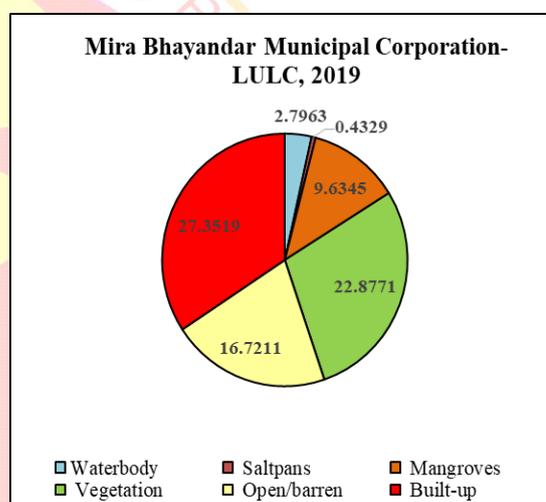
Map -4 and diagram- 4 represents land use land cover in year 1999 where it is observed that the maximum area in this region was under open/ barren land (31%) followed by vegetation cover (24.14%), built-up, salt pans and water bodies. Substantial open area was due to fallow land and open grounds. Vegetation cover was good in eastern part due to Sanjay Gandhi National Park. Area near the creek was either covered with mangroves or salt pans. Settlement or built-up area (12.19%) was only seen near railway stations and national highway. It clearly indicates that in 1999 there was initiation stage of urbanization process in this region.

Map-5 and diagram - 5 represents land use land cover in year 2019. Lots of changes took place in LULC from year 1999 to 2019. The built up area increased more than double and it covers 27.3 sq. kms. Major increase in built-up area is observed on open/ barren land. Those open plots were there in 1999 brought under the construction of residential and commercial purposes. Built-up area which was almost absent in western side of railway stations in 1999 was substantially increased in 2019. The road which is connecting Kashi-Mira to Miraroad and Bhayandar railway station also seen with major construction activities. It also indicate that there is very rapid population growth in this City. This is not the natural growth but it is the

Map-4: Mira-Bhayandar LULC -2019



Diag-5 : Land Use in sq. Kms



growth due to migration of middleclass families from Mumbai to Mira-Bhayandar.

One can see a sharp decline in the area under open/ barren land and natural vegetation. The area which was under agriculture and salt pans, mainly the privately owned land is brought under the construction. Slight increase in mangrove and vegetation is good sign but in comparison with population growth it is too less. This city needs more open spaces, gardens and play grounds. Regular belts of vegetation are needed to control air pollution in the city.

Table-1: Changes in LULC over the two decades

Sr. No	Land Use	% of area in 1999	% of Area in 2019	% Change
1	Built-up	15.06	34.28	+19.22
2	Mangroves	12.07	12.61	+ 0.54
3	Vegetation	28.66	29.82	+ 1.16
4	Open / Barren	38.27	20.95	-17.32
5	Salt pans	0.54	00.38	-0.16
6	Water bodies	3.50	3.86	-0.36
	<b>Total</b>	<b>100</b>	<b>100</b>	

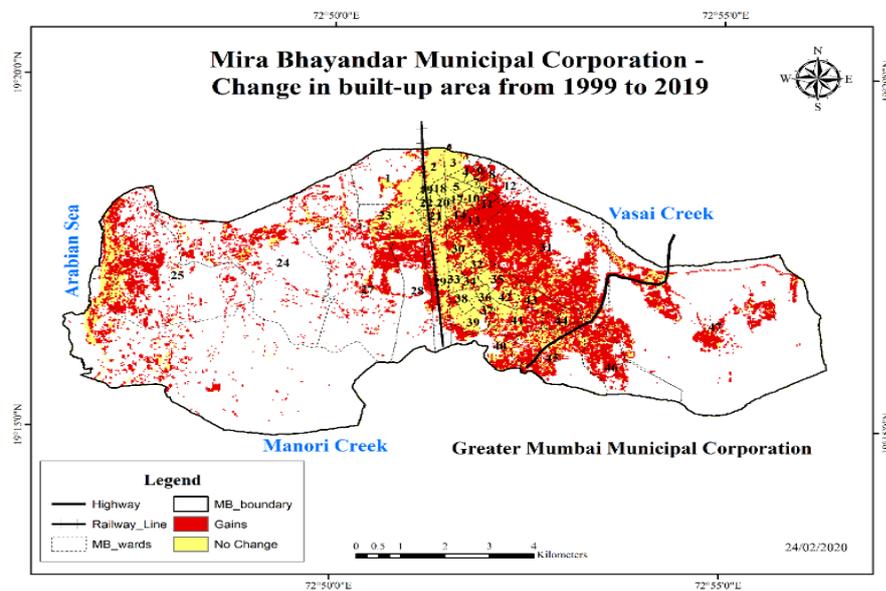
Mira Bhayandar is located on the coastal belt and has good network creeks and inlets. The city is not having waste water or sewage treatment plant, so entire amount of this water allowed to drain in to the

creeks. So this growing city need the waste water treatment plant to control water pollution in creeks. Area around Uttan and Dongari was associated with farming and fishing. The hills were covered with vegetation. But since last two decades this belt is emerging as tourist destination. Number of resorts are coming up in this area on farm lands and on hills. There is need to implement CRZ rules and efforts to protect natural vegetation. Table -01 shows status of land use changes in the city from year 1999 to 2019.

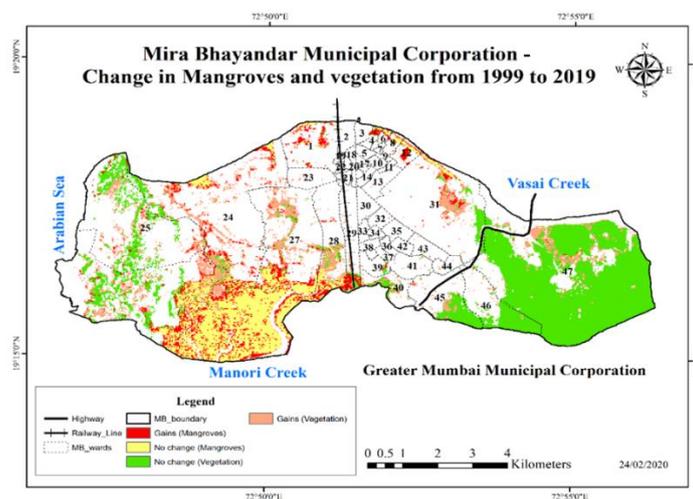
**2. Change Detection in Major Land Use:**

Map -06 shows change detection built up area in Mira-Bhayandar from 1999 to 2019. No change in built-up area has been observed near the railway line as this area was already occupied by residents. Major gain in built up area is seen along the road connecting Mira Road and Bhayandar station with National Highway no-08. Second important area with gain in built up area is observed at Bhayandar west. This is mainly due to construction of railway fly over which connected National Highway with Uttan. Third area of built-up area gain is seen in and around Uttan. Slight increase in built-up area is observed near village Kashi and Mira around highway. Major gain in built-up area is over the land which was open or barren.

**Map-5: Change in Built – up Area**



**Map-6: Change in Mangroves and Vegetation**



From 1999 to 2019, the vegetation got also changed. Over the years the few patches of mangroves as well as vegetation cover had gained. This is mainly due to conservation efforts taken by Mangrove cell and some NGO's. A major gain is observed along the Manori and Vasai creeks. Loss of vegetation is seen near the built-up areas. Here one can see the change in economic activities of the people from primary to others and that is contributing towards vegetation changes.

### Conclusion:

There has been drastic LULC change over the two decades in the Mira Bhayandar region. As the Mira Bhayandar is situated near to the Mumbai city, there has been substantial increase in population from the year 1991 onwards. This resulted in change in LULC over the years. Mira Bhayandar comes under the Mumbai Metropolitan Region. Hence, there are quite good facilities are available to the people. Property rate are quite less in this city and therefore lower middle class and middle class population prefers this city for residence. Still substantial area of city is under open or under vegetation, this areas need the attention of local authority and MMR implement good planning. This study will help the planners in planning the LULC, to maintained environmental balance.

### References:

1. Aldogom, D., Aburaed, N., Al-Saad, M., Al Mansoori, S., Al Shamsi, M. R., & Al Maazmi, A. A. (2019). Multi temporal satellite images for growth detection and urban sprawl analysis; Dubai City, UAE. *Remote Sensing Technologies and Applications in Urban Environments IV*, 11157, 111570C.
2. Hassan, Z., Shabbir, R., Ahmad, S. S., Malik, A. H., Aziz, N., Butt, A., & Erum, S. (2016). Dynamics of land use and land cover change (LULCC) using geospatial techniques: A case study of Islamabad Pakistan. *SpringerPlus*, 5(1), 812.
3. Khan, R., & Jhariya, D. C. (2018). Assessment of land-use and land-cover change and its impact on groundwater quality using remote sensing and GIS techniques in Raipur City, Chhattisgarh, India. *Journal of the Geological Society of India*, 92(1), 59–66.
4. Usman, M., Liedl, R., Shahid, M. A., & Abbas, A. (2015). Land use/land cover classification and its change detection using multi-temporal MODIS NDVI data. *Journal of Geographical Sciences*, 25(12), 1479–1506.
5. Angelovicova, L and Fazekasova, D. (2014), 'Contamination of the soil and water environment by heavy metals in the former mining area of Rudnany (Slovakia)', *Soil and Water Res*, 9, PP 18-24. Retrieved at: [www.agriculturejournals.cz&gt;public files](http://www.agriculturejournals.cz/public/files). On February 2020 at 4 p.m.
6. Chandra M.(2015), 'Environmental Concerns In India Problems And Solutions', *Journal Business And Law*, vol; 15, Issue 1, pp 1- 15, Published by Scholarly Common at Hofstra Law, 2015. Retrieved at: <http://scholarlycommons.law.hofstra.edu/jibl/vol15/iss1/1> on February 2020 at 9.30 a.m.

## Industrial impact on Urban and Rural area in Thane District

Dr. Rupwate R. L

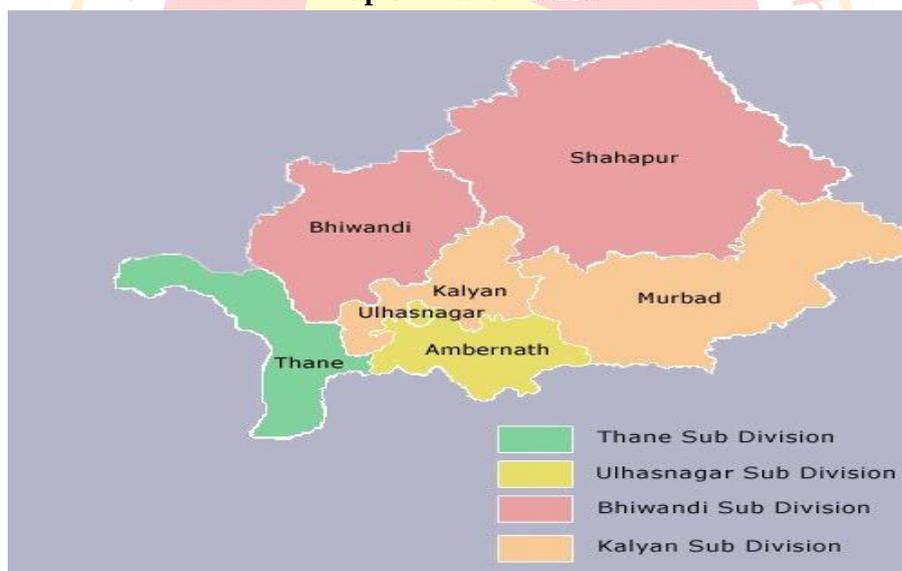
### Introduction

Thane district is a district in the Indian state of Maharashtra in Konkan Division. At the 2011 Census it was the most populated district in the nation, with 11,060,148 inhabitants; however, in August 2014 the district was split into two with the creation of a new Palghar district, leaving the reduced Thane district with a 2011 Census population of 8,070,032. The headquarters of the district is the city of Thane. Other major cities in the district are Navi Mumbai, Kalyan-Dombivli, Mira-Bhayander, Bhiwandi, Ulhasnagar, Ambarnath, Badlapur, Murbad and Shahapur.

### Aims And Objectives

1. To study industrial development in Thane District.
2. To determine the population characteristics and its effect on agriculture and industries.
3. To analyze the non-agricultural determinants from the view point of agro based industries.
4. To study performance of micro and small scale industries of Thane district.
5. To study the cottage and village industries of the region.
6. To find out the industrial problem and suggest our own measures.

Map of Thane District



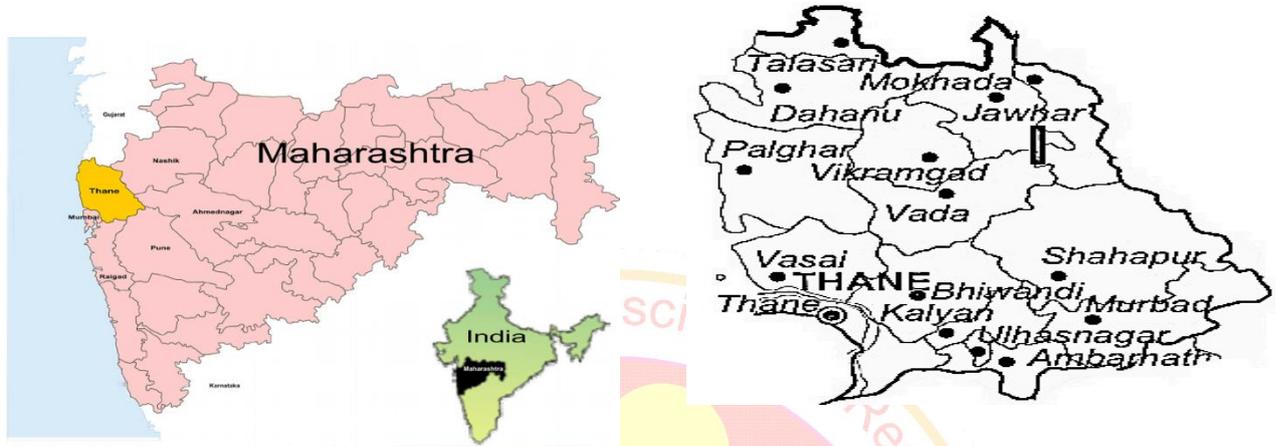
### Hypothesis

- Improve industrial status and give the infrastructure facilities to change the industrial development.
- Globalization process helps to industrial development in Thane District.
- Change the socio-economic condition of the industrial workers through the process of industrial development.

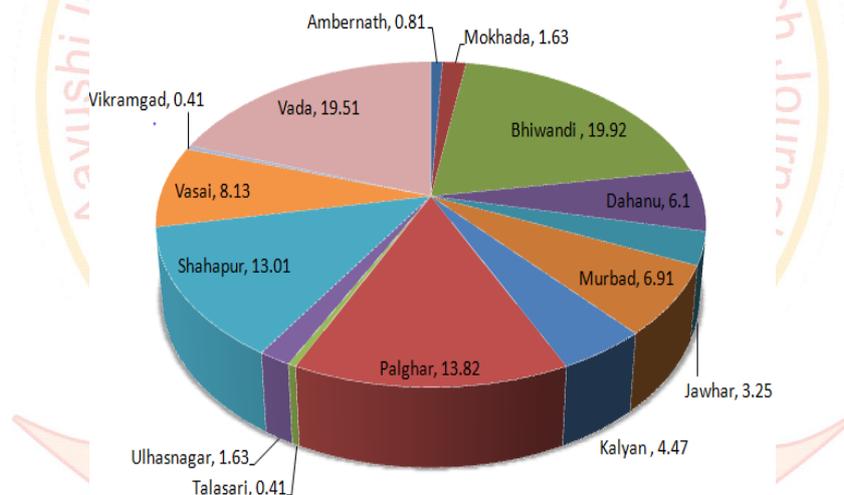
### Database and Methodology

- ✓ The primary and secondary is used for the study .Particularly the period of study is chosen from 2011 to 2018.
- ✓ Collection of primary data field survey, special questionnaires will be used. Secondary data obtained from Socio-Economic review, District statistical census handbook etc.
- ✓ Data regarding the number of large, medium and small, micro scale industries, capital investment and working capital capacity obtained from District industries center (DIC) and field survey, special questionnaire have been used to collect data.

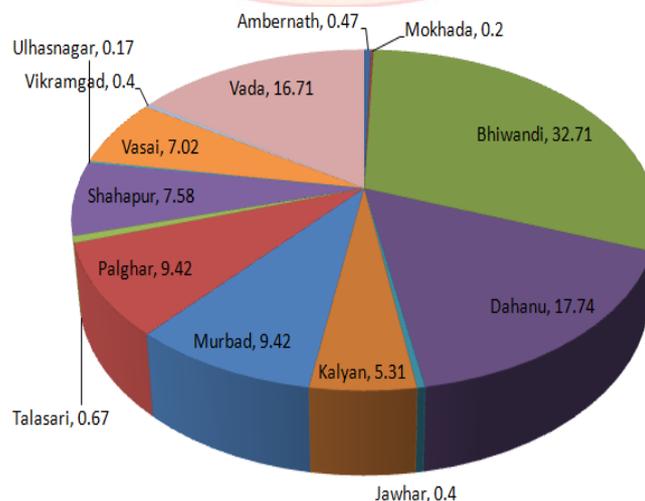
- ✓ The region under study Thane district a part of the Maharashtra state is situated in Vaitarna Basin & in the extreme north of Konkan.
- ✓ The area of the District is 9558 sq.km.
- ✓ The Arabian Sea forms the western boundary, while it is bounded by Mumbai city district and Mumbai sub urban district on South-West & Raigad district on the south.



Percentage of Cottage & Village Industries



Percentage of Employment in Cottage & Village Industries



**Physiographically Thane district divided into three parts.**

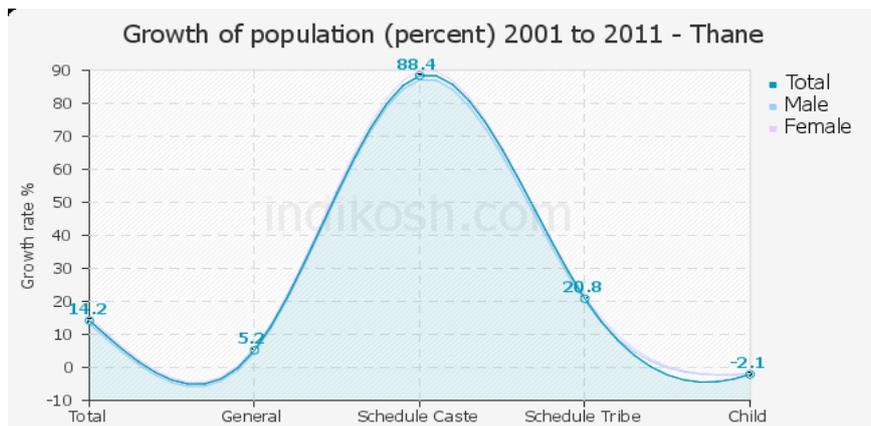
1. In the eastern parts of the district Sahyadri ranges & its north side the thick forest is situated.
2. The Central region to the district is mostly flat & this area is covered by Vaitarna, Ulhas river & their tribute rivers.
3. The Western parts of the district is coastal which covers 15 sq.km to 20 sq.km area. This region has a 112kms Coastal line.



**Industries**

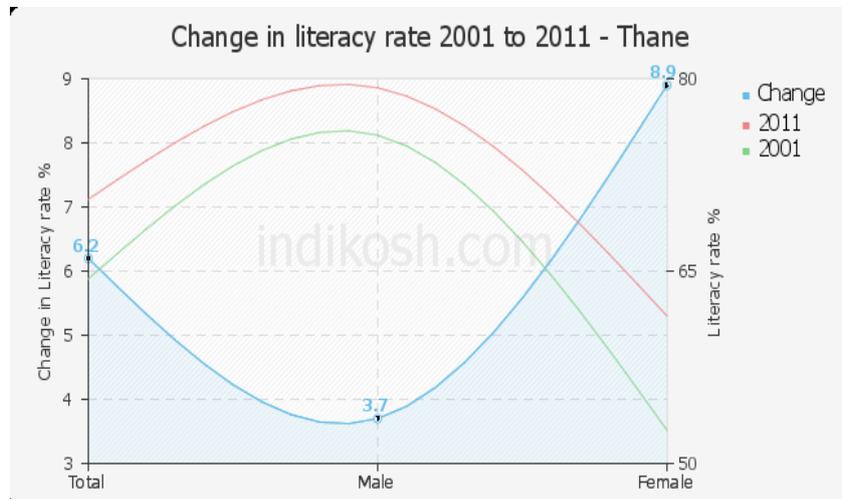
- Thane is the third most *industrialized* district in the State. There are **1548 large** and medium scale and 18,480 small scale industries in the district. The main products of these industries are Drugs, Textiles, Adhesives, Plastics, Rubber, Steel, Pharmaceuticals, Engineering, Fertilizers, Electronics, Chemicals and Iron & Steel. The **Thane-Belapur-Kalyan** industrial belt is the center of highly sophisticated modern industries. In Ulhasnagar, Ambernath, Bhiwandi, Badlapur, Tarapur, Palghar, Vasai and Murbad there are nearly 4000 industries which contribute towards the *industrialization* of the district.
- Manufacture of machinery, machine tools and parts except electrical machinery together with the iron and steel industry and metal products are the **most important and the biggest** group of industries in the district and includes manufacture of Prime movers, Boilers, Refrigerators, Machine Tools, Computing and Accounting machinery, Industrial machinery for food and textile industries, machinery for chemicals, paper and cement industries.

**Urban & Rural Areas**



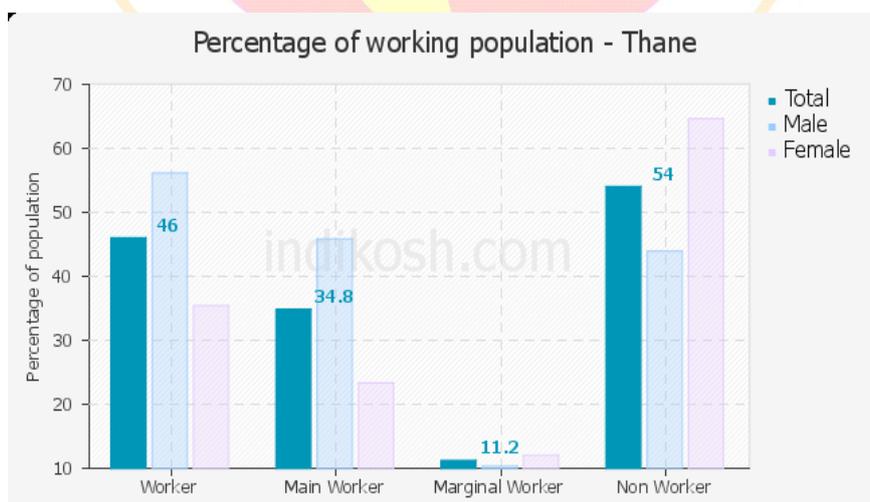
### Literacy

Total about **15.4 lakh** people in the district are literate, among them about 8.8 lakh are male and about **6.6 lakh are female**. Literacy rate (children under 6 are excluded) of Thane is **71%. 79% of male and 62% of female** population are literate here. Overall literacy rate in the district has increased by 7%. Male literacy has gone up by 3% and female literacy rate has gone up by 9%.



### Drainage Pattern

- i. The Ulhas originates from Tungarli. It meets the sea at Vasai creek. River is 135km long & has many tributaries; two important of them are Barvi & Bhatsa.
- ii. Vaitarna is largest of Konkan Rivers & rises in the Trymbak hills in Nasik district, opposite to the source of Godavari.
- iii. River is 154 km long & has number of tributaries; the most important of them are Pinjal, Surya, Daherja & Tansa.



### How have the rural-to-urban numbers risen?

The number of migrants who moved from rural to urban areas stood at 52 million out of a total population of 1.02 billion, as per the 2001 Census. Thus, the 2011 number of 78 million is a jump of 51%. The share of rural-to-urban migrants in the population rose from 5.06% in 2001 to 6.5% in 2011. Women outnumber men in making the rural-to-urban shift. Of the 78 million, 55% were females and they outnumbered males in 554 of the 640 districts. The share of male rural-to-urban migrants in the total male population rose from 4.6% to 5.7%; for females, the share rose from 5.5% to 7.4%.

### Conclusion:

- i. The industrial development in Thane has been highly commendable and impressive, particularly in relation to setting up of key industries. However, there has been imbalanced development of industries in the country.
- ii. During the last two decades, Maharashtra State showed the highest position in respect of major industrial output; however, all these industries have been concentrated in and around the areas of district.
- iii. To comply with the objective of industrial dispersal, M.I.D.C. was established to develop industrial areas in the State of Maharashtra and in this direction initially M.I.D.C. developed industrial areas near big cities and thereafter the areas were developed at remote places of the state.

### References:

1. Human Geography- Dr.Majid Hussain, Gadget thane District.
2. Jadhav Satish, Agriculture Geography.
3. Nadaf F.M. & Manohar R.S., Environmental Science.
4. Rupawate R.L., Critical studies of Agricultural land use in north theme district.



## Emerging Trends of Eco Tourism-Agro Tourism

Dr. Manasi Manojkumar Kambale

### Introduction

The tourism sector is witnessing some new trends that are supplementing the established trends in the sector. These include solo trips, road trips, pocket-friendly travelling, and wellness tourism. These trends are expanding the horizon of the tourism industry in India and generating newer avenues for revenue creation. Tourism is travel for pleasure or business, also the theory and practice of touring, the business of attracting, accommodating and entertaining tourists and the business of operating tours.

The tourism industry is the world's largest and most diverse industry many nations rely on this dynamic industry as a primary source for generating revenues, employment private sector growth, and infrastructure development The tourism industry, as part of the severe sector, has many regions and even for entire countries the tourist direct effects on the social, cultural, educational, and economic sectors of national societies, and on their international relations.

Tourism brings large amounts of income into a local economy in the form payment for goods and services needed by tourists, accounting as of 2011 for 30% of the world's trade in severest, and as an invisible export for 6% of overall exports of goods and services. It also generates opportunities for employment in the service sector of the economy associated with tourism. The hospitality industries which benefit from tourism include transportation services and entertainment venues .This is addition to goods bough by tourists, including souvenirs.

### Objectives

- Identifying the factors that determine the success of a tourism destination
- Related tourism planning to tourism policy
- Strengthening the Commitment to quality and excellence in tourism management

### Methodology

This paper uses literature review and tools of collecting secondary data to highlight various impact of tourism, document review, varies polices and tourism statistics from the Ministry of Tourism, Government of Indian and from world travel and tourism council, research of journals books newspapers professionals meeting act.

### Need and Importance of the India's Tourism Industry

The India Tourism Industry is large and has significant potential to be a key contributor to India's economic prosperity. Despite infrastuaral constraints, the industry is on an exponential growth path and offers many opportunities which can be converted into economic benefits. Travel and tourism industry's contribution to Indian industry is immense.

Tourism in India has registered significant growth in the recent years and Indian has tremendous potential to become a major global tourist destination, Travail and tourism industry is the third highest foreign exchange earner for India, and according to an estimate total direct employment in the tourism sector is around 20 million Indian's tourism industry is thriving due to an increase in foreign tourism arrivals and greater than before travel by Indians to domestic destinations. In the past few years significant growth has come from within the domestic sector, there is a need to bring the tourism in India on per with standards prevailing in other countries.

Indian should capitalize on the strengths in different type of tourism products available to the country. Indian has a lot to offer in terms of tourism and related activities. The diversity that India is famous for ensures that there is something to do for all tourism in India, no matter what their interests.

Features of some of the tourism product features are - Adventure tourism, Wildlife tourism, Medical tourism, Pilgrimage tourism, and Culture tourism, Heritage Tourist India, Beaches, Health and Wellness, Eco Tourism, Agro Tourism. The types of tourism in India have grown and this has boosted the Indian economy.

That it continues to grow efforts must be taken by the Indian government so that the tourism sector can contribute more substantially to the national's GDP

Ecotourism is a form of tourism that fosters learning experiences and appreciation of the natural environment or some component thereof, within its associated cultural context' ecotourism a unique subset of the tourism industry is focused on the enhancement or maintenance of natural systems through tourism. Ecotourism means different things to different people. To some it is the general term that encompasses natural-based, adventure, soft adventure, and cultural tourism .Ecotourism itself is meant to be a sustainable form of natural resource- based tourism. Ecotourism is a very specific form is part of the broad concept of natural-based tourism, or it can be said that ecotourism describes a nature-based operation in the field of tourism. Ecotourism is a form to tourism involving visiting fragile, pristine and relatively undisturbed natural areas, intended as a low-impact and often small scale alternative to standard commercial ma's tourism ecotourism focus on socially responsible travel, personal growth, and environmental sustainability. Minimize physical, social, behavioural and psychological impact. Build environmental and experiences cultural awareness and respect. Provide positive experiences for both visitors and hosts. Provide direct financial benefits for conservation.

Ecotourism helps protect natural habitats and pristine environments. The wealth of poorer countries is often tied up in natural resources like forests, minerals and land that could be used for agriculture. Exploiting these resources often means altering of destroying wildlife habitats and beautiful natural landscapes.

Agro tourism or agro tourism, as it is defined most broadly, involves any agriculturally based operation or activity that brings visitors to a farm or ranch. Agro tourism has different definitions in different parts of the world, and sometimes refers specifically to farm stays as in Italy, Elsewhere, agro tourism includes a wide variety of activities, including a corn maze, slopping hogs, picking fruit, feeding animals, or staying at a bed and breakfast on a farm. Agro tourism activities fall within at least one of the five categories of agro tourism and they may span multiple categories. The five categories are direct to consumer. The five categories are agriculture education, hospitality, recreation, and entertainment. Agro tourism is a form of niche tourism that is considered a growth industry.

Agricultural tourism has become a necessary means foe many small farms survey. By diversifying business operations, farm operators are able to ensure a more stable income. This is because agro tourism activities can occur during times of the year that crops may not be in season, and by providing a completely separate stream of income. Some studies have found that agro tourism operations often benefit their surrounding communities by drawing tourists to the area. The economic boost by the increase in traffic can be beneficial to rural areas in need of diversified streams of income.

People have become more interested in how their food is produced. They want to meet farmers and processors and talk with the about what goes in to food production. For many people who visit farms, especially children, the visit marks the first time they see the source of their food, be it a dairy cow, an ear of corn growing in a field or an apple they can pick right off a tree. Farmers and ranchers use this interest to develop traffic at their farm or ranch, and interest in the quality of their products, as well as awareness of their products.

### **Why the Tourism as an Emerging Industry**

Tourism plays a major can be considered to be the world. The contributions of tourism to developing countries like India significant for its development as its evident from the following facts. Tourism is considered as a job creator with multiplier effects. Job creation in tourism is growing one and a half times half times faster than any other industrial sector

Government earn huge tax revenue through the taxes levied on accommodation, restaurants and various forms of fees, etc. Tourism stimulates investment in new infrastructural developments like airport, seaports, roads, civic systems, restoration of monuments etc. and it improves the living conditions in the regions where projects are undertaken Tourism can be considered to be world's largest industry and the largest creator of employment across the economy.

The major economic benefit in promoting the tourism industry is the earing of forging exchange. Incomes from inbound tourism in the form of foreign exchanges earnings adds to the national income and as

an invisible export, may offsets a loss on the visible trading account and is of critical importance in bridging the balances of payment deficits. The top ten careers in tourism and hospitality travel agents , research plan and book, trips for individuals and groups, hotel manager, spa manger, tour operator, event and conference organiser , tour guide ,executive chef , sommelier, PR Manger, Leisure Activity Co-Ordinator

Tourism is a very vast vibrant dynamic and growth oriented industry tourism as an industry in the set of all business activities which serves the needs tourists while they visit dig gerent places by way tourism touring or

#### **Economics benefits of tourism**

- Provides employment opportunities
- Generates foreign exchange
- Increases incomes increases GNP,
- Can be built on existing infrastructure.
- Develops an infrastructure that will also help stimulate local commerce and industry.
- Can be developed with local products and resources Diversifies the economy
- Tends to be compatible with other economic activities
- Spreads development
- High multiplier impact
- Increases government revenues

#### **Social Benefit of tourism**

- Broadens educational and cultural horizons
- Improves quality of life – higher incomes and improved
- Standards of living
- Justifies environmental protection and improvement
- Provides tourist and recreational facilities that may be used by a local population

#### **Cultural benefits of tourism**

- Reinforces preservation of heritage and tradition visitor interest in local culture
- Provides employment for aeries
- Musicians and other performing artists enhancing cultural heritage
- Breaks down language barriers, sociocultural barriers, and religious barriers
- Creates a favourable worldwide image for a destination
- Promotes a global community
- Promotes international understanding and peace

It is an engine of growth for Indian economy and helps to promote sustained development of infrastructure, such as airports, railways and roads leading to connectivity of various tourist destinations. Tourism is improving the trade relations with other nations. Tourism industry is the third largest forging exchanges earner for India. Despite the slowdown in the economy, the Fore earrings from the tourism sector has increased from 7.6% to 8.7%.Domesitic tourism plays vital role in achieving the national objectives of promoting social and cultural cohesion and national integration.

#### **Tourism's contribution to GDP of India**

Tourism and travel is the one of the important sectors of the Indian economy. The direct impact consists of the supporting sectors of the economy which soppo to the traditional travel and tourism industry full and catering companies, laundry services, housekeeping and sanitation services, security services and accounting firms etc. The total contribution of the Indian travel and tourism sector to India's GDP was Rest. 3410 Ban in 2010 which was 6.1% of India GSP in that year.

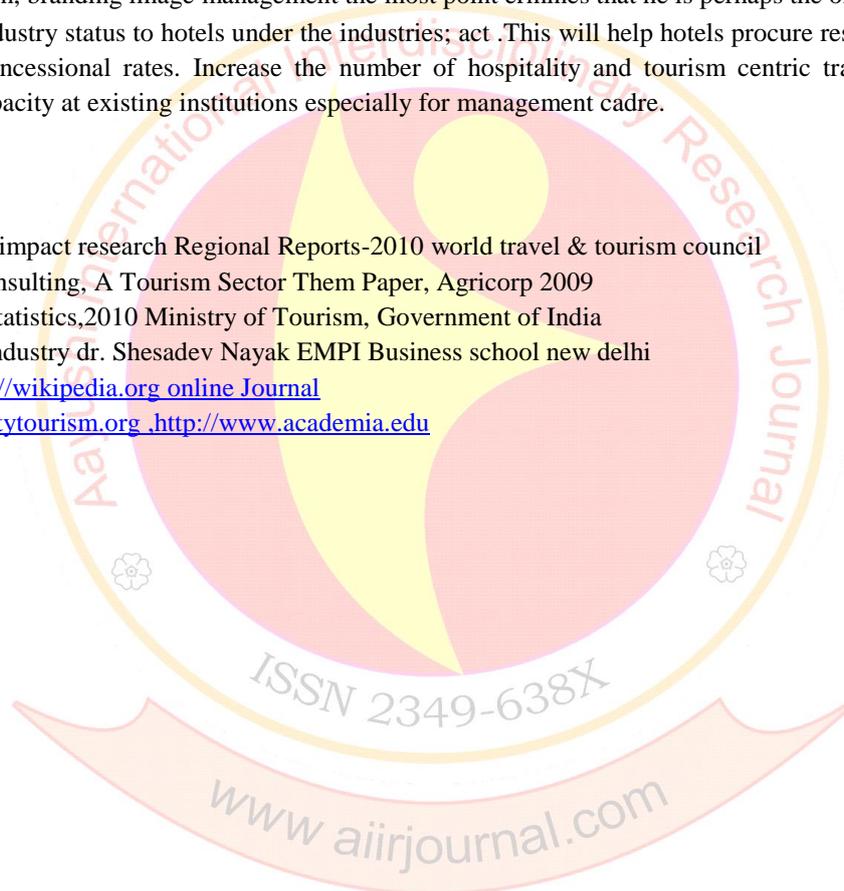
Grew at faster than the global economy for the eighth successive year 3.9% to contribute a record \$8.8 trillion global economy and 319 million jobs to the world economy in 2018 .for the eight consecutive year, this was above the growth rate of world GDP. The total contribution of travel and tourism to GDP was USD8, 272.3bn (10.4%of GDP) in 2017, and is forecast to rise by 4.0% in 2018, and to rise by 3.8% pa to USD12, 450.1bn (11.7% of GDP) in 2028.

## Conclusions

- Tourism evidently plays a great role in the developing countries. This is more so in countries that have put tourism at the top of investment priorities. Considering these important factors there is need to conserve and maintain this industry by having many improvements in ensuring the industry is attracting and retaining more tourists
- Provide hygienic tourist infrastructure remove differential entry fee for foreign tourism, Encourage public private partnership model for monument restoration and conservation.
- Create powerful sub brands and destination branding under the umbrella of incredible India to help potential tourism reinforce their decisions to visit India by providing adequate recall. Single window clearance for all licenses and should be implemented.
- Ministry of Tourism should institute a mechanism for fast track passing of initiatives which require coordination with other ministries. The India is low level national and international tread limits its inbound tourism potential further is sauce much issue Hotel capacity, transport infrastructure, human capabilities, licensing and permits, visa, taxation, branding image management the most point ermines that he is perhaps the only person.
- Give the industry status to hotels under the industries; act .This will help hotels procure resources like power and water at concessional rates. Increase the number of hospitality and tourism centric training institutions and enhance capacity at existing institutions especially for management cadre.

## References

1. Economic impact research Regional Reports-2010 world travel & tourism council
2. Avalon consulting, A Tourism Sector Them Paper, Agricorp 2009
3. Tourism Statistics,2010 Ministry of Tourism, Government of India
4. Tourism Industry dr. Shesadev Nayak EMPI Business school new delhi
5. [www.http://wikipedia.org](http://www.wikipedia.org) online Journal
6. [www.realitytourism.org](http://www.realitytourism.org) .<http://www.academia.edu>



## Trends in Geography, Commerce, it and Sustainable Development

Dhulgude Abhijeet, Research Scholar, Dr. Zodage S.B.

### 1.0 Introduction

Mahableshwar is the only hill station in India, from which the sea is visible. The peculiar moisture level of this station is maintained by sea breezes. Hence the station is unique due to its location and climate.

Tourism is considerable as a significant factor in the economy of many nations, today tourism related infrastructure in various parts of the country has improved the quality of life of the local people and helped to promote local arts and crafts. Tourism has contributed to increased awareness about conservation of the environment and the cultural heritage. Tourism is the fastest growing industry. The horizons of tourism are ever expanding in the modern world because of increasing income, tourist facilities, advertisements and other psychological and organizational set up. More and more people wish to visit different tourist places, especially hill stations.

As a result of overcrowded tourism, there are some threats to the environment like deforestation, pollution, soil erosion, ecological disturbance etc. Therefore the new concept of ecotourism is evolved. Ecotourism is a sustainable form of nature based tourism where the principal motivation is to observe, appreciate nature and traditional cultures living in natural areas.

India has several hill stations. Many tourists are attracted to these hill stations and they become overcrowded it is, therefore necessary to develop these hill stations from the view point of eco-tourism. Mahableshwar is one of the oldest and eyes catching hill stations, situated in the Western Ghat at an altitude of 1438 meters high in Satara district of Maharashtra. Every year thousands of tourist visits to this hill station. Due to the nearness of Mumbai, Pune and Kolhapur cities, large number of tourists visits to Mahableshwar hill station. In spite of this, it is most unspoilt hill station in India.

### 1.2 Concept of Tourism and Eco-tourism

Tourism, is a generic concept, defined as activities of persons traveling to and staying in places outside their usual place of environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited. (WTO, 2001).

“When approached in a sustainable manner, tourism can help drive economic growth and alleviate poverty. In fact, tourism has proved to be one of the leading ways for least developed countries to increase their participation in the global economy”.

Tourism has been specified by different types of prefixes like, adventure tourism, nature tourism, laser tourism, corporate tourism, backpacker tourism, extreme tourism, hobby tourism, book-store tourism, cultural tourism, music tourism, coastal tourism, garden tourism, health tourism, medical tourism etc. Tourism is one of the fastest growing trends in the worldwide tourism industry. In this context, ‘eco-tourism’ is being promoted as a means of ‘giving nature value’ and hence of achieving sustainable tourism. The term ‘eco-tourism’ has been defined in many ways and is usually used to describe tourism activities which are conducted in Harmon with nature. The environment is one of the primary concerns to ecotourism, which often involves travel to relatively undisturbed areas. Ecotourism is the best option to take a break from the routine work. Ecotourism is a tourism market based on areas natural resources that attempts to minimize the ecological impact of the tourism which takes account of environmental, cultural and social consideration is what ecotourism all about. According to the definition and principles of ecotourism established by The International Ecotourism Society (TIES) in 1990, ecotourism is “responsible travel to natural areas that conserves the environment and improves the well-being of local people”.

### 2.0 Objectives

- To investigate the tourist facilities available at Mahableshwar.
- To study the responses of the tourists visited to Mahableshwar.
- To study the efforts taken for ecotourism at Mahableshwar.
- To suggest the remedial measures for the development of ecotourism in Mahableshwar.

## 2.1 Database and Methodology

The present study is based on the primary as well as secondary data.

The primary data has been derived from the following sources:

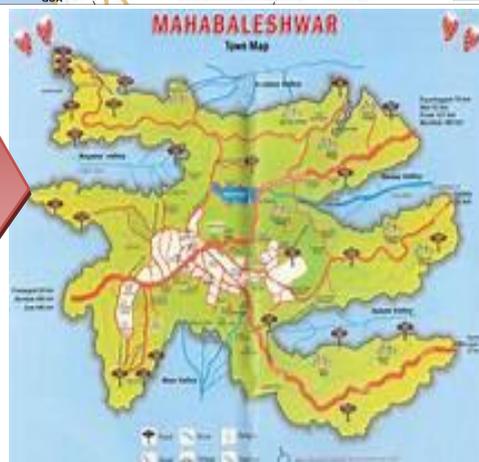
- a) Questionnaire – 300 Sample questionnaires are filled from tourists where tourists profession, income, purpose of visit, interest, opinion, suggestions etc. are taken into consideration.
- b) Interview –The interview of the Members of Municipal Council, MIDC, Forest officials, the hotel and shop owners and the local residents are taken to understand the view and efforts taken for ecotourism,
- c) Observation – To support primary and secondary data, observation method is also used to collect the data

Secondary data will be collected from the Gazetteer and Socio-economic abstract of Satara district, published data of Mahableshwar Municipal Council, Report of Forest Department, scholars study etc.

The data is analysed by using statistical methods and cartographic techniques and results are interpreted.

## 3.0 Study Area

Mahableshwar is a small hill station of Satara district and lies on the ridge of the Western Ghats at an altitude of 1438 meters above MSL. The hill station is on the edge of the escarpment of the Deccan plateau, from here mountains fall away steeply towards the western coastal plain of Maharashtra. The location of Mahableshwar is 17°51' N. latitude and 73°30' E. longitude. They are about 53 kms. North West of satara and 32 kms. West of Wai. A famous hill station Panchgani is 19 kms. Away from Mahableshwar. The climate is mostly moderate. The temperature in summer is between 15° to 30° C and 10° to 20° C in winter and the average rain fall is 3500mm. The soil is laterite and reddish in colour. There are 150 types of trees and 40 species of birds observed in Mahableshwar. It has a thickest forest cover after Chandrapur in Maharashtra. There are many points in Mahableshwar among which The Mahableshwar Temple, River origin point, Venna lake point, Wilson points, Babington point, Bombay point, Lodweick point, Elephanstine point, Arthur's seat etc. are the important places of tourist interest.



Location Map of Mahableshwar

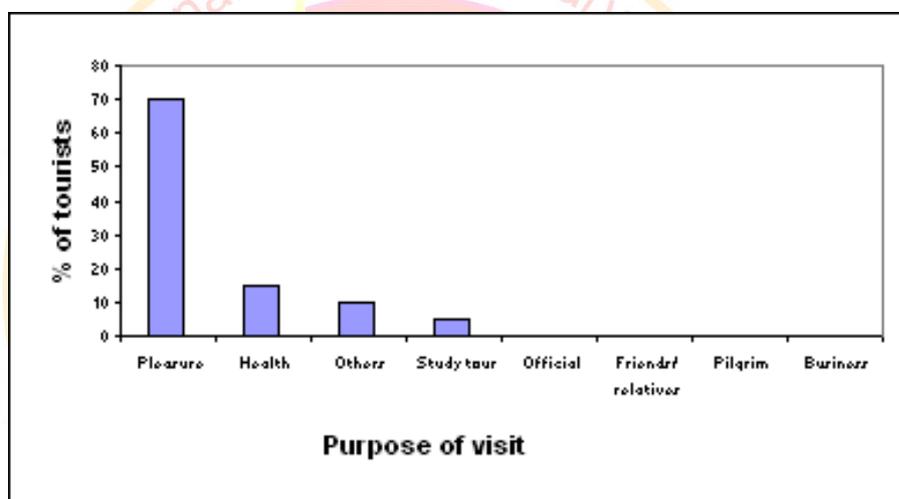
#### 4.0 Analysis of Data

##### 4.1 Purpose of the Visit

By analysing questionnaires answered by the tourists at Mahableswar, we can highlight some of the outcomes as follows-

**Tab.- 1**  
**Purpose of the Visit**

Sr. No.	Purpose of visit	Tourists (%)	Sr. No.	Purpose of visit	Tourists (%)
1.	Pleasure	210	5.	Official	00
2.	Health	45	6.	Friends/ relatives	00
3.	Nature	15	7.	Pilgrim	00
4.	Study tour	30	8.	Business	00
Total					300



##### 4.2 Satisfaction Index

**Tab. - 2**

**Satisfaction Wise Average Value Assigned By the Tourist and Satisfaction Index**

Sr. No	Factor	Numerical Values for					Satisfaction Index	Rank
		Excellent	Very Good	Good	Satisfactory	Unsatisfactory		
1	Transportation Accessibility	8.3	7.2	5.7	3.2	1.5	6.0	3
2	Accommodation Facility	8.7	7.8	5.6	3.5	1	6.2	2
3	Quality of Food	8.2	7	5.3	3.8	1.6	5.2	7
4	Quality of Drinking Water	8	7.6	5.2	3.1	2	4.4	8
5	Tree Plantations	8.1	7.4	5.4	2.4	1	5.5	5
6	Maintenance	8.4	7.1	5.6	2.8	2	3.8	9
7	Banking and ATM Facility	9	7.4	4.8	3.5	1.4	5.1	9
8	Sanitary Facility	8	6.2	4.2	3.7	0.5	4.1	

9	Information Signs.	8.5	7.9	5.1	2.9	0.5	5.6	4
10	Recreation Facility	9.6	7.8	5.9	2.6	1.8	6.0	3
11	Cleanliness	9.2	6.9	4.1	3.8	1.6	5.3	6
12	Co-operation from Natives	9.4	6.8	5.9	3.1	1.3	6.8	01

Source: Compiled By Researchers (2019)

Tab.No.2 shows the satisfaction index of tourist's amenities at Mahableshwar. Satisfaction index has been calculated on the basis of grades given by the tourists for the selected parameters. These grades are 8 to 10 for excellent, 6 to 8 for very good, 4 to 6 for good, 2 to 4 for satisfactory and 0 to 2 for unsatisfactory parameters. With the help of satisfaction index rank size has been determine. Table - 4 shows ranking of tourists amenities. First rank has given by the tourist to the co-operation from the natives of Mahableshwar and second having 6.2 satisfactory indexes. Recreation and transportation facility rank third and four having the satisfaction index 6. Information signs have ranked fifth which Index is 5.6 whereas tree plantation got rank 6 and its satisfaction index is 5.5. Tourists have given rank seven to cleanliness and its SI is 5.3 whereas quality of food got the 8<sup>th</sup> rank having 5.2 SI. Tourists have given rank nine to ATM and Banking facilities, rank ten to quality of drinking water and there satisfactory index are 5.1 and 4.4 respectively. Sanitary facility of Mahableshwar ranked eleven and its SI is 4.1. Maintenance has ranked twelve and it has the least SI that is 3.8. According to satisfaction index tourists have satisfied with the facilities like accommodation, recreation, transportation, co-operation, security, market and maintenance. But however tourists are not so much satisfied with the facilities like drinking water, food quality, sanitation, maintenance, and cleanliness.

#### 4.3 Ecotourism At Mahableshwar Hill Station

As per the guidelines issued by Central Govt. Mahableshwar is declared as an eco-sensitive zone from 4th February 2003. As per these guidelines Mahableshwar hill station comes under Ecotourism centre. Ecotourism basically encompasses and three components ecosystem: - conservation, local benefit, and environmental education.

To ensure and fulfil the indicators of ecotourism at the Mahableshwar Hill Station Municipal Council, Forest department, M.T.D.C. and the local residents, have under taken the following activities--.

- a. **Restriction on entry of vehicles at hill station**
- b. **Ban on new construction**
- c. **Forest conservation programme**
- d. **Ban of plastic carry bags and recycling of plastic bottles**
- e. **Cleaning of hill station**
- f. **Help of Senior Citizens**
- g. **Garbage separation**
- h. **Vermicomposting plant**
- i. **'Nisarg Rhino' Biogas project**
- j. **Environmental education**
- k. **Benefits to the local people**

#### 5.0 conclusion

Mahableshwar is pleasant Hill Station in Sahyadri mountain range. Most of tourists visiting to Mahableshwar for energetic climate and natural scenery. Maximum tourists visiting to Mahableshwar are in the view that the tourist centre is good in all respects. Above 70% tourists are appreciated the tourist amenities available at Mahableshwar Hill Station. The most appreciable thing shared by the tourists is the co-operative nature of the local people in Mahableshwar hill station. There is a need to strengthen some of the tourist amenities like sanitary facilities, parking and traffic control, cleanliness of lake, more number of ATM centres

and display of transport routes with distances at different tourist spots. There is a prime need to be develop forest conservation which can give environmental stability to Mahableshwar hill station.

The ecological environment in ecotourism setup is very peaceful and natural at Mahableshwar. The efforts of the Municipal Council of Mahableshwar are satisfactory for restoration of the ecology. This leads to increasing number of new tourists as well as increase of revisit of the tourists. The local people understands the importance of Sustainable tourism.

This study will be useful for the planning of tourism to Mahableshwar Municipal council and Tourism Department for further development.

## 6.0 Suggestions

1. Needs to developed massive tree plantation and maintenance of existing plants.
2. Road maps conservation signs and with distances should be displayed at every tourist spots so can the tourist can easily understand the ways, distances and rules and regulations of ecotourism.
3. Number of Tourist Information Centre should make available at Mahableshwar.
4. Lake and mall road should be cleanly on regularly basis.
5. More sanitary facilities should be made available at all places specifically for ladies.
6. Permit rooms and Bars should not permitted in hotels.
7. More number of ATM Centres should be making available at strategic places.
8. Need of awareness about ecotourism among the tourists

## 7.0 References

1. Cook, D.,(1989), 'China's hotels: still playing catch-up. The Cornell Hotel & Restaurant Administration Quarterly', 30 (3).
2. E.Naychander & Others, (2010) , 'CTE Development in the Rupununi-A Blueprint. Conservation International Foundation Guyana Inc'.
3. Kandari, O.P. & Chandra Ashish, (2004), *Tourism Development Principles and Practices*, Shree Publishers & Distributors, New Delhi. p - 124..
4. Khan, M. A. (2005), *Introduction to Tourism*, Anmol Publication Pvt.Ltd, New Delhi. pp- 2 -4.
5. Cooper, C et.al (1999), *Tourism Principles and Practices*, Addison Wesley Longman Publishing,New York, p-5.
6. Khan, M.A(2005), *Principles of Tourism Development*, Anmol Publication Pvt. Ltd, New Delhi, p-250.
7. Narasaiah Lakshmi, M (2004), *Globalization and Sustainable Tourism Development*, Discovery Publishing House, New Delhi, p-56.
8. Ratti Manish, (2007), *Tourism Planning and Development*, Rajat Publication, New Delhi, p-25.
9. Khan, M. M. (2009), *Encyclopaedia of Tourism, Vol. I*, Himalaya Books Pvt. Ltd, Mumbai.
10. Potdar, M. A. (2003), *Tourism Development in South Konkan*, Unpublished Doctoral Thesis, Shivaji University, Kolhapur

## Women Empowerment - A Case Study of Women *Sarpanch* in Khed Tehsil, Dist Ratnagiri

Surekha Gavit

### Introduction:

Women empowerment is the one of the most vital concerns of socio-economic development in India. Women empowerment is the process in which women elaborate and recreate what they can do and accomplish in a circumstance that they were previously denied of (Shettar,2015). Women empowerment is term refer space of women activates who challenge the patriarchy system for basic power relations and aimed at changing the nature and direction of systemic forces that deprecated women. (Shantilin, 2011). Women empowerment is basically about the enhance potential to make a difference in their surroundings, which affects their life Women empowerment is required in increasing the participation of women at individual and societal level in socio-cultural, economic and political spheres for a just and equitable pattern of development.

### Objectives:

- To identify the status of women *sarpanch* with reference to their positioning in the local political systems.
- To study the involvement women *sarpanch* in decision making.
- To study the problems and challenges faced by women *sarpanch* in *Panchayats*.

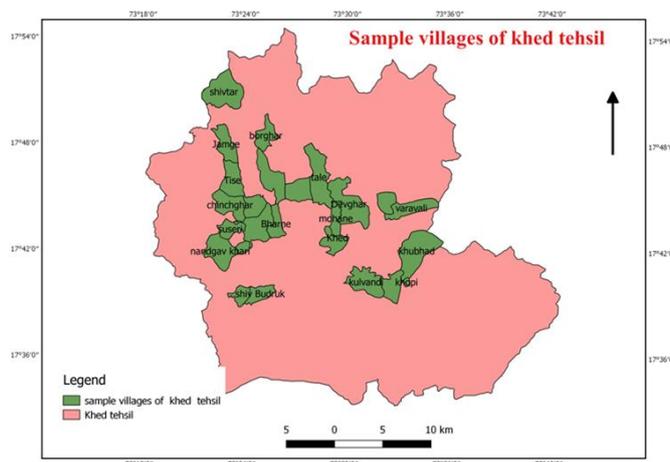
### Literature review:

A report of All Women *Panchayat* in Maharashtra and Who Will Make The Chapatis? by Bishakha Datta in (2001), dealt with women *sarpanch* in *panchayat* is important for rural development. All women *panchayats*, which are elected institutions of local government, represented attempts by rural women to carve out a political space that will enable them to place their needs and priorities on the political agenda.

The research on "Women in gram *panchayat*" by Satyam (2014) dealt with the *Panchayati Raj* at grass root political point of view, for the welfare of marginalised society and for women especially. Impact of women leadership in *panchayati Raj* representative in democracy and how it can be enhanced the women participation in politics without any social or gender discrimination.

### Study area:

The study area is Khed tehsil. The study cover the representative villages those have women *sarpanch* in khed tehsil.



### Data source and methodology:

The study is mainly based on primary data which has been collected from the representative sample villages that are headed by a women *sarpanch* in Khed Tehsil. The sample village has been selected using a stratified sampling method. Questionnaire survey and interview method has been applied for the generation of primary data. The secondary data has been collected from various government reports, census documents, reports published by non-governmental organisations, tehsil office records, etc

### Analysis: Socio-economic status of women sarpanch

The main concern of this research is women participation in local bodies and how women empowerment to be achieved through political participation and to analyse the women status through their participation on local bodies. In khed tehil there are 215 villages and 114 *grampanchyat* out of 114 *grampanchyat* 62 villages have women *sarpanch*. The women *sarpanch* indicates in a way political inclusion

of women. The socio-economic background of women *sarpanch* was also found to be affecting their confidence and performance. Age, literacy, occupation helped to analyse the social and economic status of women *sarpanch*. . 22 women *sarpanch* were interviewed. As per the findings largely women *sarpanch* elected are from the age group between 26 to 40. The reason is this age group is largely of married women, mainly involved in domestic works and her whole day would revolve around her family.

#### **Literacy rate of women sarpanch:**

Educated woman will actively play a better role in politics. But the present scenario out of 22 women *sarpanch* more than 10 women *sarpanch* education comes under the below matrix. . Education has become a major indicator in the path of playing active role in the functioning of local bodies. Education should be a means to empower humans alike to become active participants in the transformation of their societies.

#### **Women sarpanch and decision making:**

Women generally have been excluded from political decision-making processes. Cultural stereotypes remain, in my view, the major obstacle to gender equality and thus to women's inclusion in decision-making. As per findings, it has been experienced that women *sarpanch* in khed tehsil are not at all involved in decision making process. While having interviews with them, many of them invited their family members to answer to the questions that were mostly opinion oriented.

#### **Women sarpanch and training:**

If the training programme is effective then the elected women the leaders become transformative. Training is most essential thing for elected member. 22 out of 12 women *sarpanch* have received the training by government but the nature of training was very poor. Giving training to elected women *sarpanch* is the most vital thing in today's scenario. Only giving reservation will not bring political empowerment of women, training and educating them to be empowered is what we need if we want them politically strong.

#### **Conclusion:**

It can be concluded that women empowerment in contemporary world is the most important concern in every society. The other question into which the study delves is to understand reservation dynamics. Most of the candidates interviewed agree that reservation has helped in mainstreaming the weaker sections of the society; however, while there is agreement on the issue of reservation, there seems to be a lot of angst connected with how the reservations are structured. The study also found that while Maharashtra has made inroads into ensuring women empowerment on paper but in reality rural women have to be empowered to make these reservations practicable and workable. Secondly, the men are also to be trained into gender equality and sensitisation to work with the elected women members. Women empowerment comes only with men empowerment. The study found that the only reservation can't help to empower the women.

#### **Problem faced by women sarpanch:**

- \*Lack of political awareness
- \*Low level education
- \*Lack of training to elected post
- \* lack of interest in politics
- \* patriarchal society

#### **Suggestions:**

1. To increase women participation in political process and implementation of policies, organisation of workshop, awareness camps and training program would help to inspire them to take part in politics.
2. Family support is most important thing in human life. Every family member helps her to balance between political and family responsibilities and encouragement regarding social work. So the family members can also be involved in the process of making of a women leader *sarpanch*.
3. Government should assist NGO like Mahila Rajsatta Andolan and interact with them to take their suggestion to empower the women
4. Only reservations are not enough to empower women. Government should be take suggestions and feedback of women contribution in local bodies.

**References:**

- i. Batliwala, S(1995): Concepts of women's empowerment - a framework. Presented Paper in National Seminar on Women in Panchayati Raj: Perspectives from Different States (1995: Bangalore). Organised by Institute of Social Studies Trust, CD-597(1)
- ii. Chakraborty .S (2017): "Women Empowerment: A study of political participation of women in Surat". International journal of development Research, 7,(07), 13786-13791.
- iii. Datta, B.(2001): Study of All Women Panchayat in Maharashtra, Who Will Make Chapatis?
- iv. Satyam.S.( 2014): "Women in gram panchayat: emerging leaders in grassroot politics".
- v. Shantilin, S. (2011). Empowerment Of Women Through Education:A Case Study Of Puducherry Union Territory . tamil Nadu : Manonmaniam Sundaranar University
- vi. Shettar. R.(2015) : "A study of issues and challenges of women empowerment in India". IOSR Journal of Business and Management . Vol.17,Issue -4,2319- p-ISSN:2319-7668



## Meaning And Main Causes Of Global Warming: A Review

Dr, Murlidhar Wagh,  
 Assistant Professor

### The Term Global Warming Used By Scientists:

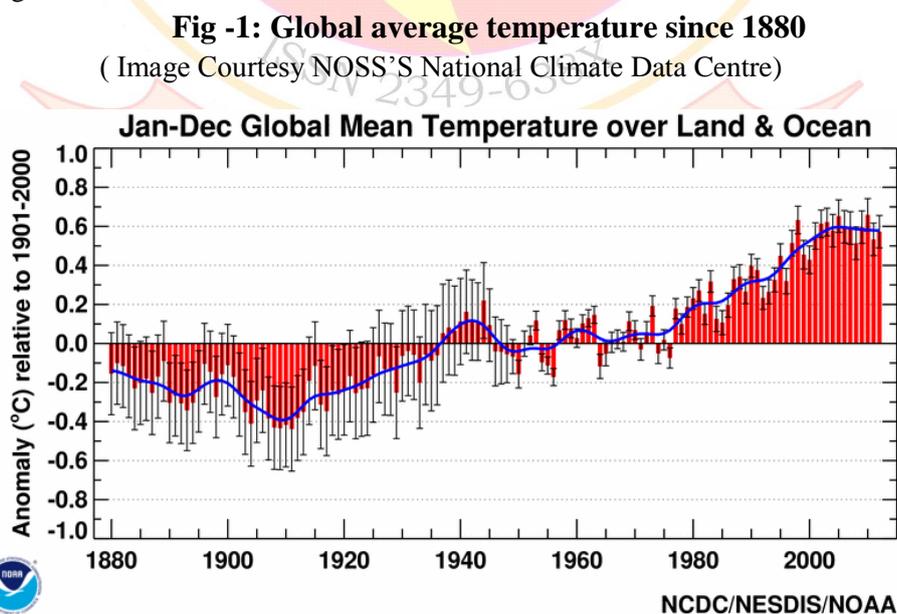
The National Academy of Sciences first used global warming in a 1979 paper called the Charney Report, which said: "if carbon dioxide continues to increase, (we find) no reason to doubt that climate changes will result and no reason to believe that these changes will be negligible." The report made a distinction between referring to surface temperature changes as global warming, while referring to other changes caused by increased CO<sub>2</sub> as climate change.

The term global warming became more widely popular after 1988 when NASA climate scientist James Hansen used the term in a testimony to Congress. He said: "global warming has reached a level such that we can ascribe with a high degree of confidence a cause and effect relationship between the greenhouse effect and the observed warming." His testimony was widely reported and afterward global warming was commonly used by the press and in public discourse.

### Global Warming: Meaning And Facts:

"Global warming is the rise in the average temperature of Earth's atmosphere and oceans since the late 19th century and its projected continuation". Since the early 20th century, Earth's mean surface temperature has increased by about 0.8 °C (1.4 °F), with about two-thirds of the increase occurring since 1980. The Earth's average surface temperature rose by 0.74±0.18 °C over the period 1906–2005. The rate of warming over the last half of that period was almost doubles that for the period as a whole (0.13±0.03 °C per decade, versus 0.07±0.02 °C per decade). The urban heat island effect is very small, estimated to account for less than 0.002 °C of warming per decade since 1900. According to satellite temperature measurements, temperatures in the lower troposphere have increased between 0.13 and 0.22 °C (0.22 and 0.4 °F) per decade since 1979. Climate proxies show the temperature to have been relatively stable over the one or two thousand years before 1850, with regionally varying fluctuations such as the medieval warm period and the little ice age.

This graph from NOAA shows the annual trend in average global air temperature in degrees Celsius, through December 2012. For each year, the range of uncertainty is indicated by the grey vertical bars. The blue line tracks the changes in the trend over time.



Average over all land and ocean surfaces, temperatures have warmed roughly 1.33°F(0.74°C) over the last century, according to the Intergovernmental Panel on Climate Change (see page 2 of the IPCC's Climate Change 2007: *Synthesis Report* summary for policy makers ). More than half of this warming-about 0.72°F (0.4°C)-has occurred since 1979. Because oceans tend to warm and cool more slowly than land areas, continents have warmed the most (about 1.26° F or 0.7° C since 1979), especially over the Northern

Hemisphere. The graph above clearly shows the variability of global temperature over various time intervals. There are slight differences in **global records** between groups at NCDC, NASA, and the University of East Anglia. Each group calculates global temperature year by year, using slightly different techniques. However, analyses from all three groups point to the decade between 2000 and 2009 as the hottest since modern records began more than a century ago. Temperatures in the 2010 have been running slightly warmer still.

**Causes of Global Warming:**

According to IPCC scientists there are several greenhouse gases responsible for warming and human emit them variety of ways. Most come from the consumption of fissile fuels in cars, factories and electricity production. These are as follows:

• **Carbon Dioxide:**

The gas responsible for the most warming is carbon dioxide, also called as  $CO_2$ . Under pre industrial conditions of recent centuries, the atmospheric content of  $CO_2$  As maintained at a level of about 0.0294 percent by volume or 294 parts per million (ppm.). But past century human greatly increased the rate of extraction and burning of fossils and fuels such as coal, petrol, natural gas. Consumption of these fuels release into the atmosphere both water and  $CO_2$ . During the past 130 years means 1860 to 1990 atmospheric  $CO_2$  has increased about 22 percent by volume and it reached a level of about 350 ppm. Or 0.0350 percent by volume in 1990 and it reached level of about 380 ppm., or 0.0380 percent by volume. Current estimates are that about 5 billion tons of the element carbon(s) in  $CO_2$  gas are released annually into the atmosphere by the combustion of fossil fuels. In addition, clearing and burning of forests injects an estimated 1 to 3 billion tones (gig tons or Gt.) of carbon annually into the atmosphere, but at the same time growth of new trees removes a substantial part of that carbon from atmosphere. It is clear that net carbon released into the atmosphere is about 6 Gt/year. It results that  $CO_2$  in the atmosphere increased in some extent and heat retained by the  $CO_2$  in atmosphere. Due to this, temperature increased and occurred global warming effects.

**The Role of Trace Gases in the Green House Gases**

Other contributors including methane released from landfills and agriculture (especially from the digestive systems of grazing animals), nitrous oxide from fertilizers, gases used for refrigeration and industrial processes, and the loss of forests that would otherwise store  $CO_2$

Besides  $CO_2$  several gases absorbs outgoing long wave radiation through the troposphere known as trace gases, because of their relatively small concentration. They are Methane, nitrous oxide, ozone and two forms of Chlorofluorocarbons (cfc). Table lists these gases along with  $CO_2$  showing their relative concentration, rate of increase per year and relative contribution of greenhouse effects and warming.

**Table-1: Gases that contribute to the Greenhouse effect.**

Sr. No.	Name of Gas	Concentration in ppm x1000	Rate of increase in % per year	Relative concentration (%)	Warming capacity
01	Carbon Dioxide ( $CO_2$ )	3,53,000	0.5	60	01
02	Methane ( $CH_4$ )	1,700	1.0	15	36
03	Nitrous Oxide ( $N_2O$ )	310	0.2	05	140
04	Ozone ( $O_3$ )	10-50	0.5	08	430
05	Cfc-11	0.28	4.0	04	14600 (Hydrofluorocarbons)
	Cfc-12	0.48	4.0	08	1700 (Perfluorocarbons)

Source: Henning Rodhe (1990) Sci. vol. 248.

Altogether these four gases contribute 40 percent to that effect and Methane leads with 15 percent. Methane is emitted from the soil and from digestive tracts of animals. It is thought that much of the natural emission of Methane comes from peat soil (histosols) of the arctic lands. The additional emission caused by human activities, designated as anthropogenic Methane, has resulted from such process as the expansion of rice

agriculture in the increase in number of domesticated grazing (ruminants) animals disposal of organic wastes in landfills, various kinds of mining operations, and the burnings of fossil fuels. The rate of increase of atmospheric Methane has been extremely rapid since about 1900. Global warming, causing melting of frozen Tundra soils would tend initially to increase the rate of production of Methane.

Table-1 shows the two form of cfc have experienced a much faster rate or increase than the other listed including  $\text{CO}_2$  and their combined effects is 12 percent and second only to Methane among the trace gases.

In the future the forcing contribution of  $\text{CO}_2$  likely to decline. For example Cfc's may be up to 100000 times more effective than the  $\text{CO}_2$  in forcing global warming, cfc's came into wide spread use after second world war and primarily emitted by the industrial world (Foley,1991). Atmospheric concentration of the two most commonly used Cfc's have risen from zero in 1940 to 3,20,000 tons in 1985. Annual rates of increase up to Montreal Protocol were an estimated 5 percent. Cfc's used for purposes including refrigeration, air conditioning, aerosols propellants, insulation foams, the cleaning of electronic components and fire fighting gases. Although the global production of Cfc's has been declining in the 1990s (Brown, 1996) they remain active in the atmosphere for periods up to 75 years in the case of Cfc-11 and 110 years for Cfc-12 (R. D. Thompson-1992:70) : eventually they are destroyed by the Ultraviolet radiation in the stratosphere.

Cfc's are also the primary cause of Ozone depletion in the upper atmosphere, which leads to the exposure plant and animal systems to the damaging effect increased ultraviolet radiation.

#### **Deforestation:**

Deforestation is estimated by the IPCC to account for approximately 10-15 percent of the recent increase in atmospheric  $\text{CO}_2$ . The loss of tree cover itself reduces the uptake of the  $\text{CO}_2$  from the atmosphere and associated burning of logs and biomass sources contributes further to the production of the  $\text{CO}_2$  through oxidation processes. The continued reliance in many developing Countries on fuel wood and biomass sources of energy for national development and for daily survival of the majority of the people in these regions is evidently in itself a major factor in deforestation and in global warming.

#### **References:**

1. <https://www2.ucar.edu/category/faq/global-warming-climate-change>.
2. IPCC's Climate Change 2007: *Synthesis Report* summary for policy makers.
3. Resource material for Refresher course in Geography (27th Nov. 2001 to 20<sup>th</sup> Dec. 2001, organized by ASC, University of Mumbai on "Contemporary issues of Development and Environment".

## Agro Tourism A new trend in Tourism

Sandhya Gore, Indrajit Kadam

### Introduction

Indian economy is largely agro- based. Tourism is a recent phenomenon occurring and widely now recognized as a major industry contributing to G.D.P. Tourism not only brings the economic growth and development in the state, but it also has socio-cultural and environmental impacts; which may be positive as well as negative. The recent boom in tourism at specific destinations in India and abroad has shown devastating impacts of mass tourism on ecology, and environment of the region.

"Agro-tourism" is one such form of tourism which is gaining popularity amongst the non-conventional tourists. In a progressive state like Maharashtra where farmers are ready to experiment, agro-tourism is spreading slowly but steadily. There are 638, 691 villages in India as per the Census Report 2001 and the rural population is 741,660,293. Some villages are near to big cities and towns. Most of the villages have scenic beauty due to availability of lakes, rivers, hills, mountains, paddy fields, fruit orchards. Rural community has the potential, resources and ability to exploit the growing tourism industry. The scenic beauty, historical monuments, serenity and nature always appeal to urban tourists, caught-up in today's fast pace of life(AARF 2019).

Nature is an open door school without brick walls, observe carefully , explore the hidden treasures and learn something or the other , moreover India is agriculture country , hence it is expected of us to be well informed about it. Urban population is increasing day by day, today urban children's world is restricted in the closed door school, classes, cartoon programs on the television, video games, chocolates, soft drinks, spicy fast food, computer, internet, and so on, and they see Mother Nature only on television screen. Moreover out of people living in the cities 35 % do not have relatives in villages and 43% never visited or stayed in village. Agriculture as business is becoming more and more expensive and many farmers cannot afford it. To add to this the gradual loss of fertility of the land that is giving diminishing yields. Unless and until the farmers start business of any form to compliment and support to their income from land, they shall be doomed to eke out bare existence below poverty line.(Gopal Karri)

Agro tourism which is based on agricultural activities with a subtle underline and touch of rural culutr. One cannot easily imagine a farm being a reason to travel for a tourist. But the attraction can be created by adding value to the product. Agrotourism is not just visiting a farm growing crops and vegetables; it is giving an opportunity to the tourist to interact with a culture. It provides tourist with an experience of being part of our rural culture. Observing and experiencing a lifestyle different from urban routine. It offers some meaning to the tourist at the destination along with a sense of pleasure away from routine activities

### Methodology

This study used only secondary data through outfit's analysis. The concepts used in the study are agro tourism analysis for the research are mainly from the research papers and books which throw light upon new trends of the agro tourism concept.

### Importance of Agro – Tourism are:

1. It brings major primary sector agriculture closer to major service sector tourism. This convergence is expected to create win-win situation for both the sectors.
2. Tourism sector has potential to enlarge.
3. Agriculture sector has the capacity to absorb expansion in tourism Sector.

### Scope Of Agri - Tourism

Agro-Tourism has great scope in the present context for the following reasons:

- **An inexpensive gateway** - The cost of food, accommodation, recreation and travel is least in Agro-Tourism. This widens the tourist base. Present concept of travel and tourism is limited to urban and rich class which

constitutes only a small portion of the population. However, the concept of Agro-Tourism takes travel and tourism to the larger population, widening the scope of tourism due to its cost effectiveness.

- **Curiosity about the farming industry and life style** - The urban population having roots in villages always have had the curiosity to learn about sources of food, plants, animals, raw materials like wood, handicrafts, languages, culture, tradition, dresses and rural lifestyle.
- Tourism which revolves around farmers, villages and agriculture has the capacity to satisfy the curiosity of this segment of population.
- Strong demand for wholesome family oriented recreational activities -
- Villages provide recreational opportunities to all age groups i.e. children young, middle and old age, male, female, in total to the whole family at a cheaper cost. Rural games, festivals, food, dress and the nature provides variety of entertainment to the entire family.

**Health consciousness of urban population and finding solace with nature friendly means** - Modern lifestyle has made life stressful and average life span has come down. Hence, people are in constant search of pro-nature means to make life more peaceful. Ayurveda which is a pro-nature medical approach has roots in villages. Indigenous medical knowledge of villagers is respected. Organic foods are in greater demand in urban areas and foreign countries. In total, health conscious urban population is looking towards pronature villages for solutions.

- **Desire for peace and tranquility** - Modern life is a product of diversified thinking and diversified activities. Every individual attempts to work more, in different directions to earn more money to enjoy modern comforts. Hence, peace is always out of his system. Tourism is a means for searching peaceful location. Peace and tranquility are inbuilt in Agri-Tourism as it is away from urban areas and close to nature.
- **Interest in natural environment** - Busy urban population is leaning towards nature. Because, natural environment is always away from busy life. Birds, animals, crops, mountains, water bodies, villages provide totally different atmosphere to urban population in which they can forget their busy urban life.
- **Disillusionment with overcrowded resorts and cities** - In resorts and cities, overcrowded peace seekers disturb each other's peace. Hence, peace is beyond cities and resorts. Even though efforts are made to create village atmosphere in the sub urban areas through resorts, farm houses, it looks like a distant replica of the original.
- **Nostalgia for their roots on the farm** - Cities are growing at the cost of villages. Villagers are migrating to cities in search of jobs and to seek the comforts of modern life. Hence, yesterday's villagers are today's urbanites. Deep in the heart of urbanites lies the love and respect for their ancestors and villages. Hence, visit to villages satisfies their desire. This is also expressed through the hatred of urbanites to flat culture and love for farmhouses located in the outskirts of cities. Any opportunity to visit villages and spend time with family is dream of any urbanite. But, minimum decent facilities are always problem. Agro-Tourism attempts to overcome this problem.
- **Rural recreation** - Villages provide variety of recreation to urbanites through festivals and handicrafts. Villagers (farmers) lifestyle, dress, languages, culture / traditions which always add value to the entertainment. Agricultural environment around farmers and the entire production process could create curiosity among urban taught. Places of agricultural importance like highest crop yielding farm, highest animal yielding farm, processing units, farms where innovations tried add attraction to the tourists. Agricultural products like farm gate fresh market, processed foods, organic food could lure the urban tourists. As result of this agro – atmosphere in the villages, there is scope to develop Agri – Tourism products like agro-shopping, culinary tourism, pick and own your tree / plot, bed and breakfast, pick and p bullock cart riding, camel riding, boating, fishing, herbal walk, rural games and health (ayurvedic) tourism.
- **Educational value of AgroTourism** – AgroTourism could create awareness about rural life and knowledge about agriculture science among urban school children. It provides a best alternative for school picnics which are urban based. It provides opportunity for hands on experience for urban college students in agriculture. It is a means for providing training to future farmers. It would be effectively used as educational and training tool to train agriculture and line department officers. This provides unique opportunity for education through recreation where learning is fun effective and easy. Seeing believes, doing is learning. This experience based concept is the USP of Agro- Tourism.

## Challenges Faced by Agro tourism in India

### • Lack of Irrigation :

Agriculture in India is mostly monsoon dependent. In 2010, only about 35% of total agricultural land in India was reliably irrigated and remaining subjected to the whims of nature. (World Bank Report, 2013).

### • Climatic Conditions :

Climatic condition in most of the Indian terrain is not supportive to Agritourism throughout the year. During summer, which is a period of 3 to 4 months, there are no crops and the weather is hot and dry in most of the states. During rainy season, tourist may not be able to be ready to access the farms full of mud. This period lasts to at least 2 months. Thus, Agritourism is practically difficult to be operated for six months in a year. (Chadhdha & Bhakre, ibid).

### Financial Problems of Farmers :

Floods, drought, debt, use of genetically modified seed, public health, usage of lower quantity of pesticides due to less investments produce a decreased yield and this makes farmers difficult to repay the interest on loans taken from either Banks or landlords/ savkars. They lose credibility and are unable to get further loans from both. In this scenario, investing in agro tourism, may it be a minimum amount, becomes difficult for farmers. (Indian Social Institute, 2011).

### Educational Profile of Farmers and Lack of Orientation in Marketing and Customer Communications

Most of the farmers are very less educated, mostly undergraduates and do not know the manners of customer communications to promote and marketing of their farm (Sanjay Sharma, 2012).

### Unawareness about the Concept of Agro tourism

Agro tourism as a concept is not well promoted in all farmers' non agricultural people and unknown to maximum farmers in India.

### Less Cultivable Land and Fragmented Land

Due to inheritance the land of father is divided and distributed to his sons. Thus, the total cultivable land per farmer goes on reducing in each generation. As per survey, 80% farmers have less than 1 hectare land and only 7% farmers in India have more than 2 hectare land. (Rukhmini S, 2016). For agro tourism, a farmer should have bare minimum land of 2 hectares so that the farmer can have adequate crops to offer as a tourism product and sufficient land for tourists to rest and recreate. If farmers do not have sufficient land, agro tourism project will be a challenge to implement and execute.

### Lack of Government Support

There is lack of Government support for agro tourism in India in tourism policy of Maharashtra Government, there is a mention of rural tourism but no specific mention of Agro tourism. The detailing about the provisions and action plan is not in the abovementioned policy document. (Upadhye, 2015). This discourages farmers from undertaking new ventures like agro tourism which are in their favor and source of income generation.

## Conclusion

Agro tourism industry in India has a lot potential to develop the rural India. It is a field with potential to develop. The issues like guest host relationship, sustainability, economic feasibility are important for any new tourism development at a destination. It is more so in the case of agro tourism as it has a direct impact on the host culture and rural community as a whole.

However, there are many challenges ahead for the growth of agrotourism in India. Major challenges discussed are financial problems of farmers in India, less education and less marketing orientation of farmers, unawareness about the concept of agrotourism, less cultivable and fragmented land and lack of Government support. There needs to be a proper business model to promote and propagate the concept of agrotourism as an easily adoptable and implementable venture for farmers in India. All challenges stated above can have solutions and agrotourism can be ventured in gradually step by step. All it depends on the will power of farmers and proper promotional strategies adopted to market the concept in weekend tourists. It can be understood that success of Agrotourism does not depend on how big, how massive and how traffic generating

Agrotourism but on the fact that whether it is operating on live and working farms of farmers and whether it provides direct monetary benefits to the local farmers or not.

## References

1. Agritourism Development Corporation. Indian agritourism Industry-challenges and strategies. 2017. <http://www.agritourism.in/tourism-in-india.html>
2. Prasanna Shashikant Shembekar, Scope & Challenges of Agritourism- Literature review,
3. Gopal Naidu Karri, Scope of Agritourism in India,
4. <http://www.ncagr.gov/markets/agritourism/laws.htm>
5. Kumbhar VM. Tourists expectations regarding agritourism: empirical evidences from Ratnagiri and Sindhudurg district of Konkan (Maharashtra). Online International Interdisciplinary Research Journal, 2(3), 82-91, 2012.



## The Crux of Job Security in the Workers' Satisfaction Level

Prof. Prasad S. Bhanage

### Introduction:

Job satisfaction is always been considered necessary for higher productivity. The level of job satisfaction is the basic reason for many things like productivity, workers' turnover, participation in management, absenteeism, attrition rate, workers performance, innovation, creativity, organizational development, retention etc. and many others. The importance of job satisfaction has been widely accepted in the literature reviewed for this purpose. It is found that the job satisfaction of a worker is directly or indirectly connected with the organizational productivity and many problems related to human resource management.

The researcher wants to find out contribution of the organizational factors of the job satisfaction of the workers, which is the basic reason behind most of the problems in Human Resource Management. Based on the definition of the Job Satisfaction the researcher feels that if the job satisfaction of a worker were a mental or emotional state of mind, it must be on certain emotional criteria. Out of those criteria, the management does not have control over the personal issues. However, the organizational issues can be studied for knowing the composition of organizational factors in the job satisfaction of workers. The researcher believes and that the composition of these organizational factors is strongly affecting on the level of job satisfaction. Thus, it is necessary in the initial stage to know the behavior of the organizational factors in the construction of job satisfaction of any worker.

### Theoretical Framework:

#### Definitions of Job Satisfaction:

L.M. Prasad, 1989 mentions in his book as "Job satisfaction is the amount of pleasure or contentment associated with a job. If you like your job intensely, you will experience high job satisfaction. If you dislike your job intensely, you will experience job dissatisfaction". (Andrew J., 1990).<sup>1</sup>

The following are some definitions of job satisfaction given by various authors:

1. Williams, J., 2004, "Job satisfaction is simply how people feel about their jobs on different aspect of their jobs." – Specter (1997)<sup>2</sup>
2. Locke, 1976, "Job satisfaction is a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences".<sup>3</sup>
3. Cranny, Smith & Stone, 1992, "Job satisfaction is feelings effective response to face the situation."<sup>4</sup>
4. R.D. Agarwal, 1983, "Job satisfaction was an important element in managerial effectiveness." – Parker and Kleemeirt 1951<sup>5</sup>
5. Andrew J., 1990, "Job satisfaction is the amount of pleasure or contentment associated with a job. If you like your job intensely you will experience high-satisfaction, of you dislike your job intensely, you will experience job-dissatisfaction."- Andrew J. Dubrin.<sup>6</sup>

#### Relativity of Job Satisfaction:

The concept of job satisfaction is relative term. It changes from time to time. The primitive man certainly had experienced job satisfaction or dissatisfaction. From primitive stage to every stage of human civilization, there must be the all levels of job satisfaction in existence. Being job satisfaction is an emotional state of mind, the level of job satisfaction changes with the changes in rewards, conditions, job security and interpersonal relations. These all situations always change with the time, but the standard mindset in the context of job satisfaction doesn't change. For instance, previously, Kings or rich people were deriving higher level of satisfaction by using *BUGGY* driven by horses, covered by *KHUS* curtains sprinkled by water and perfume. Presently, higher class people probably can derive the same level of satisfaction by driving a branded AC car having fresheners and perfumes inside. If we transfer the King from *BUGGY* to AC car then he may derive much higher satisfaction than that of the higher class person of present age because the king and the higher class person both have equal level of satisfaction originally. Now the king is getting something very

great in the form of AC car which will boost the satisfaction level very high. Alternatively, the king may get lower level of satisfaction from AC car because of the feel of insecurity as AC car is something very strange and fearful object for him. In short, the level of satisfaction for the same situation may higher or lower for different persons, in different contexts. Therefore the term job satisfaction is relative term.

**Perception Base of Job Satisfaction:** Followed by relativity another feature of job satisfaction is Basis of Perception. The level of job satisfaction changes due to change in the perception of people. Perception of a person about the job is always based on certain criteria or certain expectations from the job performance. These criteria or expectations are rewards, working conditions, job security and interpersonal relations. Here we are now focusing only on the organizational factors. Every person has specific or unique way of thinking that results in deciding the priorities while forming such perceptions. Everybody knowingly or unknowingly gives ranking to these organizational factors in the order of importance supported by his or her emotions. There would be wide variations in the ranking given to these factors by the worker in any organization or in a given region or country. Based on these perceptions, people form their particular level of job satisfaction.

**Objectives of the Study:** Following are the main objectives of this research:

- 1 To study the organizational factors of job satisfaction and their contribution in workers' job satisfaction.
- 2 To measure the percent contribution of organizational factors in the job satisfaction of workers in *Pimpri-Chinchwad* industrial area.
- 3 To provide scientific suggestions and recommendations in problem areas through the improvement in the level of job satisfaction.

**Hypotheses of the Study:** The researcher aims at proving the following hypotheses:

**Hypothesis:** The contribution of job security in workers' job satisfaction is the most significant as compared to other factors since this factor provides higher level of job satisfaction for longer period.

**Research Design and Methodology:**

The present study determines 1) what level of influence organizational factors have on workers' job satisfaction and 2) the percentage contribution of each organizational factor in the job satisfaction of worker. The researcher sent research questionnaire to 500 workers in various industrial organizations by visiting personally to the workers in the selected industries. The research package contains a cover letter stating the purpose of the study, the importance of the study and a confidentiality statement, a copy of the questionnaire, since no names were taken, no follow-up surveys were distributed.

**The Universe:** This study was undertaken to find out the contribution of organizational factors in workers' job satisfaction in *Pimpri-Chinchwad* area. By the end of 2007 the total number of industries in this area are 6195 consisting of 54(large), 621(medium), 5520(small) industries.

**Selection of the Sample:**

Selection of the Sample: Total 398 Workers replied as respondent on the basis of following criterion:

Sr.No.	Industry	No. of Industries surveyed	Total No. of Respondents Actual
1	Industry with workers from 100 to 500 Nos	10	245
2	Industry with workers more than 500 Nos	04	153
<b>Total</b>		<b>14</b>	<b>398</b>

**Reference Period:**

The primary and secondary data as on 31-10-2011 was taken in to account.

**Techniques of the Analysis:**

While analysing the data and testing of hypotheses statistical tools like mean, standard deviation, correlation, regression, test statistics were used with the help of M.S.Excel, and SPSS. For the presentation of the data, tables, charts, bar diagrams are used.

**Parameters:** Following are the determinants of job satisfaction which are taken as parameters for the purpose of this research project:

Pay and Perks: This includes salary structure, perquisites, bonus, incentives, subsidized food, subsidized commutation etc.

Promotion and Benefits: This consists of future job prospects, stability, job security, awards or rewards, performance bonus etc.

Nature and Conditions of work: This includes the nature of job, quality and sufficiency of the equipment provided, necessary health and safety requirements, production targets, level of authority and responsibility etc.

Job Security: Requirement of worker's services for a longer period, sense of belongingness, fulfillment of family and personal needs for considerably longer period creates relaxation in the mind of workers.

Relations with Superiors: Here communication, level of discretion, trust, empowerment, understanding between the worker and supervisor is the main concern.

Relations with Co-workers: Mutual co-operation, comparative division of work, formal and informal groups, moral support, team attitude, seniority issues, inter-personal problems and conflicts are the important sub-factors.

**Tools used for Collection of Data:**

The Primary and Secondary data was collected for the purpose of this study from different sources as under:

**Primary Data:**

Primary data has been collected by conducting survey in the selected industries in Pimpri-Chinchwad industrial area. The personal interviews of workers were conducted with the help of well-constructed questionnaire.

Maximum possible care was taken to ensure the accuracy and reliability of the collected data for this research.

**Questionnaire:**

The primary instrument of this study was a questionnaire.

The questions are pertaining to: 1) Pay and Perks, 2) Promotion and Benefits, 3) Nature and Conditions of work, 4) Job Security, 5) Relations with Superiors, 6) Relations with Co-workers.

**Secondary Data:** The secondary data has been collected for this project from the following sources:

- 1 Industrial Directory-MIDC Pune zone.
- 2 Published sources such as books and journals.
- 3 Research papers published/unpublished.
- 4 Master and Ph.D. theses in the related area.
- 5 Websites and search engines on the internet.

**Scope and Limitations of the Study:**

- 1 Fourteen industries consisting of four large scale and ten medium scale industries which are considered as first stage sample size, as representative organizations for the study.
- 2 Only internal organizational factors are taken in to consideration for the purpose of carrying out this research.
- 3 Industries in which more than 100 workers are employed were selected for survey.
- 4 Industries from Pimpri-Chinchwad industrial area were selected where mostly mechanical engineering and automobile industrial units are in majority.
- 5 The responses were collected from 398 workers from the selected organizations.

*(Note: It is necessary to clarify here that, for the purpose of this study the term 'job satisfaction' is written in the context of job satisfaction based only on organizational factors. Therefore it is requested to take note of this throughout the further discussion in this Thesis.)*

**Findings through Analysis of the Data:**

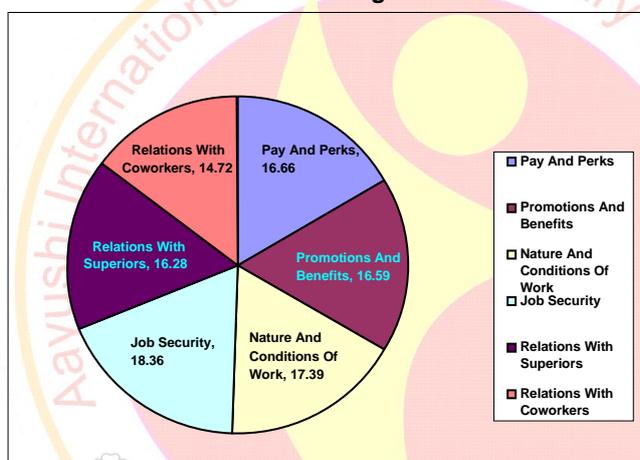
The Percent Contribution of factors of Job Satisfaction: The factors of job satisfaction of workers contribute in different percentages individually. This is the internal structure of all the organizational factors to construct the actual job satisfaction of workers in the respondent organizations. The average share of organizational factors of workers' job satisfaction in respondent organizations is found as under:

**Percentage Share of Factors of Job Satisfaction**

Type of Organization	Pay And Perks	Promotions And Benefits	Nature And Conditions Of Work	Job Security	Relations With Superiors	Relations With Co-workers
Medium Scale (MS)	16.85	16.92	17.56	18.42	16.18	<b>14.06</b>
Large Scale (LS)	16.46	16.26	17.22	18.30	16.39	<b>15.37</b>
Average of MS & LS	<b>16.66</b>	<b>16.59</b>	<b>17.39</b>	<b>18.36</b>	<b>16.29</b>	<b>14.73</b>

This is shown in the following pie chart:

**Chart 7.3 Average Percentage Contribution of factors of job satisfaction in Medium Scale & Large Scale Organizations**



**Correlation between overall satisfaction and job satisfaction component**

Factor of Job Satisfaction	Overall Satisfaction
Pay And Perks	0.65
Promotions And Benefits	0.60
Nature And Conditions Of Work	0.68
Job Security	0.57
Relations With Superiors	0.52
Relations With Co-workers	0.43

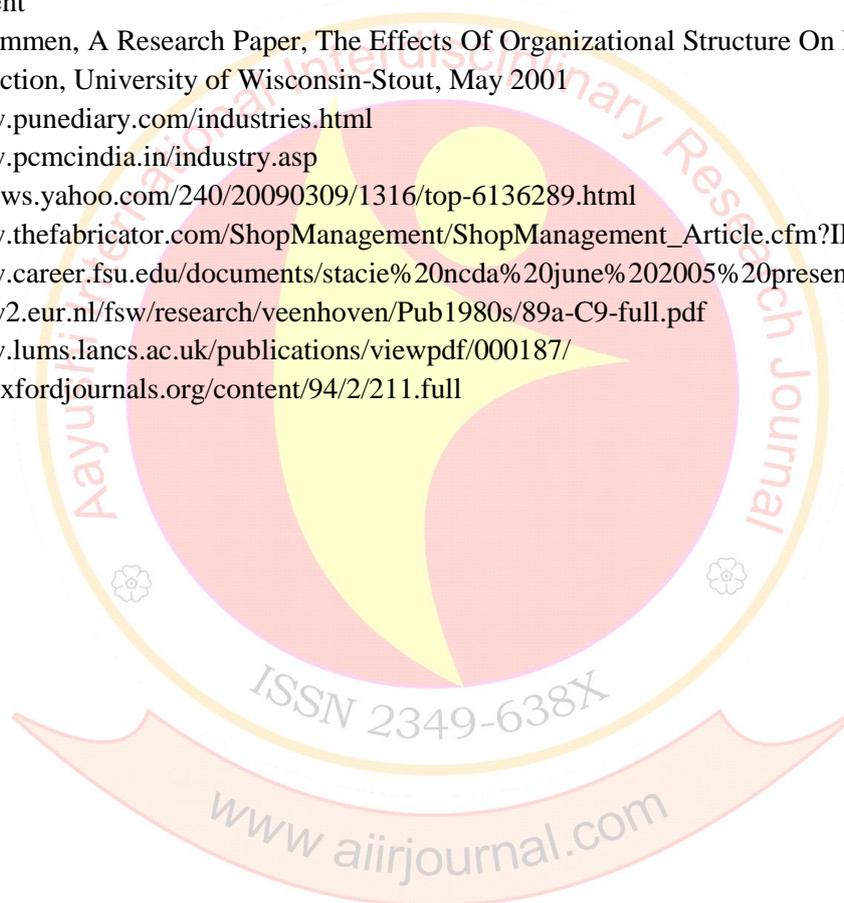
**Conclusions:**

- Correlation between the factors of Job Satisfaction:** The four factors "Pay and Perks", "Promotions and Benefits", "Nature and Conditions of Work" and "Job Security" are moderately correlated with each other and the degree of positive correlation between them is more than with the components "Relation with Superiors" and "Relation with Coworkers".
- The contribution of job security in workers' job satisfaction:** The contribution of job security in workers' job satisfaction is the most significant than the other factors in the industries. Additionally the shares of the factors of job satisfaction for Medium scale industries are almost equal to that of large-scale industries except the factor "Relations with Coworkers".
- Significance of Job Security:** The analysis of the data indicates that a significant correlation exists between pairs of the factor of "Job security" with other factors. Therefore the factor Job Security is the

most important for better job satisfaction of the workers. This is very valuable result in the context of designing effective retention policy for any organization.

### References:

1. <http://www.punediary.com/industries.html> Accessed on 20/02/2008
2. Uma Sekaran, 'Research Methods for Business A Skill Building Approach', 4<sup>th</sup> edition, Published by, Wiley India Pvt. Ltd., New Delhi, 2006.
3. Brief, A. P., & Weiss, H. M.-2001, Wikipedia encyclopedia
4. Ruut Veenhoven (ed), (1989) How harmful is happiness? Consequences of enjoying life or not, Universitaire Pers Rotterdam, The Netherlands, ISBN nr. 90 257 22809
5. Olugbenga J. Ladebo, Coworkers' and Supervisor Interactional Justice: Correlates of Extension Personnel's Job Satisfaction, Distress, and Aggressive Behavior, Institute of Behavioral and Applied Management
6. Kelli J. Dammen, A Research Paper, The Effects Of Organizational Structure On Employee Trust And Job Satisfaction, University of Wisconsin-Stout, May 2001
7. <http://www.punediary.com/industries.html>
8. <http://www.pcmcindia.in/industry.asp>
9. <http://in.news.yahoo.com/240/20090309/1316/top-6136289.html>
10. [http://www.thefabricator.com/ShopManagement/ShopManagement\\_Article.cfm?ID=304](http://www.thefabricator.com/ShopManagement/ShopManagement_Article.cfm?ID=304)
11. <http://www.career.fsu.edu/documents/stacie%20ncda%20june%202005%20presentation%20final1.ppt>
12. <http://www2.eur.nl/fsw/research/veenhoven/Pub1980s/89a-C9-full.pdf>
13. <http://www.lums.lancs.ac.uk/publications/viewpdf/000187/>
14. <http://bj.oxfordjournals.org/content/94/2/211.full>



## Green Marketing and Its Impact on Consumer Buying Behaviour

Dr. L. Jagadeesan, Dr. P.Sumathi

### I. Introduction

**Green marketing** refers to the process of selling products and/or services based on their environmental benefits. Such a product or service may be environmentally friendly in itself or, like reducing water usage. It's also about using products from conscientious companies with sustainable business practices.—Green is an umbrella term that refers to products and produced and/or packaged in an environmentally friendly way. The obvious assumption of green marketing is that potential consumers will view a product or service's "greenness" as a benefit and base their buying decision accordingly. The not-so-obvious assumption of green marketing is that consumers will be willing to pay more for green products than they would for a less-green comparable alternative product - an assumption that, in my opinion, has not been proven conclusively. While green marketing is growing greatly as increasing numbers of consumers are willing to back their environmental consciousness with their dollars, it can be dangerous. The public tends to be skeptical of green claims to begin with and companies can seriously damage their brands and their sales if a green claim is discovered to be false or contradicted by a company's other products or practices. Presenting a product or service as green when it's not is called green washing. Simply put, green cleaning is about using products that are safe and healthy for you and the environment and about employing eco-friendly cleaning practices that are organic, sustainable and/or otherwise environmentally friendly.

a. product may be considered —green if it:

- Conserves water and energy
- Prevents contributions to air, water and land pollution
- Protects indoor air quality
- Uses renewable, responsibly sourced materials
- Produces little environmental impact
- Is manufactured in an environmentally conscious way
- Using one's own bag, rather than a plastic carrier provided by a shop.

Broad and fairly ambiguous, the terms —green and —eco-friendly may be misleading. For example, a product labeled —green may have been responsibly sourced but may not necessarily be organic. What's more, some manufacturers have been known to intentionally mislead consumers in a practice known as —green washing. Products and businesses that have been green washed may appear to be eco-friendly, but upon closer inspection, often amount to little more than a well-executed green marketing campaign.

For green marketing to be effective, you have to do three things; be genuine, educate your customers, and give them the opportunity to participate.

1. **Being genuine** means that a) that you are actually doing what you claim to be doing in your green marketing campaign and b) that the rest of your business policies are consistent with whatever you are doing that's environmentally friendly. Both these conditions have to be met for your business to establish the kind of environmental credentials that will allow a green marketing campaign to succeed.
2. **Educating your customers** isn't just a matter of letting people know you're doing whatever you're doing to protect the environment, but also a matter of letting them know why it matters. Otherwise, for a significant portion of your target market, it's a case of "So what?" and your green marketing campaign goes nowhere.
3. **Giving your customers an opportunity to participate** means personalizing the benefits of your environmentally friendly actions, normally through letting the customer take part in positive environmental action.

## WHY IS GREEN MARKETING CHOSEN BY MOST MARKETERS?

Most of the companies are venturing into green marketing because of the following reasons:

Opportunity in India, around 25% of the consumers prefer environmental-friendly products, and around 28% may be considered healthy conscious. Therefore, green marketers have diverse and fairly sizeable segments to cater to. The Surf Excel detergent which saves water (advertised with the message—"do bucket paani roz bachana") and the energy-saving LG consumers durables are examples of green marketing. We also have green buildings which are efficient in their use of energy, water and construction materials, and which reduce the impact on human health and the environment through better design, construction, operation, maintenance and waste disposal.

### b. Social Responsibility

Many companies have started realizing that they must behave in an environment-friendly fashion. They believe both in achieving environmental objectives as well as profit related objectives. The HSBC became the world's first bank to go carbon-neutral last year. Other examples include Coca-Cola, which has invested in various recycling activities. Walt Disney World in Florida, US, has an extensive waste management program and infrastructure in place.

### c. Governmental Pressure

Various regulations are framed by the government to protect consumers and the society at large. The Indian government too has developed a framework of legislations to reduce the production of harmful goods and by products. These reduce the industry's production and consumers' consumption of harmful goods, including those detrimental to the environment; for example, the ban of plastic bags in Mumbai, prohibition of smoking in public areas, etc.

### d. Competitive Pressure

Many companies take up green marketing to maintain their competitive edge. The green marketing initiatives by niche companies such as Body Shop and Green & Black have prompted many mainline competitors to follow suit.

### e. Cost Reduction

Reduction of harmful waste may lead to substantial cost savings. Sometimes, many firms develop symbiotic relationship whereby the waste generated by one company is used by another as a cost-effective raw material. For example, the fly ash generated by thermal power plants, which would otherwise contributed to a gigantic quantum of solid waste, is used to manufacture fly ash bricks for construction purposes.

## II. Benefits Of Green Marketing

Today's consumers are becoming more and more conscious about the environment and are also becoming socially responsible. Therefore, more companies are responsible to consumers' aspirations for environmentally less damaging or neutral products.

Many companies want to have an early-mover advantage as they have to eventually move towards becoming green. Some of the advantages of green marketing are, It ensures sustained long-term growth along with profitability. It saves money in the long run, though initially the cost is more. It helps companies market their products and services keeping the environment aspects in mind. It helps in accessing the new markets and enjoying competitive advantage. Most of the employees also feel proud and responsible to be working for an environmentally responsible company.

## III. Literature Review:

A study by Peter Kangis (1992), proposes that the challenges both for marketing specialists and for consumers, raised by the concept of green marketing, are due to several issues, such as the lack of an acceptable definition for green marketing, the absence of a clear understanding of cause-and-effect relationships in matters affecting the environment, and the overt and covert reasons for concern about such issues. Suggested that, in the hands of unscrupulous marketers, green marketing can turn into green gold. An important study by Vasanthkumar N. Bhat (1993) suggests since inputs, manufacturing processes, distribution, use and disposal methods are decided during the design stage, any company venturing out with a green

marketing program must start with green design. Presents source reduction and waste management strategies to cut down wastes, and also presents a method to compare green design alternatives which can provide designers with guidance to select superior designs. As a product must meet several criteria, suggests a concurrent rather than sequential product development approach. Concludes with tips for top management to improve green design in their organizations. Another study by John Grant (2008) aims to look at how companies obtain a greener strategy and what is the future of green marketing. A study by Elham Rahbar (et al, 2011) proposes to determine the effect of green marketing tools on consumer's actual purchase behaviour in case of Penang (Malaysia). A survey was carried out on 250 Chinese, Malay, Indian and other races that represent the Penang population. Factor analysis, Cronbach alpha and multiple regression were used to identify factors impact on Penang consumers actual purchase behaviour. The result revealed that customer's trust in eco-label and eco-brand and their perception of eco-brand show positive and significant impact on their actual purchase behaviour. According to Hallin (1995) and McCarty and Shrum (2001), people engage in environmental behavior as a result of their desire to solve environmental problem, to become role models and a belief that they can help to preserve the environment. However, consumers' indications of positive attitude towards environmental issues do not necessarily lead to actual environmentally friendly purchasing behavior (Laroche et al., 2002). Majority of consumers do not purchase products based on the environmental concern alone and they will not trade-off other product attributes for a better environment. Businesses and consumers today confront one of the biggest challenges – to protect and preserve the earth's resources and the environment. They have become more concerned with the natural environment and are realizing that their production and consumption purchasing behavior will have direct impact on the environment (Laroche, Bergeron, and Barbaro-Forleo, 2001). This awareness is congruent with the belief that the world's supply of natural resources is finite and the ecological balance of the environment may be at a critical disruption stage (Hayes, 1990). In addition, the great majority of our environmental problems – excess garbage, pollution, waste of energy and material, etc. are the result of consumers' consumptive behaviors.

### Objectives

- The aim of this study is to find out how consumer behavior is influenced by Green Marketing by Companies.
- To exhibit the challenges being faced by companies pursuing green marketing.
- To study the relationship between consumers' attitude and perception towards green marketing.
- To analyse consumer's willingness to pay high for green products.

**Hypothesis:** The purchase behaviour of buyers is not influenced by green marketing practices of organisations.

### Research methodology and Data collection

**Sample method :** Sample Data has been collected from randomly selected buyers from markets / retail outlet of the green products.

Primary data would be collected through questionnaires. The questionnaire contained questions - asking like your purchase decision is affected by green marketing activities of the company, repurchase decision is affected or not, how much extra you are ready to pay etc Secondary data

**Sample Size-** A Random sampling strategy would be carried out. A survey of about 100 consumers would be taken. They are familiar with the purchase of these products and also responsible for the purchase decisions.

### Data Analysis

Likert 5 point scales were used in all measures. In order to achieve the objective of the study, the statistical tool has been used to analyze the data.

### Findings

- 1) 70% of respondents are aware of green products
- 2) 30% can pay more for eco friendly products
- 3) 60% have agreed that there is enough information about the products while 40% not.

- 4) 50% of the population in the sample agrees or strongly agrees that the organisations should practice green marketing.
- 5) majority of the people are not concerned about organisations polluting environment as 58% are neutral regarding the issue.
- 6) 60% customers are not affected by green marketing while making purchasing decision and 40% are affected.
- 7) 55% buyers prefer to repurchase such products which are green and 45% are not affected.
- 8) Survey Questionnaires provided to reflects a social consciousness around respondents: saving and advancing the Earth's natural In short Green marketing encourages consumers to use eco-friendly products and manufacturers to develop more.

The awareness about the products should be done through advertising so that individual buying behaviour can be changed which can have an impact on the welfare of the environment. It is also important that companies aiming at developing new eco-friendly products should ensure that products perform competitively.

**Challenges of green marketing** Green products require renewable and recyclable material, which is costly Requires a technology, which requires huge investment in R & D Water treatment technology, which is too costly Majority of the people are not aware of green products and their uses Majority of the consumers are not willing to pay a premium for green products

#### IV. Conclusion

Green marketing should not neglect the economic aspect of marketing. Marketers need to understand the implications of green marketing. If you think customers are not concerned about environmental issues or will not pay a premium for products that are more eco-responsible, think again. You must find an opportunity to enhance you product's performance and strengthen your customer's loyalty and command a higher price. Green marketing is still in its infancy and a lot of research is to be done on green marketing to fully explore its potential.

#### References:

1. Polonsky, M. J. "An Introduction to Green Marketing." Electronic Green Journal 1, no. 2 (November 1994).
2. Ottman, J A (Jan2004) "empower to the people" Inbusiness.
3. Prakash, A. (May2002) " Green Marketing, public pol icy and managerial strategy" Business Strategy and The Environment, Bus.Strat.Env.II, pg 285-297.
4. Ottman JA, Stafford ER, Hartman CL,(June-2006)" Avo iding Green Marketing Myopia", The Environment,Vol-48,No-5,pg.22-26.
5. Frankel, C. 1992. "Blueprint for green marketing", marketing executive review,2(5):pg22-23.
6. Freman, R.E and J. Liedtka.1991." Corporate Social Responsibility: "A Critical Approach." Business Horizons 34(4):pg 92-98.
7. Carlson, Les, Stephen Grove and Norman Kangun (1993)," A Content Analysis of Environmental Advertising." Journal of Advertising Vol- 22(3), pg 27-38.
8. The ICAFI Journal of Environmental Economics, Vol-IV, No4, Nov.06.
9. "Down to Earth", March 15, 2007 issue.
10. Saxena Rajan(2006,3rd Edition), Marketing Management, New-Delhi, Tata McGrawHill Publishing Co. Ltd.
11. Ottman J.A (1998, 1st Edition), Green Marketing: Opportunity for Innovation, NTC-McGrawHill, 1998. View publication stats

## A Study of the Modes of E-Payment in India

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### Introduction:

Digital India and Cashless India commenced by government to promote and encourage e-payment and digital payment in economy. Digitally empowered economy that as 'Faceless, Paperless, Cashless' is the main objective behind it. It means maximum utilization of electronic medium for the purchase of goods and services that is an online transaction. It reduces need to carry bulk cash, cheques at the time of shopping in market, make the payment became more easy and without any delay. It revolutionized the payment processing by reducing paper work, transaction costs, and personnel cost with paperless e-commerce payments. This system is user-friendly and consumes less time and helps to extend their businesses to market. With this revolution in the payment and transaction modes of payment through mobile makes payments at any time from any place. India introduces several new innovative methods in the digital payment system.

### Objectives:

- To examine the availability of the various modes for electronic payments.
- To study the use of UPI Payment Apps in India.

### Research Methodology:

The study is based on secondary sources of data. Different books, journals, newspapers and relevant websites have been consulted in order to make the study an effective one.

### Different Modes for Electronic Payments:

#### 1. Unified Payments Interface (UPI):

UPI is a type of inter operable payment system through which any customer holding any bank account can send and receive money through a UPI-based app. The service allows a user to link more than one bank account on a UPI app on their smart phone to seamlessly initiate fund transfers and make collect requests on a 24/7 basis and on all 365 days a year. The main advantage of UPI is that it enables users to transfer money without a bank account or [IFSC code](#). All you need is a Virtual Payment Address (VPA). There are many UPI apps in the market and it is available on both Android and IOS platforms. To use the service one should have a valid bank account and a registered mobile number, which is linked to the same bank account. There are no transaction charges for using UPI. Through this, a customer can send and receive money and make balance enquiries.

#### 2. Internet Banking:

Internet Banking is the process of carrying out banking transactions online with the help of internet facility. Many services such as transferring funds, opening a new fixed or recurring deposit, closing an account, etc. are included in this mode. Internet banking is also referred to as e-banking or virtual banking. Internet banking is usually used to make online fund transfers via [NEFT](#), RTGS or IMPS. Banks offer customers all types of banking services through their website and a customer can log into his/her account by using a username and password. Unlike visiting a physical bank, there are to time restrictions for internet banking services and they can be availed at any time and on all 365 days in a year. There is a wide scope for internet banking services.

#### 3. National Electronic Funds Transfer (NEFT):

National Electronic Funds Transfer (NEFT) is a national payment system facilitating one-to-one funds transfer. This Scheme provided facility to different participants like individuals, firms and corporate electronically transfer their funds from any bank branch to any individual, firm or corporate having an account with any other bank branch. Individuals, firms or corporate maintained their accounts with a bank branch which transfers funds as per transactions between them by using NEFT.

#### 4. Immediate Payment Service (IMPS):

IMPS offers an instant, 24 hours within a week, interbank electronic fund transfer service through mobile phones facility among bank and other parties. IMPS are an important service offered by banks to transfer money instantly within banks across India through mobile, internet and ATM. This is not only safe but also economically beneficial in both financial and non-financial perspectives. It saves money as well as time and energy of banks and customers with corporate sector.

#### 5. Banking Cards (Debit/Credit/Visa/Master/Rupay/Other):

**Credit Card** The most popular form of payment for e-commerce transactions is through credit cards. It is simple to use; the customer has to just enter their credit card number and date of expiry in the appropriate area on the seller's web page. To improve the security system, increased security measures, such as the use of a card verification number (CVN), have been introduced to on-line credit card payments. The CVN system helps detect fraud by comparing the CVN number with the cardholder's information.

**Debit Card** Debit cards are the second largest e-commerce payment medium in India. Customers who want to spend online within their financial limits prefer to pay with their Debit cards. With the debit card, the customer can only pay for purchased goods with the money that is already there in his/her bank account as opposed to the credit card where the amounts that the buyer spends are billed to him/her and payments are made at the end of the billing period. **Smart Card** It is a plastic card embedded with a microprocessor that has the customer's personal information stored in it and can be loaded with funds to make online transactions and instant payment of bills. The money that is loaded in the smart card reduces as per the usage by the customer and has to be reloaded from his/her bank account.

#### 6. Point of Sale: POS

Traditionally, POS terminals referred to those that were installed at all stores where purchases were made by customers using credit/debit cards. It is usually a hand held device that reads banking cards. However, with digitization the scope of POS is expanding and this service is also available on mobile platforms and through internet browsers. There are different types of POS terminals such as Physical POS, Mobile POS and Virtual POS. Physical POS terminals are the ones that are kept at shops and stores. On the other hand, mobile POS terminals work through a tablet or Smartphone. This is advantageous for small time business owners as they do not have to invest in expensive electronic registers. Virtual POS systems use web-based applications to process payments.

#### 7. Mobile Banking Applications:

**Mobile Banking:** Mobile banking is referred to the process of carrying out financial transactions/banking transactions through a Smartphone. The scope of mobile banking is only expanding with the introduction of many mobile wallets, digital payment apps and other services like the UPI. Many banks have their own apps and customers can download the same to carry out banking transactions at the click of a button. Mobile banking is a wide term used for the extensive range or umbrella of services that can be availed under this.

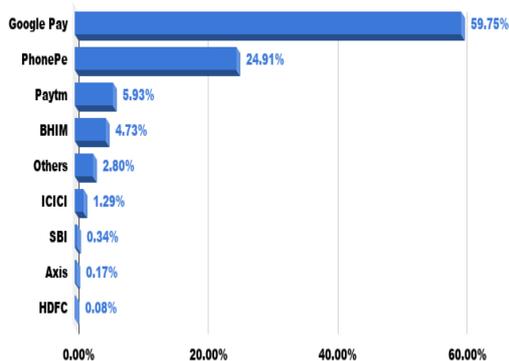
#### Popular UPI Apps:

Google pay, Phone Pe, Paytm App and BHIM App are largely using APPS in India. There are total numbers of the transaction as on January 2020 was 1305.02 million (Source: NPCI) and top 4 UPI App Market Share as on August 2019 in terms of value (in Crores) as shows below.

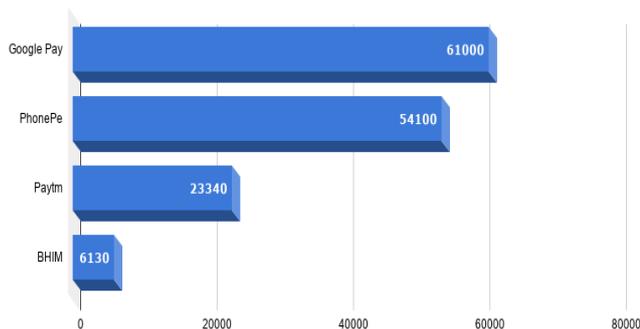
##### 1. Google pay:

Google Pay is number one in this list. Google Pay is the most innovative and unique UPI payment app in India launched by Google. Google Pay also leads in India's UPI transaction both in terms of Transaction Value. Google Pay has more than 6.7 Crores active monthly users in India. Google Pay has tied up with 4 PSP banks in India namely SBI, ICICI, Axis Bank & HDFC Bank to provide VPA service in India. This payment app does not have any wallet option, therefore, no KYC documents are needed to operate this app, only you need a bank account and your mobile number should link to this account.

App Wise Share of UPI Transaction As on August 2019



Top 4 UPI App Market Share (Value in Crores)



You can create VPA id by installing the Google Pay App and business deal MPIN by authenticating the debit card linked to your Account. The VPA id will be your Gmail id @okhdfc, SBI, axis or ICICI. Google Pay has now more than 2000 online merchants' partners in India. As per NPCI data, Google Pay leads the UPI payment market with a 60% market share and 18 Crores users downloaded the App since September 2017.

## 2. Phone Pe:

Phone Pe is a Bangalore based UPI payments App launched in 2016. This e-payments App is now acquired by e-commerce giant Flipkart. Phone Pe is the first UPI Payment platform in India, will be integrated as a payment option in Walmart India's "B2B Cash & Carry Stores". Phone Pe is partnered with Yes Bank to provide UPI payment service in India. As of August 2019 data Phone Pe has a 37.3% market share in UPI transaction volume. You can link your existing Jio Money, Free charge and Airtel Money e-wallet with Phone Pe App and seamlessly transfer money between these wallets.

## 3. Paytm App:

India's largest digital wallet service provider and most downloaded UPI app in both Android and IOS platforms. Paytm was the pioneer of digital payment service in India and one of the best UPI app in India. The App has excellent UI and integrates many services in a single app platform. As of August 2019 data, Paytm accounts for around 5.93% market share in overall UPI transactions and dominates QR code-based offline transaction market in India.

## 4. Free charge Payment App:

Free charge is also a very popular UPI money transfer app in India for its several cash back and in-app discounts and offers. You can get your own @freemove UPI Id using this App. You can add multiple Bank Account linked with the mobile number registered for the Free charge App. You can also create a Free Charge mobile wallet by uploading some KYC documents. This Gurgaon based Fintech startup now is acquired by Axis Bank.

## 5. BHIM App:

The BHIM app allows users to make payments using the UPI application. This also works in collaboration with UPI and transactions can be carried out using a VPA. One can link his/her bank account with the BHIM interface easily. It is also possible to link multiple bank accounts. The BHIM app can be used by anyone who has a mobile number, debit card and a valid bank account. Money can be sent to different bank accounts, virtual addresses or to an Aadhaar number. There are also many banks that have collaborated with the NPCI and BHIM to allow customers to use this interface.

## 6. Amazon pay:

Another convenient, secure and quick way to pay for online purchases is through Amazon Pay. Use your information which is already stored in your Amazon account credentials to log in and pay at leading merchant websites and apps. Your payment information is safely stored with Amazon and accessible on thousands of websites and apps where you love to shop. If you are planning to sell your products online, Amazon would be happy to help you in setting up payment gateways for your products and services. You can also consider selling on Amazon, one of the most popular e-commerce platforms in the world. To sell on Amazon, please register yourself for free.

### 7. MobiKwik:

This Gurgaon based eWallet cum UPI payment App is competes with other major UPI Apps like Google Pay, PhonePe and Paytm. It is also one of the most popular money transfer App in India. Mobikwik provides the UPI transaction facility. It not only that but also have a variety of utility services from mobile. It helps to recharge to Direct Mutual Fund investment from the single App. Mobikwik is work with collaboration of companies like Uber, Zomato, Dominos, IRCTC, etc uses their payment gateway. This is one of the most popular payment gateway service providers in India and is one of the most downloaded. This is highly rated UPI apps both in Android and IOS App Store.

### 8. Yonoby SBI:

State Bank of India was launched a mobile wallet to transfer money for pay bills, recharge, book for movies, hotels, shopping as well as travel. This offers its services in 13 languages. It is available for non-SBI customers also to increases e-payments. This app also allows its customers to set reminders. This reminders set for dues, money transfers and view the mini-statement for the transactions carried out.

### 9. Pay Zapp:

This is one of the UPI payments app and digital wallet offered by HDFC Bank in India. This mobile Payment app provides numerous cash back offers across different merchant sites. This is also very popular in India due this cash back offers. There is provision of a Visa Virtual Debit card for online payments.

### Conclusion:

Day by day UPI transactions are increased and people are carrying at least one UPI app in their phone. Banking transactions are more easy and simple to use these UPI apps. UPI apps are probably use for online payment like shopping bills, all types of recharge, hotel bills, gas bills, light bills, cable TV, rent, Toll, fastage, fees, donations, transfer etc. Banking hours are limited but UPI is available for 24 X 7 for make this engagement. As the popularity of UPI apps are increasing, people are keeping less cash. The way in which UPI transitions have been increasing in the last two years, it can certainly be said that in the coming period we will definitely be paperless and cashless. We should take proper care when using the apps, as it has its advantages as well as its disadvantages. Considering the growing trend of cybercrime, we should not share confidential information with anyone about transaction. Do not share your password; pass-code, PIN, MPIN, OTP with anyone.

### References:

1. <http://special.ndtv.com>
2. <http://cashlessindia.gov.in>
3. <https://www.rbi.org.in>
4. [www.thequint.com/news](http://www.thequint.com/news)
5. <https://en.wikipedia.org>
6. <http://cashlessindia.gov.in>
7. [www.socialbeat.in](http://www.socialbeat.in)
8. <https://services.amazon.in/>
9. <https://money.howstuffworks.com/>
10. [www.softwaresuggest.com](http://www.softwaresuggest.com)

## Community Involvement: A Study of PAANI Foundation Water Cup Project

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### Introduction

Water scarcity has caused to water crisis and it has become worldwide issue. India is one of them; where the issue may cause to major setback to the people as well as economy. Poor water management, lack of environmental approach, deceptive monsoon, over exploitation of the resources and poor action plans are major hurdles in tackling the issue. In the past, life of human was mainly depended upon natural resources and they were aware of the conservation of these resources. The present scenario is totally different, lifestyle and consumption pattern of the people has totally changed and artificial resources are being produced at large scale at the cost of natural resources including water. Such over consumption has caused to environmental degradation and imbalance to eco-system. Water scarcity has adversely affected on agro based rural economy and it has resulted in huge migration of villagers towards cities in the search of employment. Government and concern authorities are working with huge budgetary provisions but results are not satisfactory. Corruption and lack of community involvement including route level people are observed as thrust area. Peoples' active involvement has proved grand success in numerous projects and it becomes mass movement if they are the part of decision making.

The present research paper is the outcome of such mass movement undertaken with the banner of 'PAANI Foundation'. Said NGO is working with joint hands of BJS to conserve the rain water harvesting under 'shramdan' on community basis. Drought prone villages of Maharashtra State are focused as target area under this project; such efforts are proved as sustainable activities with community support.

### Water scarcity in the country

World commission on Environment and development i.e. Brundtland commission has Introduced the concept of sustainable development at first in their report in 1987; it defined as development is such; which meets the needs of present generation without compromising the capabilities of the resources to meet & fulfills of requirements of future generation. In the present scenario partially world has suffering by water scarcity including India. As developing country, India is not able to provide recommended quality fresh water to its population which is more than 125crore. India is placed at 120<sup>th</sup> among 122 countries in the water quality index as per UN report 2010. As per ADRI report-2015, India's per capita water availability is less than 1700 m<sup>3</sup> with reference to international norms. According to ADRI study report; data for the period 1970 to 1914 exhibits; drought has observed as major natural disaster than the flood in the country. As per NITI AYOJ Repo-2017, which is based on the study of 24 states out of 29, water crisis of the country will be more severe in few years mainly in rural India including some mega cities.

### Objectives of the Syudy

The present study has mainly attempted to analyse work profile of *PAANI Foundation* as a model of community involvement. It has also studied; how natural challenges can be coped with joint efforts of people in organised form. The study has enabled to carry out systematic assessment of the outcome of the project in water harvesting. It has also enabled to study; how women are being empowered by training and can be by encouraged through their active involvement in the project. It has studied as how project has succeeded to boost agro economy of the Maharashtra mainly in drought prone area.

## Research Methodology

Present research is a form of case study. It was a systematic analysis of the rain water harvesting project; that has initiated by *PAANI Foundation* by encouraging active involvement of the sample villagers. These villagers are the main benefiter of the project at mass level. Present analysis is mainly based on secondary data for the period of 2016 to 2019. As well as researcher has deployed observation technique by conducting field visits to project sites on sample basis to verify the reality of the project.

## Findings

- An introduction to PAANI FOUNDATION

PAANI FOUNDATION is a self-financed non-profit organisation founded by actor cum social activist Amir Khan with joint collaboration of technical experts and corporate donors to ensure sustainable approach in the development of villages in Maharashtra. This NGO is mainly working to spread knowledge for watershed management and ground water replenishment as its main aim. Said foundation does not provide any direct cash and tools except technical support in the form of knowledge with joint collaboration of Government and other technical expertise.

Bhartiy Jain Sanghatan (BJS) is also NGO formed by Mr. Shantilal Muttha in 1993, with multiple objects to serve the society on charity basis. BJS is one important co-partner of PAANI Foundation in their rain water harvesting project. BJS accepts finance in the form of public donations to provide tools and machinery for the field works under this project. It has provided numerous tools, equipment and machineries including JCB and other earth moving machineries to those villages who have achieved set parameters under 'Satyamev Jayate Water Cup-Project'. BJS has provided Backhoe more than 490 loaders and Excavators on free of cost to the qualified villages in 2017.

- Project wise activities of the of the PAANI FOUNDATION

### 1. *Satyamev Jayate* Water Cup Event

To ensure the community involvement in watershed and rain water harvesting PAANI Foundation is conducting annual competition to drought prone villagers. WOTR-Watershed Organisation Trust is the knowledge partner that helps PAANI foundation in conducting water cup event. PAANI Foundation makes open appeal to those *Gram Panchayats* of Maharashtra; which are half-abandoned into battling droughts. Said villages are being appealed to participate in water cup event in given time by passing resolution in Gram Sabha. Each participating village has to select five representatives including two women to participate four days residential training programme. These trained representative are required to prepare plan with mutual communication of the villagers and concern authorities to for watershed management in the village as per given norms. *PF* has developed separate technical team to give several visits to the participating villages. That team provides necessary guidance and technical assistance in due course to achieve the watershed targets. Community level *Shramdan* (Participation in physical work voluntarily) is mainly expected by the concern villagers to build trenches, ponds to marks contour lines up to 45 days on continuous basis in between April to May.

The participating villages are being judged for a total 100 marks under the following broad heads.

Table No-1 Competition Marking System

Sr. No.	Criterion	Maximum Marks
1.	Wastewater Management	05
2.	Conservation of Trees	05
3.	Soil & Water Conservation structures Built Through <i>Shramdaan</i>	25
4.	Soil & Water Conservation structures Built Using Machines	15
5.	Adequate Weightage to Area Treatment & Ridge Line Work	10
6.	Quality of Structures	10
7.	Soil Testing	05
8.	Farms Free of Crop Burning	05
9.	Water Saving Techniques	05
10.	Water Budgeting	10
11.	Repair of Existing Structures/Innovative Initiatives	05
	<b>Total-</b>	<b>100</b>

Above table represents criteria wise marks under broad category, beyond to this broad heads individual contribution of the villagers are also considered to confirm community participation in the socio-economic development of the village. It consist of total numbers of villagers participants, quantitative increase in numbers of soak pits, public farm lakes, numbers of existing trees and newly survived trees are being considered separately. As well as type of crop pattern, type planted saplings; individual waste water management etc. factors are also considered including participation of female members and members from backward and minor communities as total community involvement.

The state level winners i.e. top three villages are being appreciated with cash prizes as Rs.75 lakh, Rs.50 lakh and Rs.40 lakh respectively. Taluka wise villages are also appreciated excluding state level winners with cash prizes as Rs.10 lakh, 5 lakh & 4 lakh respectively.

Each village that takes part in the Water Cup has an opportunity to become water-abundant. That is the biggest and most important prize as outcome of this project.

## 2. *Samrudhha Gram Spardha*

This competition is conducted for selective villages those have already completed threshold of water conservation work as per norms of PAANI Foundation water cup. The main aim of this competition is to empowering citizens to create their village as they dreamed and to transform village ecology and economy.

This competition has designed to address the basic problem beyond the water scarcity. It works towards the restoring the environment, boosting financial security and ensuring long-lasting resilience against drought.

Key areas- *Samrudhha Gram* approach consist of, soil and water conservation, water management and budgeting, increasing tree cover and growing forests, creating protected grasslands of nutritious and palatable grasses. Restoring soil quality and health as well as creating the basis for every family to increase their income.

## 3. Training

To ensure smooth functioning of the watershed development activities, training is being provided by PAANI Foundation with help of technical expertise including Government officials. This

training is especially conducted to the nominated representatives of those villages who have taken active participation in water cup event. Said four days residential training programme is conducted in model village which is water abundant and so far away from irrigated developments.

Training activities are designed in a manner so participants' gets knowledge and field experience of technical and social aspects that are required to implement watershed development programme in their respective villages. Following activities are majorly covered under this training programme.

#### Training Activities-

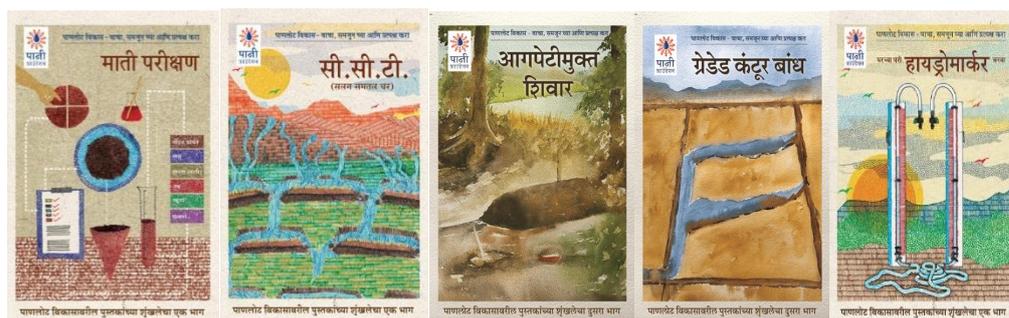
- Measuring annual rainfall in respective village including how much water is wasted and can be saved.
- Understanding watershed structures including farm ponds and contour trenches through field work.
- Understanding topography of your village and designing what can be suitable by the study of model villages.
- Field tour to successful watershed village.
- Understanding importance of supplementary activities including tree plantation and water testing.
- Playing games to develop leadership skills, team spirit and to teach importance of water.
- Computer and mobile app training is also provided to know data input processing.



Source- <https://www.paanifoundation.in/water-cup/training-programme/>

#### 4. Books

Success of watershed management mainly depended upon scientific approach and proper understanding of its technical aspects. Villagers are the main target group of this project. Therefore PAANI Foundation has designed and published around **20 handbooks** at present in simple Marathi with effective pictures and graphs to provide fieldwork direction and scientific information to work on the projects. These books are written and designed with mutual consultation of the experts in respective areas. All these books are freely circulated and freely available in a form of e-books for everyone at free of cost.



These books facilitate to work on field on community basis. These books are also being referred by other villages those are and were not part of *PF* project. Some books like *Aag Mukh Shivar* i.e. fire free surrounding are especially designed to conserve the ecosystem of the villages. While, book like *Hydro Marker* not only discuss about use and application of hydro marker but this book is also very useful to make all these scientific instruments with locally available sources by volunteers with negligible cost.

## 5. Films

Audio visual tools are always proved more effective teaching and training tools for all category learners beyond their age and educational status. *PF* has produced numerous documentaries, videos as well as YouTube films including short films as source of training in Marathi language with intention to channelise watershed programme on mass level mainly in drought prone rural Maharashtra. All the short films, documentaries are produced in regional Marathi language. These films helps to create awareness among the community, help them to get motivated also helps them to experience the changes in their life and rural economy after successful implementation of the project.

Following are the some examples of those **27 films** and documentaries that are available on *PF* website as well are circulated to the village representatives during their training programme.

Some titles are as, Introducing Chaturrao and Chatura, How to make your Hydro marker, How to construct Soak Pit, Compartment Bunding, Soil Testing, How to make Gabion etc. Film like 'Instructions for JCB and Poklane operators are also very valuable that facilitates to concern operator about his exact role and importance of his role in making water enriched village.

## 6. School Projects

Collective participation and role playing is major requirement for any sustainable programme. *PF* has kept its focus to ensure sustainability of watershed development programme and therefore future generation is also being get involved by assigning them school based projects. *PF* has developed such activity based projects for school children to develop and to highlight inseparable bonding between humans and nature. This project is titled as '*Nisargachi Dhammal Shala*'. *PF* has spread the effect of this concept in various schools with the help of Government of Maharashtra. Today, this project has reached around 38,000 students from 1174 schools at the end of Jan –Feb 2019. As a result it has observed school students are taking lead to communicate the society about social problem and also addressing them to mobilise to conserve the nature.

The outcome of this project is resulted as; students have developed their seed banks and nurseries and actively participating in tree plantation. Awareness rallies are being conducted to mobilise crowd for public meetings and field activities. Even students are dug soak pits to store and filter the drainage water as well as actively taking part to raise the fund. Parents are get encouraged in numbers of villages as a result of active involvement of their wards in watershed development programme.

## 7. *PF* App

To monitor the watershed development progress in selected villages; *PF* has developed software based application with mutual cooperation of BJS. Each village has given separate login ID and volunteers are trained to upload the data on daily basis according different heads. This app also

facilitates villagers to count their marks on daily basis and they can compare their daily work progress in respect to work standards. This app also facilitates to provide online guidance to deal various issues if any occurs during daily work.

## 8. Mass Participation

Environment conservation and watershed development is the basic requirement of the time. To channelise the said activity at mass level and to create public awareness; *Mass Shramdan* is being organised by *PF*. It has provided platforms to the urban citizens who are ready to volunteer their labour services on 1<sup>st</sup> May which is celebrated as Maharashtra State formation day as well as Labour Day. *PF* makes public appeal to all citizens of Maharashtra with different age and sex categories to join in this one day *Shramdaan* at any village as per their convenience on 1<sup>st</sup> May in Public *Shramdaan*. It helps to motivate the villagers as well as it also works to complete their task in large quantity in a one day mass activity. Citizens can contribute by donating money to BJS to meet the requirements of this project as well as can render their expertise and technical services on voluntary basis as per their choice and schedule even if they are not part of any village. This idea has observed as practically successful concept. Numerous citizens including celebrities are being observed as volunteering their services under this appeal with the title as '*Chala Gawakade*'.

- **Achievements of the *PF* Watershed Development project**

Qualitative change in the approach and social as well as individual behaviour of the villagers can be defined as major achievement of the *PF* watershed development project. This change has observed in more than 70% villages who are participating in *Satyamev Jayate Water Cup* event on continuous basis since 2016. Villagers **participation in Gram Sabha** have increased and they are showing more interest in village policy making including water budgeting. Women's are observed as more active in social meetings than earlier practices. All these villages have formed Women SHG and most of these groups are become financially independent and stable. Marriage issue has become more severe in Maharashtra. Girls are not ready to marry with the boy if he is staying in village and especially if he is engaged in farm activities. As well as this issue is very serious if the village lies in drought prone zone. This scenario has brought minor change in case of villages those are the part of *PF* watershed development project.

The major qualitative change has observed in **water consumption pattern** of the villagers. Now they do not waste the water and their household water consumption has controlled and they manage most of their activities with less water than the earlier even after having regular supply of the water in villages. It has specially observed in 48 villages those have secured prize at Tehsil level.

**Quantitative achievements** can be stated as; the first edition of the competition was held during April 20 - June 5, 2016. About 116 villages took part in the competition to make their villages water-sufficient. As a result, 1,368 crore litres of water which is equivalent to 13, 68,000 tankers of water worth Rs.272 crore was saved as per *PF* report-2019.



Water Reservoirs



Farm lake

## Conclusion

It is to be said in Marathi, '*Gav Karel Te Rao Karel Kay*'; it can truly experienced by the watershed development programme channelised by PF in Maharashtra. Community involvement led to overcome water scarcity in drough prone villages of Maharashtra where PF has stood with some model ideas including 'SAMRUDHHA Gram" project. Increased numbers of participating villages including increased numbers of village volunteers exhibits the success of the project. The mjaor key area of the can be stated as –Increased level of under ground water, decreased numbers of water tankers in the month of may even some villages are reached at zero numbers of tankers requirement. Community involvement has also encouraged team spirit in the villages and decreased nubers of communal disputes. Social bonding has also increased as well as womens are observed as major benifitiers in most of cases on the basisi of finacile security due to increased source of income. As well as women were most sufferer and strugling in case of water scarcity. Watershed development has helped them to supply of guranteed water for drinking and for household requirements. Farmers are observed as engaged in two seasons with multiple crops. Villagers are become aware of the varois Government schemes as well as in most of cases farmers have changed type of corp according to soil fertility. Soil testing policy has observed as part of practice in said villages. Gram panchayat was just administrative an political center in these villages like other, PF watershed programmed has turned this administrative center in to development and welfare center through ground based traing and by developing true spirit by time to time motivational programmes. Now these villages are taking lead to change the socio-economic scenario of nearby villages by volunteering their services, knowledge and experinces.

## References:

1. Gulati A., Banerji P.(2018), 'Emerging Water Crisis In India: Key Issues And Way Forward Indian Journal of Economics, Special Centennial Issue, Vol. XCVI, No. 383, 2016: 681-704.
2. Rana, Mamta and Guleria,(2018) Water Scarcity in India: A Threat to Sustainable Management of Water, International Journal for Environmental Rehabilitation and Conservation ISSN: 0975 — 6272, IX (2): 35— 44
3. TISS(2015), 'Status of Rural Water Supply in Maharashtra', Study report for Ministry of Drinking Water & Sanitation Govt. of India
4. [www.paanifoundation.in](http://www.paanifoundation.in)
5. <https://www.paanifoundation.in/our-work/app/>
6. <https://economictimes.indiatimes.com/news/politics-and-nation/17-maharashtra-districts-under-threat-of-water-scarcity/printarticle/65870516.cms>

**Analysis of Marketing and Pricing policies of Cashew as farm Product****Satish S. Kadam ,**Assistant Professor Dr. Jayashree Bhakay  
Assistant Professor, MBSIM Khed (Ratnagiri)**Introduction**

Cashew is one of the important tropical crops called as the 'poor man's crop, rich man's food'. The cashew nut is native of Brazil and Portuguese travelers took the cashew tree to colonies in India, first recorded in Cochin by 1578 AD, in Goa by 1598 A.D. (Mohod A. G. et al., 2010). The commercial cashew production in India was started in 1960. Ever since, the production and productivity of the cashew is increasing. The National Horticultural Mission (NHM) has supported well to bring more and more area under cashew cultivation. India has progressed in developing new cultivators, progression system and also a large number of products, which could be improvised with further research. The need for the development of propagation technologies is being increased for providing higher returns for the farmers producing cashews. This could bring out cashew cultivation possible even in the non- traditional regions. Use of seedlings propagated from seeds, poor adoption of improved planting materials (clone), low population density per unit area and adoption of poor agronomic practices can also help improve yield. The market price of the cashew is very attractive that also inclined the farmers for its cultivation. The statistics on area, production, and productivity of cashew in different state of the country reveals that the state of Maharashtra ranks first in the production and productivity. The area under cashew in Maharashtra is about 1.75 lakh ha and the production is 1.98 MT. The productivity of cashew in Maharashtra is 1186 kg/ha compared to average value of 695 kg/ha for the country (CEPC, 2012). In last few years in Goa, the cashew yield showed the increasing trend exceptionally in one or two years. (Table 1).

**Table 1 Year-wise cashew production (tons) in Goa (Source: Times of India)**

Year	Cashew yield
2017-18	28,012
2016-17	24,396
2015-16	17,549
2014-15	25,011
2013-14	24,332

Climatic condition at the flowering and fruit setting stage are the crucial factor that primarily determines the yield of the cashew. As raw cashew nuts need to have processing i.e. boiling or roasting and shelling or cutting, cashew nut processing industries have good demand in the cashew growing areas. Cashew industries is a good source of employment for the local people. The cashew mill in India employed different unit operations/methodology for processing and depending on variety of raw material, location, technological mechanization and availability of secured energy supply. The most energy and time intensive unit operations in cashew processing are drying of raw seed in open sun, steaming of raw nut and kernel drying with electrical energy (Balasubramanian, 2000). The average installed production capacity of the surveyed cashew processing industries was about 9800 kg of raw cashew nut seeds per annum. The actual raw material processed by these industries was in the tune of 5833 kg per annum, which revealed the average percent plant capacity utilization of 55% only. The women workers were prominent in the small scale cashew nut processing mills. (Mohod A. G. et al., 2010). Based on the observations, economic analysis of cashew nut processing plant showed that, if the plant be operated with full capacity and efficiency then there would be profit of ` 1329.07 per day, excluding all expenses. This is quite profitable, but the profit margin could be increased more by plant mechanization and modernization. Processing capacity could be increased with significant reduction in labour requirement and processing time by modernizing the processing plants. (Banerjee and Shrivastava, 2014).

**Table: AVERAGE PRICING TREND OF RAW CASHEW**

NUT IN DIFFERENT STATES (Prices Rs/Kg)					
Year	Kerala	Karnataka	Andhra Pradesh	Tamilnadu	Goa and Maharashtra
2018	158.87	148	144	150	164
2017	133.03	137.22	114.18	101.8	142.02
2016	99.68	112.69	100.35	80.68	129.81
2015	90	115	74.84	72.27	122
2014	61.32	78	74.2	63.89	87.08
2013	51.8	53	52.5	55.5	72.78
2012	59.59	60.5	58.5	60.5	76.67
2011	71	70.5	70	71	83

Cashew nut occupies a prime place in the Indian economy, accounting for 16.95 per cent of the total area under plantation crops, which stood second position after coconut, and production of cashewnut accounts to 16.57 per cent of total production of selected plantation crops in India during 2000-01. India possesses about 21.6 % of area under cashew plantations (Murugamani & Ravi, 2016). It is the third highest foreign exchange earner among agro-based export items with production standing at 6.95 lakh tones and productivity of 778.28 kg/ha (Indian Cashew Statistics, Cashew nut Export Promotion Council, Cochin, 2010) It provides beneficial employment for about 3 million people all around the world, in which, about 1 million are employed in India alone (Padmbanaban, 2010).

The cashew apples, cashew kernels, broken and whole; raw cashew nuts; roasted cashew nuts and cashew nut shell liquid (CNSL) are the forms in which the cashew can be sold in the market. As cashew apples are perishable, it is having the local and very less market value. Cashew apple which is major part of Cashew Produce is perishable goes waste unlike in Goa where it is used to extract Alcohol. CNSL is a byproduct of the cashew industry having tremendous export potential. In spite of this potential, a good portion of it still continues to be burnt as crude fuel in the local manufacturing units for running boilers or other purposes. Export of CNSL from India stood at 6,908 MT, valued at Rs 26.28 crore (US\$ 4.08 million) during April 2017-December 2017, while exports of cashew kernels stood at 67,653 MT, valued at Rs 4,715.21 crore (US\$ 731.15 million) during the same period. (Indian brand equity foundation,2017).

Due to recent rise in interest from other countries, cashew production and processing has reached new heights. As per food and agricultural organization's report of 2012, India made about 1,72,719 metric tons (MT) of cashews in the country at a rate of 0.70 MT/ hectare (Murugamani and Ravi, 2016) (Table 2). India is the single largest producer and exporter of cashews, accounting for 40 % of the global share. It is also the largest importer of row cashew nut globally, with around 8 lakh metric tons of average annual imports, followed by Vietnam.

**Table 2 Leading cashew nut producing countries and its production.**

(Source: Global statistical Review 2015)

Sr.No.	Country	Production in MT
1	India	1,72,719
2	Cote d'Ivoire	1,71,111
3	Brazil	1,33,000
4	Vietnam	1,13,059
5	World	7,38,861

Cashew is a major crop in Ratnagiri and Sindhudurga districts such as Lanja, Sangmeshwar, Chiplun, Khed, Mandangad, Sawantwadi, Kankavali and all those areas beyond 15 kilometers from the sea coast. Vengurla varieties give good seed count. Cashew grown locally gives good outturn especially the vengurla

varieties. Organised plantations are better managed with fences and compounds, irrigation and use of organic material such as vermicompost and othercompost to maintain soil fertility.

The major challenges faced by the Indian cashew trade industry are stringent policies regarding cultivation, availability of labor, competition from other crops and competitive pricing of crops. India is facing major competition with cashew producing country like Vietnam and Nigeria. These countries are exporting its cashew at cheaper rates than the domestic rates of our country.

In view of the above, it was felt necessary to conduct a survey and analyze the data available through internet to find out the new technology adaptation of cashew industry in south Konkan region. The study was also focused to evaluate and understand several value added products of cashew industries, to understand labor related issues and women empowerment as a result of cashew industries and to understand other subsidiary activities that can be conducted to improve cashew industry.

### Research Methodology

A survey was made with a questionnaire to know the status of the cashew nut processing industries in the South Konkan region. The information was gathered through the interviews with the industry owners and the labors. The data available on internet through the reliable resources was used for the study. Among the four district of Konkan region, the two district of south Konkan viz. Ratnagiri and Sindhudurga were selected for the study. Total 6 processing units and 50 farmers selected randomly. The information from sample grower was collected by survey method through personnel Interview and data pertaining to the agricultural year 2016-17.

The current study tries to elucidate the problems associated with the cashew industry, from production to marketing and the generation of revenues. The current study is shedding light on the current status of cashew industries and recommends improvements to current practices adopted by them. This research is descriptive in nature as it aims to establish detailed understanding of the topic and providing an overview of the cashew industry as a whole. To examine the challenges faced by the industry it is essential to realize the issues faced by the people who are closely and directly linked to the industry. Keeping in mind the overall requirements of the study, it was suggested that a quantitative method of data collection be applied. This study utilized both primary and secondary data for the purpose of data collection for the research. The primary data shall be obtained by means of a questionnaire that was designed keeping in mind all the variables that were to be tested. The questionnaire shall be closed ended with two major sections; one to obtain demographic information and the next containing questions related to the problems faced by the industry. The primary data shall be collected from traders from within the cashew processing industry who have inside knowledge of the workings of the industry. The survey aimed to the traders who belong either a processing or a producing industry in the state of Maharashtra in Sindhudurg district.

### Results and Discussion

The observations recorded through the survey, interview and the internet data reached to the following conclusions.

Estimated tentative export and import of cashew for December 2017 showed that India is having a good quantum of export compared to the import. This in turn adds to the income to the farmers and in all to the country too. In 2016, the export and import both were more compared to estimated in 2017. This might be because of the production, cost of the produce and the demand by the consumers. It is observed from the table below that the cost of the imported cashew kernels is remarkably less than the export value. This indicates that even importing and then the cashew kernels can be a good business.

**Table 3 Estimated tentative Export /Import details of cashew kernels for December 2017(Source-CEPCI, Cochin 2018).**

Export/Import	Quantity	Value	Value	Unit Value
	(M T)	(Rs. Crs)	(US \$ Mins)	(Rs. Per Kg.)
<b>EXPORT</b>				
<b>Dec-17</b>	8031	528.44	82.26	658
<b>Dec-16</b>	8476	581.57	85.65	686.14

April 2017- December2017	67653	4715.21	731.15	696.97
April 2016- December2016	61369	3739.32	557.36	609.32
<b>IMPORT</b>				
Dec-17	40	1	N.A	336.14
Dec-16	493	26.22	3.86	531.85
April 2017- December2017	2651	161.46	25.04	609.07
April 2016- December2016	2964	146.56	21.85	494.47

### Cashew grower' condition

Cashew growers, especially the small cashew growers are least bothered about the market rate of the raw cashew nuts. To curtail the efforts to go up to the industry, they use to sell their produce to the mediator. Mediator purchase the raw nut at comparatively low rates. It was also observed that there many middle persons who are earning on the basis of purchasing from the farmers and making stocks and selling it to the industries at higher rates. It is even observed that the scrap dealers (kabadi or bhargarwalas) are also involved in this business just as middle person. This is because they are having good investing capacity. During the season, they work more on cashew nut dealing than the scrap. The growers due to their negligence, laziness and more over periodic harvesting of the cashew nuts, avoids to make the stock locally and selling it to the industries. Non availability of the cashew processing industries also compels them to do so. The transportation of the raw nut in small quantity up to the industry adds to the expenditure and reduces their benefit. Hence, they prefer to sell it to the local middle man only. The middle man gets the benefit that all the nearby cashew nut growers contribute raw cashew nut to him that helps to transport a lump sum quantum of cashew nut to the processing industries. It reduces the transportation cost and adds to his benefit just for making stock.

### Status of cashew processing industries

The fuel and the labor requirement of the cashew nut processing industry is very high. This is due to the fact that most of the industries are working on the old technologies. The industries are set up according to the land availability and no importance is paid to the proper lay out of the industry. The old industries are set years back and are expanded as per the space available. Due to the improper layout of the industry, the time and motion required for the processing is much more than the properly set and layout newly established industries. The small and medium processing industries are still stuck up to the traditional practices even though new technologies are available. The lack of technology transfer, insufficient capital investments, shortage of resources and mere negligence may be the cause behind it. The minimum concern have been paid to the safety and ergonomic standards in the industry. In some industries it was observed that even availability sufficient light is lacking. The workers are least bothered about their health. Deogirakar et al. (2016) observed that the layout of the industry affect the processing cost. They found in their study of two different industries that the properly lay out industry has the processing charge as Rs 553 per kg compared to Rs 597 per kg in the gradually expanded and improperly layout industry. More processing cost reduces the profit to the owner.

### Cashew nut shelling machines in industries

Many of the cashew processing industries in Sindhudurg are using the manually operated cashew nut shelling machines. The reason behind it the low investment capacity of the industry owner, gradual expansion of the industry, he feels it is less risky to have more number of small units than a costly bigger unit. The owners believe that the quality obtained by shelling the cashew nut with the manual machines are far better than the automatic machines considering the oil deposition over the cashew kernels. Owners are used to manually operated units as female labors are available for doing the shelling operation. Their per day shelling capacity is also good (about 25 kg kernels per day). During interview with the owners, it came to know that

automatic machines are avoided because the servicing and repairing facilities are not available nearby. The technician has to come from Kolhapur for the minor technical faults too that held up the job.

#### Unit operations on cashew nut processing and the energy utilization

It was observed that the equipments adopted by the industries are not the standard and hence the energy consumption is supposed to be much more than the actual needed. There is a scope for an overall energy savings of up to 30–48 % and utilization of renewable energy sources such as solar energy and biomass gasification in this sector (Mohod et al., 2010). As the unit operations are scattered in the industry, there is wastage of human energy due to more movement in the premises during the processing.

#### Challenges associated with Cashew Industry in Ratnagiri and Sindhudurga.

**Table : Constraints faced by cashew processors**

Sr.No	Problems
1	Non-availability of adequate working capital finance & high rate of interest
2	Non -availability of quality raw material and their prices were high
3	Govt. rules and regulations
4	Problem of raw cashew nut storage
5	Problem in marketing of cashew kernels
6	Non -availability of labour in time and adequately

#### The major challenges associated with processing and marketing of cashew nut are found to be

1. High wage rate of labors
2. Non-availability of sufficient skilled labour,
3. Non-availability of graded and good quality of raw material
4. High commission rates of the agents
5. Improper layout of industry
6. Location of the processing industry with respect to transportation facility
7. Distance of processing industry from the main market i.e. Sindhudurg to Mumbai and Goa is about 500 km and 580 km respectively.

KOCHI: The Indian cashew industry is facing the double whammy of plunging exports and weak local prices that have hit profitability of the processing units in the country. Exports fell to a two-decade low in 2018-19, down 20 per cent year-on-year to 66,693 tonnes and, in terms of value, down 24 per cent year-on-year to 4,434 crore, according to the data of the Cashew Export Promotion Council of India (CEPCI).

From over 1,00,000 tonnes, the export quantity has fallen steadily in the past few years as Vietnam and other countries held a price advantage over India through lower processing cost.

#### Conclusion

Cashew is the major source of foreign exchange earnings, jobs and income in rural areas. A major portion of produce is brought by village traders and agents who visit the growers as well as open the shops in weekly market for collection of raw Cashewnut.

Cashew grower's preference for different channels was assessed and five Cashewnut marketing channels were observed in the study area. They were

- 1) Channel I : Grower- Village merchant- Wholesaler- Processor.
- 2) Channel II: Grower- Itinerant merchant/ village merchant- Processor
- 3) Channel III: Grower- Village merchant- Factory agent- Processor
- 4) Channel IV: Grower- Wholesaler- Processor
- 5) Channel V; Grower- Processor

The channel I was most popular in the study area as 45 and 40 per cent cashew grower in Ratnagiri and Sindhudurg districts respectively sold their produces through this channel. Among the different marketing cost, transport cost was a major item of cost. When marketing efficiency is more than that marketing channel said to be more efficient. In study area channel V is the most efficient having 1:76.56 and 1:67.06 marketing

efficiency in Ratnagiri and Sindhudurg districts respectively. So the producer should be encourage to sell their produce directly to the processor to get highest price.

Cashew is the perennial plantation crop having gestation period of four years. During this period of establishment a cashew grower has to incur initial investment. The establishment amount per hectare required for HYVs cashew orchard was Rs 77519.97 and for local variety cashew orchard was Rs. 27253.29. Out of total establishment cost maximum expenditure was incurred on labour wages ie 37.21 per cent in HYVs and 33.05 per cent in local variety of cashew.

The benefit cost ratio was higher in HYVs cashew orchard( 1.95) than local variety cashew orchard(1.71)

The major marketing constraints expressed by the cashew growers were problem of distant location of processing units( 80%) followed by high price fluctuations( 74.17) and malpractices of village merchant( 65.83%)

### References:

1. Murugamani and Ravi, (2016), "An Assessment on Cashew Nut Production in Cuddlore District, Tamil Nadu", International journal of business and economic research, 1(1), pp. 1-15.
2. Padmbanaban, K. (2010). A Statistical Investigation on Export of Cashew nut from India. College of Agriculture, Dharwad, Department of Agricultural Statistics. Dharwad: University of Agricultural Sciences.
3. Panda P.K., (2017), "Assessment of Cashew Value Chain in Odisha: Key Issues, Challenges and Way Forward", Research magma, 1(4), pp. 1-15.
4. Sajev M.V. and Saroj P.L., (2014), "Technology Utilization and Its Socio-economic Determinants among Cashew Farmers of Karnataka", Indian Res. J. Ext. Edu. 14 (3), pp. 59-65.
5. Senthil A. and Mahesh M.P. (2013), "ANALYSIS OF CASHEW NUT PRODUCTION IN INDIA", Asia Pacific Journal of Marketing & Management Review, 2(3), pp. 106-110.
6. Bhat, M. G., Nagaraja, K. V., & Rupa, T. R. (2016). Cashew research in India. Journal of Horticultural Science, 5(1), 1-16.
7. Krishnakumar P.K. (2017, 28th July), Vietnam eats into India's cashew export plans, Economic Times, <https://economictimes.indiatimes.com/news/economy/foreign-trade/vietnam-eats-into-indias-cashew-export-plans/articleshow/59807531.cms>



## Opportunities & Attrition in Organized Retail Market in Pune

**Jyoti Bhanage,**  
IICMR, Nigadi, Pune

### 1 History & Present status of Organized Retail Market in India:

"The Organized Retail Industry in India has come forth as one of the most dynamic and fast paced industries with several players entering the market. A large young working population with median age of 24 years, nuclear families in urban areas, along with increasing working women population and emerging opportunities in the services sector are going to be the key factors in the growth of the organized retail sector in India".<sup>1</sup>

The above information gives a basic idea as of how the problems in organized retail sector are going to affect on society because this sector is emerging as major sector for employment opportunities for youngsters and working women as referred above.

1.1 **Report from consultancy firm Booz & Company, 2013,** Fast growth in organized retail and opening of new malls and stores have raised attrition levels at the shop floor to alarming levels of eight per cent a month, or 96 per cent a year, say consultants. Just three to four years earlier, attrition was only two to three per cent a month.

The Indian retail sector grew eight per cent annually between 2007 and 2011, with the organized segment growing at more than three times the pace of the unorganized one. The share of organized retail is expected to touch 14 per cent of the total by 2016, says a recent report from consultancy firm *Booz & Company*.

Suresh J, M.D., Arvind Lifestyle Brands says: "When retailers open new stores, they offer Rs. 500 more and get people. For many sales staff, even Rs. 500 hike is big enough to move."

In a recent survey done (from July 2012 to January 2013, with 34 retailers taking part) by Tata Consultancy Services and the Retailers Association of India (RAI), a third of the respondents said they had average attrition rates of more than eight per cent in a month, translating to almost 100 per cent a year.<sup>2</sup>

The above report highlights on certain important and relevant points like 8% growth rate of Organized Retail Sector (ORS), increasing rate of attrition from 3% per month in 2010 to 8% per month in 2013. Expected share of ORS is 14% in the Indian economy. This is an indicator of the need to focus on the issues related to attrition in ORS.

1.2 **Shreya Biswas, 2013,** has written in her article "*Attrition in India to top world charts in 2013*"; in Economic Times that one in four employees in the organized sector in India is set to switch jobs, the highest attrition rate globally, according to a Hay Group study.

This indicates the extreme need of strong and urgent steps to be taken to introduce good retention policy in organized retail malls.<sup>3</sup>

The author has clearly mentioned in the above article that India has the highest attrition rate in ORS against which strong action has to be taken.

1.3 **Govind Shrikhande, 2013,** M.D. of Shoppers Stop, says in his opinion in the article, "HR Challenge" in news paper Business Standard, says that employees are leaving for a combination of reasons. "About 25-30 percent employees leave for higher education, another 30 per cent leave for higher salaries and others for various other reasons."

Shoppers Stop has put career progression modules within the company. Any customer associate who completes 18 months with the company becomes eligible for a 'Baby Kangaroo' program, wherein he will get a mentor and additional responsibilities".<sup>4</sup>

This is really a good example of retention policy implemented by Shoppers Stop which gives the opportunities to rise on the career ladder. The opinion of Mr. Govind Shrikhande describes major two reasons of attrition in ORS viz. 30% for higher education and 30% for higher salary and rest 40% leave jobs for various reasons.

1.4 **Chiranjiv Singh, 2012**, says in his "FDI in Indian Retail Sector – Highlights and Analysis" in CAclub India- An Interactive Platform for Finance Professionals that, like every other economy, the retail sector is also one of the most crucial and extremely potential sectors of the Indian Economy. As of now, the retail sector in India accounts for approximately 33% of the GDP with 46% growth rate in past three years from 2008 to 2011. The Indian retail market is one of the top 5 retail markets in the world and employs 7% of the total Indian work-force.

The retail sector in India is divided into two main heads, viz., organized sector and unorganized sector. Organized Sector Retailers means to include the licensed retailers i.e. those, who have registered themselves for sales tax/VAT, income tax, etc. If we talk about the statistics, the market share of unorganized retail sector is 97% of the total retail sector, as compared to organized retail sector, which accounts for only 2-3%. Significantly retail industry contributes about 10% to the GDP of India, and it is the largest source of employment after agriculture in the country.<sup>5</sup>

In this article it is mentioned that India has found its place in the world's retail market. It also mentions that the growth of organized retail is less but it is increasing and generating good scope for employment.

1.5 **Gouri Agtey Athale, 2006**, mentioned in her article in *Economic Times* dated Aug 15, 2006, PUNE: The retail sector rolls on, especially in Pune where studies indicate that organized retail attracts a higher spend than the national average. Estimates indicate that Pune has 8-12 lakh sq ft in organized retail space already built up, with another 30 lakh sq ft space to be added over the next two years. Most of this development is being done by local developers although their tenants will be global or Indian brands. Retail real estate begins to look up in Pune.<sup>6</sup>

The author in this article highlights the point that huge investments are made by organized retail malls in Pune and therefore there is a lot of scope for employment in organized retail sector.

Some statistical information is given below in the graph to know the growth of the Organized Retail Industry in India in comparison with the total retail in the country. It shows that the contribution of organized retail is increased from approximately Rs.5000 crores to Rs.70000 crores from the year 1999 to 2010. In comparison with that the total retail was Rs. 750000 crores in 1999 and Rs. 2200000 crores in 2010. In conclusion, the percentage in the contribution of organized retail over total retail in the country is increased from 0.6 % in 1999 to 3.2 % in 2010.<sup>7</sup>



Source: Saxena Ranjan, Marketing Management, Tata McGraw Hill Education Private Limited, New Delhi, 2009, p 476

1.6 **Scope for employment opportunities:**

With reference to one article in newspaper Times of India, 2012, it is a small wonder that retail sector has opened the floodgates of employment opportunities to the Indian youth. Statistics reveal that the organized retail sector has increasing employee base burgeoning from 5.4 lakh to an awesome 16 lakh over the last couple of years. About 2 millions jobs were thrown open in the organized retail sector by 2010 with all key players including Pantaloon India, RPG Retail, Lifestyle, Wills lifestyle, Shoppers shop, Trent Ltd, Crosswords Bookstores Ltd., Ebony Retail Ltd. and Reliance Retail Ltd. The retail sector has abundant opportunities for part time positions as well due to the long working hours.<sup>8</sup>

According to this newspaper article it is sure that tremendous job openings are going to throw open in organized retail sector.

Until 2011, Indian central government denied foreign direct investment (FDI) in multi-brand Indian retail, forbidding foreign groups from any ownership in supermarkets, convenience stores or any retail outlets, to sell multiple products from different brands directly to Indian consumers..

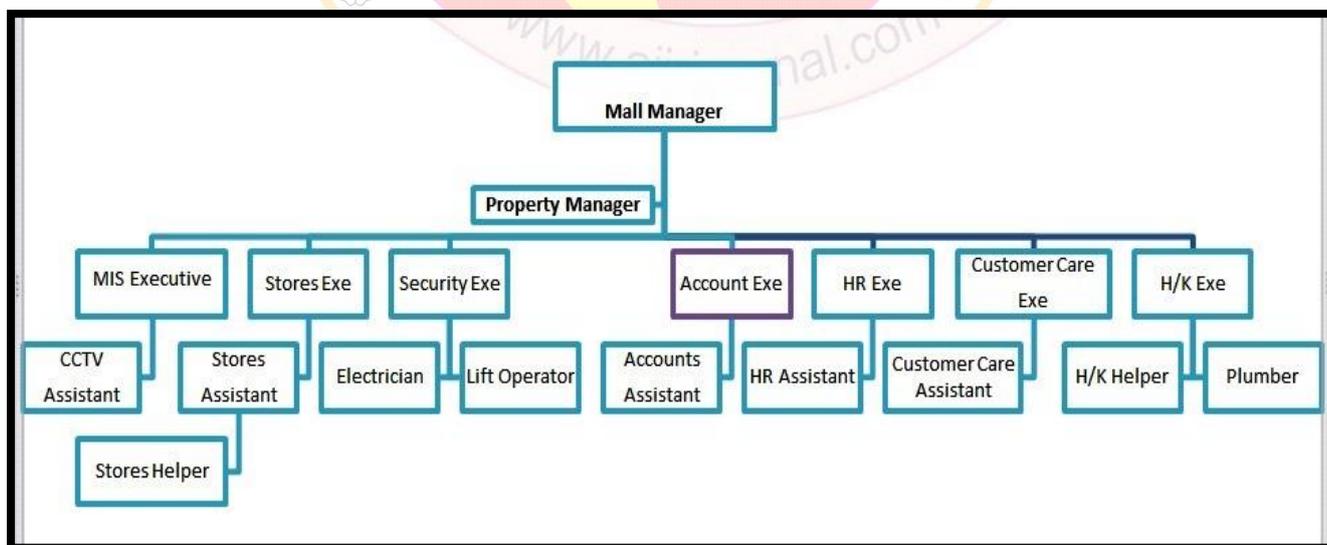
The government of Man Mohan Singh, Prime Minister, announced on 24<sup>th</sup> November 2011 the following:

- India will allow foreign groups to own up to 51 per cent in "multi-brand retailers", as supermarkets are known in India, in the most radical pro-liberalization reform passed by an Indian cabinet in years;
- Single brand retailers, such as Apple and Ikea, can own 100 percent of their Indian stores, up from the previous cap of 51 percent;
- Both multi-brand and single brand stores in India will have to source nearly a third of their goods from small and medium-sized Indian suppliers;
- All multi-brand and single brand stores in India must confine their operations to 53-odd cities with a population over one million, out of some 7935 towns and cities in India. It is expected that these stores will now have full access to over 200 million urban consumers in India;
- Multi-brand retailers must have a minimum investment of US\$100 million with at least half of the amount invested in back end infrastructure, including cold chains, refrigeration, transportation, packing, sorting and processing to considerably reduce the post harvest losses and bring remunerative prices to farmers;
- The opening of retail competition will be within India's federal structure of government. In other words, the policy is an enabling legal framework for India. The states of India have the prerogative to accept it and implement it, or they can decide not to implement it if they so choose. Actual implementation of policy will be within the parameters of state laws and regulations.

The opening of retail industry to global competition is expected to spur a retail rush to India. It has the potential to transform not only the retailing landscape but also the nation's ailing infrastructure.

A Wall Street Journal article claims that fresh investments in Indian organized retail will generate 10 million new jobs between 2012–2014, and about five to six million of them in logistics alone; even though the retail market is being opened to just 53 cities out of about 8000 towns and cities in India.<sup>10</sup>

**Diagram No. 1: (Organization Structure of ORMs)<sup>11</sup>**



## 2. Review of Literature:

- 2.1.1 **Deloitte Touche Tohmatsu India Pvt Ltd, 2013**, in its article “Retail Sector - An HR Point of View”, Human Capital Advisory Services, February 2013, has commented as under: In order to address on-going challenges of retention, HR needs to continue to deploy effective on boarding programs, engagement initiatives. The Report also gives the information about past, present and future of organized retail market.<sup>12</sup>

**Past:** As mentioned above, past focus has been mostly on hiring since attrition is very high in this sector. As retail is one of the fast growing sectors in India, the key business motive was also on expansion, thus, having HR majorly focus on recruiting and getting people on floor on time.<sup>12</sup>

**Present:** Due to the boom in the retail sector there are lots of attractive job opportunities in the market, especially for front line sales. The current focus has shifted to control attrition, increase productivity, reduce cost, and minimize hiring. This is done so that profitability can be matched by the initiatives taken. Some companies are making huge investments in their people by introducing, Individual Development plans, and professional grooming courses to match with international standards and building the culture and organizational capability. This would help HR move up the value chain.<sup>12</sup>

### 2.1.2 Defining Attrition:

**Oxford Dictionary, 2013** defines the word attrition as under:

"The process of reducing something's strength or effectiveness through sustained attack or pressure."<sup>13</sup>

"The gradual reduction of a workforce by employees leaving and not being replaced rather than by redundancy". For example, The Company said that it will reduce its worldwide employment by about 10% through attrition.<sup>13</sup>

As per **CiteHr, 2013**, Attrition means "The unpredictable and uncontrollable, but normal, reduction of work force due to resignations, retirement, sickness, or death."<sup>14</sup>

As mentioned in the encyclopedia- **Wikipedia, 2013**, "Attrition may refer to the gradual reduction of the size of a workforce by not replacing personnel lost through retirement or resignation."<sup>15</sup>

### 2.1.3 Reasons for attrition:

2.1.3.1 **Geraldine Garner, 2008**, has written in the article "*Five Attrition Factors and What You Can Do about Them*" in the magazine for professional engineers that following are the reasons of employee attrition:

- a. People and Communication
- b. Work Assignments
- c. Lack of Career Opportunities
- d. Infrastructure
- e. The Company<sup>16</sup>

2.1.3.2 **Citeman, 2012**, It is not easy to find out as to who contributes and who has the control on the attrition of employees. Various studies/surveys conducted indicate that everyone is contributing to the prevailing attrition. Attrition does not happen for one or two reasons. The way the industry is projected and speed at which the companies are expanding has a major part in attrition. The specific reasons for attrition are varied in nature and it is interesting to know why the people change jobs so quickly. Even today, the main reason for changing jobs is for higher salary and better benefits. While attrition cannot be attributed to employees alone, let us look at some of the possible reasons:

1. Organizational matters: The employees always assess the management values, work culture, work practices and credibility of the organization.
- 2 Working environment
- 3 Job pressure and stress
- 4 Monotony
- 5 Salary and other benefits
- 6 Personal reasons:

The personal reasons are many and only few are visible to us. They vary widely from getting married to relocating for health/family reasons. The next important personal reason is going for higher education.<sup>18</sup>

2.1.3.3 **As per Indian Retail Industry website, 2012**, following are the Challenges with respect to human resources: The Indian organized retail players shell out more than 7% of sales towards personnel costs. The high HR costs are essentially the costs incurred on training employees as there is a severe scarcity for skilled labor in India. The retail industry faces attrition rates as high as 50%, which is high when

compared to other sectors also. Changes in career path, employee benefits offered by competitors of similar industries, flexible and better working hours and conditions contribute to the high attrition.<sup>19</sup>

**Diagram No. 2: Parameters of Attrition for the purpose of this study.**



### 3 Conclusion:

Under the present circumstances, retention and motivation of personnel on ORM has become the major concern of HR. Looking at the current scenario, it could be said that there is an acute shortage of middle level management professionals in the Indian Retail Industry. The current trend is to hire from a smaller organization tempting the incumbent with a better pay package. It is imperative that suitable talent be hired in various areas such as technology, supply chain, logistics, product development and marketing in order to stay side by side of the hectic race for success among MNCs. The call is for HR practitioners to play a more proactive and prominent role in order to retain the high tech skilled employees who are constantly looking for greater gains and prospects in their work. This is the real HR challenge to retain the "workers" by introducing new processes and procedures and still ride high in implementing organizational effectiveness.

The study of attrition will certainly enable to find out the ways to ensure longer sustainability of the organized retail malls.

Good HR practices can build better relationship with customers. Traditional shop keepers have been successful to create and maintain good customer relations. In organized markets it is necessary to inculcate better values in the initial stages of the development to establish high quality HR practices and organizational culture. This will create a strong bonding between employees and customers for longer period.

Without the help of well trained, loyal and committed human resource, organized retail malls cannot achieve strong position in the retail sector. The reason is a very strong and wide spread network of traditional market has notable personal touch with the customers and even their family members. This results in the lifelong business with customers for generations.

### References:

1. <http://www.indianmirror.com/indian-industries/retail.html> (accessed on 15th November, 2012)
2. Report from consultancy firm Booz & Company, 2013, Newspaper Business Standard dated Thursday, July 18, 2013.
3. Shreya Biswas, 2013, "Attrition in India to top world charts in 2013" Article in Economic Times ET Bureau June 7, 2013.
4. Govind Shrikhande 2013, News paper Business Standard, dated Thursday, July 18, 2013
5. Chiranjiv Singh, 2012, "FDI in Indian Retail Sector – Highlights and Analysis" an article in CAclub India-An Interactive Platform for Finance Professionals, (<http://www.caclubindia.com/articles/fdi-in-indian-retail-sector-highlights-analysis-12546.asp#.T9SdvIGHOuN>)
6. Gouri Agtey Athale, 2006, Economic Times dated Aug 15, 2006, ([http://articles.economicstimes.indiatimes.com/2006-08-15/news/27456123\\_1\\_ft-of-retail-space-sq-ft-retail-juggernaut-rolls](http://articles.economicstimes.indiatimes.com/2006-08-15/news/27456123_1_ft-of-retail-space-sq-ft-retail-juggernaut-rolls))

7. Saxena Ranjan, 2009, "Marketing Management", Tata McGraw Hill Education Private Limited, New Delhi, p 476.
8. [http://articles.timesofindia.indiatimes.com/2012-02-07/pune/31033203\\_1\\_retail-space-retail-real-estate-retail-mall](http://articles.timesofindia.indiatimes.com/2012-02-07/pune/31033203_1_retail-space-retail-real-estate-retail-mall)
9. Dileep Athavale, 2012, A Report in Times News Network, Feb 7, 2012, 02.47A.M. IST
10. [http://en.wikipedia.org/wiki/Retailing\\_in\\_India](http://en.wikipedia.org/wiki/Retailing_in_India), Accessed on 28/08/2013
11. [www.managementparadise.com](http://www.managementparadise.com)
12. Deloitte Touche Tohmatsu India Pvt Ltd, 2013, A Report on "Retail Sector - An HR Point of View", Human Capital Advisory Services, [www.deloitte.com/in](http://www.deloitte.com/in), February 2013,
13. Oxford Dictionary, 2013 Edition. Published by Oxford University Press, London, U.K.
14. <http://www.citehr.com/182831-attribution-concept-working-conditions.html#ixzz2Zfdae9zN>
15. <http://en.wikipedia.org/wiki/Attrition>
16. Geraldine Garner, 2008, "Five Attrition Factors and What You Can Do about Them" the magazine for professional engineers, © Published by the National Society of Professional Engineers, May 2008, U.S.
17. Jacqui Barrett-Poindexter, on November 09 2012 Posted on Glassdoor Talent Solutions Copyright 2014 - <http://www.glassdoor.com/employers/blog/10-reasons-employees-resign/>
18. <http://www.citehr.com/182831-attribution-concept-working-conditions.html#ixzz2Zfdae9zN>
19. <http://www.dnb.co.in/IndianRetailIndustry/issues.asp>



## Impact of Digital Banking for the Economic Growth in Rural India

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### Introduction

In this era, we can see a very significant level of change in the means of making and receiving payments. Due to constant level of technological infrastructure and policy changes, there has been an increase in the number of modes of payments. Cashless economy is the future of Indian economy where there will be no physical flow of cash. All the payments will be made and received in the virtual world. Cashless economy got popular after demonetization where plastic money was widely used. The study is aimed towards studying the level of awareness among the citizens about cashless economy. The study also helps in determining the factors which influence the people to switch from cash towards cashless payments and what are the benefits people avail by using other means of payments. After the research conducted we can say that the working people, students and business class people use digital payment methods more. There are various factors which influence the people to shift such as offers, cash back etc. There is still a long run for India to be cashless to full extent as the government needs to develop a smooth and secure infrastructure. The prime minister of India, on 8th November, 2016 demonetized the two largest denominations of currency notes of INR 500 and INR 1000, which were ceased with immediate effect with a few exceptions. The entire nation was in a state of shock because such a huge render was declared invalid in just one announcement and it was not the first time the government of India has not taken such a step earlier. Indian government took this step in 1946 and 1978 but in 2016 it faced a lot of criticism as people were left with only INR 100 notes or less denomination to transact with. The main aim of this step was aimed to attack on counterfeit currency, currency used for terrorist financing, black money and corruption. Not only is this the Prime Minister of India also working towards digitization of India (DIGITAL INDIA). Thus, both moves DEMONETISATION and DIGITIZATION if worked upon effectively will help the Indian Economy to become Cashless Economy. Cashless Economy refers to the term where the physical flow of currency notes and coins are replaced with digital flow of money, which includes use of plastic money, digital means and over the net transactions. Such a replacement doesn't mean immediate removal of currency notes but slowly and gradually expelling of paper currency by means of following a proper procedure. Physical money means the paper currency notes and coins issued by the government as legal tender. Plastic money involves the use of plastic cards such as debit cards, credit cards, pre-paid cards, contact less cards etc. Electronic payment modes include all kinds of mobile wallets and payments made done through smart phones, laptops etc.

### Objectives of the Study:-

- To Studying the concept of cashless economy.
- To identify the prospects and challenges of cashless transaction system in rural India.
- To Studying the current position of cashless in rural India.
- To study the opportunities and advantages if India become a cashless
- To bring every Indian in the flow of Digital India.
- To give benefit of government schemes to every citizen of India.
- To encourage and motivate all payers and payees to use a digitally enabled cashless economic system.
- To find out the challenges to establish cashless economy in India.
- To analyze the initiative taken by the government and RBI to discourage the use of cash in India.
- To analyze the future trend of cashless transaction.
- To suggest the future prospects of cashless India.

➤ **Research Methodology:-** The present is mainly based on secondary data which is available in the papers, articles, journals and internet etc.

**A. Research Design:** The research is analytical and descriptive in nature. The researcher for the purpose here had made use of primary data and secondary data. The researcher has made use of questionnaire was used. The data was collected and was analyzed by manually.

Secondary sources were also used with respect to Review of Literature, Journals and articles.

Descriptive Statistics was done by using Mean, Standard Deviation, Frequency and inferential statistics was used

**B. Sources of Data:-**The data required for doing the research has been collected mainly by using primary and secondary sources. The primary sources include the questionnaire. The secondary source includes the various journals, research paper and internet websites.

➤ **Benefits of Cashless Economy:-**

- **Cost of printing physical money or currency notes:-**It is the direct cost and affects the Indian economy. If there is cash system, people will work on cash transaction and government will be bound to produced the new notes. But on adaptation of cashless economy we will be able to save this cost up to a certain level.
- **Reduce the Maintenance Cost:-**Other than printing cost of currency notes such as storage cost of notes, transportation cost of notes, security cost of notes, and device for detection counterfeit notes etc. may be saved. Cashless transaction will also reduce the cost of maintenance of ATM machines.
- **Fast Transactions:-**A queuing at the point of sale terminals and vending machine will be reduced. It means three times more people can be served using a cashless system than could have been if they were paying cash.
- **Save Money and Time:-**Cash less economy will reduce the costs as there is no need to maintain the manual accounting because the banks employees a large no of staff attend and redress the complained.
- **Collection of Higher Revenue:-**It will increase the collection of taxes. This increased collection may be converted into public welfare policy and schemes.
- **Convenience and Lower Risk:-**It is safer of both Bank as well as customers because of having high degree of secrecy and if stolen, may be easily locked credit cards or mobile wallet remotely.
- **Reduction of Income Tax Rate:-**Due to the lesser availability of hard cash in home and banks, it will be very easy to hide and evade the income tax. It will certainly increase not only the no of taxpayer but also the collection of income tax. It will ultimately lead to reduce the income tax rate for the whole country.

➤ **Benefits of digital banking:-**

1. There is no need to keep printed notes for financial transaction.
2. Expenditure on note printing, transport and machinery will be saved.
3. Time and wages charges will be saved.
4. There will be no side effects like theft, note cutting while handling. So, our journey will be safe.

➤ **My Mobile, My Bank, My Pocket...**

If we want rocket, there is a queue. If we want bus/railway tickets, there is a queue. If we go to bank, there is a queue. If we go for admission in school/college, there is a queue. So, government of India has taken a very good step about digital economy. One of the main decision in that is JAM. { J = Jan Dhan, A = Aadhar and M = mobile}. The three primary needs digital payment are bank account, one Aadhar number for smooth functioning of work and mobile number for internet and connectivity. The government is working on this issue from the last two years. The burning example of digital banking is gas subsidy deposited in our bank account. This is possible because we have linked aadhar card number and mobile number to our bank account. The roadmap of cashless Maharashtra is ready. So, Government of Maharashtra will be launching very soon —Maha Wallet mobile app. Now, we are using debit and credit cards, POS machines, UPI, USSD, E – wallet etc. for cashless transaction.

The following table shows the survey of mobile, debit and credit card holders in India.

Sr.No	Media	Number of people use (Cr.)
1	Mobiles	100
2	Smart Phones	30
3	Debit Cards	6.65
4	Credit Cards	2.25
	Online net banking	0.78

- **Motivation to cashless transaction:-**Central Government and Reserve Bank of India have decided to motivate cashless transaction. There is a positive impact to this mission in the last two years. Digital Literacy Abhiyan has implemented in 476 districts in India. Approximately more than 1 crore people and 3.50 lakh shopkeepers have given training of digital payment.

Government of India motivate to all citizen of India to go for digital. There are some facility and prizes declared by government. Digital payment users are getting following facilities.

1. 0.75% concession on petrol on the petrol pump, which is approved by central government
2. Toll discount of 10% on National Highway for RFID cards and ICICI bank presents
3. FAST tag for effortless toll payment in the year 2019-20
4. Free accidental insurance of Rs.10 lakh for online railway ticket booking and 0.5% discount on monthly seasonal tickets from 1 January 2019.
5. No service tax on every cashless transaction of Rs.10,000
6. 4.32 crore Kisan Credit card holders will get Rupay cards from rural regional and government banks.
7. 2 POS devices are installed in 1.25 lakh villages whose population is less than 10,000.
8. Digital payment transaction charge will be given by central government department.

➤ **Challenges in Making India Cashless Economy**

- **Lack of Digital Literacy:-**Since more than 60% population of India does not know how to use the computer and rural Indian does not know about the smart phone. There is need of high speed internet connection but in India, there are various rural and urban area where the access of internet is very difficult. The areas which have internet connection also have problems in continuous connection. The costs of internet facilities are very high in comparison to developed countries.
- **Lack of Infrastructure in India:-**There are various area in the rural where banks is still a distant dream because these area are still having the banks at their door step. There is lack of ATMs in such 46 Emerging Trends and Innovations in Modern Management areas and the areas which have ATMs are not fully backup with the electricity and other IT facilities. So it is necessary to have basic infrastructure for banking services.
- **Lack of Education:-**Person of villages and remote area are neither educated enough nor able to operate the banking facilities effectively. Due to illiteracy, Indian rural and remote area people having the bank accounts feels unable to fill the deposit and withdrawal form of their bank account without the help of other people. It may be the big challenge for Indian government to start a campaign to literate them to discharge their duty by themselves. Due to lack of education they are not aware for the security measures of the PIN no.
- **Financial Inclusion:-**Only 60% of Indian population has bank account in present scenario. It means a large no of Indian people do not have bank accounts. Government has launched a Scheme named Pradhan Mantri Jan Dhan Yojna to open the massive bank accounts for every citizen of India. More than 228 million accounts have been opened under this scheme but mostly accounts were opened with zero balance and now they are dormant in the banks. A lot of Indian does not only know how to operate the account but also inefficient to operate the account due to lack of money, lack of income, lack of information and illiteracy etc.
- **To Cover Large No. of Indian:-** In spite of that a large no of bank accounts was opened by people under PMJDY, around 40% of Indian population does not have any access to bank and banking services. There is need of proper penetration into the market to provide banking service to all Indians. To include a large no of Indian in the main stream of banking services is a major challenge for the Indian government.
- **Unwillingness of Indian to Make Cashless Transactions:-**Mostly Indian does not prefer to deal with cashless transaction because seller does not accept the cards and cheques at the point of sales and they demand for transaction

fees that makes the things costly. This problem may be solved to lower the transaction fees by the banks or service provider if large no of Indian use the debit and credit cards for making the cashless transactions.

- **One English or Barrier of English Language:-** Since India have characteristics of unity in diversity. But English is the basic platform of internet as well as details on plastic cards. Moreover the message of transaction are mobile are also received in English. Therefore, it must be attempted to teach English everyone or we must use multiple language regarding such processes. Impact of Cashless Society for the Economic Growth in India 47
- **Uneven Participants Profile:-** There are not only different priorities in the nationalized and private banks but also they have uneven extent because various cards are issued by the nationalized bank having the different level of motives whenever there is lack of service mission in private banks which makes the affairs costly.
- **Lack of Customer Awareness:-** There is lack of awareness about different aspects of cashless transactions. It is the need of the hour to stress upon the matter relation to the service tax, transaction fees, security of accounts etc to make the consumer aware and effective party of the mission.
- **Costly Swipe Machine:-** Since swipe card machine are not provided at subsidy rate hence it may only be used by the rich shopkeepers because it may not be possible to have swipe machine by auto driver or a normal vendor. Besides it various shopkeepers does not know how to use swipe machines.

➤ **Few of the major finding according to this study are:**

1. There are still a lot of people who do not use any kind of digital payment method.
2. There is a lot of scope in the future for cashless society.
3. People are mostly influenced by convenience and offers provided for switching to cashless modes of payments.
4. There is still a lot to be done to digitalize India.
5. People don't feel safe sharing their financial and personal information over the internet.
6. People face various problems while using digital payment methods.

➤ **Cyber Security in Digital Banking**

We always remember following key points while doing cashless transaction.

1. Do not store any information in mobile regarding bank account.
2. Do not save user name and password in mobile.
3. Do not use public Wi-Fi for banking purposes.
4. Download bank app from official store of the bank.
5. Do not click on unknown link of bank. If bank website link begin with **https**, then it is
6. Original site of bank. If it is only begin with **http**, then such sites are fake.
7. Change your password regularly and it should be difficult.
8. Do not tell our pin to other person.
9. Use only security connection for online transaction.

**Suggestions:-**

- To abolish the government fees on credit card transactions.
- To reduce the interchange fee on card transactions.
- To provide additional tax rebated to consumer use mostly electronic payment.
- To provide the education to the Indian for the suitable and proper use of cards.
- To develop proper infrastructure in the remote area of India to provide the internet and banking facilities in that area.
- To create awareness among buyer and seller about the benefits of cashless transactions.
- To establish a regulatory authority to ensure that policy is being properly enforced.
- Government of India should try to educate people about the benefits of going cashless before taking any crucial steps.
- They should also be able to implement their plans properly and without troubling the public.
- They should also tell about the opportunities which the public will get if they become digital.
- People should try and use any digital payment method at least once.
- Government should develop infrastructure to cope up with any policy change or a plan implementation beforehand.
- People and government should work together to develop infrastructure and technology to digitalize India.

**Conclusion**

India is gradually transitioning from an economy based on cash to cashless economy. Now, there is an immense need for India to move towards a cashless economy to save huge money which is being spent on the

printing and maintenance of currency. It may assist the Indian government not only to achieve the objective of inclusive growth but also to make public utilities more effective. Cashless economy is based on digital transactions which are easily traceable and taxable and does not leave any room for circulation of black money. The cashless transaction system is reaching its growth day by day because it is not only safer than cash transaction but also it is less time consuming and avoid the trouble of carrying and trouble of wear and tear like physical paper notes.

Cashless exchanges or electronic exchanges dependably lead a computerized confirmation gainful for both the citizen (Consumer) and expense gatherer (government). Cashless exchange is a help regarding handling expenses and holding up time. On the off chance that actualized legitimately it will expand the utilization and generation rates in this way enhancing the economy.

Government should take measures to expand liquidity into the framework so individuals confront fewer burdens. Government ought to likewise attempt to enhance general foundation with the goal that an ever increasing number of individuals can come into keeping money net and web.

Society has likewise to have its impact. They need to comprehend the significance of cashless economy and acknowledge measures taken by the legislature.

As a conclusion, one might say that going cashless gives significantly a greater number of advantages than only comfort to individuals, organizations and the administration specifically.

#### Reference:-

1. Mr. Pradeep H. Tawade (2017), Future and scope of cashless economy in India
2. Dhanda and Arora (2017), Genesis of cashless society: A study on growing acceptability towards plastic money
3. Dr. Rashmi Gujrati (2017), India's march towards faceless, paperless, cashless economy
4. Dr. Asha Sharma (2017), Potential for cashless economy in India
5. Dominic, Saranya, and Rajani (2018), A study on transformation in behaviour of individual towards cashless economy
6. [www.google.co.in](http://www.google.co.in)
7. [https://en.wikipedia.org/wiki/Cashless\\_Transaction\\_\(India\)](https://en.wikipedia.org/wiki/Cashless_Transaction_(India))
8. <http://www.livemint.com/Opinion/XGbavEnoeP7dZITeh21MRM/Making-India-a-cashlesseconomy.html>
9. <http://www.thehindubusinessline.com/opinion/editorial/cashless-india-editorial/article9386837.ece>
10. [www.thehindubusinessline.com](http://www.thehindubusinessline.com)
11. [www.indianeconomy.net](http://www.indianeconomy.net)
12. [www.researchgate.net](http://www.researchgate.net)

## An Overview on Concept & Challenges of Green Marketing

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### Introduction

The term Green Marketing came in the late 1980s and early 1990s, began in Europe in the early 1980s when certain products were found to be harmful to the environment and Society as a whole. Consequently new types of products were created, called "Green product" that would cause less damage to the environment.

Polonsky (1994) defines green marketing as .all activities designed to generate and facilitate any exchanges intended to satisfy human needs or wants, such that the satisfaction of these needs and wants occurs, with minimal detrimental impact on the natural environment.

Elkington (1994: 93) defines green consumer as one who avoids products that are likely to endanger the health of the consumer or others; cause significant damage to the environment during manufacture, use or disposal; consume a disproportionate amount of energy; cause unnecessary waste; use materials derived from threatened species or environments; involve unnecessary use of, or cruelty to animals; adversely affect other countries.

Green products are designed to reduce energy consumption, use less natural resources, raise the recycled materials, and reduce or eliminate toxic substances, which are harmful to both the environment and human health. The development of a green product is a process within the internal processes of a company. The development of green marketing has opened the door of opportunity for companies to co-brand their products into separate line, lauding the green-friendliness of some while ignoring that of others.

Green marketing involves developing and promoting products and services that satisfy customers want and need for Quality, Performance, Affordable Pricing and Convenience without having a detrimental input on the environment. As a result of this, green marketing has emerged which speaks for growing market for sustainable and socially responsible products and service.

### Objective Of Study

- 1) To know the concept of Green Products
- 2) To study the basic concepts and ideas behind green marketing.
- 3) To study the importance of green marketing.
- 4) To identify the challenges associated with different aspects of green marketing in the present scenario.

### Concept Elaboration

#### Green Products

A green product is a sustainable product designed to minimize its environmental impacts during its whole life-cycle and even after it's of no use. Green products are usually identified by having two basic goals – reducing waste and maximizing resource efficiency. They are manufactured using toxic-free ingredients and environmentally-friendly procedures and are certified by recognized organizations like Energy star, Forest Stewardship Council, etc. The terms "green" or "sustainable" often refer to products, services or practices that allow for economic development while conserving for future generations. We prefer to describe a green product as one that has less of an environmental impact or is less detrimental to human health than the traditional product equivalent. While on the topic of defining a green product, you must realize that almost no product will ever be 100% "green," since all product development will have some impact on the surrounding environment. It all comes down to degrees of impact and as we discussed above, trading off between impacts. To understand the trade-offs you should realize that there are select attributes that describe green products and services; we list them below to help you further understand what a green product truly is. Green products are...

- Energy efficient, durable and often have low maintenance requirements.
- Free of Ozone depleting chemicals, toxic compounds and don't produce toxic by-products.
- Often made of recycled materials or content or from renewable and sustainable sources.
- Obtained from local manufacturers or resources.
- Biodegradable or easily reused either in part or as a whole.

#### Some of the characteristics of green products

- Grown without the use of toxic chemicals and within hygienic conditions
- Can be recycled, reused and is biodegradable in nature
- Comes with eco-friendly packing
- Uses the least resources
- Is eco-efficient
- Has reduced or zero plastic footprint

#### Green Marketing

Green marketing is known as sustain-able marketing, environmental marketing, green advertising, co marketing, organic marketing, all of which point to similar concepts though perhaps in a more specific fashion, green marketing is essentially a way to brand your marketing message in order to capture more of the market by appealing to people's desire to choose products and services that are better for the environment.

According to the American Marketing Association, green marketing is the marketing of products that are presumed to be environmentally safe. Thus green marketing incorporates a broad range of activities, including product modification, changes to the production process, packaging changes, as well as modifying advertising. Yet defining green marketing is not a simple task where several meanings intersect and contradict each other; an example of this will be the existence of varying social, environmental and retail definitions attached to this term. According to Pride and Ferrel (1993), green marketing refers to the organization's efforts at designing, promoting, pricing and distributing products that will not harm the environment.

#### Importance of Green Marketing

Possible Reasons for firms increased use of Green Marketing are:

1. Organizations perceive environmental marketing to be an opportunity that can be used to achieve its objectives
2. Organizations believe they have a moral obligation to be more socially responsible
3. Governmental bodies are forcing firms to become more responsible
4. Competitors' environmental activities pressure firms to change their environmental marketing activities.
5. Cost factors associated with waste disposal, or reductions in material usage forces firms to modify their behavior.

#### Reasons for Companies going Green

**1. Opportunities** -As demand changes, many firms see these changes as an opportunity to exploit and have a competitive advantage over firms marketing non- environmentally responsible alternatives.

**2. Government Pressure** - As with all marketing related activities, governments want to "protect" consumers and society; this protection has significant green marketing implications. Governmental regulations relating to environmental marketing are designed to protect consumers in several ways,

- 1) Reduce production of harmful goods or by- products;
- 2) Modify consumer and industry's use and/or consumption of harmful goods; or
- 3) Ensure that all types of consumers have the ability to evaluate the environmental composition of goods.

Governments establish regulations designed to control the amount of hazardous wastes produced by firms. Many by-products of production are controlled through the issuing of various environmental licenses, thus modifying organizational behaviour. In some cases governments try to "induce" final consumers to become more responsible. For example, some governments have introduced voluntary curb-side recycling programs, making it easier for consumers to act responsibly.

**3. Competitive Pressure** - Another major force in the environmental marketing area has been firms' desire to maintain their competitive position. In many cases firms observe competitors promoting their environmental behaviors and attempt to emulate this behavior. In some instances this competitive pressure has caused an entire industry to modify and thus reduce its detrimental environmental behavior.

**4. Social Responsibility**-Many firms are beginning to realize that they are members of the wider community and therefore must behave in an environmentally responsible fashion. This translates into firms that believe they must achieve environmental objectives as well as profit related objectives. This results in environmental issues being integrated into the firm's corporate culture. Firms in this situation can take two perspectives;

1) They can use the fact that they are environmentally responsible as a marketing tool; 2) They can become responsible without promoting this fact.

**5. Cost of Profit Issues** –Firms may also use green marketing in an attempt to address cost or profit related issues. Disposing of environmentally harmful by-products, such as polychlorinated biphenyl (PCB) contaminated oil are becoming increasingly costly and in some cases difficult. Therefore firms that can reduce harmful wastes may incur substantial cost savings. When attempting to minimize waste, firms are often forced to reexamine their production processes. In these cases they often develop more effective production processes that not only reduce waste, but reduce the need for some raw materials. This serves as a double cost savings, since both waste and raw material are reduced. In other cases firms attempt to find end-of-pipe solutions, instead of minimizing waste. In these situations firms try to find markets or uses for their waste materials, whereon firm's waste becomes another firm's input of production. One Australian example of this is a firm who produces acidic waste water as a by-product of production and sells it to a firm involved in neutralizing base materials, increasing calibration of consumer knowledge, and credibility of product claims.

#### **Examples of / green products/ Green Projects/ Companies adopted green marketing**

- **Best Green IT Project: State Bank of India: Green IT@SBI**

By using eco and power friendly equipment in its 10,000 new ATMs, the banking giant has not only saved power costs and earned carbon credits, but also set the right example for others to follow.

SBI is also entered into green service known as "Green Channel Counter". SBI is providing many services like; paper less banking, no deposit slip, no withdrawal form, no checks, no money transactions form all these transaction are done through SBI shopping & ATM cards. State Bank of India turns to wind energy to reduce emissions: The State Bank of India became the first Indian bank to harness wind energy through a 15-megawatt wind farm developed by Suzlon Energy. The wind farm located in Coimbatore uses 10 Suzlon wind turbines, each with a capacity of 1.5 MW. The wind farm is spread across three states – Tamil Nadu, with 4.5 MW of wind capacity; Maharashtra, with 9 MW; and Gujarat, with 1.5 MW. The wind project is the first step in the State Bank of India's green banking program dedicated to the reduction of its carbon footprint and promotion of energy efficient processes, especially among the bank's clients.

- **Lead Free Paints from Kansai Nerolac**

Kansai Nerolac Paints Ltd. has always been committed to the welfare of society and environment and as a responsible corporate has always taken initiatives in the areas of health, education, community development and environment preservation.

Kansai Nerolac has worked on removing hazardous heavy metals from their paints. The hazardous heavy metals like lead, mercury, chromium, arsenic and antimony can have adverse effects on humans. Lead in paints especially poses danger to human health where it can cause damage to Central Nervous System, kidney and reproductive system. Children are more prone to lead poisoning leading to lower intelligence levels and memory loss.

- **India's 1st Green Stadium**

The Thyagaraja Stadium stands tall in the quiet residential colony behind the Capital's famous INA Market. It was jointly dedicated by Union Sports Minister MS Gill and Chief Minister Sheila Dikshit on Friday.

Dikshit said that the stadium is going to be the first green stadium in India, which has taken a series of steps to ensure energy conservation and this stadium has been constructed as per the green building concept with eco-friendly materials.

- **Eco-friendly Rickshaws before CWG**

Chief minister Sheila Dikshit launched on Tuesday a battery operated rickshaw, "E-rick", sponsored by a cellular services provider, to promote eco-friendly transportation in the city ahead of the Commonwealth Games.

- **Wipro Green It.**

Wipro can do for you in your quest for a sustainable tomorrow - reduce costs, reduce your carbon footprints and become more efficient - all while saving the environment.

**Wipro's Green Machines (In India Only)**

Wipro InfoTech was India's first company to launch environment friendly computer peripherals. For the Indian market, Wipro has launched a new range of desktops and laptops called Wipro Green ware. These products are RoHS (Restriction of Hazardous Substances) compliant thus reducing e-waste in the environment.

- **Going Green: Tata's new mantra**

The ideal global benchmark though is 1.5. Tata Motors is setting up an eco-friendly showroom using natural building material for its flooring and energy efficient lights. Tata Motors said the project is at a preliminary stage.

The Indian Hotels Company, which runs the Taj chain, is in the process of creating eco rooms which will have energy efficient mini bars, organic bed linen and napkins made from recycled paper. But there won't be any carpets since chemicals are used to clean those. And when it comes to illumination, the rooms will have CFLs or LEDs. About 5% of the total rooms at a Taj hotel would sport a chic eco-room design. One of the most interesting innovations has come in the form of a biogas-based power plant at Taj Green Cove in Kovalam, which uses the waste generated at the hotel to meet its cooking requirements. Another eco-friendly consumer product that is in the works is Indica EV, an electric car that will run on polymer lithium ion batteries. Tata Motors plans to introduce the Indica EV in select European markets this year.

**Challenges of Green Marketing**

- **Need for standardization of the products:** There is no 'yard stick' currently, from where we could certify that the product as organic. Until or unless some of regulatory bodies are involved in providing the certifications, which can be proved helpful to verify the authenticity of the product's characteristics. A standard quality control board needs to be in place for such labelling and licensing.
- **New concept :** The new green movements and advocacy programs need to reach the masses and that will be a time consuming process. Indian Ayurveda heritage can help to boost up the green marketing for beauty products. Indian consumers have an extensive exposure to healthy living life style such as yoga and natural food taking habits; can be helpful to make out the concept of green marketing thoroughly.
- **Need to be Patient:** It has been observed that the investors and corporate need to view the environment as a long-term investment opportunity. It is because of the projects related to 'Green marketing' have long-gestation period. It requires a lot of patience to get the desired results.
- **Avoiding Green Myopia:** The first principle of green marketing is focusing the customer benefits. I.e. that is why consumers buy particular goods and services in their first priority. Is it a right approach and motivate the customers to buy particular brands or even pay premium for a 'greener' surrogated products. If green product not economical viable, as a result, it will reduce the market acceptability. Other challenges, associated with 'Green Marketing' are green products which require renewable and recyclable material at the cost effective. It require a modern technology which again huge cost in Research and Development.
- Green products require renewable and recyclable material which is **costly**.
- Requires a **technology**, which requires **huge investment** in R and D.
- **Water treatment technology is too costly.**
- Majority of the people are **not** aware of green products and their uses.
- Majority of the people are **not willing to pay a premium** for green products.

**Challenges in Green Marketing Mix**

Every company has its own favorite marketing mix. Some have 4 P's and some have 7 P's of marketing mix. The 4 P's of green marketing are that of a conventional marketing but the Challenge before marketers is to use 4 P's in an innovative manner.

**Product :** The ecological objectives in planning products are to reduce re-source consumption and pollution and to increase conservation of scarce resources

**Price:** Price is a critical and important factor of green marketing mix. Most consumers will only be prepared to pay additional value if there is a perception of extra product value. This value maybe improved performance,

function, design, visual appeal, or taste. Green marketing should take all these facts into consideration while charging a premium price

**Promotion :** There are three types of green advertising: -

- Ads that address a relationship between a product/service and the biophysical environment
- Those that promote a green lifestyle by highlighting a product or service
- Ads that present a corporate image of environmental responsibility

**Place :** The choice of where and when to make a product available will have significant impact on the customers. Very few customers will go out of their way to buy green products

### **Conclusion:**

Now this is the right time to select "Green Marketing" globally. It will come with drastic change in the world of business if all nations will make strict roles because green marketing is essential to save world from pollution

Green marketing has to evolve since it is still at its infancy stage. Adoption of Green marketing may not be easy in the short run, but in the long run it will definitely have a positive impact on the firm. For green marketing to be effective, a company has to do three things; be genuine, educate your customers, and give them the opportunity to participate.

Women are likely to be more sensitive than men companies may try targeting products towards women "Green" products should be as effective as "on-green". Communicate quality, performance in addition to sustainable aspects Emphasize the personal benefits. Use terms like "safe", "energy efficient" instead of pure "green" terms Well educated audiences are more analytical and have more questioning mindsets, Use labels in compliance, Provide credible endorsements, facts. Green marketing should not be considered as just one more approach to marketing, instead should be pursued with greater vigor as it has societal and environmental dimensions.

Marketers also have the responsibility to make the consumers understand the need for and benefits of green products as compared to non-green ones. In green marketing, consumers are willing to pay more to maintain a cleaner and greener environment. Finally, consumers, industrial buyers and suppliers need to pressurize effects on minimize the negative effects on the environment-friendly. Green marketing assumes even more importance and relevance in developing countries like India.

### **References:**

1. J. Bharanitharan, "green marketing in India: emerging opportunities and challenges"
2. Preethi. S, Mr. Mahesh kumar\* M.Phil. Scholar, sngc, Coimbatore, India "Challenges in green marketing"
3. [www.greenpeace.org/international](http://www.greenpeace.org/international)
4. [www.wikipedia.com](http://www.wikipedia.com)

## Tourism – An Instrument of Economic Development in Guhagar Tehsil

Dr. Khot Subhash Shamrao

### Abstract-

Tourism has become a national and international phenomenon in the past 25 years. Nowadays it is sunshine sector of all the country. Tourism has become fastest growing service industry in the Maharashtra, India and universe. It is a development engine of economic growth, foreign exchange and employment opportunity without pollution for the people. More than 60 employment opportunity created for every 10 lakh of investment in tourism sector. In 2018 India's share in the international tourist's arrivals was hardly 1.24 % of world's total tourism traffic and share in international receipt was 1.97, in spite of the country possessing most favourable tourism resources. India is fastest emerging tourist sector in the world. Potentials of tourism in India are very huge. In India 42.673 million jobs, 8.1% of its total employment created by tourism.

Maharashtra is one of the attractive tourist destinations in India. More than five Million foreign tourists visit to Maharashtra. In Maharashtra Konkan belt (Palghar to Sindhudurg) is highly natural beauty, enhancing coastline, dotted silvery beaches, a rich cultural heritage and hospitable people and various religious centers. All Konkan districts are located in the southwestern part of Maharashtra state on the Arabian Sea coast. Guhagar taluka is blessed with hills, sea shores, creeks, forests, food, culture, and historical temples among many others. However, Guhagar is still unable to utilize to its tourism potential and needs to put more rigorous efforts for tourism development. Guhagar taluka offers a totally distinct tourism experience with its diverse geography and cultures. Economy of Guhagar taluka will totally change with the help of tourism. In this taluka except a one company not an industry developed. So, tourism can become an instrument of economic development of Guhagar region.

**Key word-** Tourism, destination, potential, tradition, marketing, Konkan, Guhagar

### Introduction-

Maharashtra is one of the favorable tourist destinations in India for national and international tourists. Konkan belt is highly natural beauty, enhancing coastline, dotted silvery beaches, historical forts, a rich cultural heritage and hospitable, religious people and various Religious centers. The rising hills of Sahyadri on east and the depths of Arabian Sea on the west contribute to the unparallel beauty of Konkan. All the area of Konkan is blessed with hills, sea shores, creeks, beautiful rivers, hot water springs, historical forts, forests and waterfalls among many others. As compare to other state like Goa, Kerala, and Andhra Pradesh Maharashtra less developed and less marketing of tourism so in spite of potential of tourism tourist are prefer other state. In Ratnagiri district Guhagar taluka are historical and different beautiful destinations. More than 17 important destinations are located but not properly developed. Guhagar taluka offer the most diverse attractions for the tourists. This region is endowed with many tourist assets.

### Objectives-

- 1) To understand different types of tourism and potential of tourism in Guhagar taluka.
- 2) To make suggestions for development of tourism in Guhagar taluka.

### Methodology-

This paper is based on primary and secondary data collection. All the data used for the purpose of this research has been sourced from various sources like research paper, annual reports, paper Articles, websites and books and field visits.

### Position of Ratnagiri district-

Ratnagiri has naturally strong position but due to some reason not properly developed. Ratnagiri district is depending upon Mumbai region. Mumbai is the capital of Maharashtra and business capital of India is well connected by all modes of transport to Ratnagiri. In the Ratnagiri district lot of tourist places like religious, beaches, creeks, forts, adventure places, waterfalls, nature, heritage, monuments. Good rail and road connectivity of major cities of Maharashtra and India.

Foreign tourists arrivals Maharashtra ranks second with 17.6 percentage of share. International Airport at Mumbai is used as transit destination by the business traveler as they prefer to fly out for quick holiday to

Goa and Kerala. There is nothing difference between Goa, Kerala and Ratnagiri district but there is only difference of infrastructure and marketing. Rare foreign tourist visits the Ratnagiri district. Forty percentage of the total international tourists arriving to India use Mumbai as gateway of Mumbai. At least two percentages of these tourists should visit Ratnagiri area.

#### **Potential of Guhagar taluka tourism-**

Tourism in Guhagar taluka for its economy is very crucial but it is growing slowly. Guhagar taluka has immense tourism potential with its natural beaches, heritage and culture. So the strengths for Guhagar taluka will lie with its unique perspective. In this Guhagar tahsil following seven major tourism types are available in this taluka.

**Religious tourism-** Guhagar town is called is temple town. Number of prominent hindu temples that are present here. Total 142 temples in Guhagar taluka but mainly four temples are famous for tourism in Guhagar taluka.

- **Vyadeshwar temple-** This temple is at entry of Guhagar town. This temple is situated near the State Transport bus stand. It is a lord Shiva shrine in Guhagar taluka. The temple is famous for a huge fair organized during the festival of Mahashivratri. This temple was built in 12<sup>th</sup> century.
- **Durga Devi temple-** This is an ancient temple located in Guhagar town. This is one of the pleasant sea side temple. Around the temple, there is lake with a central wooden pillar. In this temple Navratri, Diwali, Holi and Dussehara celebrated with great devotion.
- **Ganesh temple (Hedvi) -** This temple is situated on hill. This Ganesh temple famous for dashbhuj. The surrounding of location is very beauty and full of nature beauty. Hedvi village is famous for lord Ganesh temple. This temple was constructed in Peshwa era.
- **Lord Shiva temple (Velneswar temple)-**Velneswar is a typical Konkani and beautiful village in Guhagar taluka. The temple is called as shree Velneswar temple. There is a huge light post adorned with oil lamps at entrance of the temple. The temple is believed to be more than 500 years old. This temple is flocked by a large number of devotees during the festival of Mahashivratri. MTDC resort available near the temple.

**Beach tourism-** In the Guhagar taluka more than 15 beach destinations but six beaches are important for tourism purpose. All the beaches except guhagar beach are untouched and unnoticed by tourist.

- **Guhagar beach-** Guhagar beach is very long and clean beach and near about 7 km. Guhagar beach is safe and clean beach on the Konkan stretch. The longest beach in Ratnagiri district is in guhagar city. A tucked away beach given its idyllic soft, sandy beach that catches the golden sunset. The beach is lined with suroo, coconut trees.
- **Hedvi beach-** This beach is near about 15 km from Guhagar town. This is most beautiful beach in Ratnagiri district. One side of beach is sand and one side it is big rock. The Brahman Ghal is attractive destinations in this beach. The brahman ghal is about 35 ft in length and 20 ft in depth. It is 20 to 30 ft wide George that products milky bubbles during tide period.
- **Palshet beach-** Palshet beach is one of the most beautiful beaches in Guhagar Taluka. This beach is a clean and long over near about four k.m around.
- **Budhal beach-** Budhal is a small fisherman village. Budhal is another serene tranquil sea shore that consists of plenty of rocks and has extremely pleasant fell to it.
- **Velneswar beach-**This is one of the most impressive and pristine beaches in the entire konkan. This beach is idol for swimming and sunbathing. The entire beach is surrounded by coconut trees.
- **Karul Beach-**Karul has a small village in Guhagar taluka. This village has an attractive, beautiful and virgin beach. This beach is surrounded by greenery like Coconut, Betel nuts and Alfonso mangoes.

**Historical tourism-** Guhagar town and other important destinations has a great history. Two historical forts are existed in this taluka.

- **Gopalgad fort-** Gopalgad fort is located in Anjanvel village in guhagar taluka. This fort constructed in 16<sup>th</sup> century. It spreads near about seven acres. This fort is hidden fort in Maharashtra. This fort is segmented into two units. The lower part of the walls is called Padkot while the upper walls are referred to as Balekot. Strong fort walls comprising 12 buruj have been constructed to protect the fort against attacks.
- **Vijaygad fort-** This is important fort near Thavsal village but totally neglected of local government and government of Maharashtra. This fort has built on sea side. This fort 60 percent damage, due to negligence of government.

**Agro Tourism-** In this taluka 90 percent people are related to agriculture. Majhya Mamacha gaon is an agro tourism farm is located in Mundhar village. This farm house spread over 12.5 acres of agro land providing simple accommodation with homely food and rural atmosphere. This destination gives typical rural experience to tourist. In Aabloli and Parchuri village some farmers have also developed of Agro tourism.

**Backwater tourism-**In Guhagar and Chiplun taluka there are natural and beautiful creeks i.e Vashisthi, Jaigad. These two creeks are totally neglected by government of Maharashtra and MTDC. No infrastructure facility available on both the creeks.

**Cultural tourism-** Guhagar has a glorious in its rich cultural heritage. In this taluka, 90 percent people celebrated Ganesh festival and Shimgostav. At this time there are highly religious and cultural environment. Bagada festival (Narvan) is also famous in South Konkan. Jakhadi dances, Naman, Khele, Sankasur folkdance are famous in Guhagar region.

**Film tourism-** Guhagar taluka has every corner is unique and separate identity. All the places in this tashil are famous for Konkani touch and greenery so film tourism a lot of potential in this taluka. 'Kakparsh' and 'Killa' films have provided widespread publicity to Guhagar region.

This tourism destination can be possible to develop and all have large potential for the development. Only five percent development can taken place in this destinations. It is observed that, total 17 important destinations are exists in this taluka but only three are focused from MTDC and local government. Some destinations can become A and B class destinations.

#### **Findings of the study-**

Tourism industry in Guhagar taluka has a huge potential for growth, given the availability and the variety of tourist ideas offered by destinations. The well built infrastructure and fresh investments will give the boost of Guhagar taluka economy development. When all the destinations studied some conclusion made it.

- Guhagar tourism is only week end spot and seasonal.
- Beach tourism is the main attractions.
- Local people awareness is factor is very low.
- Safeties of tourist are serious issue on the all beach.
- Poor infrastructure in all the destinations.
- Poor response from foreign tourist.
- No new product development for tourist.
- Tourism industry is very primary in Guhagar taluka.
- Farming is the basic occupation of the people in the Guhagar taluka.
- Lack of professional approach in the local people
- Only three destinations are considered and other is neglected.
- Potential of tourism is very high.

#### **Suggestions for development of Guhagar tourism-**

Guhagar tourism industry has tremendous potential for growth. MTDC and the entire stakeholders role is important, some suggestions are required for development of Guhagar region tourism to use its potentials.

- Beach and religion tourism is common so new products innovation is required like adventure tourism, rural tourism, back water tourism, monsoon tourism, socially, Entertainment and Agro tourism.
- Infrastructure facility of international level to ease the foreign tourists to visit destinations should be developed. It is necessary to create A and B class tourist destinations for the attractions of foreign and domestic tourist in Guhagar taluka. Guhagar, Velneshwar and Hedvi can become the A class destinations. Road condition on the all the destinations are very bad so it should be developed.
- Cultural, religious and historical information is more important for tourist. Trained guide should be made available for tourism destinations. No single guide is available in this taluka. Training of local people for guide is necessary.
- In Guhagar and Chiplun there is natural and beautiful creeks are to be there but no development has taken place. As like Kerala Guhagar and Chiplun taluka should develop backwater tourism. Houseboat in backwater is necessary.

- In Guhagar taluka there is lot of accident on beaches it has negative image created. Creation of special tourism police for the security and spirit of courtesy and hospitality.
- Local product should be available in any season for the tourist. Jackfruit, karvande, pineapple, kokum etc. in all the season there should be availability of local product packing.
- In Guhagar taluka there is lot of beaches and rivers so water tourism should be developed such as swimming, surfing, sailing, wind surfing, water scooting, Para sailing, snorkeling, fishing hobby, staying in houseboat etc. Proper infrastructure and awareness about water tourism is required.
- In Guhagar taluka more than 90 percent people related to agriculture. There are highly potentials in agriculture tourism. Farmers should have start in monsoon season to attract tourist for Bhatlavni, Mashagat etc. For the agro tourism to take modern information workshop, pamphlet, guidance classes and short film should be arranged for the farmers.
- Secure red and green zone (Swimming zone) for safeties of tourist on beaches. In Guhagar taluka all the beaches are neglected, security measures should be taken to avoid negative image. On the entry point of beach there should be digital banner or flex regarding information about accident on beach. Watch tower, life guard, flood light in night and mike system to avoid accident on the beach is necessary.

### Conclusion-

People of Guhagar taluka depend upon only Mumbai because there is no any other industry developed except RGPPL Company. Tourism development play crucial role of Guhagar taluka economy. Guhagar taluka, falling short in turn their natural wealth into good business opportunity. Tourism is only one way to develop this taluka. Basically infrastructure and marketing is need for the development of Guhagar tourism industry. Now Guhagar is famous for only Christmas and summer vacation. It should be changed and this taluka should attract tourist every month every day including monsoon. Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism, Rural Tourism. Marketing of Tourism would bring many direct and indirect benefits to the Guhagar taluka people. Guhagar have transformed their economies by developing their tourism potential. Guhagar share of tourism in Konkan region is very small. Guhagar has huge variety of tourism products. The study finally concludes that the infrastructure development, marketing and promotional efforts have resulted in improved performance of the tourism industry in Guhagar.

### Reference-

1. Aurobindo Ganesh, Dr. C Madhavi 'Impact of Tourism on Indian Economy- A Snapshot', Journal of Contemporary Research in Management, Vol-1, 2-Jan-June-2007
2. Dr. Avinash Chiranjeev 'Concept of Tourism'- Jnanada Prakashan, New Delhi, (2008), ISBN: 978-81-7139-172-1
3. E-book, Ministry of Tourism, Government of India.
4. www.incredibleindia.org
5. Annual report (2017-18) ministry of tourism of India
6. Tourism survey for state of Maharashtra by A.C Nielson ORG-Marg
7. UNWTO- Tourism Highlights 2018.
8. Tourism Policy of Maharashtra, 2016, Government of Maharashtra, Department of Tourism and Cultural Affairs.
9. Partyan Aarakhada of Ratnagiri district
10. [WWW.ITDC.Com](http://WWW.ITDC.Com)
11. [WWW.MTDC.com](http://WWW.MTDC.com)
12. Loksatta- 12 January 2017

## Corporate Social Responsibility: A Study of Contribution by leading Companies in Social Development of India

Mahadeo Keshav Kelkar

### Introduction:-

According to Mahatma Gandhi - The great Indian leader of all times "whatever profits earned by the businessman it needs to ploughed back to society and its welfare." Corporate Social Responsibility can be defined as Contribution of a business organization in all aspect of the society including Arts and cultural, educational, environmental, Preventive Healthcare, Sanitation etc. Corporate Social Responsibility is also called as Corporate Citizenship. It is continuing commitment by the business organization to behave ethically and contribute in the development of the society. Today business organization being an integral part of the society must contribute positively towards the development of the various area of the society. By involving in these activities companies gains number of advantages like enhancing public image, attaining focus from customers and building up good relations with them, helps in facing strong competition by competitors, favorable conditions and healthy relations with government officials etc.

### Significance of the study:-

This study is undertaken to know the relevance and importance of CSR activities to the business organization. This study wants to focus on various CSR activities undertaken by the top Indian business organization for the development and welfare of different aspects of the society.

### Research Methodology:

This research is mainly based upon the secondary data which has been compiled from various research papers, Magazines, research articles, books, news-letters, web-links dealing with this current study on corporate social responsibility.

### Objective of the study:-

- To study the concept of Corporate Social Responsibility.
- To study various CSR activities undertaken by Leading Indian Companies
- To Study the pattern of Spending by Indian business on CSR activities.
- To study the impact of Corporate Social Responsibility.
- To study the CSR activities of Indian organizations in the area of Woman Empowerment.

### Statutory Provision:

Section 135(1) of the Companies Act 2013 provides that companies having net worth of Rs.500 Crore or more or turnover of Rs.1000 Crore or more or net profit of Rs.5 Crore during the immediately preceding financial year are required to form a CSR committee of their board of directors. The CSR committee assists in formulating and recommending a CSR policy as well as monitoring the same. This CSR policy that is formed is required to indicate the activities and the projects that will be undertaken in the areas specified in Schedule VII of the Act along with the recommended amount of expenditure to be incurred in conducting such activities.

- ❖ **The activities that can be conducted by the company in order to achieve its CSR goals, which are enumerated in Schedule VII, are as follows:**

#### Indicative Activities under CSR

- ❖ Eradicating extreme hunger and poverty;
- ❖ Promotion of education;
- ❖ Promotion of gender equality and empowerment of women;
- ❖ Reducing child mortality and improving maternal health;
- ❖ Combating human immunodeficiency virus, acquired immune deficiency syndrome, malaria and other diseases;
- ❖ Ensuring environmental sustainability;
- ❖ Employment enhancing vocational skills;
- ❖ Social business projects;
- ❖ Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government or the State Governments for socio-economic development and relief and funds for the welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women; and

- ❖ such other matters as may be prescribed

Additionally, Section 135(5) requires the board of directors to ensure that in every financial year a company spends at least two percent (2%) of the average net profits made by it during the three (3) immediately preceding financial years in pursuance of its CSR Policy.

**Findings:-**

- ❖ **CSR Indian Scenario:-** During the the period of four years overall companies spent Rs. 52533 crore on different CSR activities including education, healthcare, Rural Development, Environment sustainability, Safe drinking, Clean Ganga Fund. Etc

**CSR fund distribution by Indian companies from FY 2014-15 to FY 2018-19  
(Major Recipients)**

Beneficiary Sector	Sector wise Share in Cr.
<b>Education</b>	15742
<b>Healthcare</b>	9093
<b>Rural Development</b>	5467
<b>ENVIRONMENTAL SUSTAINABILITY</b>	3723
<b>Swachh Bharat Kosh</b>	837
<b>Prime Ministers National Relief fund</b>	763
<b>Safe Drinking Water</b>	612
<b>Senior Citizen Welfare</b>	91
<b>Armed Forced, Veterans, War widows dependents</b>	81.50
<b>Technology Incubators</b>	69.71
<b>Clean Ganga Fund</b>	67.1

❖ **C.S.R Activities of Leading Indian Businesses:-**

CSR is a voluntary action taken up by the business organizations towards betterment of the society and sustainable development. Indian Business organizations are very keen towards their social contribution even before the Amendments in Companies Act 2013 making its obligatory to certain companies which falls under the purview of this compulsion. Business Houses like TATA group, Reliance Industries, Infosys, are few among them which involves themselves serving society in various ways over number of years and inspiring the others to take active part in the social cause.

**Top Companies in India (by Market Capitalization – NSE)**

**Reliance industries:-**

The company is very keen and dedicated towards CSR activities and has been spending more than prescribed CSR Budget in last three preceding years. They are contributing considerable budget in the area of Education and Research, Skill Development, Healthcare, Sports etc.

**CSR Details in Rupees in Crores.**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	849.32	745.04	659.20
<b>Prescribed CSR</b>	811.16	703.08	620.41

**Tata Consultancy Services:-** TCS is global leader in the field of technology and consultancy. TCS is largest IT sector employer in India. This group is committed towards its social contribution. It has contributed in the socio development of the society in different ways in different area's like Water Conservation, Health and wellness, Education and skill development, Disaster relief, Environment sustainability, Restoration of heritage site, Contribution to Tata Foundation etc.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	434	400	379.71
<b>Prescribed CSR</b>	542	497	446.00

**HDFC Bank:-** HDFC Bank is a leading private sector bank India which provides banking and financial services in India and abroad. HDFC bank is committed towards its social welfare activities and spending more than its CSR budget during last three year. HDFC bank is spending CSR budget on varies projects including Holistic Rural Development, Poverty Alleviation Program, Environmental projects, Health and Sanitation etc.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
Actual CSR	443.78	374.54	305.42
Prescribed CSR	439.20	365.00	304.00

**Hindustan Unilever Limited (HUL)**

H.U.L strongly believes that Corporate Social Responsibility is an integral part of their organization according they are positively ensuring the fulfillment of their societal objectives. H.U.L is market leader in FMCG and mission and aim of the company is to improve the Quality of life through their wide range of products. H.U.L. is engaged itself in different area of CSR like Woman Empowerment, Providing Health facilities in remote area of rural India, Water Conservation and Harvesting, Special education and Rehabilitation of children with Challenges etc.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
Actual CSR	126.45	116.09	103.88
Prescribed CSR	124.19	112.20	101.71

**ICICI Bank:** ICICI is one of leading institution in Indian Banking Sector. It offers wide range of banking products and financial services to its customers. Apart from its banking business it offers various facilities to local community. As a part of CSR it mainly focuses its activities in the area of education, Woman development, Sanitation, Environmental sustainability, Empowerment of youth etc. ICICI offers free skill training to empower youth, contributed Rs 10 Cr.to kerala relief fund, Bank has reduced its energy consumption by 20% from last three years, ICICI bank has set-up Rural Self Employment Training institute in Udaipur and Jodhpur for providing Vocational Training to Local villagers.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
Actual CSR	92.20	170.30	182.00
Prescribed CSR	118.96	170.20	200.00

**Infosys Ltd:**

Infosys is one of the leading Company global leader IT sector having a cliental in more than 50 countries. As far as CSR activities are concerned this company is contributing since number of years for social cause, Infosys Foundation is a great initiative by this company to fulfill its social responsibility. The Foundation supports different activities and programs devoted to privileged class of the society. Infosys CSR includes Contribution towards Eradication of hunger, Malnutrition, In the field of education, Environmental sustainability, Making available Safe drinking etc.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
Actual CSR	342.04	312.60	289.44
Prescribed CSR	340.35	310.25	287.42

**Kotak Mahindra Bank :-** Kotak Mahindra bank is 4<sup>th</sup> largest private sector bank in India. This bank is consistently building its CSR capabilities as well spending year by year. Kotak group is funding various CSR initiatives like MAA Foundation, JSW Foundation, Lata Mangeshkar Medical Foundation, Indian Cancer

Society, Wockhardt Foundation, Give India etc. Kotak Group is active in different CSR areas like Environment sustainability, Promoting Gender Equity, Promotion of sport activities, Healthcare Initiative and the like.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	36.55	26.40	17.33
<b>Prescribed CSR</b>	96.27	73.97	54.92

**Bajaj Finance:** Bajaj Finance Ltd is one of the leading Non Banking Financial Company operating in the field of Financing the consumer durable products. Apart from its business This group believes that Common Good is always better than individual good. The Founder of this group Shri Jamanalal Bajaj was a great person who bowed the seeds of CSR in his business long back. Today this group is supporting various social causes like promoting Education and healthcare, Supporting the skilled development program for specially abled children's, Construction of OT complex and others.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	56.78	39.56	28.38
<b>Prescribed CSR</b>	56.59	39.40	28.37

**Axis Bank:** Axis bank is third largest private sector bank in India operating nationally as well as globally. Axis Bank has set up a Foundation in the year 2006 to carry out its CSR activities. This Foundation is working with various NGO's to cater the needs of privileged class of the society. Axis bank Foundation is actively involved in the field of environment and sustainability, in the field of education as well.

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	137.60	133.77	135.39
<b>Prescribed CSR</b>	127.94	186.82	196.44

**Indian Tobacco Company (ITC):-** ITC limited is India's one of the oldest private sector organization operating in diversified business activities likes hotels, IT, personal care, FMCG products and so on. This organization is reputed and widely appreciated nationally as well as globally for its CSR activities over the years. There is a wide range of CSR activities of this group and includes Woman empowerment, Integrated Watershed Management, Primary School Education, Livestock Management, e-choupal and many more...

**CSR Details in Rupees In Crores**

Year	2018-19	2017-18	2016-17
<b>Actual CSR</b>	306.95	290.98	275.96
<b>Prescribed CSR</b>	306.55	290.47	275.27

❖ **CSR and Woman Empowerment:-**

Today we can see presence woman in almost every field. We can see leadership of woman in various field like education, Health, Sport, Science and Technology and so on...However gender inequality, discrimination, tradition are some of the obstacles in process of development of woman. Woman Empowerment is process of empowering them in various ways and making them sustainable in every area of the society. Number of leading organizations are working on it and contributing in the area of woman empowerment under their CSR activities. CSR is now becoming a ray of hope to those women who were deprived and alien from their social, financial, educational development.

- ❖ Hindustan Unilever's Project Shakti aims at financially empowering the women and providing them livelihood opportunities to women in rural India.
- ❖ Tata Steel Ltd. has created woman SHG in their communities to impart skills in them to run an enterprise.

- ❖ ITC Ltd project "Economic Empowerment of Women" is an initiative to provide employment opportunities to over than 64000 poor women cumulatively.
- ❖ Reliance Industries A fortune 500 Global company aspires to achieve 15% woman workforce by end of 2030.
- ❖ "Project Drishti":- Whisper helped to restore the eyesight of 250 blind girls through corneal transplant operation in which P & G contributed Re 1 per packet of whisper sold.

### Conclusions:

- The Indian business organizations were rarely sensible towards fulfillment of CSR obligations and making it integral part of their day to day activities. Very few organizations those which are categorized as leading organizations are sensible towards their social responsibility.
- It is also observed that out of the total CSR budget education is given top priority over other area's of social importance along with education sector healthcare and rural development. These three sector together comprises 50% of total CSR funding by companies.
- Top Companies are utilizing their CSR budget up to fullest extent, sometimes even more than the prescribed funds.
- Companies are also showing keen interest in the area of woman empowerment and contributing in their development and bringing them in the main stream of society.

### References:

1. N. Sree Rajani and V.Bhargavi Reddy,"Corporate Social Responsibility: An Initiative of HUL" International Journal of Business and Management Invention ISSN online:2319-8028,ISSN(print):2319-801X,Volume 6 Issue7 II July 2017 II PP-43-48.
2. Reena shyam 'An analysis of corporate social responsibility in India', International Journal of Research-Granthaalayah,Vol.4,No.5(2016):56-64
3. Premalata & Anushika Agarwal "Corporate Social Responsibility :An Indian Perspective, Journal of Business Law and Ethics,Vol.1No.1,Dec-2013,27-32
4. Business Ethics and Corporate Governance-2017 edition by A.C. Fernando
5. <https://csrbox.org>
6. <https://www.Businessnewsdaily.com>
7. <https://thecsrjournal.in>
8. <https://Investopedia.com>
9. <https://cleartax.in>
10. <https://www.caclubindia.com>
11. <https://www.taxguru.in>
12. <https://www.csr.gov.in>
13. <https://www.tcs.com>
14. <https://indiacsr.in>
15. <https://economicstimes.com>

## Agriculture Challenges and Sustainable Agriculture Practices of Fruits Production Industry in Dharmapuri District

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### Introduction

India's diverse climate ensures availability of all varieties of fresh fruits & vegetables. It ranks second in fruits and vegetables production in the world, after China. As per National Horticulture Database published by National Horticulture Board, India produced 90.2 million metric tonnes of fruits and 169.1 million metric tonnes of vegetables. The area under cultivation of fruits stood at 6.3 million hectares while vegetables were cultivated at 10.1 million hectares. India is the largest producer of ginger and okra amongst vegetables and ranks second in production of potatoes, onions, cauliflowers, brinjal, Cabbages, etc. Amongst fruits, the country ranks first in production of Bananas (25.7%), Papayas (43.6%) and Mangoes (including mangos teens and guavas) (40.4%). The vast production base offers India tremendous opportunities for export. During 2018-19, India exported fruits and vegetables worth Rs. 10236.93 crores/ 1,469.33 USD Millions which comprised of fruits worth Rs. 4817.35 crores/ 692.01 USD Millions and vegetables worth Rs. 5419.48 crores/ 777.25 USD Millions. Grapes, Pomegranates, Mangoes, Bananas, Oranges account for larger portion of fruits exported from the country while Onions, Mixed Vegetables, Potatoes, Tomatoes, and Green Chilly contribute largely to the vegetable export basket. The major destinations for Indian fruits and vegetables are Bangladesh, UAE, Netherland, Nepal, Malaysia, UK, Sri Lanka, Oman and Qatar.

Though India's share in the global market is still nearly 1% only, there is increasing acceptance of horticulture produce from the country. This has occurred due to concurrent developments in the areas of state-of-the-art cold chain infrastructure and quality assurance measures. Apart from large investment pumped in by the private sector, public sector has also taken initiatives and with APEDA's assistance several Centers for Perishable Cargoes and integrated post harvest handling facilities have been set up in the country. Capacity building initiatives at the farmers, processors and exporters' levels has also contributed towards this effort.

### Theoretical Concept

#### Definition

A fruit is defined as the developed ovary of a seed plant with its contents and accessory parts, as the pea pod, nut, tomato, or pineapple. It is the edible part of a plant developed from a flower, with any accessory tissues, as the peach, mulberry, or banana. A fruit is the often sweet and fleshy part of a plant that surrounds the seeds, although some fruits like berries bear the seed on the outside of the fruit.

#### Review of literature

**Berhane Ghebremicahel (2013)** States that co-operative are the best rendering fruitful services to the society concerned especially to women development. It is also helpful to encourage the social and economic integration of women needed for the entrepreneurship and empowering of the small scale industry. Women should play a significant role in the development process of the nation and unquestionably acted as a part of the nation building and development for the future.

**Shushmal Maheshwari (2012)** states that carbonated drinks are popular among the teenagers, hot beverages like tea and coffee are preferred by middle age groups and health conscious people choose the fruit juices. The market size of non-alcoholic beverage was worth about Rs. 212 billion in 2011 and is projected to grow at a CAGR of about 25 per cent during 2011-2015.

**State of India Agriculture (2012)** The Indian economy is growing at compound annual growth rate of 8 percent and higher expenditure elasticity for fruits & vegetables and livestock as compared to cereals, there is an increasing pressure on the prices of such high value commodities which are perishable in nature. The per capita monthly consumption of cereals has declined from 14.80 kg in 1983-84 to 12.11 kg in 2004-05 and

further to 11.35 kg in 2009-10 in the rural areas. Again, in the urban areas, it has declined from 11.30 kg in 1983-84 to 9.94 kg in 2004-05 and to 9.37kg in the year 2009-10.

### Statement of the problem

In developing countries agriculture is the mainstay of the economy. As such, it should be no surprise that agricultural industries and related activities can account for a considerable proportion of their output. Of the various types of activities that can be termed as agriculturally based, fruit processing are among the most important. Both established and planned fruit processing projects aim at solving a very clearly identified development problem. This is that due to insufficient demand, weak infrastructure, poor transportation and perishable nature of the crops, the grower sustains substantial losses. This research would be of immense help to the common people, the policy makers, government officials, researchers and also to other nongovernmental organizations who are engaging themselves in the upliftment of the poor in particular and the socio economic development of krishnagiri district as a whole.

### Scope of the Study

Krishnagiri district is agriculture dominating state and has very bright scope for setting fruit processing industry to uplift the agri-business system which will ultimately boost all other components of agricultural business system to complete the process. Economic liberalization, globalization, entry of MNC's in processed food segment has tremendously increased the opportunities as well as competition in the market with added advantage to customers. All the selected organizations dealing with number of products as their product range and this effort has been tuned to the basic products and study was done in this light.

The present study has examined the following objectives

1. To study the Agriculture status of fruit processing industries in Krishnagiri district; and
2. To analyse the problems faced by the fruit processing units in the district.
3. To suggest remedial measure to improve the status of fruit processing industrial units.

**Methodology of the study :** This study based on theoretical research. The study is confined to units in Krishnagiri district having a large number of fruit processing industrial units and constitutes the sample district. This study is based on primary data has well structured questionnaire was administered on the study units to elicit opinion on their perception of production and marketing problems. The period of the study for collecting primary data was one year. The period was purposively selected as it was the season for fruits harvesting and processing.

**Method of Sampling :** Selection of Study Units There is 74 fruit processing units registered with the Fruits and Vegetables Processors Federation in krishnagiri district of Tamil Nadu. All the units were approached with a well structured questionnaire. Information was not forth coming from all. On the basis of responses which were amenable for analysis, some of the units had to be eliminated and the number of units for study was confined to those which had provided the desired data, which numbered 36 units. Of these, 36 units out of 74 units are from Krishnagiri district, which responded were taken for further analysis.

**Tools used for data analysis :** The collected data were classified and tabulated in a systematic manner. Simple percentage analysis, mean and standard deviation, Various statistical, mathematical and computational tools and techniques including; Pearson chi-square test, tabulation analysis etc. are being used, using MS-Excel and SPSS software packages (version 16.00) for primary data analysis. And five point scales was used to ascertain the opinion regarding the production and marketing aspects from the producers. Weighted score and rank analysis were used to analyse their opinion and their perception on problems faced.

There are over 4000 fruit processing units in India with an aggregate capacity of more than 12 lakh MT (less than 4% of total fruits produced). It is estimated that around 20% of the production of processed fruits is meant for exports, the rest caters to the defence, institutional sectors and household consumption. Mango and mango-based products constitute 50% of exports. The fruits and vegetables considered important by the Horticulture Board of India are mostly grown in the areas of Jammu & Kashmir, Himachal Pradesh, hilly regions of North Uttar Pradesh, Tamil Nadu, Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Assam, Madhya Pradesh, Rajasthan, Punjab, Tripura, West Bengal and Orissa.

## OVERVIEW

Indian is an agriculture based country, where more than 50% of population is depend on agriculture. This structures the main source of income. The commitment of agribusiness in the national income in India is all the more, subsequently, it is said that agriculture in India is a backbone for Indian Economy. The contribution of agriculture in the initial two decades towards the total national output is between 48% and 60%. In the year 2001-2002, this contribution declined to just around 26%. The aggregate Share of Agriculture and Allied Sectors, Including agribusiness, domesticated animals, and ranger service and fishery sub segments as far as rate of GDP is 13.9 percent during 2013- 14 at 2004-05 prices. Agricultural exports constitute a fifth of the total exports of the country. In perspective of the overwhelming position of the Agricultural Sector, gathering and support of Agricultural Statistics expect incredible significance. According to the fourth Advance Estimates of Production of food grains for 2013-14, aggregate food grain production is assessed to be 264.77 million tons (MT). Export of spices from India are relied upon to reach US\$ 3 billion by 2016-17, on the back of imaginative promoting strategies, inventive bundling, quality in quality and an in number appropriation system. The Indian flavors business is pegged at Rs 40,000 crore (US\$ 6.42 billion) every year, of which the marked portion represents 15%.

The National Food Security Mission (NFSM) was launched from Rabi, 2007-08. The fundamental targets of the National Food Security Mission (NFSM) is to expand production of rice, wheat, pulses and coarse cereals through region extension and efficiency upgrade in a supportable way in the recognized locale of the nation; restoring soil ripeness and profitability at the individual ranch level; and improving farm level economy (i.e. ranch benefits) to restore confidence amongst the farmers. The Mission met with a staggering achievement and accomplished the focused on extra generation of rice, wheat and heartbeats. The Mission is being kept amid Twelfth Five Year Plan with new focuses of extra generation of sustenance grains of 25 million tons including 10 million tons of rice, 8 million tons of wheat, 4 million tons of pulses and 3 million tons of coarse cereals by the end of twelfth five year plan.

Training is an important procedure of capacity building of people as to enhance the execution. Consequently, training needs appraisal is imperative to the training process. It serves to recognize present issues and future difficulties to be met through training and improvement. It is obliged to figure out the needs of individual trainee on which proficient skills ought to be assembled to do the relegated occupation in the associations. The 6% of agricultural production is converted in to processed food, which is focused to achieve 20% in coming future. The business is work escalated and contributes around 50% for industrial production. Multi- National Food Companies have assumed a part of making business sector draw and rivalry. Selection of inventive and experimental bundling strategies by food industry has empowered the assembling of sheltered and quality sustenance.

**The agriculture sector employs more than 50 per cent of the workforce in India. It plays a vital role in our overall economy.**

- 1. Contribution to National Income :** Agriculture and its related activities have always held a significant share in our national income. In recent years, the share of contribution has declined gradually with the growth of other industrialized sectors in the country. In 1950-51, agriculture and allied activities contributed about 59 per cent of the total national income. This number declined to 40 per cent in 1980-81 and then to 18 per cent in 2008-09. But the agriculture share in India still remains very high as compared to many developed countries of the world. For example, agriculture contributes only 3 per cent to the national income in U.K. and U.S.A.
- 2. Source of Livelihood :** Over two-thirds of the working population in India is engaged directly in the agricultural sector. As per estimate, about 57 per cent of the working population is engaged in agriculture, as opposed to 2 to 3 per cent in U.K. and U.S.A. and 6 per cent in France.
- 3. Source of Food Supply :** Agricultural products are the major source of food supply for the huge population of our country. As per certain estimates, it meets about 60 per cent of household consumption.
- 4. Role of Agriculture for Industrial Development :** There are several important industries in India such as cotton and jute textiles, sugar manufacturing, edible oils, plantation industries (tea, coffee, rubber) and many agro-based cottage industries that depend on the agricultural sector for the supply of their raw materials. These agro-based industries generate about 50 per cent of income in the manufacturing sector, thus, agriculture helps in the industrial development of this country.

**5. Commercial Importance :** Agricultural products constitute a large part of the total exports of this country. Some of the main items in our export list include tea, coffee, sugar, tobacco, spices, cashew nuts, etc. These contribute to about 50 per cent of the total exports from India. In addition to agricultural products, products from agro-based industries like jute and cotton textiles also contribute another 20 per cent to the country's total exports. Hence, the agriculture sector is vital to the country's international trade and commerce activities.

**6. Source of Government Revenue :** Both the Central and State Governments of the country earn significant revenues from the agriculture sector. The rising land revenue contributes towards a substantial income. There are also other sectors like railways and roadways that derive a good part of their income from the movement of agricultural goods. With all the above points, it can be safely said that agriculture is an essential foundation in the country's economy. As per the Economic Survey 2017-18 Report, agriculture sector employs more than 50 per cent of the total workforce in India and contributes around 17-18 per cent to the country's GDP. The report also stated that Indian farmers are adapting to farm mechanization at a faster rate in comparison to recent past.

### Major Agricultural Problems of India and their Possible Solutions

Some of the major problems and their possible solutions have been discussed as follows. Indian agriculture is plagued by several problems; some of them are natural and some others are manmade.

**1. Small and fragmented land-holdings:** The seemingly abundance of net sown area of 141.2 million hectares and total cropped area of 189.7 million hectares (1999-2000) pales into insignificance when we see that it is divided into economically unviable small and scattered holdings. The average size of holdings was 2.28 hectares in 1970-71 which was reduced to 1.82 hectares in 1980-81 and 1.50 hectares in 1995-96. The size of the holdings will further decrease with the infinite Sub-division of the land holdings.

**2. Seeds:** Seed is a critical and basic input for attaining higher crop yields and sustained growth in agricultural production. Distribution of assured quality seed is as critical as the production of such seeds. Unfortunately, good quality seeds are out of reach of the majority of farmers, especially small and marginal farmers mainly because of exorbitant prices of better seeds. In order to solve this problem, the Government of India established the National Seeds Corporation (NSC) in 1963 and the State Farmers Corporation of India (SFICI) in 1969. Thirteen State Seed Corporations (SSCs) were also established to augment the supply of improved seeds to the farmers. High Yielding Variety Programme (HYVP) was launched in 1966-67 as a major thrust plan to increase the production of food grains in the country.

**3. Manures, Fertilizers and Biocides:** Indian soils have been used for growing crops over thousands of years without caring much for replenishing. This has led to depletion and exhaustion of soils resulting in their low productivity. The average yields of almost all the crops are among the lowest in the world. This is a serious problem which can be solved by using more manures and fertilizers.

**4. Irrigation:** Although India is the second largest irrigated country of the world after China, only one-third of the cropped area is under irrigation. Irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain, unreliable and erratic India cannot achieve sustained progress in agriculture unless and until more than half of the cropped area is brought under assured irrigation.

**5. Lack of mechanization:** In spite of the large scale mechanization of agriculture in some parts of the country, most of the agricultural operations in larger parts are carried on by human hand using simple and conventional tools and implements like wooden plough, sickle, etc.

**6. Soil erosion:** Large tracts of fertile land suffer from soil erosion by wind and water. This area must be properly treated and restored to its original fertility.

**7. Agricultural Marketing:** Agricultural marketing still continues to be in a bad shape in rural India. In the absence of sound marketing facilities, the farmers have to depend upon local traders and middlemen for the disposal of their farm produce which is sold at throw-away price. In most cases, these farmers are forced, under socio-economic conditions, to carry on distress sale of their produce. In most of small villages, the farmers sell their produce to the money lender from whom they usually borrow money.

**8. Inadequate storage facilities:** Storage facilities in the rural areas are either totally absent or grossly inadequate. Under such conditions the farmers are compelled to sell their produce immediately after the harvest at the prevailing market prices which are bound to be low. Such distress sale deprives the farmers of their legitimate income.

**9. Inadequate transport:** One of the main handicaps with Indian agriculture is the lack of cheap and efficient means of transportation. Even at present there are lakhs of villages which are not well connected with main roads or with market centres. Most roads in the rural areas are Kutcha (bullock- cart roads) and become useless in the rainy season. Under these circumstances the farmers cannot carry their produce to the main market and are forced to sell it in the

local market at low price. Linking each village by metalled road is a gigantic task and it needs huge sums of money to complete this task.

**10. Scarcity of capital:** Agriculture is an important industry and like all other industries it also requires capital. The role of capital input is becoming more and more important with the advancement of farm technology. Since the agriculturists' capital is locked up in his lands and stocks, he is obliged to borrow money for stimulating the tempo of agricultural production. The main suppliers of money to the farmer are the money-lenders, traders and commission agents who charge high rate of interest and purchase the agricultural produce at very low price. All India Rural Credit Survey Committee showed that in 1950-51 the share of money lenders stood at as high as 68.6 per cent of the total rural credit and in 1975-76 their share declined to 43 per cent of the credit needs of the farmers. This shows that the money lender is losing ground but is still the single largest contributor of agricultural credit. Rural credit scenario has undergone a significant change and institutional agencies such as Central Cooperative Banks, State Cooperative Banks, Commercial Banks, Cooperative Credit Agencies and some Government Agencies are extending loans to farmers on easy terms.

### Conclusion

Most of the Indians are directly or indirectly depending on the agriculture. Some are directly attached with the farming and some other people are involved in doing business with these goods. India has the capacity to produce the food grains which can make vast difference in Indian Economy. To achieve targeted mark by the government it needs to provide support in case of land, bank loans and other machineries to the small farmers along with the big farmers with this we can expect some improvement in Indian economy.

### References

1. Ministry of External Affairs (2015) India in Business. Investment and Technology Promotion Division, Govt. of India
2. <http://www.ccsniam.gov.in/research/KCG%20Final%20report.pdf>
3. Indian Brand Equity Foundation (2015) Indian Agriculture Industry: An Overview.
4. Department of Agriculture and Cooperation. Ministry of Agriculture, Govt. of India
5. Pandey MM (2009) Indian Agriculture—An Introduction. Fourth Session of the Technical Committee of APCAEM Chiang Rai, Thailand, pp. 1-39.
6. ArjunKM (2013) Indian Agriculture- Status, Importance and Role in Indian Economy. International Journal of Agriculture and Food Science Technology 4:343-346.

ISSN 2349-638X

www.aiirjournal.com

## Current Status of Corporate Social Responsibility in Indian Companies

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### Introduction

Corporate social responsibility promotes a dream of industry responsibility to a wide variety of stakeholders, besides shareholders and investors. Key areas of anxiety are environmental security and the welfare of employees, the community and civil society in general, both now and in the future. The concept of corporate social responsibility understands by the idea that corporations can no longer act as inaccessible economic entities operating in lack of involvement from broader society. Corporate social responsibility involves addressing the legal, ethical, commercial and other outlook society has for business, and building decisions that moderately stability the claims of all key stakeholders. Nowadays, the objectives of the industries are not narrow to profit maximization, economic gains or enhancing competencies but at the same time ensure environmental protection, encouragement of community responsibility with customer interest. It will lead to excellent community representations which in turn have positive impact on the wealth of the organization.

### Objectives of the Study:-

The present study covers the following objectives:

1. To explain the concept of Corporate Social Responsibility.
2. To study the Current Status of Corporate Social Responsibility in Indian Companies.
3. To study the trends of Corporate Social Responsibility in Indian Companies.

### Research Methodology:-

The present research study is expressive and systematic in nature. The research paper is typically based on secondary sources, which include books, journals, thesis and web pages.

**Khanna Parul & Gupta Gitika (2011)**, this paper indicated that an analytical study on status of corporate social responsibility: in Indian context .It is found that corporate social responsibility is receiving stronger as potential among key opinion formers, consumers and the community are rising. Being a good corporate citizen is more and more crucial for marketable success and the key lies in matching community expectations and priorities, and in communicating involvement and achievements broadly and efficiently.

**Kaur Simran & Tandon Nidhi (2016)**, the aim of this study on the role of corporate social responsibility in India. This study reveals that the Indian corporate sectors are planning to set up corporate social responsibility in the small and medium enterprises (SME) sector to raise its reach in isolated areas. Also some industries have already started using the corporate social responsibility as a strategy, which aims at common development of company and the society at the same time.

**Saxena Neha (2016)**, in this research paper authors have identified the Corporate Social Responsibility: Issues & Challenges. This study reveals that there is a need for creation of awareness about corporate social responsibility amongst the general community to make CSR initiatives more successful. This responsiveness generation can be taken up by various stakeholders as well as the media to highlight the good work done by business houses in this area.

**Singh Chand (2016)**, this paper indicated that the study on CSR: Issues and Challenges in India. It provides corporate social responsibility policy functions as a built in self flexible mechanism whereby business monitors and ensures its active contribution towards the society. Corporate compassion a effect that creates helpful efforts to improve their competitive context along with the excellence of the industry environment. CSR moulds in creating a contribute to value with the procedure of corporate success with social welfare.

**Shyam Reena (2016)**, this paper indicated an analysis of corporate social responsibility in India. They also suggested that corporate social responsibility is actually about ensuring that the company can grow on a sustainable basis, while ensuring equality to all stakeholders, CSR has come a long way in India. It has effectively interwoven commerce with social enclosure and environment sustainability. From receptive actions to sustainable initiatives, corporate have clearly exhibited their ability to make a significant difference in the society and recover the overall quality of life. In the present

social circumstances in India, it is complicated for one single unit to bring about change, as the scale is huge. Corporate have the proficiency, deliberate thinking, manpower and money to facilitate extensive social change.

**Concept of corporate social responsibility:-**

CSR is a management concept where by companies put together social and environmental concerns in their business operations and relations with their stakeholders. Corporate social responsibility is a growing business carry out that incorporates sustainable development into a company's business model. It has a constructive impact on social, economic and environmental factors.

Corporate Social Responsibility is the long-term dedication by business to behave ethically and contribute to economic development while improving the quality of life of the employees and their families as well as of the restricted society and society at large.

**Current Status of Corporate Social Responsibility in Indian Companies:**

The statistics used for the investigation has been obtained from the fillings made by the companies up to 31<sup>st</sup> mar 2019 in the MCA registry. The report of the high level committee on CSR 2019 represents the liable CSR related to companies profile based on reporting status. Following table shows total no. of liable industries consist of those which are compulsory to fulfill CSR commitment and can be bifurcated in to company’s coverage on CSR and not reporting on CSR. Liable Profile CSR companies increases in 2019 compare to financial year 2013-14.

**Table 1.1 Company Profile based on reporting Status.**

Company profile based on reporting status	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18
Liable and reporting on CSR	9,418	11,671	12,407	10,868
Liable Companies on whom Schedule III <sup>5</sup> of CA, 2013 is not applicable but reporting on CSR	1,000	1,284	775	716
Liable but not reporting on CSR	6,130	5,335	6,350	9,753
<b>Total Number of Companies liable for CSR</b>	<b>16,548</b>	<b>18,290</b>	<b>19,532</b>	<b>21,337</b>

**Note:** Figures in the Table indicate number of companies in each profile and year.

Source:-MCA registry March 2019

**Table:-2.1 Geographical distribution of CSR fund:**

Following table shows geographical distribution of CSR fund in various states in India from 2014-15 to 16-17 and projected up to 2019. All stated CSR fund increasing trends going on projected financial year 2018-19. It means CSR Practices are day to day increasingly by Indian companies. Percentages of India’s CSR funds also increasing up to 2019. In case of Maharashtra CSR practices is good compare to other states. The Indias CSR fund of Maharashtra is highest about 15.59 % in 2018-19.

State	Spend between FY14-15 to FY16-17	Projected Spend FY17-18 & 18-19	% of India's CSR fund
Andhra Pradesh	996.9	1169.9	4.52%
Arunachal Pradesh	255.5	319.8	1.20%
Assam	404	478.1	1.84%
Bihar	336.3	425.9	1.59%
Chhattisgarh	434.6	514.6	1.98%
Delhi	653.2	780.1	2.99%
Goa	156.8	197.9	0.74%
Gujarat	1157.3	1373.8	5.28%
Haryana	469.6	575.4	2.18%
Himachal Pradesh	228.3	284.6	1.07%
Jammu & Kashmir	291.2	379.9	1.40%
Jharkhand	722.5	1003.3	3.60%
Karnataka	1237.1	1615.2	5.95%
Kerala	357.4	448.0	1.68%
Madhya Pradesh	634.9	793.7	2.98%
Maharashtra	3275.8	4197.7	15.59%
Manipur	158.7	210.4	0.77%
Meghalaya	153.6	196.3	0.73%
Mizoram	140.3	180.9	0.67%
Nagaland	137.2	174.4	0.65%
Odisha (Orissa)	972.2	1199.4	4.53%
Punjab	345.9	445.1	1.65%
Rajasthan	1233.6	1729.0	6.18%
Sikkim	163	206.1	0.77%
Tamil Nadu	960.3	1216.1	4.54%
Telangana	692.9	855.5	3.23%
Tripura	160	199.5	0.75%
Uttar Pradesh	681.3	852.7	3.20%
Uttarakhand	382.5	475.6	1.79%
West Bengal	985.4	1195.8	4.55%
Pan-India (Not specified)	--	--	9.57%
Union Territories			1.83%

Source:NGOBOX and CSRBOX CSR report July 2018

### Corporate Social Responsibility trends in India:

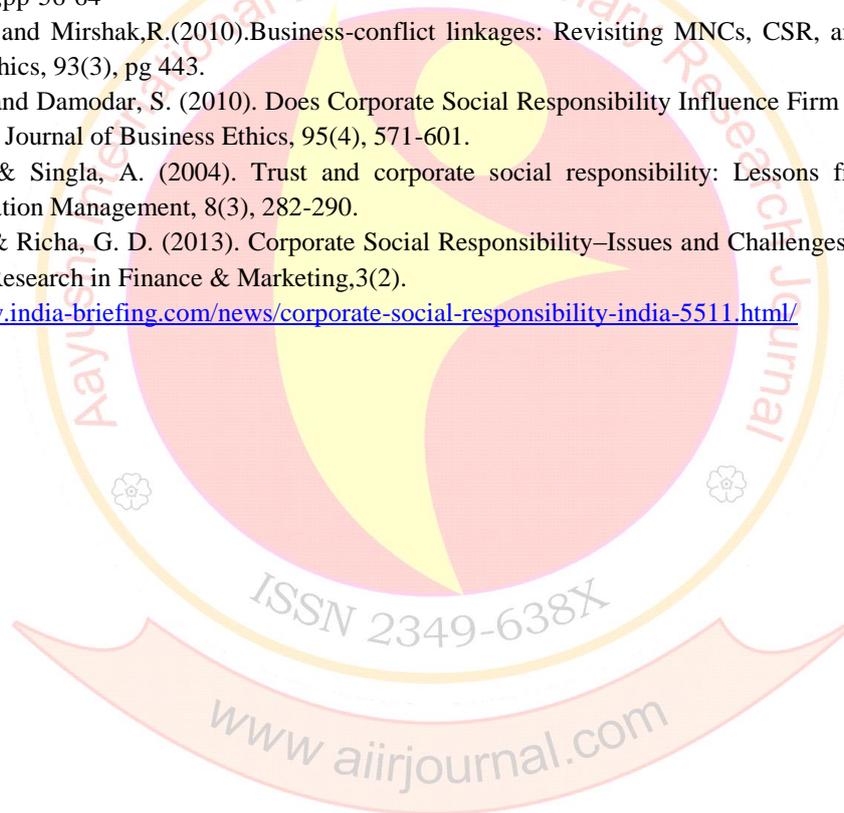
According to India briefing since the applicability of compulsory CSR provision in 2014, CSR spending by corporate India has increased considerably. In 2018, Indian companies spent 47 percent superior as compared to the amount in 2014-15, contributing INR 7,536 crores (US \$1 billion) to CSR initiatives, according to a survey. Scheduled Indian companies in spent INR 10,000 crore (US\$1.4 billion) in different programs ranging from instructive programs, skill development, social welfare, healthcare, and environment conservation, while the Prime Minister's Relief Fund saw an increase of 139 percent in CSR contribution over last one year. Taking into account the current amendments to corporate social responsibility provisions, industry research estimates CSR fulfillment to improve and range between 97 to 98 percent by FY 2019-20.

### Conclusion:-

The main conclusion to be strained from above conversation is that corporate social responsibilities have no restrictions and are not forced by race, colour, or religion. Sadly, concern for the the public is often incorrect for communalism. In India some companies have already ongoing using the corporate social responsibilities as a strategy, which aims at common development of company and the society at the same time .

### References:

1. Khanna Parul & Gupta Gitika (2011), "Status of corporate social responsibility: in Indian context." APJRBM, pp-178-187, Volume 2, Issue 1
2. Saxena Neha (2016), "Corporate Social Responsibility: Issues & Challenges", IJRSI, pp-41-46, Volume III, Issue IA
3. Singh Chand (2016), "CSR: Issues and Challenges in India", IJARIE, pp-1779-1788, Vol-2 Issue-6
4. Kaur Simran & Tandon Nidhi (2016), "The role of corporate social responsibility in India." The international research publications, Research journal of Commerce and Behavioral Science, pp-29-34
5. Shyam Reena (2016), "An analysis of corporate social responsibility in India", International research journal granthalaya, pp-56-64
6. Jamali, D., and Mirshak, R. (2010). Business-conflict linkages: Revisiting MNCs, CSR, and conflict, Journal of Business Ethics, 93(3), pg 443.
7. Mishra, S. and Damodar, S. (2010). Does Corporate Social Responsibility Influence Firm Performance of Indian Companies, Journal of Business Ethics, 95(4), 571-601.
8. Sagar, P., & Singla, A. (2004). Trust and corporate social responsibility: Lessons from India. Journal of Communication Management, 8(3), 282-290.
9. Arora, R., & Richa, G. D. (2013). Corporate Social Responsibility—Issues and Challenges in India. International Journal of Research in Finance & Marketing, 3(2).
10. <https://www.india-briefing.com/news/corporate-social-responsibility-india-5511.html/>



## Service Quality of Apparel Speciality Store: A case study of Mahalaxmi Apparel store Rajarampuri, Kolhapur

Jyoti Chougale, Pruthviraj Chougale

### 1. Introduction

As the retailing industry in India continues to experience tremendous expansion, along with it the rapid growth in the number of apparel or clothing specialty stores is also evident. Fashion retailing in India is poised to reach its height with the openings of big size shopping centres in big cities and towns. These new malls house a proliferation of clothing retailers, both domestic and foreign, all of which aggressively compete for the consumers' attention. Considering the competitive environment, there is a need for a retailing strategy that differentiates one clothing store from another. This can be achieved through the delivery of high service quality (Berry, 1986; Hummel & Savitt, 1988). Moreover, fashion consumers today are savvier, better informed, more sophisticated and discriminating that they expect service quality (e.g. helpful and courteous salespeople, convenient store layout, etc) apart from the quality of merchandise purchased. The practice of excellent service quality has been proven to lead to increased customer satisfaction and significantly indicate the effectiveness of the retailers' performance. As service quality can be the cornerstone to retailing success, retailers need to constantly evaluate their service quality through the use of a reliable measuring instrument. Such an evaluation can serve as a diagnostic tool that helps the company monitor, detect any imperfections and most importantly improve their service.

### 2. Conceptual Background:

#### 2.1 Service Quality

Measuring and managing service quality from the consumers' point of view is still a developing and a challenging issue. Both from the academic community point of view, and in business practice, it is well established that measurement of service quality is an important procedure for improving the performance of the overall service quality. Thus, there has been an abundance of research on the measurement issues of service quality, which have contributed to the development of a solid research foundation.

#### 2.2 Customer Satisfaction (CS)

Customer satisfaction has been a subject of great interest to organizations and researchers alike. The principal objective of organizations is to maximise profits and to minimise cost. Profit maximisation can be achieved through increase in sales with lesser costs. One of the factors that can help to increase sales is customer satisfaction, because satisfaction leads to customer loyalty (Wilson *et al.*, 2008, p. 79), recommendation and repeat purchase.

Customer satisfaction is defined by one author as "the customer's response to the evaluation of the perceived discrepancy between prior expectations and actual performance of the products or service as perceived after it's consumption" (Tse&wilton 1988, p 204) hence considering satisfaction as an overall post purchase evaluation by the consumers (C Fornell, 1992 p 11)

#### 2.3 Relationship between Service Quality & CS

Customer satisfaction and service quality are closely related. It can be said that satisfaction assists consumers in formulating a revised opinion about their service quality perception. Consumer perceptions of the service quality of a firm with which hi prior experience is based on the consumers' expectations. High quality satisfying service requires that a firm understand the consumer needs in detail as also the operational constraints. It reminds the service provider to focus on quality, and the process should be designed to support this system by proper control & delivery, service quality, which is a long term overall measure of customer satisfaction Service quality is more difficult for the consumers to evaluate than goods quality. Service quality perceptions result from comparison of consumer exceptions with actual service performance. Quality expectations are not made solely on the outcome of the service they also involve evaluations of the process of the service.

### 3. Objective Of The Study

- 1) To measure the service quality of specialty apparel stores with the help of Retail Service Quality Scale (RSQS) for measuring service quality in retail.
- 2) To study the relationship between service quality and customer satisfaction.

### 4. Methodology Of The Study:

Service quality is measured with five variables

- i) Physical aspect ii) Reliability iii) Personal interaction iv) Problem Solving v) Policy.

**The Sample Design:** For this research, "purposive convenient quota sampling method" is used. 130 respondents are select.

**Data collection:** Primary data is collected through RSQS instrument consisted of 26 items of Dabholkar *et al.*, (1996) for measuring retail service quality.

### 5. Analysis And Interpretation

The questionnaire is divided into two parts. The first part consists of personal information and the second part consists of RSQS instrument. Accordingly analysis and interpretation of data was made in two parts.

General data Analysis and interpretation.

RSQS data analysis and interpretations.

#### General data analysis and interpretation

- 1) **Residence** –The Customer residing in Kolhapur city and also in the areas close to Kolhapur.
- 2) **Age** – The Customer of above 25 year of age, as the Customer above this age are comparatively more independent of their parents.
- 3) **Educational status** –The Customer who are educated up to 10<sup>th</sup> and above and who are more perceptive of the service quality.
- 4) **Income** –the Customer having annual income of Rs. 1, 00,000 or more.

### RSQS Data Analysis and Interpretations:

#### Service Quality Variables:

Using the mean values, level of performance of service quality variables for various apparel stores, the mean value between 3.00 to 4.00 shows the service quality of these variables at an excellent level, the mean values between 2.00 to 3.00 indicate good level, the mean value between 1.00 and 2.00 shows fair level and the values below 1.00 indicates poor level of quality of performance. In order to express the score in percentage the score 4 is taken as 100 percent and the mean score is converted in to percentage applying the following formula.

$$\text{Percentage score} = \text{mean score} \times 100/4.$$

**Table No.01 means scores/ percentage scores:**

Sr. No.	Range of Mean Score	Percentage	Quality
1	3.00 to 4.00	75 to 100	Excellent
2	2.00 to 3.00	50 to 75	Good
3	1.00 to 2.00	25 to 50	Fair
4	Below 1.00	Below 25	Poor

#### Factor structure of RSQS

**Table No. 02**

Dimension	Sub Dimension	Perception Item	Mean	%
<b>Physical Aspects</b>	Appearance	P1. The store has modern looking equipment and fixtures.	2.56	<b>64.00</b>
		P2. The store and its physical facilities (trial rooms & restrooms) are visually attractive.	2.45	<b>61.25</b>
		P3. Materials associated with this store's service (such as shopping bags, loyalty cards) are visually appealing.	2.40	<b>60.00</b>

		P4. The store has clean, attractive and convenient physical facilities (restrooms, fitting rooms)	0.88	<b>22.50</b>
	Convenience	P5. The store layout at this store makes it easier for customers to find what they need.	3.62	<b>90.20</b>
		P6. The store layout at this store makes it easier for customers to move around in the store	3.68	<b>92.00</b>
		<b>Total</b>	<b>2.59</b>	64.95
<b>Reliability</b>	Promises	P7. When this store promises to do something (such as alterations) by certain time, it will do so.	1.32	<b>33.00</b>
		P8. This store provides its services at the time it promises to do so	1.62	<b>40.50</b>
	Doing it Right	P9. This store performs the service right the first time.	1.63	<b>40.75</b>
		P10. This store has merchandise available when the customers want it.	2.10	<b>52.50</b>
		P11. This store insists on error-free sales transactions & records	2.70	<b>67.50</b>
		<b>Total</b>	<b>1.87</b>	46.85
<b>Personal interaction</b>	Inspiring confidence	P12. Employees in the store have the knowledge to answer customers' questions.	1.62	<b>40.50</b>
		P13. The behaviour of employees in this store instils confidence in customers	2.65	<b>66.25</b>
		P14. Customers feel safe in their transactions with this store.	3.76	<b>94.00</b>
	Courteousness/ Helpfulness	P15. The employees in this store give prompt service to customers	1.58	<b>39.50</b>
		P.16 Employees in this store tell customers exactly when services will be performed	2.55	<b>63.75</b>
		P.17 Employees in these stores are never too busy to respond to customers' request.	2.58	<b>64.50</b>
		P18. This store gives customers individual attention	2.62	<b>65.50</b>
		P19. Employees in this store are consistently courteous with customers	2.52	<b>63.00</b>
		<b>Total</b>	<b>2.49</b>	62.13
<b>Problem solving</b>		P20. The store willingly handles returns and exchanges	0.88	<b>22.00</b>
		P21. When a customer has a problem this store shows a sincere interest in solving it.	1.31	<b>32.75</b>
		P.22 Employees of this store are able to handle customer complaints directly & immediately.	1.75	<b>43.75</b>
		<b>Total</b>	<b>1.31</b>	32.83
<b>Policy</b>		P23. This store offers high quality merchandise.	3.56	<b>89.00</b>
		P24. This store provides plenty of convenient to all their customers.	0.98	<b>24.50</b>
		P25. This store has operating hours convenient to all their customers.	3.72	<b>93.00</b>
		P26. This store accepts all major credit cards	2.96	<b>74.00</b>
		<b>Total</b>	<b>2.81</b>	70.13
		Average mean	2.21	55.35

Table no. 02 indicate that the overall performance of Apparel speciality stores. The overall performance of this stores is (mean score 2.21) at a good level. Physical facility of these stores is including Appearance and Convenience of these stores is good level (mean score 2.29), i.e. 64.95% of the respondents are of opinion that it is at good level. Reliability of these stores is including Promises and doing it right of these stores is (mean score 1.87) fair level i.e. 46.85% of the respondents are of opinion that it is at fair level. Personal interaction of these stores is include Inspiring confidence & Courteousness/ Helpfulness of these stores is good level (mean score 2.49), i.e. 62.13% of the respondents are of opinion that it is at good level. Problem solving of these stores is fair level (mean score 1.31) i.e. 32.83% of the respondents is of opinion that

it is at fair level. Policy indicates the overall performance of the stores is a good level (mean score 2.81) i.e. 70.13% of the respondents are of opinion that it is at good level.

## 6. Finding Conclusion And Suggestion

### Finding

- 1) The overall performance of these apparel stores is at a good level
- 2) The performance of physical aspect of apparel speciality stores is at a good level.
- 3) The performance of reliability of these stores is at a fair level.
- 4) The performance of this personal interaction of these stores is at a good level.
- 5) The performance of problem solving of these stores is at a fair level.
- 6) The performance of policy of these stores is at a good level.

### Conclusion:

However, 55.35% customers' response positively which is above 50% and customers are satisfied, various factors effect on customer satisfaction like, physical aspect, reliability, personal interaction, problem solving, & policy. It has been observed that, 64.95% customer reported positively on physical appearance and 35.05% are negatively response to customers. Also, 46.85% customer reported positively on reliability and 53.15% negative response to customers. 62.13% customer reported positively on personal interaction and only 37.87% negative response to customers. Then 32.83% customer reported positively on problem solving and 67.17% customer reported negative response to customers and 70.13% customer reported positively on stores policy and only 29.87% customer reported negative response to customers.

### Suggestion:

Based on the above analysis, to attain an excellent level, apparel specialty stores are suggested to provide immediate attention to the following issues.

- For physical facilities the store is required to make it attractive outside with convenient store layout and sufficient room for with ease along with spacious waiting and trial rooms.
- Improve reliability, the store promises, stores provides its service, store performance, merchandise available when the customer wants it.
- During their personal interaction with improve employees knowledge to answer customer question, promote service, customers employees have to pay individual attention to customers and improve the system of handling customer complaints promptly.
- To improve problem solving, the store is required to pay proper attention to Handling returns and exchanges and handling customers properly. To make store policy more responsive to customer for spacious parking lot should be the top priority.

### Bibliography

1. Gupta, Pankaj, Tata Strategic Management Group (2008), "Organized Retailing in India: The next Growth Frontier,"
2. Parasuraman, A., Zeithmal, V.A., Berry, L.L. (1985), "Conceptual Model of Service Quality and its Implications for Future research," *Journal of Marketing* Vol.49, 41-50.
3. Gronroos, Christian (1982), "Strategic management and Marketing in the Service Sector," Swedish school of Economics and Business administration, Helsingfors.
4. Dabholkar, Pratibha, Dayel Thorpe and Joseph Rentz (1996), "A Measure of Service Quality for Retail stores: Scale Development and validation," *Journal of the Academy of Marketing Science*, (24) 3-16.
5. Parasuraman, A., Zeithmal, V.A., Berry, L.L., (1988), "SERVQUAL: A Multiple Item Scale for Measuring Consumer Perceptions of Service Quality," *Journal of Retailing* 64, 12-40.
6. Mehta, Subhash C., Ashok Lalwani and Soon Li Han (2000), "Service Quality in Retailing: Relative Efficiency of Alternative Measurement Scales for different product- service .

## Role of 4ps for Sustainable Development in Green Marketing

Mr. Sanjay Jagannath Kasabe

### Abstract

*In the era of globalization, it's become a challenge to stay the shoppers furthermore as consumers in fold and even keep our natural surroundings safe which is that the biggest would like of the time. shoppers also are attentive to the environmental problems like; warming and also the impact of environmental pollution. Inexperienced promoting may be a development that has developed particular necessary within the trendy market and has emerged as a very important thought in Republic of India as in different elements of the developing and developed world, and is seen as a very important strategy of facilitating property development. During this analysis paper, main stress has been created of concept, would like and importance of inexperienced promoting. Knowledge has got to be collected from multiple sources of proof, additionally to books, journals, websites, and news papers. It explores the main problems in adoption of inexperienced promoting practices. The paper describes the present Scenario of Indian market and explores the challenges and opportunities businesses have with promoting. Why firms square measure adopting it and way forward for inexperienced promoting and concludes that inexperienced promoting are some things which will unendingly grow in each observe and demand.*

### Introduction

According to the yank marketing association, inexperienced Green marketing is that the promoting of products that square measure likely to be environmentally safe. so inexperienced promoting incorporates a broad vary of activities, together with product modification, changes to the assembly method, packaging changes, furthermore as modifying advertising. nonetheless process inexperienced marketing isn't a simple task wherever many meanings meet and contradict every other; an example of this will be the existence of variable social, environmental and retail definitions hooked up to the present term. Different similar terms used square measure Environmental promoting and Ecological promoting. Thus "Green Marketing " refers to holistic promoting thought wherby The assembly, marketing consumption and disposal of product and services happen during a manner that's less prejudicious to the surroundings with growing awareness regarding the implications of world warming, no biodegradable solid waste, harmful impact of pollutants etc., each marketer and shoppers are becoming progressively sensitive to the requirement for switch in to inexperienced product and services. While the shift to "green" might seem to be overpriced within the short term, it'll undoubtedly prove to be indispensable and advantageous, cost-wise too, within the long standing time marketing and property promoting, refers to an organization's up efforts at coming with, promoting, rating and distributing product which will not damage the surroundings Polonsky (1994) defines inexperienced promoting as .all activities designed to get and facilitate any exchanges supposed to satisfy human wants or desires, specified the satisfaction of those needs {wants and desires} happens, with stripped-down prejudicious impact on the natural surroundings.

### Objective And Methodology

One of the most important issues with the inexperienced promoting space is that there has been very little try to academically examine environmental or inexperienced promoting. Whereas some literature will exist, it comes from divergent views. This paper makes an attempt to throw light-weight on the abstract issues related to inexperienced promoting. the current study is exploratory in nature to role of sustainable development in green marketing wherever the main focus is 4 ps in green marketing on fact finding investigation with adequate interpretation. For this purpose secondary knowledge were collected. The secondary knowledge were collected through newspapers, magazines, books, conference proceedings, Government reports and websites.

### What is Green Marketing?

Green marketing consists of all activities designed to come up with and facilitate any exchanges intended to satisfy human desires or desires, such the satisfaction of those desires and desires occurs, with borderline harmful impact on the natural setting. it's sorry to mention, a greater a part of folks believe that inexperienced selling refers alone to the

promotion or advertising of product with environmental characteristics. Terms like Phosphate Free, Recyclable, Refillable, gas Friendly, and Environmentally Friendly square measure a number of the items consumers most frequently keep company with inexperienced selling. whereas these terms square measure inexperienced selling claims, generally inexperienced selling could be a lot of broader construct, one which will be applied to consumer merchandise, industrial merchandise and even services includes inexperienced selling, environmental selling and ecological selling. This early definition has 3 key elements, like it's a set of the selling activity; It examine each the positive and negative activities and slender ranges of environmental problems are examined.

### Green Product

Green product stresses the straight and tangible edges provided by greener style, such as energy potency or recycled content, instead of stressing the environmental attributes them. Reducing the environmental impact of a product improves the product's overall performance and quality in ways in which ar necessary, not simply the foremost dedicated and constant inexperienced shopper, but to any or all shoppers as an example, CNG (Converted Natural Gas) use within the vehicles, super concentrated laundry detergents not solely save energy and packaging, they save finish area, money and energy. Organically full-grown food not solely higher preserves soil and reduce the amount of poisons within the water supply; they need superior style and health edges compared to their counterparts. so inexperienced product means that any product, that isn't dangerous for environment and client furthermore, and it conjointly work as a future remedy of negative impact of a product.

### 4 Ps OF GreenMarketing

Standard marketers, inexperienced marketers should address the 4 Ps in innovative ways that.

#### 1.PRODUCT

Entrepreneurs desirous to exploit rising inexperienced market either: determine customers 'environmental wants and develop merchandise to handle these needs; or develop environmentally accountable merchandise to possess less impact than competitors. The more and more wide kinds of merchandise on the market that support property development and square measure sensible for the triple bottom line include: merchandise made up of recycled product, like Quik'N tufa housing materials created from recycled broccoli boxes merchandise which will be recycled or reused. economical merchandise, that save water, energy or gasoline, save cash and scale back environmental impact.

Queensland's solely dry printer, Print point, reduces operating prices by mistreatment less water than standard printers and is in a position to pass the savings on to costumers and merchandise with environmentally accountable packaging.

#### 2.PRICE

Pricing could be a crucial component of the promoting combine. Most customers square measure ready to pay a premium if there's a perception of further product price. This price could also be improved performance, function, design, visual charm or style. Environmental edges square measure sometimes an extra bonus however can usually be the deciding issue between merchandise of equal price and quality. Environmentally accountable merchandise, however, square measure usually more cost effective once product life cycle prices square measure taken into thought as an example full-efficient vehicles, water efficient printing and non hazardous merchandise.

#### 3.PLACE

The choice of wherever and once to create a product on the market features a vital impact on the customers being attracted. Only a few customers exit of their thanks to obtain inexperienced merchandise merely for the sake of it. Marketers wanting to with success introduce new experienced merchandise should, in most cases, position them broadly speaking within the market place in order that they don't seem to be simply appealing to a little inexperienced niche market. The placement should even be in keeping with the image that a company needs to project.

The placement should differentiate a corporation from its competitors. This can be achieved by in-store promotions and visually appealing displays or mistreatment recycled materials to emphasize the environmental and different edges.

#### 4.PROMOTION

Promoting merchandise and services to focus on markets includes paid advertising, promotion, sales promotion, marketing and on site promotions. Smart inexperienced marketers are going to be ready to reinforce environmental believability by mistreatment property marketing and communications tools and practices. as an example, several firms within the financial trade square measure providing electronic statements by email, e-marketing, and written materials are providing electronic statements by email, e-marketing often made mistreatment recycled materials and economical processes, like dry printing. Retailers, as an example, are recognizing the worth of alliances

with different firms, environmental teams and research organizations once promoting their environmental commitment. to cut back the utilization of plastic baggage and promote their inexperienced commitment, some retailers sell looking baggage, under the banner of the go inexperienced surroundings Fund.

The key to self-made inexperienced promoting is Ne'er exaggerate environmental claims or establish chimerical expectations, and communicate merely and thru sources that individuals trust. Promote your inexperienced credentials and achievements. Publicize stories of the company's and employees inexperienced initiatives. Enter environmental awards programs to profile environmental credentials to customers and stakeholders.

### Conclusion

Now this can be the correct time to pick to pick globally. it'll keep company with forceful change within the world of business if all nations can build strict roles as a result of inexperienced selling is essential to save lots of world from pollution. From the business purpose of read as a result of a resourceful marketer is one WHO not solely convinces the patron, however additionally involves the patron in marketing his product.

Inexperienced selling mustn't be thought-about as only one additional approach to selling, however should be pursued with abundant larger vigor, because it has an environmental and social dimension to that. With the threat of worldwide warming looming giant, it's very important that inexperienced selling becomes the norm instead of an exception or simply a furore. Recycling of paper, metals, plastics, etc., during a safe and environmentally harmless manner should become far more systematic and universal. it's to become the overall norm tousle energy-efficient lamps and alternative electrical merchandise. Marketers even have the responsibility to create the shoppers perceive the necessity for and benefits of inexperienced merchandise as compared to non-green ones. In inexperienced selling, shoppers are willing to pay additional to keep up a cleaner and greener surroundings. Finally, consumers, industrial patrons and suppliers ought to pressurize to reduce the negative effect on the environment friendly, inexperienced selling assumes even additional importance.

### References

1. Alsmadi, S. (2007), —Green Marketing and the Concern over the Environment: Measuring Environmental Consciousness of Jordanian Consumersl ,
2. Journal of Promotion Management, Vol. 13(3–4), 2007. Brahma, M. & Dande, R. (2008),
3. The Economic Times, Mumbai. Donaldson, R. H. (2005), —Green brands, NZ Marketing Magazine, 24(8), 14–17. J.A Ottman., et al, "Avoiding Green Marketing Myopia",
4. Perspective. Journal of Marketing Management, 14(6), July, pp. 641-656. Kotler, Philip. Marketing Management – The Millennium Edition Prentice Hall of India Private 5)
5. Green Community. Journal of Macro marketing, 20(1), pp. 46-56. Sanjay K. Jain & Gurmeet kaur (2004),
6. Green Marketing: An Attitudinal and Behavioural Analysis of Indian Consumers, Global Business Review, Vol.5 no. 2 187-205
7. www.google.com www.greenmarketing.net/stratergic.html
8. www.cohnwolfe.com/en/ideas-insight/white-papers/green-brands-survey-2011  
[http://en.wikipedia.org/wiki/Green\\_marketing](http://en.wikipedia.org/wiki/Green_marketing) [www.emeraldinsight.com/0263-4503](http://www.emeraldinsight.com/0263-4503)
9. www. Businesswireindia.com. [www.greenpeace.org/international](http://www.greenpeace.org/international)
10. Marketing and Human Resource Management, Sheth Publication Mumbai university

## Agro-Tourism and Nanded District

Sudarshan Kishanrao Dawane,  
Assistant Professor

### Introduction:

Tourism is now well recognized as an engine of growth in the various economies in the world. Several countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large scale employment and additional income of sources to the skilled and unskilled.

Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people. As commercialism and mass production become the standards by which we live, agro-tourism has given people who work in the agricultural and horticultural sectors a chance to share their work with the masses. Some agro-tourism experiences allow guests to buy food products grown on the farm or hand-crafted products made by the farmer's families. Purchasing these goods helps provide ranchers who rely on their land with another source of income.

Home and consumer education has given way to technology courses in middle and high schools, and many children grow up without ever really knowing what the countryside is or what it's like to interact with live farm animals. Agri tourism, therefore, gives parents the opportunity to introduce their children something other than the city life. It has a great capacity to create additional source of income and employment opportunities to the farmers.

### Why Agro Tourism?

Mother Nature is open door school without brick walls of observed carefully one can learn something or the other, moreover India is agriculture Country, it is expected that we should know the information related to agriculture Today urban children's world has become limited in the closed door classes, cartoon programme on the television, video games, chocolates, soft desi spicy fast food, computer, internet, and so on, they see mother nature only television screen.

Now it has become very necessary that children know the traditional, of agricultural farming activities, and other businesses dependent on agriculture. Those children come very close to Mother Nature and learn many new things in life.

### Objectives of the study:-

1. To understand Agro-Tourism
2. To look the importance of agro-tourism development in Nanded district.
3. To illustrate a proper framework for the agro-tourism centers.
4. To identify the problems and make suggestions to establishment agro-tourism.

### Research methodology of study:-

The study is exploratory and quantities in nature. An extensive use of secondary data is made. Further the secondary data pertaining to the study is originated from various published sources websites and various government departments, and also used reference book journals etc.

**Limitations of the study:-** Present study is depends geographical study only for Nanded District. Its focus on only Agro-Tourism sector and ignore other sector of tourism.

**Location for the agro-tourism center-** Location is playing an important role for success in the agro-tourism. The location have a good natural background and easy to arrive. Tourists an interested into enjoying the nature and rural life. So, farmers should develop their center in the rural areas only which have a beautiful background to attract urban tourist in your farm.

The place of agro-tourism center must need easy accessible by roads with having some agro-tourism center must need easy accessible by roads with having some historical and natural tourist places along with the

agro-tourism. Hence, the center should be developed near of this tourist place. The places which are already developed as a tourist centers those are better for the development of agro-tourism.

### **Infrastructure facility at agro-tourism centers:-**

To develop an agro-tourism must have basic infrastructure and facilities in the development of agro-tourism their farm as follows:

- Accommodation facilities such as farmhouse, which have the rural look along minimum required facilities.
- Wealthy resources in agriculture specifically water and plants at the place.
- Cooking equipment's for cooking food, if tourist have interested.
- The well or lake or swimming tank for fishing, swimming.
- Bullock cart, cattle shade, etc.
- Drinking water, food, telephone facilities etc., essential facilities.
- Indian or Maharashtra food for breakfast, lunch and dinner.
- Farmers should offer to see and participate in the agricultural activities.
- Offer an opportunity to participate in the rural games to the tourist.
- Present bullock cart for riding and horse riding. Fishing facility in your pounds or nearest lake.
- Offer fruits, corns, groundnuts, sugarcane and other agro-products as par availability.
- Show local birds, animals, and waterfalls etc. and authentic information about them.
- Show rural art and craft.

### **Agro Tourism in Nanded District:-**

Nanded is located in the North Latitude – 8.16 to 19.55 East Longitude – 76.55 to 78.19. Nanded is one of the historical places in Marathwada region of Maharashtra State. It is situated on the north bank of Godavari River. It is famous for Sikh Gurudwaras. Nanded is a town of great antiquity. It is said that during the Puranic days, Pandavas travelled through Nanded district. Nandas ruled over Nanded through generations. Nanded is second largest city in the Marathwada area from a socio-cultural, industrial and educational dimension. Nanded district have borders of Karnataka and Andhra Pradesh. The geographic area of Nanded District is 10528 Sq.k.m and district population is 3361291. Population divided in rural areas are 247394 and 913898 in urban areas. Due to unemployment in urban areas migrating to the city in search of work.

Nanded is nice place for tourism. The most popular Tourist place in Nanded district is as follows

- Takht Sachkhand is the gurudwara of Shri Huzur Saheb. Gurudwara was built by Maharaja Ranjit Singhji.
- Mahur gadh one of the 9 Shakti Peetha's, one Shakti Peetha as temple of Mata Renukadevi. This land is peaceful and like paradise. The temple was built near 800 to 900 years ago during the Yadavas. At the time of Dussehra, there is a large crowd of devotees. The Jatra of Malegaon in Loha is also famous for Jatra. In Maleragaon jatra, there are horse market, camel market and other animal markets.
- Sahasrakund waterfall is famous waterfall near to Himayatnagar in Nanded district. Thousands of tourists come here to see the waterfall in rainy season.
- The ancient Kaleshwer temple at visnhupuri temple in Nanded district.
- Kandahar Forts and Nanded forts is also famous tourist places in Nanded district
- The ancient temples of ancient temples, historical places, gurudwada, jungle etc. are attracting tourists towards Nanded district.

In the shocking life of modern times, in the solution to the turbulent pollution unrest, people are far away from nature. Agro tourism is one way to relax people life and its helps to closer the nature. In Nanded district Agro tourism started at Limbgaon. The groups of farmers have come together and started agricultural tourism. A new species of mango variety and flower garden was developed in the field at Limbgaon. A lively dining room was provided for the people to live in the field at Limbgaon to see all this glory. Tourists are seen enjoying the natural glory. These services are provided at very affordable rates and these farmers also to get extra income. Thousands of flowering species are also cultivated at Mukhed. These fields are prone to blossom in the rainy season. Tourists also visit Nanded to see only blossom at mukhed. Jambhul Bet is the best tourists place viewed as a place to stay in nature. Tourist have also enjoys Farmers' Life, their lives, the traditional methods of farming, to get experience of living in a hut, machi for all these experience agriculture tourism are the first choice for tourists in Nanded.

### **Problem of The Agro Tourism:-**

The Nanded district has greater potential of the development of the agro-tourism centers due to the good natural and climatic conditions. But there are some problems in the process of agro-tourism development, major problems are follows,

1. Not of perfect knowledge about agro-tourism.
2. Weak communication skill and lack of commercial approach of the farmers.
3. Lack of funds to development basic infrastructure for the agro-tourism.
4. Presence of unorganized sector in the agro-tourism industry.
5. Low land holding.
6. No professionalism in agro-tourism.
7. Government have not interested in development of agro-tourism in district.
8. Natural calamity affects farm and also farm products.

### **Conclusion:-**

Nanded district has a great natural conditions and different types of agro products as well as variety of rural traditions. Urban population want enjoy rural life and to know about the rural life. It is a good opportunity to development to development an agro-tourism businesses the district. But there is a problem of low awareness about this industry in the farmer and problem with the finance. Hence, the agriculture departments of the district and tourism department should not to try giving orientation about it and not providing some innovation ideas regarding the agro-tourism.

### **Suggestion:-**

The government and banks should try to provide optimum financial aids to the agro-tourism activities. A union of the agro-tourism service providers is also another need of these farmers which helps to the agricultural tourism network. Low land holding is a major problem of most of the farmers. If farmer's made a group and start agro-tourism centering which is beneficial for all farmers. They also make co-operatives societies regarding to agro-tourism for development of agro-tourism and self-improvement.

### **References:-**

1. Dennis M. Brown and Richard J. Reeder. Agri-tourism offers for opportunities for farm operators' 2004, U.S.A.
2. Dev, Mahendra S. (1996). Agricultural Policy Framework for Maharashtra: Issues and Options, Proceeding / Project Report No. July 21, 1996. Indira Gandhi Institute of Development Research, Mumbai.
3. Dora Ann Hatch, (2006). Agri - Tourism: A New Agricultural Business Enterprise Community Rural Development (Agri-Tourism) VistarYogana.
4. [www.agrotourismworld.co.in](http://www.agrotourismworld.co.in)
5. [https://www.tripadvisor.in/Attractions-g12399807-Activities-Nanded\\_District\\_Maharashtra.html](https://www.tripadvisor.in/Attractions-g12399807-Activities-Nanded_District_Maharashtra.html)
6. <https://nanded.gov.in/mr/>
7. <https://www.tourmyindia.com/states/maharashtra/nanded-tourist-attractions.html>

## Rural Tourism: Contribution to Sustainable Income

**Rucha Prajakt Khavanekar**

Asstiant Professor

### 1. Introduction:

Tourism means travelling for enjoyment. It means arranging for hotel, transport and related facilities for people who are travelling during their holidays. Tourism industry is one of the fastest growing industries in the country. Tourism contributes 6.23% to national GDP and provides 8.78% of total employment in India. According to World Travel and Tourism Corporation, India ranked third among 185 countries in terms of total contribution to GDP in 2018. India is also one of the favorite destinations of tourism for foreign tourist. The main purpose of tourism is relaxation and pleasure during holiday travel. People spend their time outside their routine environment. From daily busy and hectic schedule, people take some time and visit a place for recreation with all family members. There are different types of tourism like eco- tourism, medical tourism, adventure tourism, rural tourism etc. Indian tourism industry has huge potential for further growth specifically rural tourism. Still many places from rural India are untapped which can be explored for rural tourism. Similarly some rural tourist destinations are not developed with all infrastructural facilities. Large number of visitors can be attracted to such untapped or underdeveloped tourist destinations. Most of the popular tourist destinations are overcrowded as well as costly during peak period which do not serve the purpose of tourism. Hence tourists are looking for new destinations away from crowd to have physical and mental peace. Some tourist searches for place with natural beauty or close to nature. They prefer rural tourism for peaceful holidays which is also within their budget and can plan their own tour. Almost 65% of population of India live in rural area. Mainly they are dependent on agriculture for livelihood. Rural tourism means selecting and visiting rural areas for tourism. But most of the time, rural tourism is seasonal and young villagers entering tourism industry may not get regular income. Hence there is a need to understand rural tourism thoroughly and develop strategies to attract tourist throughout the year and generate sustainable income within rural India. Its good opportunity for travel agents, tour operators, small hoteliers, young villagers to become small entrepreneurs by providing satisfactory service to visitors. Rural tourism can give a chance to villagers to be self-employed. They can add to their income and live better life too.

Hence the research is conducted to find out capacity of rural tourism to generate sustainable income. This research paper also highlights challenges faced in rural tourism.

**Keywords: Rural Tourism, Sustainable income, Local support**

### 2. Review of Literature:

**Ali Turan Bayram, Ercan Karacar, Gul Erkol Bayram (2018)** in the research paper titled "Perception of residents towards the impacts of rural tourism in Sinop Province" explained the importance of local community and their perception about rural tourism. They concluded that local people had both negative and positive perception from social, economic and environmental point of view.

**Rezhen Harun, Gabriela O. Chiciudean, Kawan Sirwan, Felix H. Arion and Iulia C.**

**Musresan (2018)** "Attitudes and Perceptions of the Local Community towards Sustainable Tourism Development in Kurdistan Regional Governemnt, Iraq" conducted research to understand local communities' response towards tourism. He concluded that tourism is a considered as development sector. Its positive impacts are better than negative and hence local community support for increased living standards and quality life. They have suggested to analyze demand for rural tourism and develop special training programs for work force.

**Mr.Milind V.Talware, Mr. Upendrakumar A. Tiwari and Dr. B.B.Sonule (2015)**

**Infrastructural facilities for Tourism Development in Konkan Region (Maharashtra State)** in his research highlighted that Konkan is cultural and geographical potential for tourism. He concluded that development includes not only tourism facilities like hotels, recreations but also infrastructure like road, water, electricity etc. He also stated that more use of ICT is needed in tourism industry.

**Dr. Devdatta Gopal Lad (2013)** "Ecotourism Development in the Konkan Region of Maharashtra: A Review" in his research paper focused primarily on ecological sustainable tourism and explained the need of conservation of physical

ecology of the region. He further stated for development some destinations as ecotourism or marine tourism to create job opportunities.

**Dr. P. R. Karulkar, Dr. Madhukar Dalvi (2018) "Tourist's satisfaction about Tourism place: A Study of Sidhudurg and Palghar Districts of Maharashtra"** in the study analyzed that there is a significant relationship between place of tourism and customer's satisfaction. Tourist take into consideration tourism place and not behaviour of people living in that place.

### 3. Objectives:

Following are the objectives of research study:

1. To understand the concept of rural tourism.
2. To understand the perception of rural tourism among local people
3. To find out whether rural tourism can generate sustainable income.
4. To know the challenges in rural tourism.

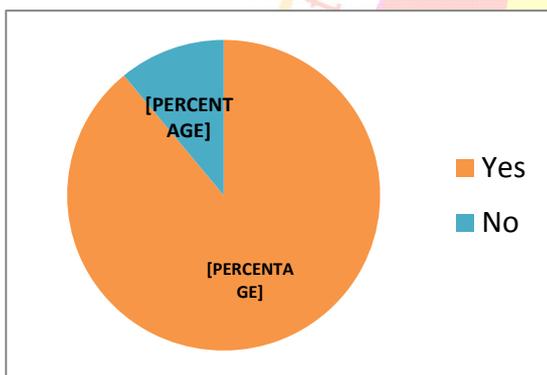
### 4. Research Methodology:

For the study, primary data collection method is used. Data is collected through questionnaire from 100 respondents from Guhagar Taluka of Ratnagiri district in Maharashtra. Guhagar is a popular tourist place with beautiful beaches, temples. The researcher has applied convenient sampling technique for survey.

### 5. Data Analysis:

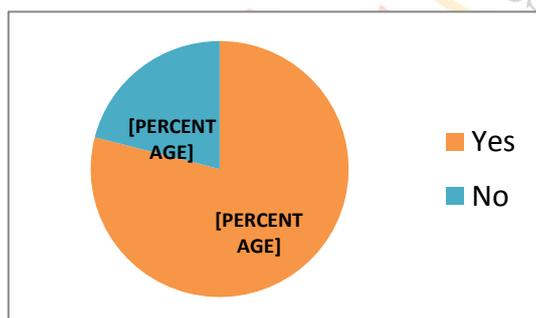
#### 5.1 Need for Rural tourism:

89% of the respondents agreed upon the need for rural tourism. They think that there are many tourist places in rural area which needs to be explored and tourist can be attracted.

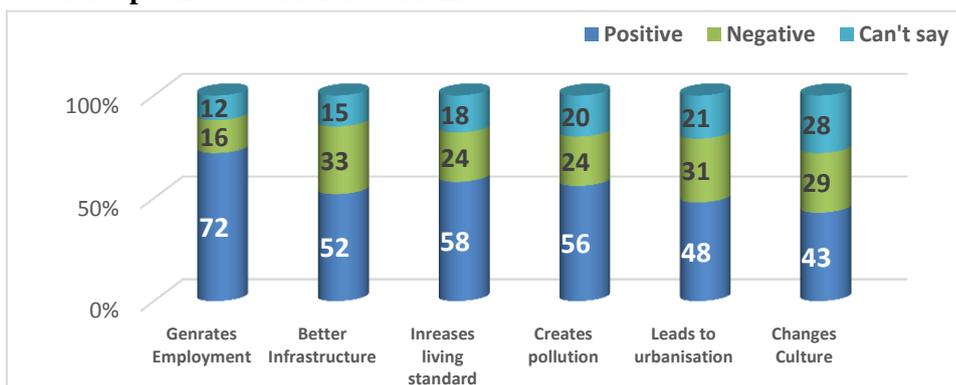


#### 5.2 Rural tourism creates small entrepreneurs locally:

It can be observed that 79% of the respondents agreed that rural tourism can create small entrepreneurs in local rural area. Local people can start small business or provide certain tourism related services by taking advantage of local contacts. They have good opportunity to begin with available resources.



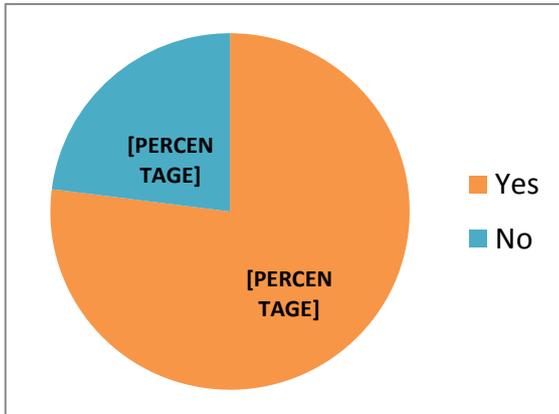
#### 5.3 Perception about Rural tourism:



Regarding generation of employment, 72% of the respondents are having positive perception. Similarly towards better infrastructure facilities and increase in standard of living, 52% and 58% of respondents are satisfied and positive. But regarding

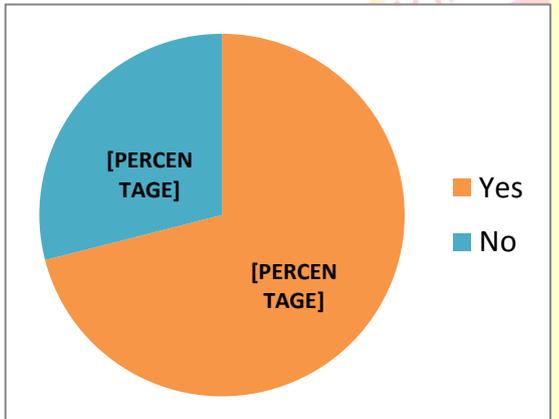
creation of pollution, increase in urbanization and change in culture, 56%, 48% and 43% of respondents agree which indicates that there is negative perception about rural tourism.

**5.4 Rural tourism generates additional income to local people:**



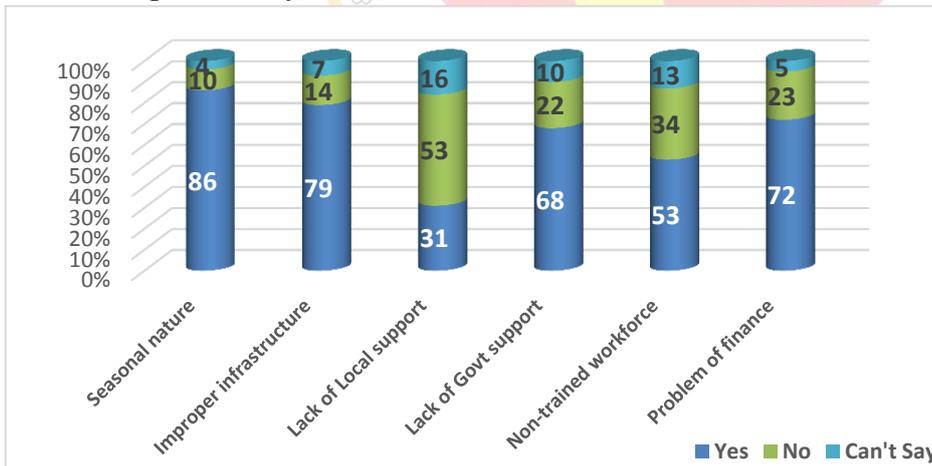
77% of the respondents think that rural tourism generates additional income to local ones. Most of the respondents are providing services or facilities along with their regular jobs or business. From locally available resources, knowledge, contacts, there operating cost reduces and additional income can be generated.

**5.5 Rural tourism generates sustainable income:**



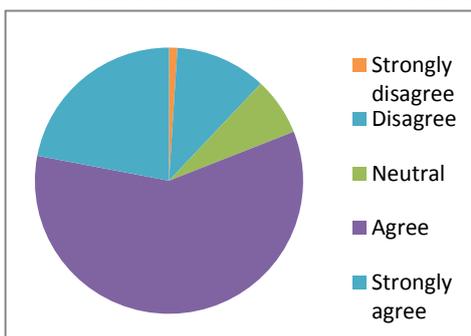
From the survey, it is understood that 71% of the respondents agree that rural tourism generates sustainable income to them. Once they realized the importance of rural tourism and look as new source of income, they take more initiative by providing better service to increase number of tourist. By effective use of social media, technology, advertisement, innovativeness and satisfactory service, tourist can be attracted. Same tourist can re-visit their place or makes mouth publicity, give references to others and this way sustainable income is generated forever.

**5.6 Challenges faced by rural tourism:**



86 % of the respondents faced the major challenges of seasonality of business. Similarly they also face other challenges like improper infrastructure, lack of government support, non-trained staff and problem of finance. But they are experiencing local support to promote their business.

**5.7 Satisfaction of tourist about rural tourism:**



It is observed that 59% of the respondents agree and 22% strongly agree that tourists are satisfied about rural tourism place visited. It means overall 81% of respondents are satisfied with rural tourism. But 11% respondents disagree about tourist's satisfaction. It means there is a need of making developments in services provided to them.

## 6. Conclusion:

Rural tourism is growing rapidly. People give preference to nature's beauty, heritage and culture. They want to take feel of rural lifestyle and enjoy natural environment. This has definitely crated opportunity for people located in rural area to attract such tourist and earn additional as well as sustainable income. Within their locality, they can generate additional source of income. They need to incorporate their culture, folk art, homemade products in single package and exhibit rural essence to tourist. Inspite various challenges, local community should develop their strong network and think commercially to bring professionalism in business. They should reach and connect themselves with the outer world by introducing good rural tourism packages. Definitely there is a huge potential in rural tourism and it can also change rural economy and help in rural development.

## 6. References:

1. www.ibef.org/industry/ tourism
2. Ali Turan Bayram, Ercan Karacar, Gul Erkol Bayram (2018) "Perception of residents towards the impacts of rural tourism in Sinop Province" Journal of Tourism and Gastronomy Studies 6/2 (2018) 512-522
3. Rezhen Harun, Gabriela O. Chiciudean, Kawan Sirwan, Felix H. Arion and Iulia C. Musresan (2018) "Attitudes and Perceptions of the Local Community towards Sustainable Tourism Development in Kurdistan Regional Governemnt, Iraq" Journal Sustainability.
4. Mr.Milind V.Talware, Mr. Upendrakumar A. Tiwari and Dr. B.B.Sonule (2015) Infrastructural facilities for Tourism Development in Konkan Region (Maharashtra State) Tactful Management Research Journal ISSN : 2319-7943
5. Dr. Devdatta Gopal Lad (2013) "Ecotourism Development in the Konkan Region of Maharashtra: A Review", Scholars Academic Journal of Biosciences, ISSN 2321- 6883, Vol 1(6):251-252
6. Dr. P. R. Karulkar, Dr. Madhukar Dalvi (2018) "Tourist's satisfaction about Tourism place : A Study of Sidhudurg and Palghar Districts of Maharshtra", International Journal of Research and Analytical Reviews, Volume 5, Issue 3, E ISSN 2348-1269, PRINT ISSN 2349-5138



## A Study of E-Wallets Preferences in Chiplun City

Mr. Chetan Prabhakar Khandekar,  
 Asst. Professor

### Introduction:-

E-Wallet is an online prepaid account used to store money and transact online through a computer or a smartphone whenever required. It is a pre-equipped electronic wallet which, just like a real wallet, is used by the customers to transact immediately (and securely). Unlike Bank Accounts, E-Wallets are considered to be a fast mode of digital transactions with guaranteed & secured payment gateways.

As studied in the research, people are now familiar with the applications of e-wallet companies i.e. Paytm, googlepay, phonepe, Freecharge, MobiKwik, amazon pay. Amazing and satisfying offers and discounts are offered for e-wallet users.

Mentioning some of the advantage: instant cashless payment, no need to access bank personally, get extra cashbacks, the amount gets refunded in case of failure, wallet to wallet money transfer.

Disadvantages: possibility of spending more money using easy way of E-wallet, if you lose your mobile you lose your e-wallet, battery and internet connection needed.

Awareness & Suggestions: Do not share your OTP /UPI PIN , fraud links to trap your bank account are sent on your mobile number, Do not proceed for transaction if your internet connectivity or bank server is low. Check the bank account number /mobile number/name of the receiver twice.

### Objectives:

- To Study The Awareness & preferences of E-wallet
- To Study The individuals purpose of Adopting E-wallet
- To Study Alternatives used by consumers To Traditional method of Payment

### Research methodology:

The current study is based on primary data collected from the different parts of Chiplun . A well-structured questionnaire was designed to collect the information from the respondents & to study the perceptions of customer towards adoption of digital payment mode(e-wallet) .The responses have been collected by means of Google forms from 100 respondents.

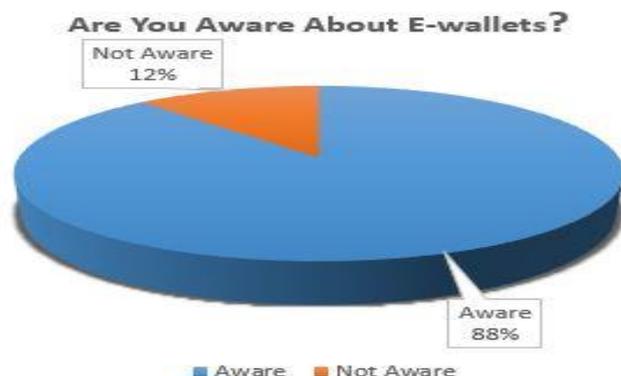
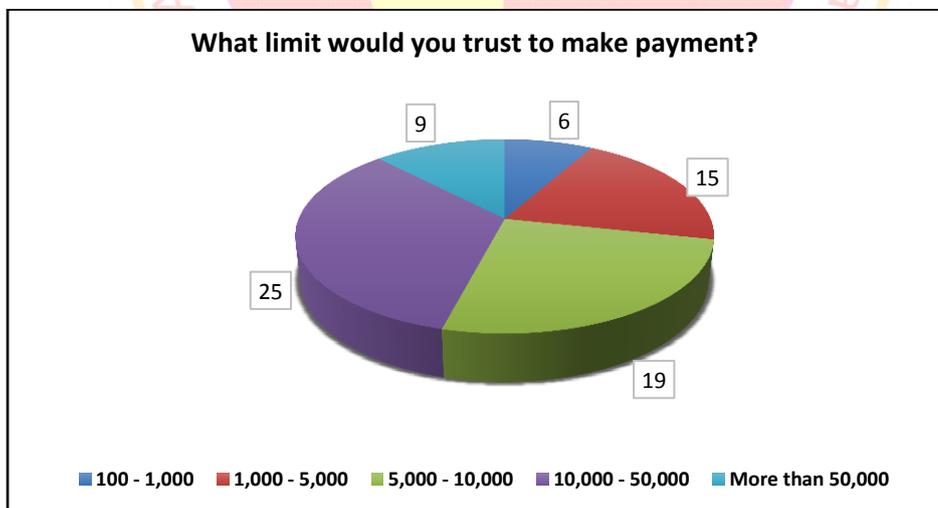
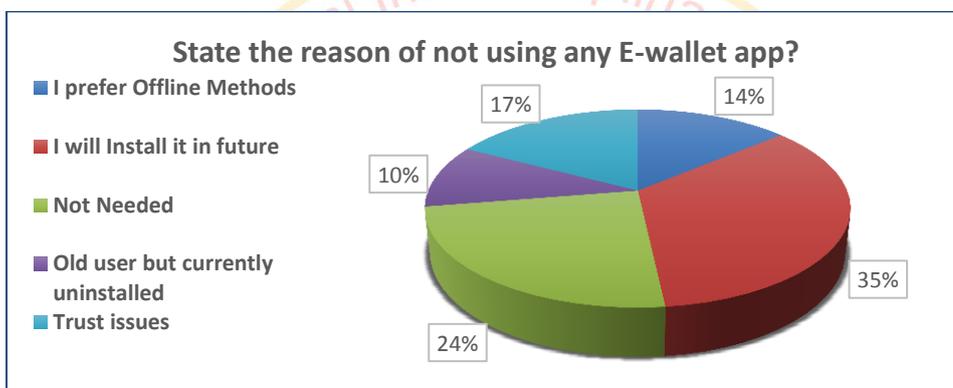
The data is analysed to find out :

- E-wallets are capable of providing benefits to individual.
- Why is E-wallet seeking attention of consumers.
- E-wallets are taking over the Traditional Methods.

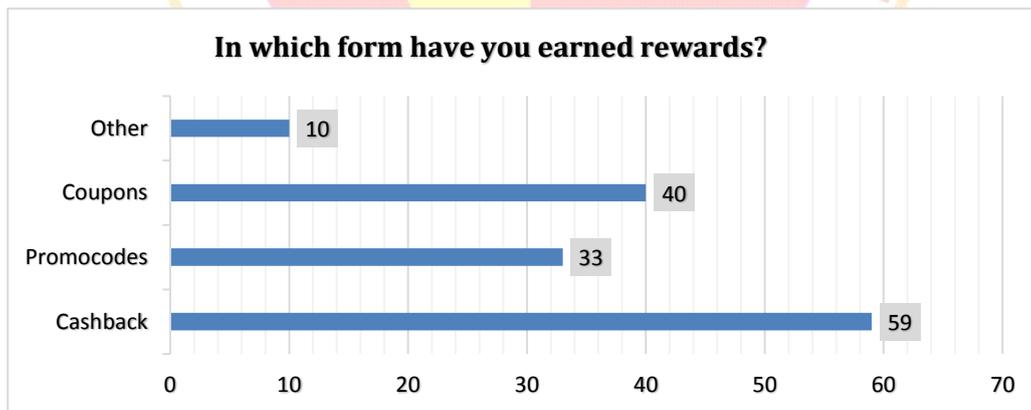
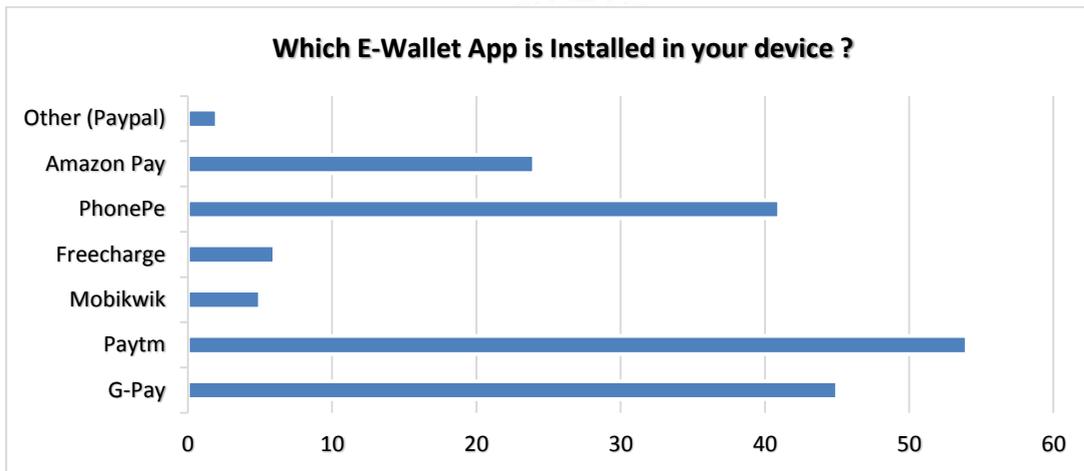
Doing payments via mobile phones has been in use for many years and is now set to explode. Also mobiles are increasingly being used by consumers for making payments. "E-Wallet" has become a part of consumers which are nothing but smartphones which can function as leather wallets.

E-wallet Features		
Store multiple credit card and bank account numbers in a secure environment.	Money Transfer & UPI payments	Partnership with your favourite Merchandise to support booking via app.
DTH recharges	Insurance policies	Give Exciting offers
Pay Utility bills	Municipal tax	E-commerce shopping store
Booking Movie, Bus & Flight tickets	Investments	Buying and selling of virtual gold
Mobile recharges	Donations	Settling up credit card bills.

Data analysis:-



### Existing users



#### Findings:

- Social media active users are aware. i.e 88% of the respondents are totally aware about E-wallets.
- 72% Active users finds convenience in settling bills and recharges via E-wallets
- E-wallet is successfully seeking consumers attention through its promotional offers i.e cashbacks, discounts, rewards. Most of the people transfer money just for the sake of rewards.
- The modern age group prefer to transfer money without carrying cash for their convenience and time management.
- Google pay , Paytm , Phonepe are the leading e-wallet apps among all other apps
- 81% of the respondents friendly make transaction from their linked bank account with the trust of UPI/OTP

**Conclusions:**

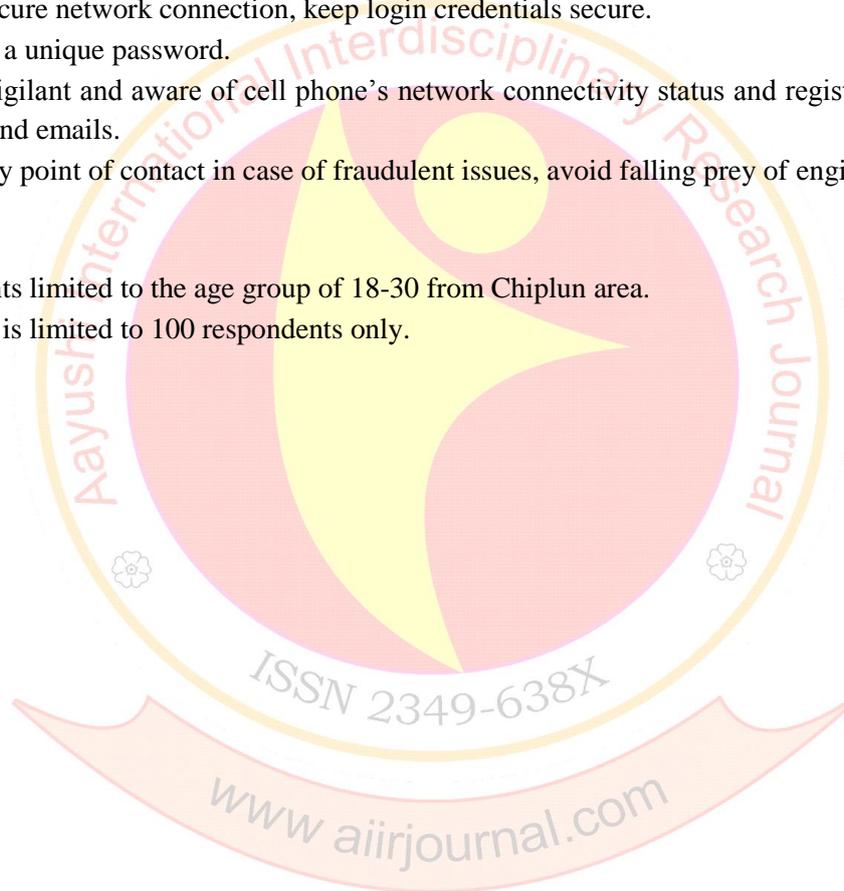
- E-wallet is Economical and preferred by all age groups
- 72% of the respondents were existing users.
- 28% Aware but not using E-wallet apps for their comfortable reasons.
- From this research it has been concluded that working status of the consumer is not likely affected to use E-wallet.
- Respondents involved in different professional services are maximum users of E-wallet , Businessman users prefer offline methods to transfer large amount of funds for their business purposes
- 3% responses experienced failed transcatons, loss of money , refunds, but yet recoverable. No major loss
- 97% respondents feel secured, friendly and easy to use E-wallet

**Suggestions:**

- The URL of the webpage should be verified, Install apps from trusted sources.
- Use secure network connection, keep login credentials secure.
- Create a unique password.
- Stay vigilant and aware of cell phone's network connectivity status and register for alerts through SMS and emails.
- Identify point of contact in case of fraudulent issues, avoid falling prey of engineering tricks.

**Limitations:**

- Respondents limited to the age group of 18-30 from Chiplun area.
- This study is limited to 100 respondents only.



## Cash Less Transactions And Green Banking: The Perception Of Customers Towards Green Banking Techniques Of Commercial Banks - A Study Made In Anegudde Village Of Karnataka State

Nagaraja U & Sandhya M

### Introduction

The protection of environment is considered to be the prime goal of all business today. Banks along with other financial institutions are also concentrating on the protection of environment. Banks also have an unlimited liability and cannot escape from the fact of the discharging their Corporate Social Responsibility (CSR). These days following Corporate Social Responsibility norms is the statutory requirement as well. Profiteering should not be the sole motive of the banking business. Along with the concept of bank concentrating on earning profit it should also aim at protecting the ecology comprising of the people as well. However it has been observed from the study that not much initiatives have been taken by some of the banks in India even though each bank plays a major role, in the development of the country.

Banking sector in India is under a huge amount of pressure making it to do the business ethically. In the year 1990 to promote sustainable banking across at the International level United Nation Environmental Programme Finance Initiatives (UNEPFI) was established. Some of the most dominating countries have also been penalised heavily for violating their social responsibilities. A sustainable banking development can take place by developing a minimum use of papers in day to day transaction, protecting the energy resources, lending for green businesses etc.

### Literature Review

**M Narmadha (2016)** the concept of green banking will serve the bank, industry and the economy in general. Each will be mutually benefitted. It was also felt that the green banking business will certainly improve the asset quality of the banks in future.

**Sudhalakshmi and Chinnadorai(2014)** tried to present the status of Indian banks and said that it is essential for all the commercial banks operating in the emerging India to adopt Green banking business. It also said that the step towards gong green will certainly secure the future.

**Rajiv Khosla and Parul Munjal (2013)** said that banks have enough scope to be familiar with their Value Added Services especially in rural areas. They say that to succeed in the long run they should be innovative and provide advanced services.

**Yadav and Pathak (2013)** said that Indian banks have realised the importance of protecting the environment. It was also found out by them that a large number of green initiatives have been taken by public sector bank when compared with the private sector banks.

**Vinay Kumar Nagu (2012)** have come out with the findings that E-CRM has reduced cot of banking operations and has increased customers loyalty.

**Pravakar Sahoo and Bihu Prasad Nayak (2008)** have said that a sincere attempt to implement green banking will serve as an effective too to mar the polluting industries that give a pass by to the other institutional regulatory mechanism

### Objectives of Study

The study has been executed with the following objectives.

- To understand the Green Banking Approaches of different commercial banks.
- To know and understand the initiatives taken by the public sector banks and the private sector banks.
- To understand the level of perceptions of general public about green banking products
- To understand one of the green banking initiatives namely cash less transactions done through internet

### Methodology

The main source used for study is the primary data. It has also made use of secondary data. A structure questionnaire has been drafted and used to collect the primary data. This questionnaire is circulated amongst

the bankers and the customers. The study has also considered the different literatures that are available offline and online as the information aid and are considered as a part of secondary data.

### Area Selected

A coastal village of Udupi district of Karnataka state named Anegudde has been selected for the study. It is a village with approximately less than 50000 population. In this village itself there are two commercial banks one of which is a private bank. The other one is the nationalised commercial bank.

### Limitations Of The Study

Any study made cannot be of no limitations. Hence the study here was also carried out with the following limitations:

- The sample size of bankers and 50 customers are too small to conclude
- Only two public sector banks and two private sector bank found in this village were considered
- Some of the respondents were unaware of the concept of green banking and the availability of different green products
- Time was the constraint to make an elaborate study

### Environmental Protection And Banks:

Each and every bank plays an important role in the sustainable development of any country. The banks might contribute indirectly also when they finance the economic activities that are adversely affecting the environment that is nothing but environment hazardous in nature. Before financing any project which is dangerous to the environment banks should think diligently and should finance only those projects which preserves natural resources, pollution free projects, projects providing safe and healthy life etc.

A direct and an indirect contribution is done by the banks to the environment as the banks finance various projects which may or may not affect the environment. These will in turn influence the environment. The influence can be a direct or indirect which again depends on the type of the project that the bank has funded. The direct influence on the environment by the bank takes place when a loan is lent to finance a project. The direct influence is observed when the bank plans for the use of power for the lights, computers, ATM machines etc. In addition banks also need water and they are required to dispose the waste water and materials. All this will directly influence the environment.

In addition to the above, the external policies of the commercial banks will influence the environments indirectly. The external influence may be in terms of bank lending to the projects which are not environment friendly.

### Green Banking And Financial Products

There are various green banking financial products they are as follows:

- ✓ Green loans
- ✓ Green credit cards
- ✓ Green deposits
- ✓ Green reward checking accounts
- ✓ Green saving accounts
- ✓ Green mortgages
- ✓ Green banking and online banking

### Green Banking And Axis Bank

Using environmental friendly technologies has been driving force of present environment. As discussed under observed funding the renewable and clean tech projects not only develops technologies but also brings down the cost.

AXIS bank has taken the green initiatives in the following manner:

- Subscribe to the E-statement to reduce paper consumption are encouraged.
- Adopting the concept of green building is encouraged
- Conducts tree plantation programs
- Solar system as a energy resources has been used
- Rain water harvesting has been encouraged
- Furniture are used by using recycled materials for greater extent
- Ten ATMs that are solar based are operating with the solar based UPS

### Green Banking And Icici Bank

Environmental protection strategies have also been initiated by ICICI bank. Various convenience banking facilities such as Any Time Banking, Internet Banking, Tab Banking, and IVR Banking are introduced as a part of green initiatives of bank. All banks are functioning electronically. The bank claim that through sending of e –statements it could able to save tonnes of papers. Making use of public transportation and pooling of taxes are encouraged to be adopted by the employees of the bank. The bank is also using shedding and recycling of all papers internally. Sharing of files electronically, voice mails and emails have replaced the issuing of paper memos. The bank has adopted two sided printing approach to reduce the quantity of papers used for the printing. To recycle waste water and to use the same for wash rooms and gardening water treatment plants have been established in some of the branches.

### GREEN BANKING INTIATIVES AND PUBLIC SECTOR BANKS

One of the major public sector bank namely State Bank of India has also started the green banking business. Collaborating with Suzlon Energy Limited in the field of wind mills at Panapatti village, Tamil Nadu, it has initiated various green banking projects. Socially and environmentally sustainable initiatives have also been taken by signing to the Carbon Disclosure Projects. Solar plants in collaboration with the EXIM Bank of India, the bank has agreed to build solar plants in India. More and more encouragements have been given by funding the green oriented projects. Using of ATM cum Debit Cards YONO Banking etc. have been encouraged for the ultimate of the customers. It also encourages paperless transactions. The bank could able to win different prestigious awards such as 'Best customer initiative award' for the green channel counter at the IBA Technology Awards for its green initiatives.

Canara Bank in the year 2013 has undertaken the green initiatives as follows:

- Mobile banking
- Internet banking etc

Several e-lounges such as internet banking, pass book printing, ATM, online trading etc. have been established. The very important point need to be mentioned is that the bank has stopped lending to the projects producing Ozone depletion substances. A compulsory clause has been inserted in the loan paper that the project should obtain No Objection Certificate from the central or state pollution control board to get funds from the bank.

### Serving The Purpose Of Green Banking Through Cashless Transaction In India

The recent digitalization of Indian economy has led most of the Indians to prefer ATM based transactions rather they preferring to point of sales payment transactions. In other words in India people do prefer ATM based transactions compared to Point Of Sales payment transactions. The data revealed by RBI also shows that the total value of ATM based transactions has also increased to a remarkable extent. It is noteworthy to remember that the card based transactions have also increased in the recent times.

#### Bank wise ATM/POS/CARD statistics for Oct 2019

Name of the bank	Credit card				Debit card			
	Amount of transactions using				Transactions using			
	ATM		POS		ATM		POS	
	On site	Off site	On line	Off line	No of transactions	Amount of transactions(lakhs)	No of transactions	Amount of transactions(Lakhs)
<b>Canara Bank</b>	4715	4066	23552	0	56723	2823.5	832855	19711.7
<b>SBI</b>	25602	32935	750252	0	127092	4970.7	37478893	1275643.8
<b>Axis Bank Ltd</b>	5322	1243	504211	0	75469	3454.7	17726691	758628.6
<b>ICICI Bank Ltd</b>	5416	9956	447284	0	51627	1919.8	30156892	937262.7
Grand total of 64 banks	<b>110425</b>	<b>97318</b>	<b>4825074</b>	<b>0</b>	<b>833239</b>	<b>41519</b>	<b>202809408</b>	<b>7115615</b>

Source: <https://rbi.org.in/scripts/atm>

It is found that ATMs have larger reach than a bank establishing a branch as they serve the purpose faster. They are easy to maintain and can serve 24x7 when compared with branch serving only for 8 hours a day.

On an average a branch banking transaction is costlier than an internet based transaction to a bank. A branch banking transaction costs a bank about Rupees 40-50. On the other hand an internet based transaction costs Rupees 15-30 per customer to the bank. (Source: the hindubusinessline.com nov.17, 2015)

A noteworthy point here is that a reduction in the banking cost take place when a customer opts for more and more card based transaction. An important point here is to notice that as the customer opts for more and more internet based banking the banking cost to the banker will reduce. Lending at an attractive rate is possible for the banks when the cost of more and more internet based banking starts getting reduced. This will make the customer to bank on. It will also lead to the creation of capital indirectly. Generally we know that a customer as an investor of a bank will expect higher return in the form of interest on the amount that he/she invests in a bank. Obviously an investor will panic when a reduction in the rate of interest on the deposits that he/she has made takes place. Indeed we should accept this fact. This will be only for a shorter period. But in the long run there will be a definite positive impact due to cent per cent banking transactions as they come within the close surveillance. These will increase the revenue to the government which will add to the growth. The good effect of this also the control of inflation. A reduction in the rate of interest should not make the investor to panic. One should remember that so long as the rate of interest is more than the rate of inflation it is always a good situation.

**Outcome Of The Study**

Following results have been noticed from the study:

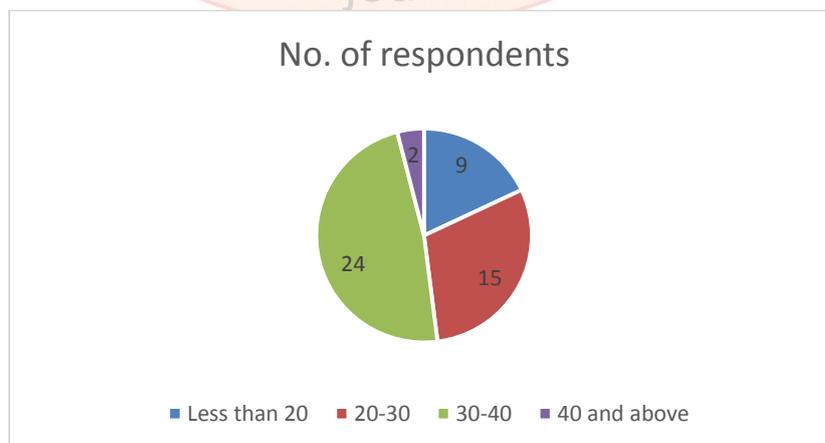
**Use of Net banking as a part of Green Banking:**

Knowledge of online banking	No of repondents saying yes	Percentage
	32	18

Out of 50 respondents 32 have said that they know about online banking and the remaining 18 have said that they do not know about online banking.

**Age and knowledge of green banking:**

Age group	No. of respondents	Knowing	Not knowing
Less than 20	9	7	2
20-30	15	11	4
30-40	24	18	6
40 and above	2	1	1



The above table and the chart reveals that the age of the respondents will not influence much regarding the use of the green banking products. Each category of the age group are aware of the green banking products to almost on an average of 69 percent extent.

**Option to select the green banking products:**

Type of facilities	No. of respondents using	Percentage
ATM/Debit card	44	88
Credit card	06	12
Online banking	18	36
Wallet application	03	06
Any other	06	12

It is observed that 88 percent of the respondents have said that they have the ATM/Debit cards and they are using it. Only 12 percent of the respondents use credit cards as they feel that using the credit card is a costly affair thing to do. 36 percent of the respondents have preferred online banking to pay and transfer funds.

**Frequency of internet banking as green banking initiative:**

Options	No. of respondents	Percentage
Once a day	12	06
More than 6 times a week	22	16
4-6 times a week	8	08
2-3 times in a week	5	06
Once a week	3	12

It has been observed that 44 percent of the respondents use internet banking more than 6 times a week. 6 percent of the respondents use internet banking only once in a week.

**Conclusion**

Not only as a part of corporate social responsibility but also as a moral responsibility as each and every bank should initiate green banking business may be as a step by step initiative measure. An ensuring of safe environment is done through this green initiative. The concept of going green will not only simplifies the process of banking but also brings more and more cost efficiency by protecting the economy as a whole. The success of green banking lies with the initiatives of bank's way by which it tries to popularise the same. The unknown green banking products should be made know to the general public. There is an urgent need to educate the rural population with regard to green products only then it is popularised.

**References**

- Chinnadorai, and Sudhalakshmi K (2014). Green Banking Practices in Indian Banks. International Journal of Management and Commerce Innovations , 232-235.
- Dattatreya, J. A. (n.d.). A Study of Indian Banking Sector- Recent Trends and Challenges. Asian Journal of Research and Finance , Vol 6 Issue 9 1-8.
- Yadav R and Pathak G (2013). Environmental Sustainability Through Green Banking: Astudy on Private and Public Sector Bank in India. OIDA International Journal of Sustainable Development , 37-48.
- Parthiban, V. N. (n.d.). Factors Inflencing the Banking Customers to Adopion of Mobile Banking: A study with special reference to Chennai City. Sumedha Journal of Management , Vol 5 Issue 3 p 93-100.
- (n.d.). Retrieved December 2016, from rbi: <https://m.rbi.org.in>
- M, Narmadha. (2016). A Study on Customer Awareness on Green Banking in Selected Public and Private Sector Banks in Chennai. International Journal of Management , 24-35.
- Alice Mani (2012). Major Banks should lead toward green banking.
- Shailesh. (n.d.). Retrieved December 2016, from <http://greencleanguide.com>
- <https://www.icicibank.com>
- <https://www.onlinesbi.com>
- <https://www.canarabank.in>
- Pravakar Sahoo Bibhu Prasad Nayak. Green Banking in India. Indian Economic Journal .

**Analysis of Marketing and Pricing Policies of Cashew as Farm Product**

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**Introduction**

Cashew is one of the important tropical crops called as the 'poor man's crop, rich man's food'. The cashew nut is native of Brazil and Portuguese travelers took the cashew tree to colonies in India, first recorded in Cochin by 1578 AD, in Goa by 1598 A.D. (Mohod A. G. et al., 2010). The commercial cashew production in India was started in 1960. Ever since, the production and productivity of the cashew is increasing. The National Horticultural Mission (NHM) has supported well to bring more and more area under cashew cultivation. India has progressed in developing new cultivators, progression system and also a large number of products, which could be improvised with further research. The need for the development of propagation technologies is being increased for providing higher returns for the farmers producing cashews. This could bring out cashew cultivation possible even in the non- traditional regions. Use of seedlings propagated from seeds, poor adoption of improved planting materials (clone), low population density per unit area and adoption of poor agronomic practices can also help improve yield. The market price of the cashew is very attractive that also inclined the farmers for its cultivation. The statistics on area, production, and productivity of cashew in different state of the country reveals that the state of Maharashtra ranks first in the production and productivity. The area under cashew in Maharashtra is about 1.75 lakh ha and the production is 1.98 MT. The productivity of cashew in Maharashtra is 1186 kg/ha compared to average value of 695 kg/ha for the country (CEPC, 2012). In last few years in Goa, the cashew yield showed the increasing trend exceptionally in one or two years. (Table 1).

**Table 1 Year-wise cashew production (tons) in Goa (Source: Times of India)**

Year	Cashew yield
2017-18	28,012
2016-17	24,396
2015-16	17,549
2014-15	25,011
2013-14	24,332

Climatic condition at the flowering and fruit setting stage are the crucial factor that primarily determines the yield of the cashew. As raw cashew nuts need to have processing i.e. boiling or roasting and shelling or cutting, cashew nut processing industries have good demand in the cashew growing areas. Cashew industries is a good source of employment for the local people. The cashew mill in India employed different unit operations/methodology for processing and depending on variety of raw material, location, technological mechanization and availability of secured energy supply. The most energy and time intensive unit operations in cashew processing are drying of raw seed in open sun, steaming of raw nut and kernel drying with electrical energy (Balasubramanian, 2000). The average installed production capacity of the surveyed cashew processing industries was about 9800 kg of raw cashew nut seeds per annum. The actual raw material processed by these industries was in the tune of 5833 kg per annum, which revealed the average percent plant capacity utilization of 55% only. The women workers were prominent in the small scale cashew nut processing mills. (Mohod A. G. et al., 2010). Based on the observations, economic analysis of cashew nut processing plant showed that, if the plant be operated with full capacity and efficiency then there would be profit of ` 1329.07 per day, excluding all expenses. This is quite profitable, but the profit margin could be increased more by plant mechanization and modernization. Processing capacity could be increased with significant reduction in labour requirement and processing time by modernizing the processing plants. (Banerjee and Shrivastava, 2014).

**Table: AVERAGE PRICING TREND OF RAW CASHEW**

NUT IN DIFFERENT STATES (Prices Rs/Kg)					
Year	Kerala	Karnataka	Andhra Pradesh	Tamilnadu	Goa and Maharashtra
2018	158.87	148	144	150	164
2017	133.03	137.22	114.18	101.8	142.02
2016	99.68	112.69	100.35	80.68	129.81
2015	90	115	74.84	72.27	122
2014	61.32	78	74.2	63.89	87.08
2013	51.8	53	52.5	55.5	72.78
2012	59.59	60.5	58.5	60.5	76.67
2011	71	70.5	70	71	83

Cashew nut occupies a prime place in the Indian economy, accounting for 16.95 per cent of the total area under plantation crops, which stood second position after coconut, and production of cashewnut accounts to 16.57 per cent of total production of selected plantation crops in India during 2000-01. India possesses about 21.6 % of area under cashew plantations (Murugamani & Ravi, 2016). It is the third highest foreign exchange earner among agro-based export items with production standing at 6.95 lakh tones and productivity of 778.28 kg/ha (Indian Cashew Statistics, Cashew nut Export Promotion Council, Cochin, 2010) It provides beneficial employment for about 3 million people all around the world, in which, about 1 million are employed in India alone (Padmbanaban, 2010).

The cashew apples, cashew kernels, broken and whole; raw cashew nuts; roasted cashew nuts and cashew nut shell liquid (CNSL) are the forms in which the cashew can be sold in the market. As cashew apples are perishable, it is having the local and very less market value. Cashew apple which is major part of Cashew Produce is perishable goes waste unlike in Goa where it is used to extract Alcohol. CNSL is a byproduct of the cashew industry having tremendous export potential. In spite of this potential, a good portion of it still continues to be burnt as crude fuel in the local manufacturing units for running boilers or other purposes. Export of CNSL from India stood at 6,908 MT, valued at Rs 26.28 crore (US\$ 4.08 million) during April 2017-December 2017, while exports of cashew kernels stood at 67,653 MT, valued at Rs 4,715.21 crore (US\$ 731.15 million) during the same period. (Indian brand equity foundation,2017).

Due to recent rise in interest from other countries, cashew production and processing has reached new heights. As per food and agricultural organization's report of 2012, India made about 1,72,719 metric tons (MT) of cashews in the country at a rate of 0.70 MT/ hectare (Murugamani and Ravi, 2016) (Table 2). India is the single largest producer and exporter of cashews, accounting for 40 % of the global share. It is also the largest importer of row cashew nut globally, with around 8 lakh metric tons of average annual imports, followed by Vietnam.

**Table 2 Leading cashew nut producing countries and its production.**

Sr.No.	Country	Production in MT
1	India	1,72,719
2	Cote dlvoir	1,71,111
3	Brazil	1,33,000
4	Vietnam	1,13,059
5	World	7,38,861

(Source: Global statistical Review 2015)

Cashew is a major crop in Ratnagiri and Sindhudurga districts such as Lanja, Sangmeshwar, Chiplun, Khed, Mandangad, Sawantwadi, Kankavali and all those areas beyond 15 kilometers from the sea coast. Vengurla varieties give good seed count. Cashew grown locally gives good outturn especially the vengurla varieties. Organised plantations are better managed with fences and compounds, irrigation and use of organic material such as vermicompost and othercompost to maintain soil fertility.

The major challenges faced by the Indian cashew trade industry are stringent policies regarding cultivation, availability of labor, competition from other crops and competitive pricing of crops. India is facing major competition with cashew producing country like Vietnam and Nigeria. These countries are exporting its cashew at cheaper rates than the domestic rates of our country.

**In view of the above, it was felt necessary to conduct a survey and analyze the data available through internet to find out the new technology adaptation of cashew industry in south Konkan region.** The study was also focused to evaluate and understand several value added products of cashew industries, to understand labor related issues and women empowerment as a result of cashew industries and to understand other subsidiary activities that can be conducted to improve cashew industry.

### Research Methodology

A survey was made with a questionnaire to know the status of the cashew nut processing industries in the South Konkan region. The information was gathered through the interviews with the industry owners and the labors. The data available on internet through the reliable resources was used for the study. Among the four district of Konkan region, the two district of south Konkan viz. Ratnagiri and Sindhudurga were selected for the study. Total 6 processing units and 50 farmers selected randomly. The information from sample grower was collected by survey method through personnel Interview and data pertaining to the agricultural year 2016-17.

The current study tries to elucidate the problems associated with the cashew industry, from production to marketing and the generation of revenues. The current study is shedding light on the current status of cashew industries and recommends improvements to current practices adopted by them. This research is descriptive in nature as it aims to establish detailed understanding of the topic and providing an overview of the cashew industry as a whole. To examine the challenges faced by the industry it is essential to realize the issues faced by the people who are closely and directly linked to the industry. Keeping in mind the overall requirements of the study, it was suggested that a quantitative method of data collection be applied. This study utilized both primary and secondary data for the purpose of data collection for the research. The primary data shall be obtained by means of a questionnaire that was designed keeping in mind all the variables that were to be tested. The questionnaire shall be closed ended with two major sections; one to obtain demographic information and the next containing questions related to the problems faced by the industry. The primary data shall be collected from traders from within the cashew processing industry who have inside knowledge of the workings of the industry. The survey aimed to the traders who belong either a processing or a producing industry in the state of Maharashtra in Sindhudurg district.

### Results and Discussion

The observations recorded through the survey, interview and the internet data reached to the following conclusions.

Estimated tentative export and import of cashew for December 2017 showed that India is having a good quantum of export compared to the import. This in turn adds to the income to the farmers and in all to the country too. In 2016, the export and import both were more compared to estimated in 2017. This might be because of the production, cost of the produce and the demand by the consumers. It is observed from the table below that the cost of the imported cashew kernels is remarkably less than the export value. This indicates that even importing and then the cashew kernels can be a good business.

**Table 3 Estimated tentative Export /Import details of cashew kernels for December 2017  
(Source- CEPCCI, Cochin 2018).**

Export/Import	Quantity	Value	Value	Unit Value
	(M T)	(Rs. Crs)	(US \$ Mins)	(Rs. Per Kg.)
<b>EXPORT</b>				
Dec-17	8031	528.44	82.26	658
Dec-16	8476	581.57	85.65	686.14
April 2017-December2017	67653	4715.21	731.15	696.97
April 2016-December2016	61369	3739.32	557.36	609.32
<b>IMPORT</b>				
Dec-17	40	1	N.A	336.14
Dec-16	493	26.22	3.86	531.85
April 2017-December2017	2651	161.46	25.04	609.07
April 2016-December2016	2964	146.56	21.85	494.47

**Cashew grower' condition**

Cashew growers, especially the small cashew growers are least bothered about the market rate of the raw cashew nuts. To curtail the efforts to go up to the industry, they use to sell their produce to the mediator. Mediator purchase the raw nut at comparatively low rates. It was also observed that there many middle persons who are earning on the basis of purchasing from the farmers and making stocks and selling it to the industries at higher rates. It is even observed that the scrap dealers (kabadi or bhargarwalas) are also involved in this business just as middle person. This is because they are having good investing capacity. During the season, they work more on cashew nut dealing than the scrap. The growers due to their negligence, laziness and more over periodic harvesting of the cashew nuts, avoids to make the stock locally and selling it to the industries. Non availability of the cashew processing industries also compels them to do so. The transportation of the raw nut in small quantity up to the industry adds to the expenditure and reduces their benefit. Hence, they prefer to sell it to the local middle man only. The middle man gets the benefit that all the nearby cashew nut growers contribute raw cashew nut to him that helps to transport a lump sum quantum of cashew nut to the processing industries. It reduces the transportation cost and adds to his benefit just for making stock.

**Status of cashew processing industries**

The fuel and the labor requirement of the cashew nut processing industry is very high. This is due to the fact that most of the industries are working on the old technologies. The industries are set up according to the land availability and no importance is paid to the proper lay out of the industry. The old industries are set years back and are expanded as per the space available. Due to the improper layout of the industry, the time and motion required for the processing is much more than the properly set and layout newly established industries. The small and medium processing industries are still stuck up to the traditional practices even though new technologies are available. The lack of technology transfer, insufficient capital investments, shortage of resources and mere negligence may be the cause behind it. The minimum concern have been paid to the safety and ergonomic standards in the industry. In some industries it was observed that even availability sufficient light is lacking. The workers are least bothered about their health. Deogirikar et al. (2016) observed that the layout of the industry affect the processing cost. They found in their study of two different industries that the properly lay out industry has the processing charge as Rs 553 per kg compared to Rs 597 per kg in the gradually expanded and improperly layout industry. More processing cost reduces the profit to the owner.

**Cashew nut shelling machines in industries**

Many of the cashew processing industries in Sindhudurg are using the manually operated cashew nut shelling machines. The reason behind it the low investment capacity of the industry owner, gradual expansion of the industry, he feels it is less risky to have more number of small units than a costly bigger unit. The owners believe that the quality obtained by shelling the cashew nut with the manual machines are far better than the automatic machines considering the oil deposition over the cashew kernels. Owners are used to manually operated units as female labors are available for doing the shelling operation. Their per day shelling

capacity is also good (about 25 kg kernels per day). During interview with the owners, it came to know that automatic machines are avoided because the servicing and repairing facilities are not available nearby. The technician has to come from Kolhapur for the minor technical faults too that held up the job.

#### Unit operations on cashew nut processing and the energy utilization

It was observed that the equipments adopted by the industries are not the standard and hence the energy consumption is supposed to be much more than the actual needed. There is a scope for an overall energy savings of up to 30–48 % and utilization of renewable energy sources such as solar energy and biomass gasification in this sector (Mohod et al., 2010). As the unit operations are scattered in the industry, there is wastage of human energy due to more movement in the premises during the processing.

#### Challenges associated with Cashew Industry in Ratnagiri and Sindhudurga.

Table : Constraints Faced By Cashew Processors

Sr.No	Problems
1	Non-availability of adequate working capital finance & high rate of interest
2	Non -availability of quality raw material and their prices were high
3	Govt. rules and regulations
4	Problem of raw cashew nut storage
5	Problem in marketing of cashew kernels
6	Non -availability of labour in time and adequately

#### The major challenges associated with processing and marketing of cashew nut are found to be

1. High wage rate of labors
2. Non-availability of sufficient skilled labour,
3. Non-availability of graded and good quality of raw material
4. High commission rates of the agents
5. Improper layout of industry
6. Location of the processing industry with respect to transportation facility
7. Distance of processing industry from the main market i.e. Sindhudurg to Mumbai and Goa is about 500 km and 580 km respectively.

**KOCHI:** The Indian cashew industry is facing the double whammy of plunging exports and weak local prices that have hit profitability of the processing units in the country. Exports fell to a two-decade low in 2018-19, down 20 per cent year-on-year to 66,693 tonnes and, in terms of value, down 24 per cent year-on-year to 4,434 crore, according to the data of the Cashew Export Promotion Council of India (**CEPCI**). From over 1,00,000 tonnes, the export quantity has fallen steadily in the past few years as **Vietnam** and other countries held a price advantage over India through lower processing cost.

#### Conclusion

Cashew is the major source of foreign exchange earnings, jobs and income in rural areas. A major portion of produce is brought by village traders and agents who visit the growers as well as open the shops in weekly market for collection of raw Cashewnut.

Cashew grower's preference for different channels was assessed and five Cashewnut marketing channels were observed in the study area. They were

1. Channel I : Grower- Village merchant- Wholesaler- Processor.
2. Channel II: Grower- Itinerant merchant/ village merchant- Processor
3. Channel III: Grower- Village merchant- Factory agent- Processor
4. Channel IV: Grower- Wholesaler- Processor
5. Channel V; Grower- Processor

The channel I was most popular in the study are as 45 and 40 per cent cashew grower in Ratnagiri and Sindhudurg districts respectively sold there produces through this channel. Among the different marketing

cost, transport cost was a major item of cost. When marketing efficiency is more than that marketing channel said to be more efficient. In study area channel V is the most efficient having 1:76.56 and 1:67.06 marketing efficiency in Ratnagiri and Sindhudurg districts respectively. So the producer should be encourage to sell their produce directly to the processor to get highest price.

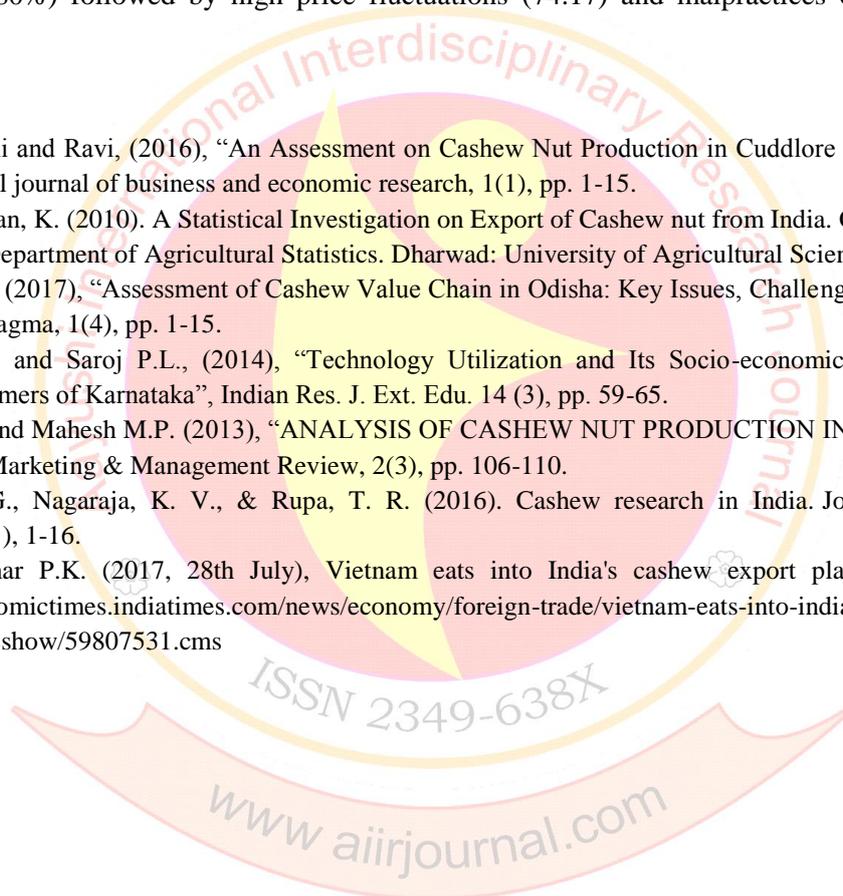
Cashew is the perennial plantation crop having gestation period of four years. During this period of establishment a cashew grower has to incur initial investment. The establishment amount per hectare required for HYVs cashew orchard was Rs 77519.97 and for local variety cashew orchard was Rs. 27253.29. Out of total establishment cost maximum expenditure was incurred on labour wages ie 37.21 per cent in HYVs and 33.05 per cent in local variety of cashew.

The benefit cost ratio was higher in HYVs cashew orchard (1.95) than local variety cashew orchard (1.71)

The major marketing constraints expressed by the cashew growers were problem of distant location of processing units (80%) followed by high price fluctuations (74.17) and malpractices of village merchant(65.83%)

### References:

1. Murugamani and Ravi, (2016), "An Assessment on Cashew Nut Production in Cuddalore District, Tamil Nadu", International journal of business and economic research, 1(1), pp. 1-15.
2. Padmabanab, K. (2010). A Statistical Investigation on Export of Cashew nut from India. College of Agriculture, Dharwad, Department of Agricultural Statistics. Dharwad: University of Agricultural Sciences.
3. Panda P.K., (2017), "Assessment of Cashew Value Chain in Odisha: Key Issues, Challenges and Way Forward", Research magma, 1(4), pp. 1-15.
4. Sajev M.V. and Saroj P.L., (2014), "Technology Utilization and Its Socio-economic Determinants among Cashew Farmers of Karnataka", Indian Res. J. Ext. Edu. 14 (3), pp. 59-65.
5. Senthil A. and Mahesh M.P. (2013), "ANALYSIS OF CASHEW NUT PRODUCTION IN INDIA", Asia Pacific Journal of Marketing & Management Review, 2(3), pp. 106-110.
6. Bhat, M. G., Nagaraja, K. V., & Rupa, T. R. (2016). Cashew research in India. Journal of Horticultural Science, 5(1), 1-16.
7. Krishnakumar P.K. (2017, 28th July), Vietnam eats into India's cashew export plans, Economic Times, <https://economictimes.indiatimes.com/news/economy/foreign-trade/vietnam-eats-into-indias-cashew-export-plans/articleshow/59807531.cms>



## Need of Security Using Ethical Hacking

Mrs. Ashwini G. Salunkhe ,Dr. Rajendra Patil , Mr. Sachin S. Bhosale

### Introduction

Security is the major fact in today's technical world where internet use is very vast and fast growing. Every organization has problems related to the security about their personal, sensitive and confidential data. This is done only because of hacking, Hacking is done by a one who gain illegal access to data and system resources having wrong intentions. There are two types of hackers, one who has permissions of the security experts for securing data using hacking tools and techniques and the other who uses that techniques and their skill to break security to harm the organization.

Some of the most costly and effective victims of hacking have been businesses. Businesses are many times targeted to hack their customers' personal and financial data and often are targeted by their own employees, whether dissatisfied or just opportunistic. Businesses can lose billions of dollars yearly as because of hacking and other computer holes. Many times, the true cost cannot be evaluated because the effects of a security breach can linger for years after the actual attack. Companies can lose user confidence and in many cases are held officially responsible for any loss to their customers. The cost of recovering from an attack can spread quickly: legal fees, investigative fees, stock performance, reputation management, customer support, etc. Companies, and more recently, consumers, are investing more and more money into preventing an attack before it actually happens. Businesses that hold stores of consumer's personal and financial data are especially taking extra steps to insure the data's safety.[5]

### Survey of Internet Crime Complaint Center

According to the IC3 website "Internet Crime Control Center". It includes yearly and aggregate data for complaints and losses over the years 2015 to 2019. Over that time period, IC3 received a total of 1,707,618 complaints. According to this survey(Fig.1) the complaints count are increased from 2015 to 2019.[2]

### Types of Hackers

There are mainly three types of hackers who perform different activities of hacking, which are explained below:

- White hat hackers
- Black hat hackers
- Grey hat hackers
- White hat hackers



Figure 1: Complaint records of IC3 [2]

These hackers are also called as ethical hackers or pen testers. Ethical hackers attempt to penetrate into the system to exploit vulnerabilities in the system, network and applications. White hat hackers always takes

approval of the security experts to find weaknesses and vulnerabilities that a malicious hacker could potentially exploit.

## 2) Black hat hackers

The crackers means black hat hackers. The black hat hackers exploit vulnerabilities of the system, network or application using different hacking techniques and their skill and enters into the system to get the personal data or harm the data.[5]

## 3) Grey hat hackers

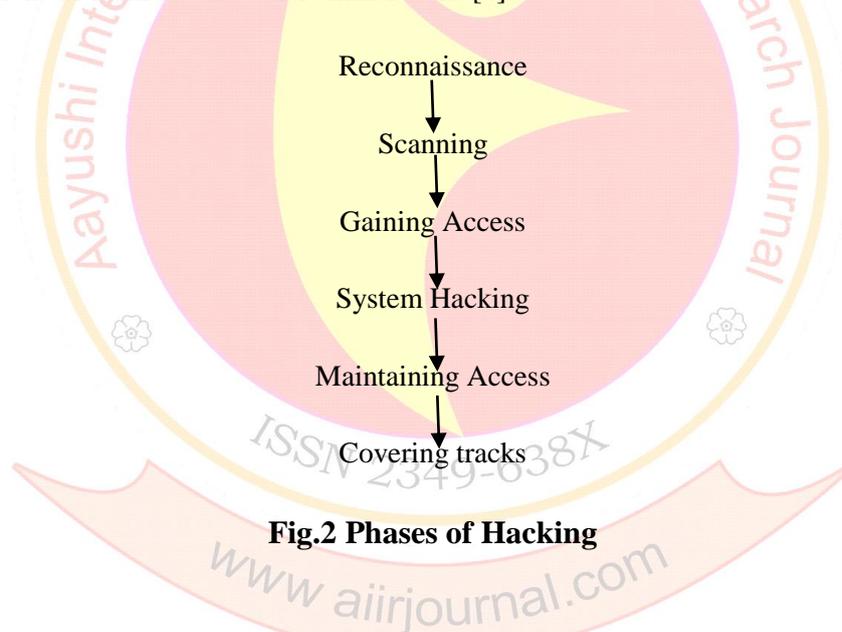
The grey hat hackers comes in the category as white hat hacker as well as black hat hackers. They are unauthorized hackers but they work as a white hat and black hat hackers.

## Phases of Hacking

- An ethical hacker always follows the process of hacking before penetrating into a system.
- There are following phases of hacking which are very useful when do the hacking

**1.Reconnaissance** - Reconnaissance is also called as footprinting. Reconnaissance is an ethical hacking process of gathering information about the target and its environment prior to performing the later attacks.[4]

**2.Scanning** - This is the phase in which you take the information gleaned from the footprinting phase and use it to target your attack much more precisely. Scanning means performing tasks like ping sweeps, port scans, observations of facilities and other similar tasks.[4]



**Fig.2 Phases of Hacking**

## 3.Gaining access

It defined as the process of take out user names, machine names, network resources, services from a system. In this phase, the attacker creates an active connection to the system and performs directed queries to gain more information about the target.[3]

The gathered information is used to identify the vulnerabilities or weak points in system security and tries to exploit in the system gaining phase.

## System hacking

Hacker can now plan and execute an attack based on the information you uncovered. For example, start user accounts to attack based on the ones uncovered in the enumeration phase.[4]

## Maintaining access

Maintaining access requires taking the steps involved in being able to be persistently within the target environment in order to gather as much data as possible. [3]

## Covering tracks

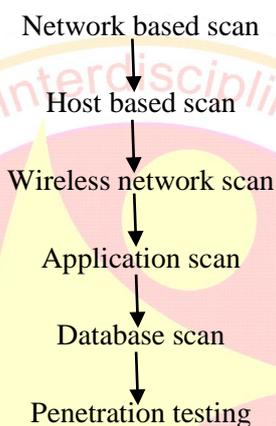
This is the phase when you attempt to remove evidence of your presence in a system.You purge log files and destroy other evidence that might give away the valuable clues need for the system owner to determine an attack occurred.

## Security using Ethical Hacking

The positive use of ethical hacking is for the security. It helps organizations to develop and maintain secure applications. Ethical hacking also provides the organization with the necessary knowledge, awareness and risk background the threats to its environment and react appropriately. Security is maintained using ethical hacking which uses following types of techniques and skills.

### 1. Vulnerability Assessment

A vulnerability assessment is the process of defining, identifying, classifying and prioritizing vulnerabilities in computer system or applications. It also provides the organization with necessary knowledge, awareness and risk background the threats to its environment and react appropriately. The types of vulnerability assessment are as follows:



Penetration testing is the process to identify security vulnerabilities in an application by evaluating the system or network with various malicious methods and techniques. The purpose of this test is to secure important data from strangers like hackers who can have unauthorized access to the system. Once the vulnerability is identified it is used to exploit the system in order to gain access to sensitive information. Penetration testing is also known as pen test and a penetration tester is also referred as an ethical hacker.

When a pen test is performed it typically takes one of three forms:

- Black box
- Grey box
- White box

**Tools** - There are different types of tools that are used to gain the information about the vulnerabilities in the system to identify risk that are dangerous to the system.

**Nessus** - Nessus is an open-source network vulnerability scanner that used to exploit common vulnerability significant capabilities of Nessus includes compability with computers and servers of all size, detection of security holes in local or remote hosts, missing security updates and patches detection, simulated attacks to pinpoint vulnerabilities.

**WebInspect** - WebInspect is a web application security assessment tool that helps to identify known and unknown vulnerabilities within the web application layer. WebInspect can also used to check that web server is configured properly, and attempts common web attacks such as parameter injection, cross-site scripting, directory traversal, and more.

### Quals

Quals perform vulnerability management scans in such a way as to collect as much information about a target, without running an actual vulnerability scan. This can be beneficial when trying to understand why your authenticated scan fails, or why not as many targets are being found as you expected.

### Proxies

It is an active web application proxy. It's a tool designed to find vulnerabilities while browsing an application. The process is very simple, it runs like a proxy listening in port 8008 by default, so you have to browse the desired web site setting your browser to use this software as a proxy, and then it will analyze all the parameters in background mode.

### Metasploit

Metasploit is used for researching security vulnerabilities and developing code that allows a network administrator to break into his own network to identify security risks and document which vulnerabilities need to be addressed first.

### Rules of Ethical Hacking:-

1) The hacker must follow the ethical hacking rules. If they don't follow the rules then it would be unsafe for the organization. [3]

- The more important thing for ethical hacker is time and patience.
- Ethical hackers duty have clear intensions to help the organization not to harm them.[3]
- Privacy is the major concern from the organization point of view, thus the ethical hacker must be kept it private because their misuse can be dangerous or illegal.
- Reach agreement with all of the stakeholders on the date and time for running test.

### Need of Ethical Hacking

- To protect our system from unauthorized access, safeguard the system and information from malicious attack.
- Develop preventive networks at regular interval.
- To form security alertness at all stages in a business.
- Ethical hacking offers an objective investigation of an organization's information security position for organizations any level of security expertise.
- Vulnerabilities in the system can be identified before they get exploited by black hat hackers.
- Preventing malicious hackers to gain access of crucial data.[3]

### Conclusion

Today, use of internet is fastly increasing so there is a need to secure our data over the internet. But this is an invitation to the "hackers or crackers" to gain access of information. Thus security is the major problem for the organization. This demonstrates the importance of ethical hackers. For this purpose the organization hires ethical hackers who are well knowledge and experienced person. Ethical hacking help organizations to develop and maintain secure applications.

### References-

1. Internet Crime Complaint Centre link: [www.ic3.gov](http://www.ic3.gov)
2. [https://pdf.ic3.gov/2019\\_IC3Report.pdf](https://pdf.ic3.gov/2019_IC3Report.pdf)
3. Deepak Kumar, IJECS Volume 4 Issue 4 April, 2015 Page No.11466-11468- [www.ijecs.in](http://www.ijecs.in)
4. <https://www.ijsr.net/archive/v2i4/IJSRON2013859.pdf>(Need of Ethical Hacking in Online World)
5. <http://www.ijcstjournal.org/volume-2/issue-6/IJCST-V2I6P2.pdf>
6. M.S. Chalke, S.S. Bhosale, Dr. R.B. Patil, Ethical Hacking, Ajanta-ISSN 2277-5730, Valume VIII, ISSUE-I, January-March 2019

## Big Data Challenges in Iot and Cloud

Mrs. Ashwini G. Salunkhe, Mrs. K. H. Sodi , Miss. Damini S. Jagtap

### Big data

Big Data is also called data but with a **lot of size** vast information is a duration used to represent a collection of data that is large in size and yet increasing exponentially with time. That means such facts is so Large and difficult that none of the old-fashioned data controlling outfits are able to stock it or Process it efficiently.



### IOT

IOT stand's for IOT it is a way of connecting with other devices within a proper system of switching. Internet is the most important part in everyone's life. Without internet we cannot doing our important work which is related to the cell phones, computers, networking etc. with the help of internet we can done the informative task easily and correctly with good results. IOT deals with the multiple technologies, embedded system, machine learning, wireless sensor network, control system, automation and other underwrite to allowing the IOT

### Embedded system:

Embedded system is a workstation system a combination of a computer processor, computer memory, and input, output devices. Embedded system control physical operation of machine. For the common use Inserted organisations manage many devices.

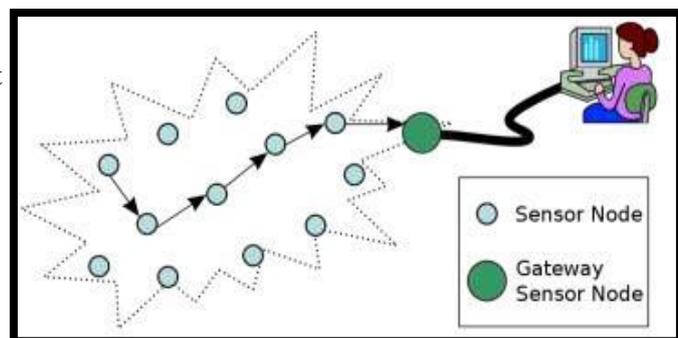


### Machine learning:

Machine learning (ML) is the **scientific study of algorithms** and **statistical models**.in that Computer systems use to accomplish an explicit chore deprived of using obvious directions. Machine Learning algorithms build a mathematical model which is depend on sample data, known as "Training data"

### Wireless sensor :

A without wire device system can be clear as a system of strategies that can interconnect the Data collect from a observed field done without wire links.



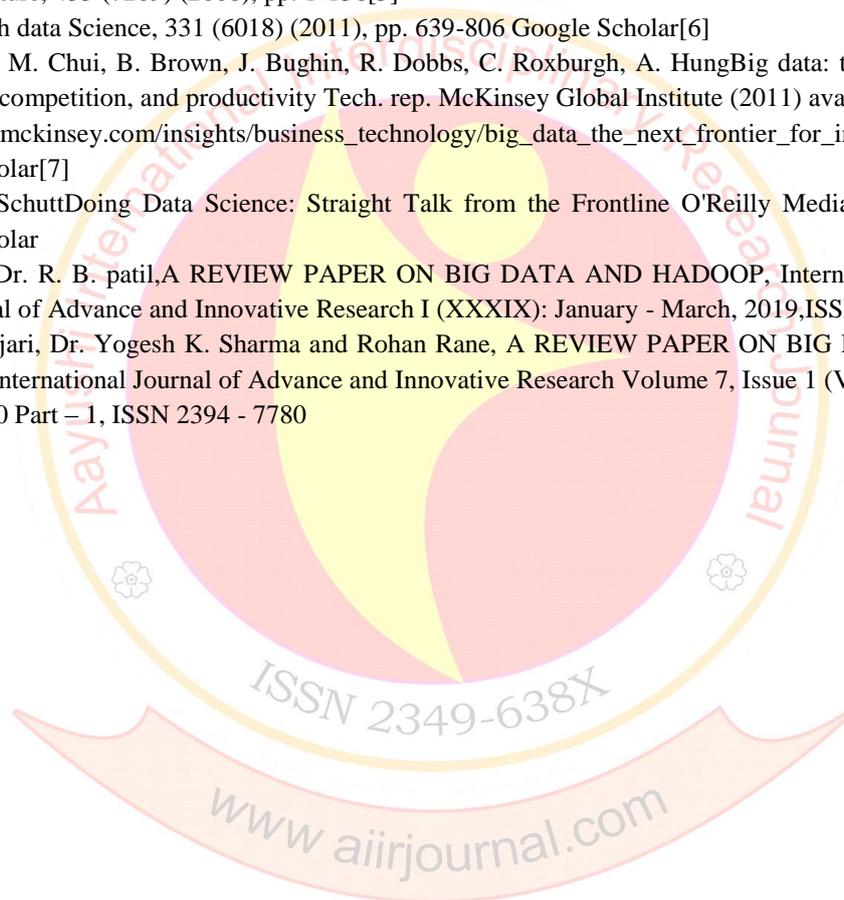
A control organisation accomplishes all the commands, and behaviour of additional strategies or Classifications using controller rounds. In other simple arguments, the Explanation of a manage organisation Cut down as a system, which is controls other systems.



thing which is related to the big data.in that also describe the are the big data tasks in cloud computing. Both are the combination of this three

### Reference:

1. V. Mayer-Schonberger, K. CukierBig Data: A Revolution That Will Transform How We Live, Work, and Think Houghton Mifflin Harcourt (2013)
2. Google Scholar[2]
3. R. Thomson, C. Lebiere, S. BennatiHuman, model and machine: a complementary approach to big data Proceedings of the 2014 Workshop on Human Centered Big Data Research, HCBDR '14 (2014) Google Scholar[3]
4. CuzzocreaPrivacy and security of big data: current challenges and future research perspectives Proceedings of the First International Workshop on Privacy and Security of Big Data, PSBD '14 (2014)Google Scholar[4]
5. Big data Nature, 455 (7209) (2008), pp. 1-136[5]
6. Dealing with data Science, 331 (6018) (2011), pp. 639-806 Google Scholar[6]
7. J. Manyika, M. Chui, B. Brown, J. Bughin, R. Dobbs, C. Roxburgh, A. HungBig data: the next frontier for innovation, competition, and productivity Tech. rep. McKinsey Global Institute (2011) available at:
8. [http://www.mckinsey.com/insights/business\\_technology/big\\_data\\_the\\_next\\_frontier\\_for\\_innovation](http://www.mckinsey.com/insights/business_technology/big_data_the_next_frontier_for_innovation) Google Scholar[7]
9. O'Neil, R. SchuttDoing Data Science: Straight Talk from the Frontline O'Reilly Media, Inc. (2013) Google Scholar
10. V.I.Pujari, Dr. R. B. patil,A REVIEW PAPER ON BIG DATA AND HADOOP, International, Volume 6. Issue Journal of Advance and Innovative Research I (XXXIX): January - March, 2019,ISSN 2394-7780
11. Vinayak Pujari, Dr. Yogesh K. Sharma and Rohan Rane, A REVIEW PAPER ON BIG DATA AND HADOOP International Journal of Advance and Innovative Research Volume 7, Issue 1 (VI): January - March, 2020 Part – 1, ISSN 2394 - 7780



## Digital Marketing and its Impact on Buying Behaviour of Youth

Mrs. Vijaya S. Bhosale<sup>1</sup>, Dr. Deepak P. Raverkar<sup>2</sup>, Prof. Karishma Sunil Kawale<sup>3</sup>

### Introduction

Digital Marketing is defined as buying and selling of information, products and services via computer networks or internet. Internet and electronic technologies are transforming the entire economy and changing business trends, customer buying preferences and supply chains. A new economy tends to a new business models. Tourism industry, ticket booking, and online shopping has seen drastic change in this recent years. One noticeable change that 82% of E-commerce share taken by travel and tourism industry in India. Online shopping are captivated with prompt delivery and smooth payment mechanisms that are building trust in consumers. Matrimonial sites are also taking the lead. Many retailers are now pulling their customers to buy the products such as electronics, glossaries and medicines, and so on. The internet is a riotous technological innovation but youngster everywhere are walking with the online shopping. Digitalization has been more impact on retail shopping and ultimately businesses to sell their goods and services. Now e-market is dominating the all physical markets.

### Digital Marketing Scenario in India

India is the third largest internet population among the world's internet population. After internet revolution marketing strategies has been changed and buying preferences of people are changing. Growth of digital marketing is tremendous hence, it cannot be compare with any other marketing strategy. Nowadays Indians are aware about uses internet not only for buying purpose, but also for employment and matrimonial purposes too. For booming digital marketing social media plays an important role. With the help of the internet marketing retail sector is booming online and offline. In next few years online sales will grow by 55 percent. Our country is third largest country of the internet user, and now our government is also in favour of digitalization and the campaign is "Digital India". For developing digital market social media playing an important role. Youngster are spending more time and money on online shopping. Presently, the internet accounts have small proportion of GDP but it will be boom in next few years. The powerful segment I market are youngsters, so they on the priority of manufacturers to satisfy their need and wants. This study is about how youth are playing important role and part on digital marketing.

### Buying Behaviour of Youth

Individual buying behaviour plays a dominant role in the consumer behaviour in public, and particularly among the youth. Buying behaviour marketing is a process of establishing relationships between products offered in the market, and targeted buying behaviour groups. It involves market segmentation based on of buying behaviour, positioning of product in a way that appeals to the preferences, opinions and activities of the targeted market. It takes to place promotional campaigns which promotes internet marketing. Internet is entered in India is around two decades before. Organised retailing on digital marketing is only 3-4%. It means some elements are hurdles in the flourishing of digital marketing in India. The risk comprehends by the youngsters of India is one of them. India has more young population and hence, it tends to prefer online shopping which is recent marketing trend. The government of India is investing a lot of money in internet infrastructure. Now organized retailers are not only easily reaching to urban areas, but also to their rural area buyer too.

**Review of Literature :** The following are the important review related to this study:

Vishal Khasgiwala & Monica Sainy: In their study titled "Gender disparity wise study of Impulsive buying behaviour and exploratory tendencies of youth in central India", impulsive buying behaviour is experimented.

Impulsive buying is a common behaviour today and can occur in any setting. Much of the human activity is driven by impulses that are biochemically & psychologically stimulated. Beatty and Ferrell described that Impulse buying refers to immediate purchases which are without any pre-shopping objective either to purchase

the specific product category or to fulfil a specific need. It is not consciously planned, but arises immediately upon confrontation with certain stimulus. India Being a transitional economy technological boom such as television shopping channels and the Internet expand consumers' impulse purchasing opportunities, increasing both the accessibility to products and services, and the ease with which impulse purchases can be made. Impulse buying is an unplanned purchase that is characterized by relatively rapid decision-making, and a subjective bias in favor of immediate possession.

Dastidar & Datta (2009): In this study it was found that, relationship present gender wise between both the variable and influence of exploratory tendencies on impulsive buying behavior on in young female is higher than young male. It reveals that, variety seeking, risk taking/innovativeness, and curiosity motivated behavior in young female is higher result spontaneous buying behavior. While study shows that, in male it is lower. The population in the age-group of 15-34 increased from 353 million in 2001 to 430 million in 2011. Current predictions suggest a steady increase in the youth population to 464 million by 2021. By 2020, India is set to become the world's youngest country with 64 percent of its population in the working age group (The Hindu, 17 April 2013).

3. Sathish and A. Rajamohan (2012): In their study Consumer behaviour, and buying behaviour marketing, a general approach of consumer is taken. A consumer's buying behaviour is seen as the sum of his interactions with his environment. Buying behaviour studies are a component of the broader behavioural concept called psychographics." Harold W. Berkman and Christopher Gilson define buying behaviour as "unified" patterns of behaviour that both determine and are determined by consumption. The term "unified patterns of behaviour" refers to behaviour in its broadest sense. Attitude formation, and such internal subjective activities may not be observable, but they are behaviour nonetheless. Buying behaviour is an integrated system of a person's attitudes, values, interests, opinions, and his over behaviour. It is found in this study that "Consumer behaviour is still a young discipline, and most of the research now available has been generalised only during the past fifteen years or so. Innovations such as the buying behaviour concept, and AIO research represent ways to move the study of consumers away from isolated, often unrelated projects towards broader integrated systems, and research techniques.

Rashmi Bansal (2007): in her article defined urban youth as youth marketers of today in India and not as per the version of sociologists and media men who relate it to the statistics of men under the age of 25. Youth could be defined as a potent and cultural force, the consumers of today and the growth engines of tomorrow. This study concentrates on the aspirations, inspiration and perspiration of urban Indian youth and not on the response of the youth's choice of either Western or Indian styles or the cultural values. There is little doubt that increasing affluence would lead to radical choices for future generations.

Priyanka Mehra (2009): in her article mentions that youth have always been a prime target for marketers. More so in India now, as two-thirds of the population is below 35 years of age. According to MindShare Insights, the research divisions of media buying agency MindShare, 65%, or over 700 million Indians, are younger than 35 years. This segment has an influence on consumer spending far in excess of its numerical strength. Nine million people in the age group of 12-25 years from the top 35 cities (one million plus population) in India are the ones setting the trends and raising the aspiration value for one-billion-plus Indians, reports Mind Share Insights.

Manjeet (1999): in her article finds out that India's youth are ambitious, technology-oriented and confident. By 2015, Indians under 20 will make up 55% of the population and wield proportionately higher spending power. In the west, the youth segment has almost always been pitted against their seniors. Rebellion was the key starting point. Adventure, music and other symbols of 'cool' became a perfect recipe for creating cult brands that rallied against the system. This model of tapping youth presupposes that it's always youth versus old. It also preoccupies itself with a continuous search for what's 'cool' among youth. Since the behavioural distance between the youth and the others in these societies are significant, it's easy to rally youth around such points of difference. This model however is at a loss in India, where everything' and everyone is young.

**Need of the Study :** Digital marketing has brought tremendous changes in the market in which the customers are buying the same. Many factors are influencing a buying behaviour of an individual which helps to

accomplish need of all customers and especially youngsters. So the research is about digital marketing and its impact on buying behaviour of the youth.

### Objectives of the Study

- To study factors influencing the buying behaviour of the youth.
- To study impact of digital marketing on buying behaviour of youth.

### Research Methodology

Primary data: The research is done through observation and interviewing technique. The data based on 60 respondents.

Secondary data: data is collected from books, online journals and magazines.

### Findings of the Study

Digitalization is the fastest growing in India. The youngsters are more preferring internet marketing as they have changed their buying behaviour. Social media plays an important role in the growth of digital marketing. As the study says digitalization will be an only buying behaviour after a decade. Digital marketing creates an opportunity in for marketers.

### Suggestions of the Study

- Marketers need to understand the exact need of youngsters before or selling online products.
- Pre market survey will help for digital marketing before entering this market.
- Consumers must be aware about digital marketing and precautionary measures while using it.

### Conclusion

The buying behaviour of youth is directly impact on individual & family behaviour of buyer. The youngsters are started more depending upon the e-commerce sites for shopping and ordering. The digitalization trend is a revolutionary element of today's economy. It is a wider scope for marketers.

### References

1. A.M. Hasan, M. b. (2006). *Conceptualization and measurement of perceived risk in online shopping*. *Marketing Management Journal*, 138-147.
2. Alves, D. d.-F. (April 2012). *Profile of the electronic commerce consumer: A study with Brazilian University students*. *Journal of Internet Banking and Commerce*.
3. Atkin C.K., "Observation of Parent-Child Interaction in Supermarket Decision-Making", *Journal of Marketing*, vol.39, no. 4, pp. 41-45, 1978.
4. Belch, M.A. and Laura A.W., "Family decision at the turn of the century: Has the Changing structure of households impacted the family decision-making process?", *Journal of Consumer Behavior*, vol. 2, no. 2, pp. 111-24, 2001.
5. Berkman, Harold W. & Gilson, Christopher; *Consumer Behaviour, Concepts and Strategies*.
6. C.R.Kothari, *Research Methodology Methods and Techniques*, New Age International Publisher.
7. Cengel, F. Y. (2012). *The Perceived Risk and Value Based Model of Digital Marketing*. *Online Academic Journal of Information Technology*.
8. Davis, F. D. (1989). *Perceived Usefulness, Perceived ease of Use and User acceptance of Information Technology*. 319-340.
9. Foxall G.R., "Consumer Behaviour: a practical guide", R.P.A. (Books), England, 1977.
10. G.C.Beri, *Marketing Research*, Tata McGraw Hill Publications, New Delhi
11. Harrigan J.A., "Children's Research: Where It's Been, Where It Is Going", *Advances in Consumer Research*, vol.18, no. 1, pp. 11-17, 1991.

## Predicting Teachers' Performance Using Data Mining Technique

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### I. Introduction

**Data Mining** is a process of extraction of useful information and pattern from huge database.

This is also known as Knowledge Discovery Database, Knowledge Discovery Process, and Knowledge Mining from Data. Knowledge Extraction or Data/Pattern Analysis. Major Knowledge Discovery Database application areas are include marketing, fraud detection, telecommunication and manufacturing.

It is a logical process that used to search large amount of data and find the useful data. The aim of this process is to find different patterns that are unknown. Once we get the pattern it helps to take certain decision or prediction for their work.

**In Data Mining three steps involved are**

**1. Exploration**

**2. Pattern Identification**

**3. Deployment**

- **Exploration:** In this step of data exploration, data is cleaned and transform it into different form and important variables and nature of database on this problems are find.
- **Pattern Identification:** In first step data is explored, refined, transform in another form and in second step is to form pattern identification. In this process we choose best algorithm which make the best prediction
- **Deployment:** In this step pattern are deploy to get expected outcome.

### II Data Mining Algorithm And Techniques:

There are different algorithms and techniques are used in a Data Mining to find best pattern. Example Classification, Regression, Clustering, Neural Networks, Decision Trees, Genetic Algorithm, Nearest Neighbor method. Etc.

**Classification:** It is a common algorithm in data mining, which has pre-classified examples that help to develop new model that can classify given data.

There are two process involve in classification that is learning and classification. In Learning first analysed the training by classification algorithm

In classification test data is used for classification, if the accuracy is acceptable the rules can be applied for the new data tuples. It uses pre-classified examples to determine the set of parameters required for proper discrimination.

There are different types of classification model

- Classification by decision tree induction
- Support Vector Machines (SVM)
- Bayesian Classification
- Classification Based on Associations
- Neural Networks

**Clustering :** It is identification of similar classes of objects.

It is the process of finding similar classes of objects. It can be used as pre-processing approach for attribute subset selection and classification

### Types of clustering methods

- Partitioning Methods
- Hierarchical Agglomerative (divisive) methods
- Grid-based methods
- Density based methods
- Model-based methods

### Regression:

Regression technique generally use for prediction. It defines the relation between one or more independent variables and dependent variables. Independent variables are those variable that we already known and response variables are what we want to predict.

#### Types of regression.

- Linear Regression
- Multivariate Linear Regression
- Nonlinear Regression
- Multivariate Nonlinear Regression

#### Association rule :

The term association and correlation is use to determine frequent item among large datasets. This is applicable for decision making. For example Customer shopping behavior analysis, Catalogue design etc.

#### Types of association rule

- Multidimensional association rule
- Quantitative association rule
- Multilevel association rule

### III Education Data Mining:

Educational Data mining (Sometime known as EDM) is a well known feature in Data mining and Knowledge Discovery Databases (KDD) field that focus on educational information such as Course Management System, Registration System.

Educational data mining (EDM) is a method for extracting important information that could potentially impact an organization. To improve teaching and learning processes it is important to use Education data mining as the large amount of student data is generated.

There are different application of EDM including find out risk students, recognising priority learning needs for diverse groups of students, growing graduation rates, effectively evaluating institutional performance,maximizing campus resources, and improving subject curriculum renewal.

In this research first get the information of student through online and offline survey, processing the data with respect to selected attributes, apply different classification algorithm on it and then predict the result.

### V. Background And Relatedwork

In Data Mining: Concepts and Techniques, Han and Kamber[1] states that data mining software allow the user to study data using different parameters like dimension,category and review the relationships between them.

Archer-North and Associates [5], describes Performance appraisal system. It gives interaction between supervisor and employee intermittently to recognize the areas of strength and weakness of employee.

Chein and Chen [6] define different attributes for evaluating employee performance and they find that employee performance is highly impacted by education degree and the job experience.

Sanders, W. L., & Horn, S. P. Research findings from the Tennessee Value-Added Assessment System (TVAAS) database [7]. In this system sanders detect that when managers take decision and provide feedback to teachers on their performance it will affect on teachers' performance, which indicate that it should include in class and out of class.

Pal and Pal [8] conducted study on 200 students' from Bachelor of computer application course and they found that secondary and higher secondary grade will effect on student academic performance.

Tongshan Chang, & Ed.D [9] . It presented a real time application using data mining technique for college recruitment and it help institute to manage their enrolment more successfully.

Z. N. Khan, "Scholastic achievement of higher secondary students in science stream "[10] conducted survey of Aligarh Muslim University, Aligarh on 400 students containing 200 boys and 200 girls and found that girls with high economic status had higher achievement and boys with low economic background had higher achievement in general.

Pal and Pal [11] study for placement of student after doing MCA using three different algorithms based on EKA tool and they found best algorithm is Naïve Bayes Classification algorithm with accuracy 86.15%

Z. J. Kovacic [12] study on educational data mining to predict student's performance. He used CHAID and CART algorithm and find accuracy 59.4 and 60.5 respectively

Pal [13] study on 1650 students on the dropout rate and he found that the different attributes affected on engineering students are HSG, SSG , family annual income and mother's occupation

### V. Data Mining Process

In this research paper author collect the different attributes of teacher's by interacting with different teachers and students' and got some knowledge about data sets.

#### A. Data selection and Transformation

In this step different attribute effect on teacher's performance were selected . A few derived attributes were extracted from database. In below table author mention the attributes.

#### Teachers Attribute

SR NO	Attribute	Possible Value
1	Teachers Name	Text
2	Speed Of Delivery	{1,2,3,4,5}
3	Content Arrangement	{1,2,3,4,5}
4	Presentation	{1,2,3,4,5}
5	Communication	{1,2,3,4,5}
6	Knowledge	{1,2,3,4,5}
7	Content Delivery	{1,2,3,4,5}
8	Explanation Power	{1,2,3,4,5}
9	Doubts Clearing	{1,2,3,4,5}
10	Discussion of Problems	{1,2,3,4,5}
11	Overall Completion of Course and Regularity	{1,2,3,4,5}
12	Student Attendance	{1-below,2-average,3-high}
13	Class Control	{1,2,3,4,5}
14	Performance of Teacher	{1,2,3,4,5}

#### B. Implementation of Mining Model

Waikato Environment for knowledge analysis (WEKA) ,developed at university of Waikato, New Zealand. It is free software licence under GNU general public licence, and widely used in data mining applications. In above mention data, arff file is created and on that different classification algorithm apply and get the prediction result.

#### C. Classification process

- Generate training dataset
- Find valuable attributes for classification.
- Design Training dataset
- Learn model in the training dataset
- Apply it on unknown data

#### D. Classification Algorithm

- J48: This classification algorithm best model for prediction with higher accuracy. It uses reduced error pruning
- Random tree: This classification algorithm efficiently on large databases. On large number of dataset it gives accurate result.
- Naïve Bayes: The best classification algorithm performance prediction. It uses when the dimensionality of the input is high. It gives highest accuracy and lowest error.

#### VI Evaluation

- This Research evaluated the result by the student and the colleague marking on questionaries'
- The student evaluate the performance of the teacher in teaching and learning time.
- The colleague evaluate the performance of teacher outside of the class, like conduct professional research on his/her filed community service, work cooperatively with a staff member, actively participate in university work. The proposed system uses this evaluation data and a play classification model to evaluate and predict the performance of the teacher. In this work find out in which area teachers have low and high performance and also factor that affect the performance.

#### VII Conclusion

- In this research paper author found the best attribute that effect on teacher's performance. The speedy delivery attribute did not useful while punctuality and regularity attribute has shown effect on teachers' performance. Other attribute effect on predicting the performance.
- The main focused on how the performance of teacher can be improved and what factors that affect teacher performance be considered in teaching and learning area.

#### References

1. J. Han and M. Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2000.
2. R. LIKERT, A Technique for the Measurement of Attitudes. Archives of Psychology, 22(140), 1-55, 1932.
3. J. R. Quinlan, C4.5: Programs for machine learning, Morgan Kaufmann, San Francisco, 1993.
4. Breiman, Leo, Jerome Friedman, R. Olshen and C. Stone (1984). Classification and Regression Trees. Belmont, California: Wadsworth.Archer-North and Associates, "Performance Appraisal", <http://www.performance-appraisal.com>, 2006, Accessed Dec, 2012.
5. Chein, C., Chen, L., "Data mining to improve personnel selection and enhance human capital: A case study in high technology industry", Expert Systems with Applications, In Press (2006).
6. Sanders, W. L., & Horn, S. P., Research findings from the Tennessee Value-Added Assessment System (TVAAS) database: Implications for educational evaluation and research. Journal of Personnel Evaluation in Education, 12, 247-256, 1998.
7. K. Pal, and S. Pal, "Analysis and Mining of Educational Data for Predicting the Performance of Students",
8. (IJECC) International Journal of Electronics Communication and Computer Engineering, Vol. 4, Issue 5, pp. 1560-1565, ISSN:2278-4209, 2013.
9. Tongshan Chang, Ed.D., Data Mining: A Magic Technology for College Recruitment's, Paper of
10. Z. N. Khan, "Scholastic achievement of higher secondary students in science stream", Journal of Social Sciences, Vol. 1, No. 2, pp. 84-87, 2005.
11. K. Pal, and S. Pal, "Classification model of prediction for placement of students", IJMECS, vol. 5, Issue11,49-56, 2013.
12. Z. J. Kovacic, "Early prediction of student success: Mining student enrollment data", Proceedings of Informing Science & IT Education Conference, 2010.
13. Pal S., "Mining Educational Data to Reduce Dropout Rates of Engineering Students", I.J. Information Engineering and Electronic Business (IJIEEB), Vol. 4, No. 2, 2012, pp. 1-7.
14. Galit.et.al, "Examining online learning processes based on log files analysis: a case study". Research, Reflection and Innovations in Integrating ICT in Education, 2007
15. S. K. Yadav, B.K. Bharadwaj and S. Pal, "Mining Educational Data to Predict Student's Retention :A Comparative Study", International Journal of Computer Science and Information Security (IJCSIS), Vol.

## Detection of Diseases in Different Plants Using Digital Image Processing

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### I. Introduction

The frequently used method for plant disease detection is by eye observation by the person who is expert in detection of plant diseases. For doing it a large team of expert persons as well as continuous observation of experts is required, which costs very high and it is not possible for when farms are large. In some countries farmers do not have a facilities to contact a experts or even idea that they can contact to experts. So consulting experts are expensive as well as time consuming too. In such condition this technique proves to be beneficial in monitoring large fields of crops.

Plant disease detection by naked eyes is very time consuming and high cost method. And very less accurate method and it is does not done in the rural and rare areas. This technique is done at that place where mobility of such person who is expert in the detection of plant diseases. Whereas if this kind of automatic technique of plant health detection is used in less efforts and less time and more accurate and in less money. This technique is work on the color of the affected area. In plants the actual part of the crop is compare with the affected area is done so farmers understand the any deficiency or any diseases is happen to the crop. So they will work on the crop as early as possible. Nutrient deficiency symptoms in plant or crop is most normally visible in the leaves of the crop. These symptoms include intervene chlorosis, marginal chlorosis, uniform chlorosis, necrosis, distorted edges, reduction in size of the leaf etc. Brown and yellow spots, or early and late scorch, and other are fungal, viral and bacterial diseases [1].

Image segmentation is a process of cutting a digital image in to the different segments. The main goal of the image segmentation is to represent the image from which meaningful data is obtained and analyses this data for the further use. Image segmentation is used to separate and group the image into the different parts. There are some different ways to perform the image segmentation are ranging from the simple threshold method to color image segmentation method. This method is actually used to locate the object and boundaries in the images.

### ii .Literature Survey

There are various methods are there to automated identification of crop diseases. The diseases includes various parts such as leaves, stem, roots, fruits, and many others. As defined earlier that this paper works on particularly on leaves.

Paper [2] explain us a method for detection of plant diseases present on leaves and stem. The work is done by K-Means segmentation method and the images are classified using neural network. And explain the framework of plant diseases.

Paper [3] explain us identification and classification of fungal disease affected on agriculture or Horticulture Crops using Image Processing Techniques. Various techniques are there to segment the affected part of the plant. That paper discussed some detailed features of extraction and classified techniques for to extract the features of infected leaf and the classified into plant diseases. The use of ANN methods for classification of disease in plants.

In paper [4] explain us unhealthy region of citrus leaf detection using image processing techniques is used for automatic plant diseases classification is done on leaf image processing the research work is concerned with the discrimination between diseased and healthy soybean leaves using SVM classifier.

In paper [5] explains an enhancement in classifier support vector machine to improve plant disease detection. It represents leaf disease extraction and classification using color image. Detection of plant diseases using classifier support takes place here.

Paper [6] explains the study of detection of crop diseases and detection of infected part of crop. Input images are taken from users and then image processing is started and get the result if any disease detected then give the details of that disease.

### III. Proposed Technique

In this section, we study about general block diagram of the processed unit. There are various steps are required to achieve desired result. The proposed diagram consists of four main steps: First one is image acquisition of cashew leaves, second one is feature extraction of cashew leaves, third one is statistical analysis and last one is disease classification. The general diagram of the disease detection system is shown in Figure 1.

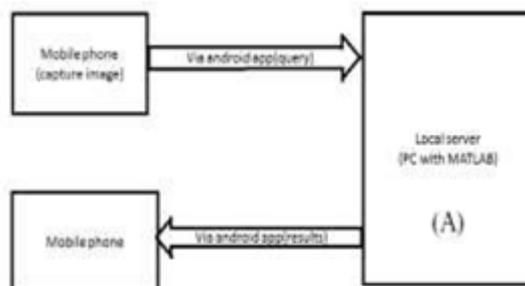


Fig.1. General Block Diagram

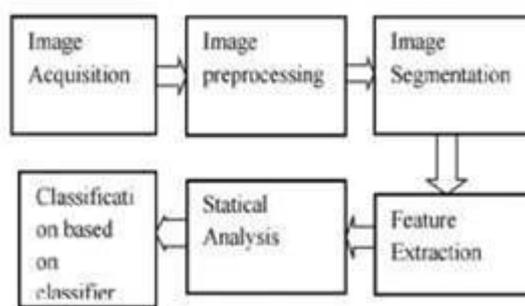


Fig.2. Block Diagram for Image Processing at Server

In the system, the initial step is getting images of cashew leaves using mobile camera is done.

#### Image Acquisition

The images of the defective plant leaf are captured by camera. This image is color image. And then it is inverted in to RGB color format (Red, Green and Blue). For color transformation data for the RGB leaf image is created. And then a color image transform is applied to an image. And next data is stored in the computer with MATLAB in local server. [6].

#### Image Pre-processing

Image Pre-processing is lower level of abstraction method. For the removal of noise in image different Pre-processing techniques are used. Data from the image pre-processing is send to the image segmentation.

#### Image Segmentation

Image segmentation is a process of cutting a digital image in to the different segments. The main goal of the image segmentation is to represent the image from which meaningful data is obtained and analyses this data for the further use. Image segmentation is used to separate and group the image into the different parts. There are some different ways to perform the image segmentation are ranging from the simple threshold method to color image segmentation method. This method is actually used to locate the object and boundaries in the images.

The segmentation can be done using various methods like k-means clustering, converting RGB image into HIS model etc.

#### K-means clustering:

The K-mean clustering is used for classify the objects by set of features into the K number of classes. K-means clustering is a method of vector quantization that is used for cluster analysis in data mining. The classification of object is perform by the process consist of minimize the sum of the squares of the distance between the object and the corresponding cluster.

The algorithm for K –means Clustering:

- Take a K cluster using centrally or randomly.
- Give each pixel in image to cluster for minimize the distance between cluster and center cluster.
- Again compute the cluster centers by averaging all of the pixels in the cluster. Repeat the steps 2 and step until process is done.

### Feature Extraction

Extraction of feature plays an important role for identify the object. In many application of image processing feature extraction is used. Color, texture, morphology, edges etc. are the features which can be used in plant disease detection [3].

The features normally used for analysis are contrast, energy, correlation, homogeneity etc. [4].

### Statistical analysis and classification

This step involves the extraction of unique features from leaf and classify the images from healthy to unhealthy or diseases is detected.

The classifier is used for support vector machine. This classifier is based on the group of supervised learning methods. They are normally used for classification and pattern recognition. Supervised learning is a one type of machine learning algorithm. And that are used for known dataset.

### IV. Results

- Image is captured through the mobile camera.
- The captured image is uploaded to the local server using android application.
- User's image is undergoes in various image processing algorithms at the server for the determination of the disease.
- The determined disease is sent back as a result on mobile application. The following figure shows step by step procedure of the process.

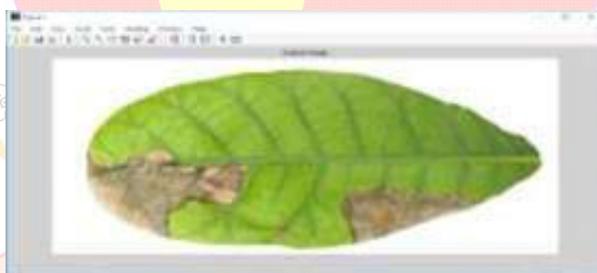


Fig.3. Original image



Fig.4. Clusters formed after k-mean clustering algorithm



Fig.5. Disease found

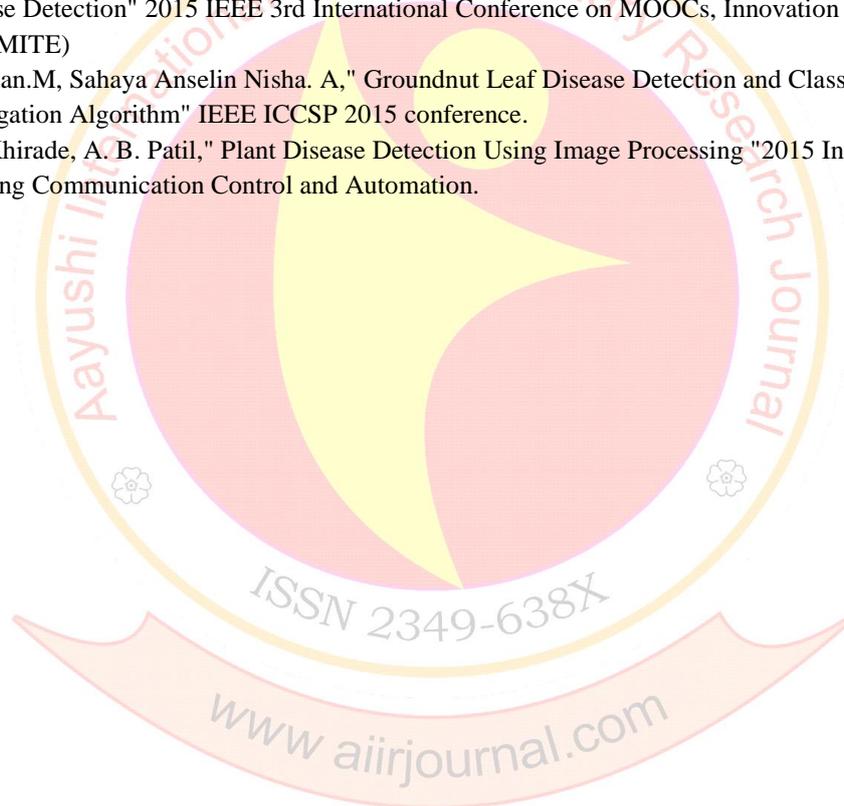
### VI. Conclusion

The cultivation of crop is done using image processing in that process the detection and classification of plant diseases is done. This paper discussed automated techniques to detection of disease using image of the

infected part. So for that features extraction to extract the features of the infected leaf. And classify of infected leaf classify in to plant diseases.

### References

1. Davoud Ashourloo, Hossein Aghighi, Ali Akbar Matkan, Mohammad Reza Mobasheri, and Amir Moeini Rad, "An Investigation Into Machine Learning Regression Techniques for the Leaf Rust Disease Detection Using Hyperspectral Measurement" 2016 IEEE.
2. Dheeb Al Bashish, Malik Braik, and Sulieman Bani-Ahmad, "A Framework for Detection and Classification of Plant Leaf and Stem Diseases", IEEE International Conference on Signal and Image Processing, 2010
3. Jagadeesh D. Pujari, Rajesh Yakkundimath, Abdulmunaf S.Byadgi, " Identification and Classification of Fungal disease Affected on Agriculture/Horticulture Crops using Image Processing Techniques" 2014 IEEE International Conference on Computational Intelligence and Computing Research.
4. Ms. Kiran R. Gavhale, Prof. Ujwalla Gawande, Mr. Kamal O. Hajari, "Unhealthy Region of Citrus Leaf Detection Using Image Processing Techniques" 2014 International Conference for Convergence of Technology.
5. Rajleen Kaur, Dr. Sandeep Singh Kang, " An Enhancement in Classifier Support Vector Machine to Improve Plant Disease Detection" 2015 IEEE 3rd International Conference on MOOCs, Innovation and Technology in Education (MITE)
6. Ramakrishnan.M, Sahaya Anselin Nisha. A, " Groundnut Leaf Disease Detection and Classification by using Back Propagation Algorithm" IEEE ICCSP 2015 conference.
7. Sachin D. Khirade, A. B. Patil, " Plant Disease Detection Using Image Processing "2015 International Conference on Computing Communication Control and Automation.



## Big Data Application in Smart Education System

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### Introduction

Information building of universities has arrived the phase of smart education, as established by the fast promotion of technologies such as bulk storage, cloud computing and Internet of things in universities. The application of big data will also develop one of the core solicitations of smart education system. Big data solicitation attaches the physical stage for data storage and calculation, the associate stage for information gathering and organization, and the management platform for data examination and dispensation. Data attaches all parts of smart education system. The huge volume of information on the rank and actions of each part pooled composed will be prepared through big data analysis to current their designs of growth and put into smart application [1].

### Smart Education System.

Information Standard System. The construction of a smart education system on the campus is an informatization project integrating unification of management, mechanism, and technology. Management is the basis of regulator, business is the source of provision, data is the source of basis, and information standard is the source of direction. Information standards, the foundation of informatization construction on campus, are a necessary condition to realize application service, data sharing and information exchange service [2].

The design and implementation of information standards in universities should follow the normative model. In agreement with Information Values for Education Management---Informatization Standards for Higher Education Institutions and drawing from the successful experiences of standardization work at home and abroad, normative systems and information standards of universities shall be designed and compiled based on their actual needs and by following the "Five Uniformization" principle of "uniformize file formats", "uniformize index systems", "uniformize terminologies", "uniformize classification codes" and "uniformize information exchange formats".

**System for safe operation and maintenance of informationization.** The building of a security maintenance system, a significant provision for the building of a smart education system, contains physical security, operation security, and evidence security. Physical security includes ecological security, apparatus security, line security, adversity prevention, and recovery. Operation security includes management security, application security, risk analysis and assessment, auditing and tracking, backup and recovery. Information security includes operating system and application system security, network security, data and communication security, virus and Trojan anticipation, encryption, individuality verification and access control [3].

### Network service system

The basis of the construction of smart education system is the complete incorporation of networks, which means to assimilate numerous types of networks on campus, accept unified management and control, and deliver expanded network accesses and open standard borders, so as to safeguard the network and communication for diverse application services within the smart campus system. Presenting cloud computing and other facilities to smart campuses and providing private cloud computing services to universities. By provided that the teachers and students with a diversity of personalized information services, cloud services can be efficiently used for teaching, technical research, management and living resolutions, allowing them to enjoy the suitability of cloud computing facilities. Construction of central data platform. By construction a unified data distribution and interaction center, uniformization of information portal, individuality verification and single sign on can be realized [4].

### Public service system

Application facility: Provided that business facility segments, containing management and provision modules such as educational administration, systematic research, OA, finance, student affairs, recruitment, personnel and logistics.

General information service: Provided that public service modules, in specific a diversity of service functions containing user management, business functions, approval, log audit, identity verification, reports, data interchange, inquiry statistics, workflow, information, official framework and network community [5].

#### **Data resource system**

As a data center, data resource system, which is a basic data layer for the overall informatization of different departments in universities, includes application business data, application exchange data and other core contents. Data source layer can, by mixing numerous data sources, deliver universities with complete and correct data, sustenance data interchange between systems, deliver a unified verification service, and deliver a united and sharing data provision platform [6]. Founding a shared data center based on big data technology. The collective data center based on SOA system construction can, by providing uniform, standard data boundaries, understand united management and use of data. With the support of big data technology, the data will be more efficiently and correctly conveyed to the top level application system, allowing more comprehensive, correct, intelligent and enhanced smart education applications.

#### **Complete information service system**

The complete information service system is functioned on the data storage and interchange stage. Built on the application of big data and from the perception of the whole university, the system conveys out on this platform centralized cleaning, adaptation and scattered storage of data collected from all business systems, before combined external data service is delivered. In the form of informations or charts, in-depth statistical analysis is delivered. This delivers strong provision for decision-making of all kinds of handling staff in universities by providing correct and effective complete system for school condition inquiry, report creation system and information filling system.

The complete information service system is based on big data podium. big data stage on campus, based on the data incorporation, storage, mining and analysis of big data technology, delivers top layer application system with data provision service.

#### **The application of big data in smart education system.**

**The conception of big data.** Big data, a creation of high-tech age that accentuates the capture, management, and processing of data, is not a single technology. It can be assumed as a massive amount of informational properties with various sources, or an accumulation of data which cannot be simply captured, deposited, achieved and examined by general software. Combined and analyzed with a new method, big data can determine appreciated information, donate to decision making, and make new value [7,8].

**Collection and management of big data.** The various types of structured, semi-structured (or weakly structured) and unstructured massive data, such as radio frequency data obtained through RFID, sensor data, social network interaction data and mobile Internet data are the important of big data provision models.

Big data management means storing composed data in the memory, found consistent database and then apply and achieve the data. The attention of big data management is to address the management and dispensation technologies of complex designed semi-structured and unstructured big data. Key difficulties to be solved include the accessibility of storage, expression, management, consistency and actual transmission of big data. We should develop dependable distributed file system (DFS), storage with optimization of energy efficacy, computing-integrated storage, big data severance and big data storage tools with high competences and low costs. We should make a innovation in distributed and non-relational big data management and treating technology, data synthesis technology of varied data, data organization technology, and manner researches on big data modeling technology. We should also make a advance in the transmission, backup, replication and other technologies of big data and develop imagining technologies of big data. Data storage can be skillful through storage devices in smart campus data center, and data management and handling can be understood through the central database of data center[9,10].

The basic data of big data system is mostly from the current information management system of universities. The main purpose of big data system is to gather, analyze and display the basic data. Moreover numerous types of third party management systems, the big data system gathers and completes information on users on campus from WEB and mobile APP, like information on geographic location and notices.

**Application of big data in smart education system.** Big data analysis technology can deliver durable data analysis for student activities management. From the point of view of data mining jobs and approaches, the main objective in the application of big data in smart education system is the conception of data, which permits users to detect data dispensation results straight. The second objective is to bring analytical analysis, giving possible decision at a sure degree allowing to visualized data.

Big data technology can, by mining the information and knowledge hidden in a vast amount of data and providing the basis for social and economic activities of human beings, improve operational efficiency. Big data analysis and mining technologies can also be functional to advance teaching quality in universities, analyze performances of users in campus network and public views, which will efficiently indorse the in-depth addition of information technology and teaching.

Promoting the optimization of teaching results. Data resources of university include abundant information on teaching, which can be effectively used. By analyzing and mining the data such as click rate, download, and repetition rate of knowledge points, the emphasis and difficulty of curriculum can be obtained, personalized learning guidance can be established rendering to the visit performances of individual student, and guidance can also be made on the career development of students in future.

Effective asset management. By completing the registration and marking of asset information such as building information (the name of the building, construction area, number of floors, number of rooms on each floor, total number of beds, fire control facilities and monitoring facilities), condition of living (name of school, profession, number and grade of students), and property information (hardware and software facilities), the administrators can request and achieve information about people, finance and assets in the management system in accordance with their access level by using fixed keyword inquiry and user-defined fuzzy inquiry, realizing the effective management of assets.

Effective asset management. By completing the registration and marking of asset information such as building information (the name of the building, construction area, number of floors, number of rooms on each floor, total number of beds, fire control facilities and monitoring facilities), condition of living (name of school, profession, number and grade of students), and property information (hardware and software facilities), the administrators can inquire and manage information about people, finance and assets in the management system in accordance with their access level by using fixed keyword inquiry and user-defined fuzzy inquiry, realizing the effective management of assets.

Decision-making aids. Focusing on data capturing smart decision analysis service application is built. By building the shared database with "captured data", the authority and consistency of data used by all systems are guaranteed. By ensuring the consistency, integrity and accuracy of data of all business systems in the universities with enterprise level information standards, accessibility, intelligibility, reliability and availability of basic data throughout the universities are enhanced in data quality.

With big data, statistical summaries can be made on various data, including population statistics, event statistics and department statistics and the like, which can be displayed in the form of reports and charts (histograms, pie charts). Big data supports decision making process by allowing administrators to clearly see the statistics on people and events of various departments under their jurisdictions.

Analysis of public feelings. Public views of universities in network age are mostly shared on campus BBS, micro-blogs, WeChat and all kinds of immediate communication software. Beside the background of big data technology, a typical application of big data is to accurately and quickly grasp the trend of online public opinions and guide students to express their views properly.

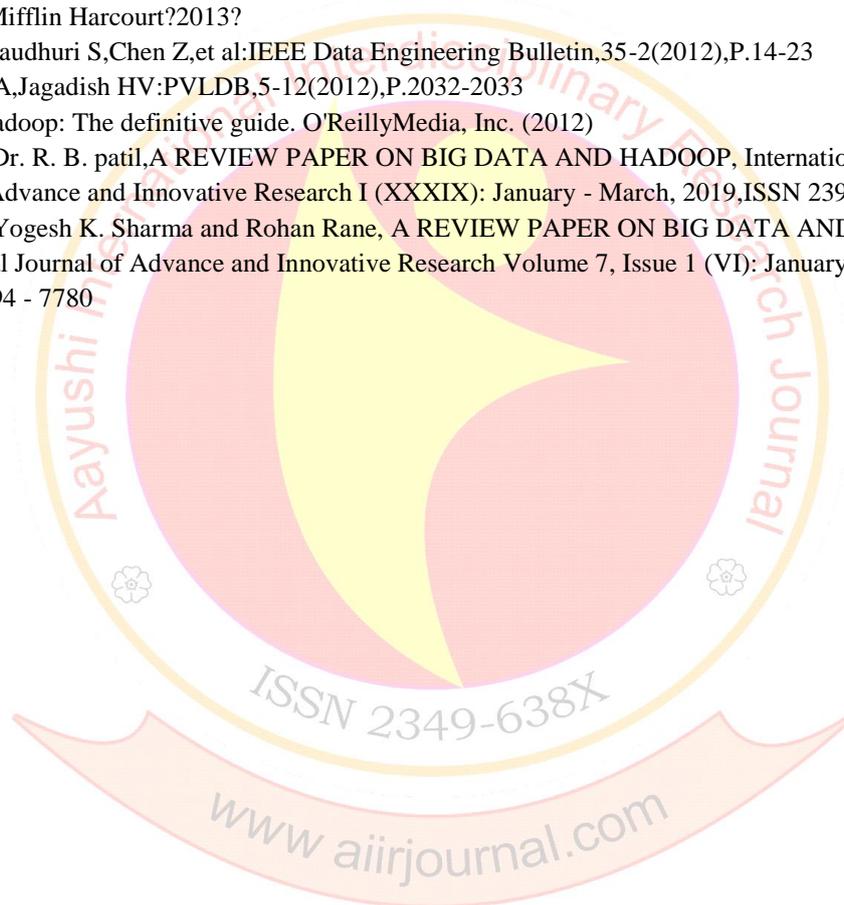
## Conclusions

With the growth of user number and data on user performance in campus network, big data application can improve the value of huge data and deliver the expectedness and significance for administration work. The application of big data, by providing more intellectual, efficient and correct services for education, scientific research, management and living, can indorse the in-depth addition of information technology and teaching and appreciate the overall development of the level of teaching. With cloud computing and IoT serving as the network basis for the gathering, delivery, exchange and storage of information, and big data as the core

technology for data mining and analysis, a smart education system featuring information gathering, source sharing, application addition and complete operation can be built to meet the growing demands at all levels in campus development. On the united smart education platform, highly effective campus management and intellectual teaching process can be realized to increase the well-being of teachers and students on campus.

## References

1. Dongxing Jiang, et al: Journal of East China Normal University. No S1(2015),p.119-125. (In Chinese)
2. Junfeng Luo, et al: The Chinese Journal of ICT in Education. No 3(2014),p.11-13. (In Chinese)
3. Qian Lu: Computer Science. Vol.38(2011),p.18-21. (In Chinese)
4. Qing-bin Sang: Journal of Nantong Textile Vocational Technology College. Vol.13(2013), p.84-87. (In Chinese)
5. Jing-yan Zhao, et al: Information Science. Vol.34(2016) ,p.92-95. (In Chinese)
6. CHENG Xue-Qi, et al: Journal of Software, Vol.25(2014), p.1889-1908. (In Chinese)
7. Mayer-Schönberger V, Cukier K. Big data: A revolution that will transform how we live, work, and think. Houghton Mifflin Harcourt?2013?
8. Arasu A, Chaudhuri S, Chen Z, et al: IEEE Data Engineering Bulletin, 35-2(2012), P.14-23
9. Labrinides A, Jagadish HV: PVLDB, 5-12(2012), P.2032-2033
10. White T. Hadoop: The definitive guide. O'ReillyMedia, Inc. (2012)
11. V.I.Pujari, Dr. R. B. patil, A REVIEW PAPER ON BIG DATA AND HADOOP, International, Volume 6. Issue Journal of Advance and Innovative Research I (XXXIX): January - March, 2019, ISSN 2394-7780 [12] Vinayak Pujari, Dr. Yogesh K. Sharma and Rohan Rane, A REVIEW PAPER ON BIG DATA AND HADOOP, International Journal of Advance and Innovative Research Volume 7, Issue 1 (VI): January - March, 2020 Part - 1, ISSN 2394 - 7780



## Influence of Modern Technology in Education

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### Introduction

The age of 21<sup>st</sup> century is often observed as an age of technology. Technology, today, plays a actual significant role in our life. It is understood as a basis of development of an economy. An economy which is unfortunate in technology can never grow in today's situation. This is because technology makes our work much informal and less time unbearable. The influence of technology can be felt in every conceivable field one such field is Education. Current technology in education According to the latest visions as to how exactly current students of today wish to use technology and how does their education get an influence if they use technology, it was exposed that the use of modern equipment technology and tools, the education and interactivity of scholars increases. They also find it much more communicating, as well as full of interesting areas, when aided by technology. The transmission of information becomes very easy and suitable, as well as effective. What this means is, that our minds now incline to work faster when helped with the use of modern technology, be it any part of life, here we talk about learning. The dependence and necessity of such an invention, that simply makes life an easy, smooth journey is completely unescapable these days even in schools, universities and colleges. Now a days Students can make use of technology in the following ways:

### *Internet connection and round the clock connectivity*

The internet has grown up in importance by many crinkles, over the process of the period. Its importance in the teaching world can now never be destabilized. In spite of the chances of deception and drawbacks, the use of the internet is like a blessing for learners. Today, the internet is something that is current in almost everything we use. From television to gaming comforts, and our phones, the internet is exactly everywhere. The use of the internet allows students to find wonderful suitability, they can find numerous kinds of help, tutorials and other kinds of assisting material that could be used to academically improve and enhance their learning.

### *Using projectors and graphics*

Visual images always have a robust appeal associated to words. Using projectors and graphics to aid in learning is another form of excessive technological use. Top institutes around the world, now depend on the use of amazing PowerPoint presentations and prognoses in order to keep the learning collaborating and stimulating. Technological use such as projectors within the schools and institutions can take the communication and attention levels right up and also improve inspiration. Students like to see pleasing visuals and something that tempts them to think rather than just reading words. The learning part also becomes pretty effective when it comes to technology.

### *Digital footprint in the education sector*

If we talk about digital and education, then the diffusion of digital media within the education sector has now grown-up. This diffusion has resulted in round the clock connectivity with scholars and diverse media that are available for different types of assignments or help. As the influence of digital increases, there are and there will be more applications that will contribution students in growth and learning.

### *Online degrees with the use of technology*

Online degrees now have become a very common sensation. Persons wish to take up online courses for their education and certifications. Top organizations offer incredible online programs with the use of numerous applications and the internet. This is a notion that will continue to increase as it gets more support and mindfulness. The online degree situation around the world is more well-known among learners who work and look for flexible studying programs.

### *Significance of technology in education*

The part of technology in the field of education is four-fold: it is comprised as a part of the prospectus, as an instructional distribution system, as a means of helping commands and also as a tool to improve the whole learning process. Thanks to technology; learning has gone from inactive and sensitive to interactive and violent.

Education is vital in business and educational settings. In the previous, education or teaching is used to help labors do things differently than they did before. In the latter; education is geared towards making interest in the minds of students. In either case, the use of technology can help learners understand and retain ideas better.

### ***Factors affecting technology in education***

I. Jung talks about the huge challenge educators are facing in our civilization due to the rapid growth of information. The current technologies are challenging that instructors learn how to use these technologies in their teaching. Hence these new technologies growth the instructors' exercise needs. Gressard and Loyd (1985) declared that instructor's attitudes toward computers are a key factor in the effective implementation of ICT in education. They pointed out that instructors do not always have positive arrogances towards computers and their poor attitudes may lead to a disappointment of the computer- based projects. Also the most commonly cited barriers are:

- lack of time;
- lack of access;
- lack of resources;
- lack of expertise and
- lack of support.

Another barricade given by Butler and Sellbom (2002) and Chizmar & Williams (2001) is dependability. Dependability involved hardware failures, incompatible software between home and school, poor or slow internet connectivity and out of date software which are accessible mostly at school while the students/educators are having more up-to-date software at home.

### ***Influence of ICT on education***

In learning context, ICT has the possible to growth access to education and progress its significance and quality. Tinio (2002) asserted that ICT has a marvelous impact on education in terms of gaining and fascination of information to both teachers and students through the promotion of:

*Active learning:* ICT tools help for the control and analysis of information got for inspection and also learners' performance report are all being computerized and made simply accessible for inquiry. In difference to memorization-based or repetition learning, ICT indorses learner appointment as learners choose what to study at their own pace and work on real life positions' problems.

*Collaborative and Cooperative learning:* ICT inspires communication and collaboration among students, teachers regardless of distance which is between them. It also delivers students the chance to work with people from different principles and working Together in clusters, hence help learners to improve their communicative skills as well as their global consciousness. Researchers have found that naturally the use of ICT leads to more collaboration among learners within and beyond school and there exists a more collaborative relationship between students and teachers (Grégoire et al., 1996). "Collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers." (Panitz, 1996).

*Creative Learning:* ICT indorses the operation of current information and to create one's own information to produce a tangible product or a given instructional purpose.

*Integrative learning:* ICT indorses an integrative method to instruction and learning, by removing the artificial separation between theory and practice unlike in the traditional classroom where prominence encloses just a particular phase.

*Evaluative learning:* Use of ICT for learning is learner-centered and delivers useful feedback through numerous interactive features. ICT allow students to discover and learn through new ways of instruction and

learning which are continued by constructivist models of learning rather than students do memorization and repetition learning.

- When a school in diverse parts of the state, students

### Positive impact

#### 1. Enhanced Teaching and Learning:

□ Technological growths like digital cameras, projectors, mind training software, computers, Powerpoint presentations, 3D visualization tools; all these have become excessive sources for instructors to help students grasp a idea easily.

- It has to be understood that a visual clarification of ideas makes learning fun and pleasant for students.

They're able to contribute more in the classroom and even teachers get a chance to make their classes more collaborating and stimulating.

#### 2. Globalization: can "meet" their complements through video conferencing without leaving the classroom.

- Some sites, such as www.glovico.com are used to help learners learn foreign languages online by combination a group of learners with a teacher from another country.

#### 3. No Geographical Limitations:

□ With the overview of online degree programs, there is hardly any need of being present physically in the classroom. Even numerous foreign universities have started online degree courses that students can join.

- Distance education and online education have become a very important parts of the education system now a day.

### Negative impact

#### *Declining Writing Skills:*

Due to the extreme usage of online chatting and shortcuts, the script skills of today's young generation have failed quite extremely.

- These days, children are trusting more and more on digital communication that they have totally forgot about educating their scripting skills.

- They don't know the spelling of diverse words, how to use grammar properly or how to do cusive writing.

#### 2. Increasing Incidents of Cheating:

- Technological developments like graphical calculators, high tech watches, mini cameras and similar tools have become countless sources to fraud in exams.

□□ It is easier for learners to write formulas and notes on graphing calculators, with least chances of being caught.

#### 3. Lack of Focus:

- SMS or text messaging has become a preferred pastime of numerous students. Students are seen playing with their cell phone, iPhones day and night or driving and very often even between lectures.

- Being ever-connected to the online world has caused in lack of focus and attention in instructors and to some extent, even in sports and additional activities.

### Advantages

- It makes students more excited to learn.

- Help students with busy schedules, freedom to work at home on their own time.

- Train students to learn new technology skills they can use later in the work place.

- Reduction paper and copying costs, promoting concept of "green revolution".

### Disadvantages

- Many experts and experienced people say that, due to such technology in education, students imagination is affected, their thinking ability is reduced.
- Sometime it's also time-consuming from teacher's point of view.
- It is costly to install such technology.
- There can be health issues too when used over limit.

### Conclusion

Technology has a positive influence on education and at the same time may also posture negative effects. Instructors and learners should take advantage of this in the good light and remove the disadvantages which are pulling back many of learners as well as schools from achieving superiority. It is thus time for every nation to present a more technologically armed education sector in the future.

### References

1. Beringer, V. (2009, October 20) For kids, pen's mightier than keyboard. [futurity.org](http://www.futurity.org).
2. Retrieved February 25th 2013 from <http://www.futurity.org/society-culture/for-kids-pens-mightier-than-keyboard/#more-4909>.
3. Bounds, G. (2010, October 5) How handwriting trains the brain – forming letters is key to learning, memory, idea. [wsj.com](http://www.wsj.com). Retrieved February 25th 2013 from <http://online.wsj.com/article/SB10001424052748704631504575531932754922518.html>
4. Bransford, J., Brown, A., & Cocking, R. (2000). How people learn: Brain, mind, experience, and school. Washington, DC: National Academic Press.
5. Brill, J. M., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom-based practices. *British Journal of Educational Technology*. 38(1), 95-105.
6. Leising, J. (2013 January 30) The new script for teaching handwriting is no script at all. [wsj.com](http://www.wsj.com) Retrieved February 25th 2013 from <http://online.wsj.com/article/SB10001424127887323644904578272151551627948.html?KEYWORDS=handwriting>
7. Roschelle, J., Pea, R., Hoadley, C., Gordin, D., & Means, B. (2000). *Future of children*, 10(2), 76-101.
8. Shah (2011, July 16) Why does writing make us smart ? [huffingpost.com](http://www.huffingtonpost.com). Retrieved February 25th 2013 from [http://www.huffingtonpost.com/2011/07/16/why-does-writing-make-us-\\_n\\_900638.html](http://www.huffingtonpost.com/2011/07/16/why-does-writing-make-us-_n_900638.html)
9. Wengliniski, H. (1998). Does it compute? The relationship between educational technology and student achievement in mathematics. Princeton, NJ: ETS.
10. Pujari, Dr.R.B.Patil, S.S.Bhosale ,Role of ELearning Through ICT For Professional Education in India, *RexJournal*,ISSN2321-1067
11. A. P. Sutar, S. S. Bhosale, V.I. Pujari, *ICT IN EDUCATION SYSTEM* , 2019 *JETIR* May 2019, Volume 6, Issue 5 , [www.jetir.org](http://www.jetir.org) (ISSN-2349-5162)

## Internet of Things (IoT): Research, Architectures and Applications

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### Introduction

The Internet of things (IoT) is the network of corporeal devices, home appliances, vehicles, and other substances fixed with electronics, sensors, software, actuators, and system connectivity which allow these substances to gather and conversation data. To each object is uniquely recognisable over its embedded calculating system but is able to interoperate within the present Internet substructure. The IoT permits substances to be detected or measured remotely diagonally existing network substructure [1], making occasions for more straight incorporation of the physical world into computer-based systems, and subsequent in better competence, correctness and economic advantage in addition to minimise human interference [2-5]. When IoT is increased with devices and actuators, the technology develops a sample of the more universal class of virtual physical systems, which also includes technologies such as smart networks, smart homes, virtual power plants, intelligent transport and smart cities. Things, in the IoT intellect, can refer to a wide variety of policies such as heart observing grafts, biochip transponders on grange animals, cameras flowing live foods of harsh animals in beach waters, vehicles with built-in sensors, DNA examination devices for ecological, food, pathogen observing [6], or field process policies that support fire fighters in hunt and release processes [7].

Created on overhead conversation the upcoming of the IoT will be on many requests. Its application will variety from, smart city, smart grid, intelligent automobiles, smart electricity meters etc. This article presents a study on IoT and its application in science and technology. A literature appraisal is providing based on different application of IoT. Architecture and basics of IoT, along with key topographies is also been conversed.

### II. Literature Review

A education founded on context-aware calculating, education, and big data in Internet of Things was providing by Sezer et al. [9]. Na et al. [10] has planned energy-efficient mobile charging for wireless power transmission in Internet of Things links. Jin et al. [11] projected an info framework for making a smart city over Internet of Things. Wu et al. [12] cultivate a new paradigm, named cognitive Internet of Things (CIoT), to empower the current IoT with a "brain" for high-level intelligence. Xia et al. [13] proposed GPS-free greedy routing with delivery guarantee and low stretch factor on 2-D and 3-D surfaces. Ren et al. [14] proposed a technique for exploiting the data sensitivity of neurometric fidelity for optimizing EEG sensing. Yu et al. [15] developed a method for carbon-aware energy cost minimization for distributed internet data centers in smart microgrids. Abdelwahab et al. [16] discussed enabling smart cloud services through remote sensing: an internet of everything enabler. Khan et al. [17] discussed a design of a reconfigurable RFID sensing tag as a generic sensing platform toward the future Internet of Things. Zhang et al. [18] provided information about ubiquitous WSN for healthcare. Främbling et al. [19] proposed a universal messaging standard for the IoT from a lifecycle management perspective. Sheng et al. [20] proposed leveraging GPS-less sensing scheduling for green mobile crowd sensing. Chen et al. [21] discussed information fusion to defend intentional attack in Internet of Things. Kantarci and Mouftah [22] proposed trustworthy sensing for public safety in cloud-centric Internet of Things. Lin et al. [23] proposes a protocol and a method of spectrum management that can guard against common types of security threats despite the limitations of the local processing. New and innovative IoT based applications and its basics were discussed in literature [26-29]. As the Internet of Things (IoT) is emerging as an attractive paradigm, a typical IoT architecture that U2IoT (Unit IoT and Ubiquitous IoT) model has been presented for the future IoT. Based on the U2IoT model, this paper proposes a cyber-physical-social based security architecture (IPM) to deal with Information, Physical, and Management security perspectives, and presents how the architectural abstractions support U2IoT model. In particular, 1) an information security

model is established to describe the mapping relations among U2IoT, security layer, and security requirement, in which social layer and additional intelligence and compatibility properties are infused into IPM; 2) physical security referring to the external context and inherent infrastructure are inspired by artificial immune algorithms; 3) recommended security strategies are suggested for social management control. The proposed IPM combining the cyber world, physical world and human social provides constructive proposal towards the future IoT security and privacy protection [30]. The Internet is evolving rapidly toward the future Internet of Things (IoT) which will potentially connect billions or even trillions of edge devices which could generate huge amount of data at a very high speed and some of the applications may require very low latency. The traditional cloud infrastructure will run into a series of difficulties due to centralized computation, storage, and networking in a small number of datacentres, and due to the relative long distance between the edge devices and the remote datacentres. To tackle this challenge, edge cloud and edge computing seem to be a promising possibility which provides resources closer to the resource-poor edge IoT devices and potentially can nurture a new IoT innovation ecosystem. Such prospect is enabled by a series of emerging technologies, including network function virtualization and software defined networking. In this survey paper, we investigate the key rationale, the state-of-the-art efforts, the key enabling technologies and research topics, and typical IoT applications benefiting from edge cloud. We aim to draw an overall picture of both ongoing research efforts and future possible research directions through comprehensive discussions [31].

### III. Architecture Of Iot

Architecture of IoT [24] depends on various applications of IoT. Fig. 1 shows general 3 layer / 4 layer architecture for IoT. For e.g. consider two scenario. Scenario-1, Lets reflect smart devices for effluence, wherein sensors intellect the amount of carbon monoxide, nitrogen dioxide, sound level etc. and sends these data continuously to the central database. These data will be examined by using investigative tools and gives info about sum of air effluence in that specific city to the traffic police. This info helps to take the protection when it surpasses the normal level. Here device layer designates sensors will be constantly detecting the air and sends the data over Wired or wireless communication to the database. This data will be handled and examined and final combined result will be send to the user smart phone over the Air pollution control application. Later four layers architecture is essential.

Scenario-2: Let's study a device is devoted near the kitchen or gas cylinder with context to find the gas leakage. In this when device senses gas leakage it has to aware the surrounding directly and then has to send the message to the vender. In this case examining has to be done in the sensor layer itself.

### IV. Elements Of Iot:

Important mechanisms [25] which are essential to build IoT are i) hardware mechanisms such as devices, actuators, ii) Middleware mechanisms such as database for storage and data logical tools iii) Visualization through diverse applications.

**4.1 Single identification for to each smart device** IoT contains of enormous number of smart devices. Each of this devices requires a unique identification for communication and also helps to control and access remote devices through internet. Ipv4 addressing supports limited number of single addressing for smart devices. IPv6 provides large set of unique address. Apart from this unique address, each of these devices also has object id. This object id is used to refer the smart device within the communication network.

**4.2 Sensing devices** Each object embedded with sensors continuously sense the data based on the context. Context may be sensing humidity or temperature or sound level, amount of air pollution or motion etc.

**4.3 Communication** Sensed data from smart devices are sent to the database through the communication technologies. This communiqué equipment may be Radio Frequency Identification (RFID), Bluetooth, Near Field Communication (NFC), Wi-Fi, ultrawide bandwidth(UWB), Z-wave, 3G, 4G and Long Term Evolution-Advanced (LTE-A).

**4.4 Data storage and analytics** In IoT smart devices produces large amount of data, which has to be stored in the storage device. These stored data has to be analysed to extract the meaningful information. To do this, analytics or logical tool which includes intellectual algorithm has to be established to extract the valuable info

from raw data. This analytical tool has to support interoperability with different platforms. In the IoT building middleware represents the both storage and analytical tools. A centralized infrastructure is required to support both Storage and analytical tools.

**4.5 Visualization** Nowadays the world has become smart with smart phones. by means of smart phones or laptops operator has to download the essential application and through which operator can cooperate with central database and get the valuable information about the actual surroundings.

## V. IOT – Key Features

The most significant features of IoT contain artificial connectivity, sensors, intelligence, active engagement, and small device use. A brief review of these features is given below:

1. **AI** – IoT basically creates virtually whatever “smart”, sense it improves every feature of life with the power of artificial intelligence algorithms, data collection, and networks. This can mean something as simple as enhancing your refrigerator and cabinets to detect when milk and your favourite cereal run low, and to then place an order with your preferred grocer. **2. Connectivity** – New allowing technologies for networking, and precisely IoT networking, mean networks are no longer completely tense to main suppliers. Networks can occur on a much lesser and cheaper scale while still existence practical. IoT creates these small networks between its system devices.

**Sensors** – IoT loses its difference deprived of devices. They performance as important tools which alter IoT from a normal passive network of devices into an active system capable of real-world integration.

**Active Appointment** – Considerable of today's communication with associated technology occurs through passive engagement. IoT presents a new example for active product, content, or service engagement.

**3. Small Devices** – Devices, as forecast, cheaper, have become smaller, and more powerful over time. IoT deeds purpose-built small devices to bring its exactness, scalability, and adaptability.

## VI. Conclusions

The Internet has different radically the way we live, touching connections between people at a simulated level in numerous settings spanning from the professional life to social relationships. The IoT has the possible to add a new measurement to this procedure by allowing transportations with and amongst smart substances, thus leading to the vision of „,anytime, wherever, any media, anything” transportations. This article providing a research review about the Internet of Things (IoT). Different aspects of the IoT are discussed in this paper. Work reported in literature is provided and discussed. Architecture and different elements of IoT is explained. Key Features and its applications are also described.

## References

1. "Internet of Things: Science Fiction or Business Fact?". Harvard Business Review. November 2014.
2. Vermesan Ovidiu, Friess Peter, "Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems", Aalborg, Denmark: River Publishers, 2013.
3. Santucci Gerald, "The Internet of Things: Between the Revolution of the Internet and the Metamorphosis of Objects", European Commission Community Research and Development Information Service.
4. Mattern Friedemann, Floerkemeier Christian "From the Internet of Computers to the Internet of Things", ETH Zurich.
5. Lindner Tim "The Supply Chain: Changing at the Speed of Technology", Connected World, 2015.
6. Erlich Yaniv "A vision for ubiquitous sequencing", Genome Research, 25 (10), 1411-1416, 2015.
7. Wigmore I, "Internet of Things (IoT)", TechTarget, 2014.
8. Noto La Diega Guido, Walden Ian, "Contracting for the 'Internet of Things': Looking into the Nest", Queen Mary School of Law Legal Studies Research, 2016.
9. O. B. Sezer, E. Dogdu, and A. M. Ozbayoglu, "Context-Aware Computing, Learning, and Big Data in
10. Internet of Things: A Survey", IEEE Internet of Things journal, Feb. 2018, Vol. 5, pp. 1-27.
11. W. Na, J. Park, C. Lee, K. Park, J. Kim, and S. Cho, "Energy-Efficient Mobile Charging for Wireless Power Transfer in Internet of Things Networks", IEEE Internet of Things journal, Feb. 2018, Vol. 5.
12. J. Jin, J. Gubbi, S. Marusic, M. Palaniswami, "An Information Framework for Creating a Smart City Through Internet of Things", IEEE Internet of Things journal, April 2014, Vol. 1, pp. 112-121.

13. Q. Wu, G. Ding, Y. Xu, S. Feng, Z. Du, J. Wang, K. Long, "Cognitive Internet of Things: A New Paradigm Beyond Connection", IEEE Internet of Things journal, April 2014, Vol. 1, pp. 129-143.
14. S. Xia, H. Wu, and M. Jin, "GPS-Free Greedy Routing With Delivery Guarantee and Low Stretch Factor on 2-D and 3-D Surfaces", IEEE Internet of Things journal, June 2014, Vol. 1, pp. 233-243.
15. Z. Ren, X. Qi, G. Zhou, H. Wang, "Exploiting the Data Sensitivity of Neurometric Fidelity for Optimizing EEG Sensing", IEEE Internet of Things journal, June 2014, Vol. 1, pp. 243-254.
16. L. Yu, T. Jiang, Y. Cao, Q. Qi, "Carbon-Aware Energy Cost Minimization for Distributed Internet Data Centers in Smart Microgrids", IEEE Internet of Things journal, June 2014, Vol. 1, pp. 255-275.
17. S. Abdelwahab, B. Hamdaoui, M. Guizani, A. Rayes, "Enabling Smart Cloud Services Through Remote Sensing: An Internet of Everything Enabler", IEEE Internet of Things journal, June 2014, Vol. 1, pp. 276-288.
18. M. S. Khan, M. S. Islam, H. Deng, "Design of a Reconfigurable RFID Sensing Tag as a Generic Sensing Platform Toward the Future Internet of Things", IEEE Internet of Things journal, June 2014, Vol. 1, pp. 300-310. Journal, Vol. 5, Issue 1, Feb. 2018.



## Advantages And Disadvantages Of Artificial Intelligence

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### 1. Abstract:

AI is the technology which is very helpful for human being. By using this technology the hard work of human can be escape. The artificial intelligence can be use in healthcare, education, in electronics, software development, pharmacies, games, engineering, communication and development. AI is based on science and technology on discipline like information technology, biology, phycology, mathematics etc. The main advantage of artificial intelligence is , the work will be accurate and the time can be save.

Keywords: Introduction to Artificial intelligence, Aims of AI ,Applications, Advantages & Disadvantages.

### Introduction:

Artificial intelligence is of two words one is Artificial and second is intelligence , artificial means man-made and intelligence means the capacity of thinking. So we can define the artificial intelligence the branch of computer science by which we can develop intelligent machines who can behave like human, think like human and make decisions as per the logic program in memory.

Artificial intelligence is a branch of science which deals with modifying machines for finding solutions of complex problems in human-like fashion. In common manner it is borrowing characteristics form human intelligence, and by using algorithm we can command the computer. The AI is very helpful for the human as well as society. In this the work of human is reduced and by using machine or devices we can complete our task. The committee of scientist every five years to assess the current state of AI. The committee checking the development of AI.

Here, one among the booming technologies of computing is AI which is prepared to make a replacement revolution within the world by making intelligent machines. The Artificial Intelligence is now all around us. It is currently working with a spread of subfields, starting from general to specific, like self-driving cars, playing chess, proving theorems, playing music, Painting, etc.

The Artificial intelligence refers to compute control robot to complete the given task. Since mid-20th century, scientists have attempted to develop a system capable of carrying out tasks perceived as requiring human intelligence.

### Definition of AI:

AI refers to the similarity of human intelligence in machines that are programmed to think like humans and copy their steps. This term is mainly use to solve the problem like human being. AI is a method in which we program the machine to work like a human example, driving cars etc.

Artificial intelligence (AI), the ability of a computer or computer- controlled robot to complete the tasks mainly associated with intelligent beings.

### Aim of AI:

**The goals of AI are:** - To build the computers then they can see, hear, walk, talk, and feel. A main thrust of AI is the building of computer functions normally clustered with human intelligence, such as thinking , learning, and problem solving. That's why John McCarthy coined the term artificial intelligence at MIT in 1956.

- -To Create Expert Systems –The device or machine which exhibit intelligent behavior, learn, think, demonstrate, explain, and give suggestions to its users.
- -To Implement Human Intelligence in computer – Creating systems that understand, think, learn, and behave like human beings.

### Applications of AI:

AI has big role in: transportation; robots ; health ; education; commination; public safety and security, entertainment; employment.

### Smarter cars:

In 2001 GPS was introduced for personal vehicle for car navigation devices and from this it is become a basic part of the transportation infrastructure. Nowadays vehicle are equipped with sensors .An average automobile in the US is predicted to have seventy sensors including gyroscopes, accelerometers, ambient light sensors, and many sensors are used. Automobiles built 2000 sensor for the better quality and service of cars.

### AI in social media:

Social Media sites like Facebook, Twitter, and Snapchat contain billions of user profiles, which require to be stored and managed during a very efficient way. AI can organize and manage massive amounts of knowledge. AI can analyze many data to spot the newest trends, hashtag, and requirement of various users

### AI in Robotics:

Artificial Intelligence has a remarkable role in Robotics. Usually, general robots are programmed such they will perform some repetitive task, but with the assistance of AI, we will create intelligent robots which may perform tasks with their own experiences without pre-programmed.

Humanoid Robots are best examples for AI in robotics, recently the intelligent Humanoid robot named as Erica and Sophia has been developed which can talk and behave like humans.

### AI in e-commerce:

AI is providing a competitive edge to the e-commerce industry, and it's becoming more demanding within the e-commerce business. AI helps shoppers to get associated products with recommended size, color, or maybe brand.

### AI in Education:

From fifteen years AI is considered as it is advance in education field. Applications are used by educators and learners today. Robots have long been popular educational devices, In 1980s in MIT Lab the Lego Mind Storms kits are developed for purpose of education. Some robots like Ozobot and Cubelets teach and help learners and children's.

### AI in Safety And Security:

AI is used only when necessary. And deployment is very carefully done, AI is also helpful for removing some of the bias inherent in human decision-making. The term AI is also helpful in Cybersecurity, and machine learning is making an impact. The CCTVs are deployed almost everywhere in the world today tend to be more useful for helping solve crimes and preventing them.

### Advantages:

By using Artificial intelligence human works can be reduce, by replacing peoples by machines, people can do others works.

- programming , self-writing , self modifying etc by these works man feels burden on him.
- The artificial intelligence is like a cheap labor, and by using this labor our work will be fast and the profit will be increased.
- Artificial intelligence can be deployed easily.
- Machines not required refreshments and breaks as like human beings.
- The machines can be re programmed for work for long time without getting bored or getting tired.
- The science of robotics and artificial intelligence can be deploy into mining and other fuel exploration process by this we can save human life because human can make new robots but we cant make that human.
- Artificial intelligence can be deployed at industries and companies.

The "human error" this phrase was born because humans are mistaking from time to time. Computers, however, don't make these mistakes if they're programmed properly. With AI , the choices are taken from the previously gathered information applying a particular set of algorithms. So errors are reduced and therefore the chance of reaching accuracy with a greater degree of precision may be a possibility.

In our day-to-day work, we'll be performing many repetitive works like sending a thanking mail, verifying certain documents for errors and lots of more things. Using AI we'll productively automate these mundane tasks and should even remove "boring" tasks for humans and free them up to be increasingly creative

Some of the highly advanced organizations use digital assistants to interact with users which saves the necessity for human resources. The digital assistants also utilized in many websites to supply things that users want. We can chat with them about what we are trying to find. Some chatbots are designed in such how that it's become hard to work out that we're chatting with a chatbot or a person's being.

Using AI alongside other technologies we will make machines take decisions faster than a person's and perform actions quicker. While taking a choice human will analyze many factors both emotionally and practically but AI-powered machine works on what it's programmed and delivers the results in a faster way.

Daily applications like Apple's Siri, Window's Cortana, Google's OK Google are frequently utilized in our daily routine whether it's for searching a location, taking a selfie, making a call , replying to a mail and lots of more.

### Disadvantages:

- Not easy to develop the machines because the equipment are also expensive.
- Can cost tons of cash and time to create , rebuild, and repair. Robotic repair can occur to scale back time and humans wanting to fix it, but that'll cost extra money and resources.
- Robots, with them replacing jobs, can cause severe unemployment, unless if humans can fix the unemployment with jobs AI can't do or severely change the govt to communism.
- Machines can easily cause destruction, if put within the incorrect hands. That is, a minimum of a fear of the various humans.
- AI is making humans lazy with its applications automating the bulk of the work. Humans tend to urge hooked in to these inventions which may cause a drag to future generations.
- As AI is replacing the majority of the repetitive tasks and other works with robots, human interference is becoming less which may cause a significant problem within the utilization standards. Every organization is looking to exchange the minimum qualified individuals with AI robots which may do similar work with more efficiency.
- There is little question that machines are far better when it involves working efficiently but they can't replace the human connection that creates the team. Machines cannot develop a bond with humans which is an important attribute when involves Team Management.
- Machines can perform only those tasks which they're designed or programmed to try to , anything out of that they have a tendency to crash or give irrelevant outputs which might be a serious backdrop.

### Conclusion:

From the above discussion we can see that Artificial Intelligent Technologies ease human's life and by coming future Artificial Intelligent Technologies can provide more competitive advantage.

At the end, we've been during this research through the AI definitions, brief history, applications of AI publicly , applications of AI in military, ethics of AI, and therefore the three rules of robotics. This is not the top of AI, there's more to return from it, who knows what the AI can do for us within the future, maybe it'll be a whole society of robots.

### Reference:

1. Horvitz, E., 2014. One Hundred Year Study on Artificial Intelligence: Reflections and Framing.
2. Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., Hirschberg, J., Kalyan Krishnan, S., Kamar, E., Kraus, S. and Leyton-Brown, K., 2016. Artificial intelligence and life in 2030. One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel.
3. Copeland, J., 2015. Artificial intelligence: A philosophical introduction. John Wiley & Sons.
4. Simon, H.A., 1996. The sciences of the artificial. MIT press.
5. Naik, P., 2016. Importance of Artificial Intelligence with their wider application and Technologies in Present Trends.
6. Shankar Shambhu, Rink, 2015. Advance applications of Artificial Intelligence Technologies in various Business Processes
7. Mark Sullivan, August 9, 2012, accessed August 1, 2016 "A brief history of GPS," PCWorld,.
8. William J. Fleming, 8, no 11, (2008): 1900-1921 "New Automotive Sensors - A Review," IEEE Sensors Journal.

9. Jean Jacques Meneu, ed., Arrow, September 24, 2015, accessed August 1, 2016 "Automotive Sensors: Now and in the Future," .
10. LeighAnne Olsen, Dara Aisner, and J Michael McGinnis, eds., 2007), accessed August 1, 2016
11. "Institute of Medicine (US) Roundtable on Evidence-Based Medicine," The Learning Healthcare System: Workshop Summary. (Washington (DC): National Academies Press (US) .
12. "Big Op-Ed: Shifting Opinions On Surveillance Cameras," Talk of the Nation, NPR, April 22, 2013, accessed August 1, 2016
13. Nilsson, N.J., 2009. The quest for artificial intelligence. Cambridge University Press.
14. Kamal Phulera<sup>1</sup>, Himanshu Singh<sup>1</sup> and Anurag Bhatt<sup>2</sup>, 2017 Analytical Study on Artificial Intelligence Techniques to Achieve Expert Systems
15. Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., Hirschberg, J., Kalyanakrishnan, S., Kamar, E., Kraus, S. and Leyton-Brown, K., 2016. Artificial intelligence and life in 2030. One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel.
16. Research papers of Artificial intelligence.
17. Sachin S. Bhosale, Ashwini G. Salunkhe and Shailesh S. Sutar, ARTIFICIAL INTELLIGENCE AND ITS APPLICATION IN DIFFERENT AREAS , International Journal of Advance and Innovative Research Volume 7, Issue 1 (VI): January - March, 2020 Part – 1, ISSN 2394 - 7780



## Green Technology

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### Introduction

Green technology which is also called as sustainable technology takes impact on the environment. Recycling, renewable resources, safety disquiets, reducing and reusing are used in making of green technology. Green technology works with science and technology to protect the environment.as this technology helps in balancing the ecosystem it is referred to as clean technology. It is seen that nowadays companies consume more energy than what is needed which leads to pollution in the environment. Green technology which is also called as environmental friendly Technology helps in making the technology without harming the nature. The aim of the green technology is to inhibit the natural resources and fresh the environment. Green technology uses the 3 mantras such as reduce, reuse and recycle for the betterment of the environment. Some of the benefit of green technology is that it is environmental impact. it reduces the emissions of toxic gases from the environment and it is used for saving the natural resources. The Green technology devours the fewer energy then conventional technology. The main purpose of green technology is to slow down the global warming and decrease the green house gases(GHG).Green energy comes from sunlight ,rain ,tides ,wind and plants this energy are renewable

### 5. Importance of Green Technology



The above figure describes Importance of Green technology which includes the effectiveness to promote the green industry. Due to green technology there is a major savior of the environment. Before the green technology there was loss of the environment by the industries but since we use the method of green technology we do not harm the environment. Green technology is the elevation to the green business. Green technology gives strategic pivot of green growth. Green technology supports in dipping the green house gas emissions. It is the new-fangled source for the progress of the country.

### IV. Limitations of Green Technology

Green Technology wants the renewable and biodegradable material which is expensive.Many of the individuals are oblivious of the green harvests and their customs. Most of the people are unwary to remuneration a premium of the green products. Water conduct technology is also overpriced.

## 6. Goals Of Green Technology



### 7.

The goals of the green technology are as follows:

- Rethinking: The goal of the rethinking is to think on changing the patterns of the production so as to reclaim or reuse the products.
- Recycling: It is the process of converting the waste materials into new ones. It is the waste discarding technique which can be used for saving the natural resources.
- Renewing: It is the process by which the renewable resources are used to save the natural resources. The things which can be used again and again are refurbished.
- Reducing: The waste which cannot be used again for eg: the electronics which are not in condition to be used are reduced.
- Responsibility: Green Technology takes the responsibility of maintaining the beauty of the nature by not harming the environment.

### VI.Future Scope of green Technology

As we grasp before few years or before the execution of green technology there was lots of complications such as global warming, energy- shortages, pollution and we were facing many environmental issues. But since we have applied the green technology there is a change in the environment as well in the human life.

Now is up to us that how we look at green technology if we support the green IT then there would be a very moral change in the society. Green technology helps in blending the fossil fuels as well as the renewable energy from the environment and minimize the environmental influences. The green electricity is the freshest and the most valuable form of renewable energy. The green technology reliefs in reducing the emissions of toxic gases. It also chains in reducing the waste. It is assumed that both the electricity and hydrogen will become the future fuels as the distribution of electric and fuel cell vehicles is growing speedily. The green technology uses the renewable energy such as geo thermal energy, rain , wind, tides, algae and plants which decreases the global warming from the environment.by saving the energy we can save the natural resources from getting harm by the toxic gases and global warming. Using the green products which are free from ozone depletion and toxic compounds can protect the nature.

### VII.Conclusion

By using the Green technology we help to encourage an eco-friendly and domestic environment along with our welfares by dropping costs, wounding down of waste and preserving energy. Green technology not only comprise in green computing but also emphases on the mechanisms used in the computers. Green technology correctly discourages the matter of global warming. Currently all the companies focuses on the concept of green IT. Green technology tips to a lot of energy savings, decrease in production of CO<sub>2</sub> and CFC's which leads to environment defense. Green economy has a latent to realize sustainable development an eliminate poverty on an extraordinary scale.

### VIII.Reference

1. Information collected from Google chrome.
2. Referred the textbook of green technology (techmax).
3. H. L. Antulet, S. S. Bhosaler and Dr. R. B.Patil, GREEN COMPUTING TODAYS NEED AND IMPLEMENTATION, International\olume 6, Issue IJournal of Advance and Innovative Research(XXXV): January - March. 20t9 PART \_ 2,ISSN-2394,7780

## IOT based Measurement and Monitoring of Relative Moisture in Crop

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### Introduction

The internet of things (IoT) is the network of physical objects, devices embedded with sensors, electronics, software and the network connectivity that enables the physical objects to collect and exchange data. IoT allows these objects to be sensed and controlled remotely across existing network infrastructure. IoT cloud platforms that store data coming from small scale computing development boards like Arduino, Raspberry etc. are an essential component in the development of such systems. The focus of this paper is to create a prototype that will monitor the relative moisture in the plant and provide alerts to notify need for watering to restore water levels for healthy growth of crop [1].

A key concept of the Internet of Things is the connectivity of multiple smaller devices to construct a larger grid of sensing network. Since application of most of these sensors are in large area sensing, such sensors are connected wirelessly to a central hub before logging the data over a larger network like the Local Area Network or the Wide Area Network. This allows the technology to obtain different statistical data over a large area which was not feasible earlier due to lack of IoT compatible hardware and software.

A general IoT setup might contain several different or similar type of sensing devices connected over a small or large network or even across a hierarchy of networks. This enable us to build different sort of network architectures and topologies - ring, bus, mesh, star, tree etc. Existing network architectures might be used to implement the connection of different IoT devices like a communication network as shown in figure a.

In the scope of IoT hardware, a wide scale of devices have been used in the recent years. Small, smart and computationally expensive devices like *Amazon's Alexa* have been used as a means to actuate, regulate and monitor various devices like house lights and air conditioning, using IoT communication standards and network protocols. Other forms of hardware include the use of mobile computers to perform intelligent communication and transfer of data from a sensor to a central remote database. An example of such a system might include the use of pocket sized computing devices like an Arduino, Raspberry Pi, Odroid or the Nvidia Jetson to acquire data from a variety of physically connected sensing devices and publish them over a wired or wireless network to a cloud based logger.

Recent developments in these smaller computing hardware devices have enabled inexpensive processors to perform previously complicated tasks like connecting to the cloud and uploading data. Such devices can similarly also be used to actuate devices over the network either manually or automated using the collected statistical data and making complex decisions based on intelligent algorithms like Machine Learning.

The software part of IoT involves the communication between the aforementioned hardware's and also their network with existing inter-connected systems. Figure b shows a general overview of the typical IoT setup and communication network. The lowest layers consist of protocols and methods to interface the sensors to small scale processors and controllers to be able to relay data to a more efficient device which can handle communication of large data. Such protocols involves hardware access communication like Serial Peripheral Interface (SPI), Inter-Integrated Circuit (I2C), and Universal Synchronous/Asynchronous Receiver/Transmitter (USART) etc. Such devices have a high bandwidth to interface these devices and can log some data temporarily. Once the data buffer in these devices have been filled, they may forward this data bunch onto a central device which connects many such devices. This communication involves transfer of relatively large data at a higher refresh rate over multiple devices.

For this reason custom IoT protocols have been developed like 6LoWPAN, alongside existing protocols like User Datagram Protocol (UDP) to acquire large amount of data from several sensor devices simultaneously and log into local storage. The next level involves transport of all acquired data to a larger storage usually using complex protocols like Wi-Fi, Bluetooth and other means to connect to the internet. This is usually done to enable remote global access to this data and to also perform complex statistical analysis of

large amount of data called *Big Data Analytics*. IoT helps to modularize the data collection process and propagates population of more sensing devices to perform better analysis of a certain type of information. This scale of data can be useful in a variety of application, for example, a large set of humidity sensors in particularly placed locations on a farm can be used to provide data about the water content in the soil, and hence to generalize and stipulate the health of the soil, by providing a analytically calculated schedule of watering specifics parts of the field at specific intervals.

This project aims to show a small example of how such a large scale system may operate by showing an application of a moisture sensor to the soil under a plant and access the data remotely.

## Research Projects

### A.Theory

Soil parameters such as soil moisture, temperature, light intensity and humidity play a vital role in the production and yield of the crop. Real-time monitoring of these parameters can be accomplished using various sensors connected to the internet using WiFi connection which comes under Internet of Things. In the past days various switches were used to control ON and OFF mechanism for irrigation which includes watering the crops. But, present day cellular technology and the inter services has made it easy to monitor the plant even in the rural areas [5]. Now-a-days water management is considered as one of the important concerns for environment [6]. Managing irrigation water needs to combine a method of irrigation scheduling along with method of measuring soil moisture.

'Smart plant system' is an IoT project tutorial which describes how to build an IoT project that monitors the plant health status. along with the soil moisture other environmental parameters like temperature, humidity and light intensity are monitored [7]. Alert is send to user's smartphone when some parameter value is out of range. In the above tutorial project

Arduino Uno and the three sensors temperature humidity sensor, soil moisture sensor and light intensity sensor are used. The values are read by the sensors and send over the IoT cloud platform Ubidots where they are converted into the variables and are monitored.

The second research paper 'Measurement and Monitoring of Soil Moisture using Cloud IoT and Android System' describes the system developed for analysing soil moisture in different soils (black and red soil) [5]. 'Smart Plant Monitoring System' is a research paper that implements a cloud based server and a mobile based device which helps the user to control and see the status of the plant which is being monitored by the hardware device. Along with the temperature, light, humidity the level of carbon dioxide is also measured.

The research paper 'IoT Enabled Plant Soil Moisture Monitoring Using Wireless Sensor Networks' describes the issues in development of a system with the cloud enabled storage and reliable wireless connectivity. Here, the Wireless Sensor Network is integrated with Internet of Things to achieve the above objective. Further, to enhance the network lifetime, Exponential Weighted Moving Average event detection algorithm is adopted [22].

### B. Soil Moisture Concepts and Terms

The paper 'Measuring Soil Moisture for the Irrigation Water Management' describes the management of the water in irrigation that is timely application of the right amount of water [6]. Soil moisture levels can be expressed in the terms of soil water content. It is commonly explained in the terms of percent water by weight, percent water by volume etc. Water in the soil is classified in the terms of availability.

#### 1) Field capacity

Is the point at which the easily drained water has drained from the soil. Generally, the field capacity is considered as  $\frac{1}{2}$  bar tension. But, for most of the irrigated soils the field capacity is  $\frac{1}{10}$  bar tension.

#### 2) Wilting point

It is the soil moisture content where most plants would experience permanent wilting and is occurred at 15 bars tension.

#### 3) Readily available water

It is the portion of the water that is readily available that is its easy for the plant to use. It common to consider about 50% of the available water as readily available water.

## Application Domain And Data Analysis Discussion

There are various applications of the IoT like smart home management, infrastructure management, energy management etc. This paper mainly focuses on environmental management one of the most important application of IoT. They typically use sensors in assisting in environmental protection by monitoring atmospheric or soil conditions, air or water quality, movements of wildlife so on. In this paper the health of plant will be taken care of by monitoring soil moisture of the plant.

### Hardware Implementation

The three main components of the hardware are Soil Moisture Sensor, Raspberry Pi, and Arduino [3]. In this project we will be using a small plant and place a moisture sensor in its soil. The moisture sensor gives an analogy reading which will be converted into digital output using the Arduino microcontroller. This digital output will be send to raspberry pi. Then the output will be structured in the form of graph and will be displayed on the web page over a wireless network.

### Soil Moisture Sensor

Soil moisture sensors are used to measure the water content in the soil. Soil moisture sensors measure the volumetric water content of the soil using various properties of the soil such as electrical resistance, dielectric constant or interaction with neutrons. In this project we will be using Soil Moisture Sensor for Arduino EK1361 as shown in figure c. Sensor will be connected to Arduino-compatible board in a minimalist fashion to show its output over the serial terminal [4]. Once we are done with the system calibration we will have the idea of the values sensor is outputting in completely dry and wet solutions and then we will calibrate it for specific soil. Getting these values and comparing them to the ones from the previous calibration will give you the best insight into what values mean for your specific plant and soil [9] [10].

### Arduino

It is a microcontroller that can sense and control objects in the physical world. The moisture sensor gives an analogue reading which will be converted into digital output using the Arduino microcontroller. Arduino boards use a variety of microprocessors and controllers which are equipped with sets of digital and analogue input and output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The boards feature serial communications interfaces, including USB on some models, which are also used for loading programs from personal laptops/computers. These microcontrollers are typically programmed using programming languages such as C++ and C. In this project Elegoo EL-CB-001 UNO R3 Board ATmega328P Arduino kit will be used as shown in figure d. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analogue inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button [11] [12].

### Raspberry Pi

It is an ARM based SBC (Single Board Computer) running on Debian based GNU/Linux operating system Raspbian. We will be creating a server on the raspberry Pi which will be connected over the internet to the third party cloud based API PubNub and it will help us to access and monitor the data given by the sensor [4] in real time. The digital output from the arduino will be sent to the Raspberry Pi. Here we are using raspberry Pi 3 as shown in the figure e. It uses a 1.2GHz 64-bit quad-core ARM Cortex-A53 CPU. It has 1GB RAM. It has integrated 802.11n wireless LAN and Bluetooth 4.1. It has RCA video, audio jack, USB 2.0, Ethernet, Sd card reader, micro usb power and HDMI slots. Also with the help of these static analysis we can create a chart of various data received from the sensor and through the arduino [13].

### Key IoT Communication Protocols

The main key communication protocol used here will be WiFi that is wireless protocol over the data link layer. With the help of WiFi we can monitor and access the data from any location in the real time. Thus, it gives us flexibility to control the sensor and be alert always for the flaws and emergency situations. As shown in the figure f there are 5 TCP/IP layers [14].

### Physical Layer

The physical layer acts as a transceiver that drives the signals on the network. It transmits and receives bits. The physical devices acts over this layer.

### **Data Link Layer**

The data link layer creates frames and transfers them with physical (MAC) addresses across the network. The WiFi protocol acts over this layer. Thus, the frames encapsulates the packets and use MAC address to identify the source and destination.

### **Network Layer**

The network link layer creates packets and transfers them with virtual (IP) addresses across the network. The IP addresses are used to identify the packages source and destination.

### **Transport Layer**

The transport layer establishes connections with remote host that is between applications running on different hosts. It uses TCP for reliable connections and the UDP for fast connections. It assigns port number to the different processes running in the applications above.

### **Application layer**

The application layer hosts the different groups of applications required for network communications. Examples of these applications are email clients and web browsers. In this project the web page will be used as a application.

### **Application Program Interface**

The Application program interface (APIs) are the inter-connectors which provide the interface between Internet and the Things. For IoT to be useful the different network topologies like mesh, tree etc. created by it must be connected to the cloud. The way in which they can be connected is Vis APIs. Thus, APIs are the sky bridge between the devices connected in topologies and the information or data crunching capabilities. APIs expose the data that enables multiple devices to be combined and connected to solve new and interesting workflows.

Here, we have used Pub Nub API [23]. It is a cloud-based, real-time messaging service that functions on mobile phones, laptops, tablets, HTML5 web browsers etc. This API allows the user to publish and subscribe to the messages. It basically uses HTTP calls and responses are formatted in JSON.

The reason behind choosing PubNub for our project was that it gives real time updates. It can be used in geo-tracking, mapping, alerts and push notifications. Thus, the values that we got from the soil moisture sensor can be sent over a PubNub API and they can be monitored at real time from any nook and corner of the world provided with internet facility.

As shown in the (pseudo code below) we need to provide the public key and the subscribe key which we will be given while creating an account in PubNub. After providing both the keys the connection is created and the output is shown in the output window as shown in the fig i.

### **Serial Communication**

Serial communication is the process of sending data one bit at a time, sequentially, over a bus or a communication channel. In this case, we have used serial communication to communicate with Arduino from raspberry pi and vice-versa. We have implemented an asynchronous serial communication, UART, between the Arduino board and the Raspberry pi board with a baud rate of 9600. It communicates on digital pins 0 (RX) and 1 (TX) as well as with the raspberry Pi via serial ports.

As shown below in the Algorithm 1 and 2, we can see serial port with baud rate 9600 is activated and used to communicate with the raspberry pi. By using this we can get a real time data to the raspberry pi from the Arduino and the sensor which is sent out to the API to remotely monitor the moisture data later.

### **IoT Architecture**

This paper will be using the following IoT architecture as shown in figure b. There will be soil moisture sensor which will sense the volumetric value of the moisture content in the soil. It then will communicate with Arduino by sending the analogue values of the moisture content to it.

The Arduino will then convert those values to the digital and will send them to the raspberry pi. The server network will be created in the raspberry pi and the data will be sent over link layer that is wireless gateway to display over the web page. Here we have used the third party API Pub Nub. It is a cloud-based service and all the moisture content values will be displayed on the Pub Nub. Thus, it will help in real time assessing and monitoring the moisture content in the soil of the plant from our current location.

#### IV. Algorithm

Algorithm can be divided into two sections. The Arduino and the raspberry pi.

##### A. Arduino

The Arduino is connected to the soil moisture sensor. Thus serial communication is initialised by setting baud rate to 9600. The analog readings from the soil moisture sensor are read and set to variable a as shown in algorithm 1. Then after that they are converted into hexadecimal form and send to the raspberry pi as shown in the algorithm 1.

```

Algorithm 1 Arduino
SET dataString from 0 to 1 with subset 0
INITIALIZE a
Function setup
  CALL Serial.begin with 9600 //Starting serial communication
Function loop
  SET a = analogRead with value A0
  CALL Serial.println a
  SET delay by 1 // delay in between reads for stability
  Print dataString by converting it to hexa // convert a value to hexa
  CALL Serial.println dataString // send the data
  SET delay by 1000 // give the loop some break
    
```

##### Raspberry Pi

The Raspberry Pi is connected to the Arduino by the USB connector and is initialised by setting up the path of the Arduino and the same baud rate 9600. The values which we get from the output of the Arduino are feeder to the input of the raspberry pi as shown in the algorithm 2. We have got the values range from 0 to 500 which are converted into percentage that is from range 0 to 100 which is user readable format as shown in the algorithm 2.

Also the values that we get are to be displayed on the web page. Thus, the publish key and the subscribe key are created while creating an account on Pub Nub API and are set to the raspberry pi in order to form a connection as shown in the algorithm 2. Thus, the values are continuously displayed in real time over the web page.

```

Algorithm 2 Raspberry Pi
SET Pubnub = input(publish key,subscribe key)
SET Channel = input(channel)
Function callback(message)
  print(message)
SET ser = input(path,baud rate)
SET s = [0,1]
WHILE True:
  Print "Opening serial port"
  Print "Reading first line from port"
  Print "initializing communication"
  GET read_serial = ser.readline()
  GET s[0] = (read_serial*100)/500
  Print s[0]
  Print read_serial
  SET m = s[0]
  IF m is less than and equal to 20
    SET params0 = m
    SET message = input("I am thirsty!!!!": params0)
  ELSE
    SET params0 = m
    SET message = input("100 % Recharged": params0)
  END IF
  CALL Pubnub with publish(channel=channel, message=message, callback=callback,
  error=callback)
    
```

The Goals and Milestone are listed below table a

Goals	Milestone/schedule
Literature review, project plan and description	Jan 23, 2018 – Feb 8, 2018
Order required hardware	Feb 15, 2018
IOT Raspberry Pi Programming	Feb 15, 2018 – Mar 8, 2018
Website for data retrieval using API	Mar 8, 2018 – Apr 4, 2018
Testing	Apr 5, 2018 – May 4, 2018
Final Project Presentation	May 8, 2018

**Table a: Goals and Milestone**

### Planning

As mentioned above this project defines how to control a crop efficiently. Where, the moisture in the soil can be considered to be primary source of data which will be helped in prediction of the crop health. To achieve this we divided the work into three major parts/steps, which are, firstly understanding the possibility of the idea with a detailed background study, referring to any available previous work and considering drawbacks and scope of improvements. Next step is to design using programming, and building the database which to analyse the data from the sensor. Finally, we consider testing as one of the important step, where, to resolve the bugs and improve the efficiency of the system [7] [8].

### VI.Result

As shown in the figure h the Soil Moisture Sensor is inserted in the plant. Thus, after that it is connected to the Arduino. At the starting we got some random values of soil moisture. We had to calibrate it by trying it in dry, wet and different types of soils. After it got calibrated we inserted it in the plant whose moisture content we are going to determine.

Now, the limit of the available water is set between the wilting point (0% available water) and the field capacity (100% available water) [21]. So the readings from the soil moisture sensor must be between the 0 to 100 level. As shown in the figure i we have got the value on an average 88 % which lies between the limit of the available water.

Thus, by observing the readings from the sensor we can monitor the moisture level of the soil. If it drops near to 20% then we need to water the crop while if it increases to 95% then we should be not watering the plant for some days till it gives an average reading.

The final output values are displayed over a webpage which we have created using a third party API which is PubNub [23]. Thus, it will help us in real time assessing and monitoring the moisture content in the soil of the plant from our current location.

### VII.Acknowledgment

We will like to thank Prof. Brian Kelly for providing us the overview and in depth knowledge in the field of IoT. We have been able to make significant progress in the project after taking up the Internet of Things course under him.

### VIII.Conclusion

We have obtained the readings from the soil moisture sensor inserted in the plant as shown in the figure h. These readings will be used to monitor the moisture level of the crop depending on the standard limit of the availability of the water in real time as shown in the figure i.

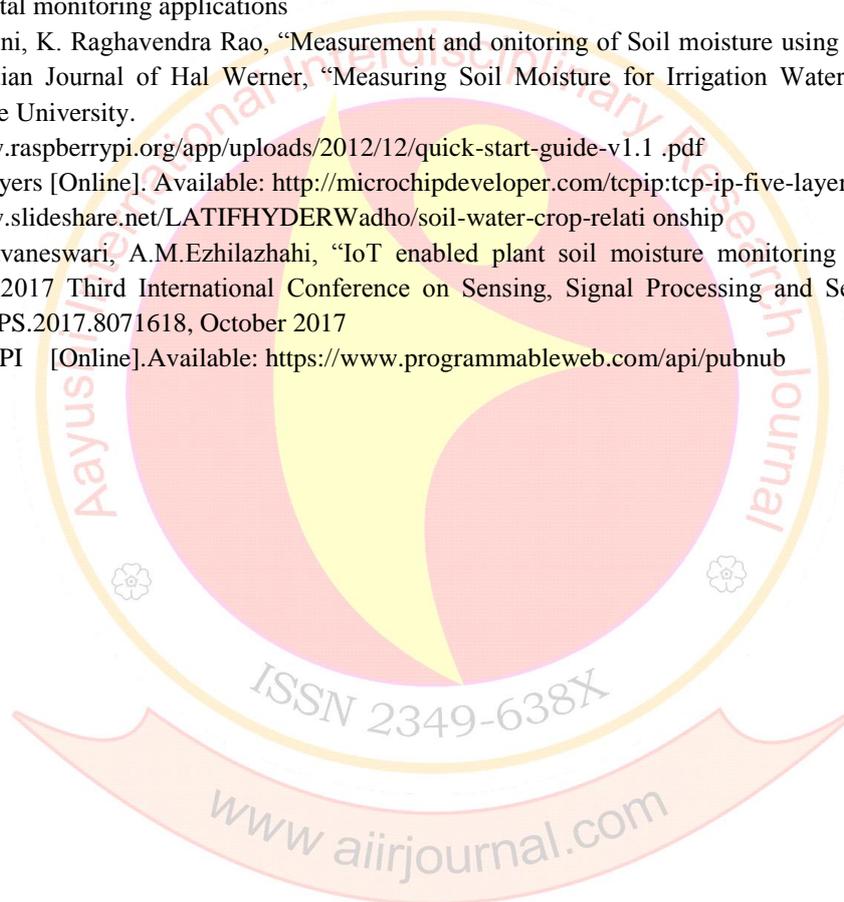
### IX.Future Implementations

Thus, we have completed our project successfully. Further, we can extend this project with adding additional sensors like temperature humidity sensor, light sensor etc. to monitor the health of the plant. It can

also be extended use machine learning to better understand and predict the health of the plant based on the moisture in the soil. Thus, we can create a more effective way to study and improve plant life.

## References

1. Sreeram Sadasivam, Vishwanath Vadhri, Supradha Ramesh, "Smart Plant Monitoring System," Researchgate.Net Publication.
2. Neha Khanna, Gurmohan Singh, D.K. Jain, Manjit Kaur, "Design
3. And Development Of Soil Moisture Sensor And
4. Response Monitoring System," Mnk Journals, International Journal Of Latest Research In
5. Science And Technology, Volume 3, Issue 6: Page No.142-145, November-December 2014.
6. Ravi, S., Bhavani, G., Sunny, B. R., P, A., & V, D. (2016). Multidisciplinary effective prediction of crop using IoT and WSN. International Journal of Advanced Research in Computer Science, 7(1)
7. Ferdoush, S. M. (2014). A low-cost wireless sensor network system using raspberry pi and arduino for environmental monitoring applications
8. P. Divya vani, K. Raghavendra Rao, "Measurement and onitoring of Soil moisture using cloud IoT and android system," Indian Journal of Hal Werner, "Measuring Soil Moisture for Irrigation Water Management," South Dakota State University.
9. <https://www.raspberrypi.org/app/uploads/2012/12/quick-start-guide-v1.1.pdf>
10. TCP/IP 5 layers [Online]. Available: <http://microchipdeveloper.com/tcpip:tcp-ip-five-layer-model> [15]
11. <https://www.slideshare.net/LATIFYDERWadho/soil-water-crop-relati-onship>
12. P.T.V. Bhuvanewari, A.M.Ezhilazhahi, "IoT enabled plant soil moisture monitoring using wireless sensor networks", 2017 Third International Conference on Sensing, Signal Processing and Security (ICSSS), DOI: 10.1109/SSPS.2017.8071618, October 2017
13. PubNub API [Online]. Available: <https://www.programmableweb.com/api/pubnub>



## Construction of Smart Shoe System for Visually Challenged People

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### Introduction

For living a life independently the vision is must. Without having the vision the living life is nothing because vision is must in our day to day life. Vision give the ability to think about or plan the future with the imagination. So every person should be able to think or imagine their own life. But some people have the problem of blindness. Blindness means the person is in the state where he or she couldn't able to see anything. Some people's also suffers from the problem of the night blindness. During night time they are unable to see. Vision plays an important role to travel independently.

The statistics by World Health Organization[1] there are around 285 million people who are visually impaired. Globally, with 39 million blind about 246 million have low vision. The vision is must for everyone in their day-to-day life. The visually challenged people need the help to travel anywhere. Mostly to cross the road, travelling by train.

Some of the peoples use the guided dogs to travel. Guide dogs can guide the peoples about the obstacles, crowd, staircases. Guide dogs give the right way to travel but it is misconception that guide dogs indicates when it is safe to cross the road, because guide dogs don't know about the traffic signals, they don't know about the indicating lights. So travelling by using the dogs will be dangerous.

Some researchers have developed the walking stick fulfilling the blind navigation. Gayathri[2] proposed a smart walking stick that can detect the obstacles, water, pit. But using the stick will not be safe because stick can get the break easily. Stick is difficult to carry, it's also a heavy.

Another work is[3] Virtual eye for the visually challenged peoples in the some specific area. This virtual eye give only the directions which are stored in it. It doesn't give all the directions. So it will be helpful only in the some area. But development of all these aids are not satisfying because according to the World Health Organization there are 285 million people's who are suffering from the blindness. So these aids doesn't fulfill the requirements of all the blind people's.

To address the limitations of previous methods we developed a smart shoe which will help the blind people's to detect the obstacles from the front, back, right and left, and it will also help to detect the knee level obstacles. Smart shoe is made up of the ultrasonic sensors which will detect the obstacles. So this smart shoe will help the blind people to travel the independently.

### Proposed System

The proposed Smart Shoe system is constructed using various hardware components like :

- **shoe** : whose size is up to knee level ultrasonic
- **sensors** : to detect obstacles in surrounding micro controller arduino mega : for calculating the distance of obstacle in the surrounding from system
- **memory** : to store the pulse samples
- **speaker** : to provide audio feedback to the user
- **connecting wires** : to connect all hardware components together
- **battery 9 volt** : to give power supply to all above hardware components.



Fig 1. Smart Shoe system showing arrangement of system components

### III.Design Of Navguide System

The designed system aims to help the visually challenged people to travel independently. The proposed system is constructed accordingly by taking into consideration various parameters that would help the visually challenged people.

The Smart Shoe system consists of total 8 ultrasonic sensors which are divided into levels i.e. level 1 and level 2. Level 1 consists of 4 sensors (G1, G2, G3, G4) for detecting ground level obstacles present in the surrounding and Level 2 consists of another 4 sensors (K1, K2, K3, K4) for detecting knee level obstacles in the surrounding. Sensors G1 and K1 are facing to the front of user and G4 and K4 are facing back to the user to detect ground level and knee level obstacles. Sensors G2 and K2 are facing at the right of user and G3 and K3 are facing at the left of the user to detect ground and knee level obstacles. The sensors transmit ultrasonic waves to the object and after hitting the wave back from the object it gives the information accordingly to the processor to calculate the distance of the object from the system. Then based on the surrounding area conditions the feedback is provided to the user in the form of audio.

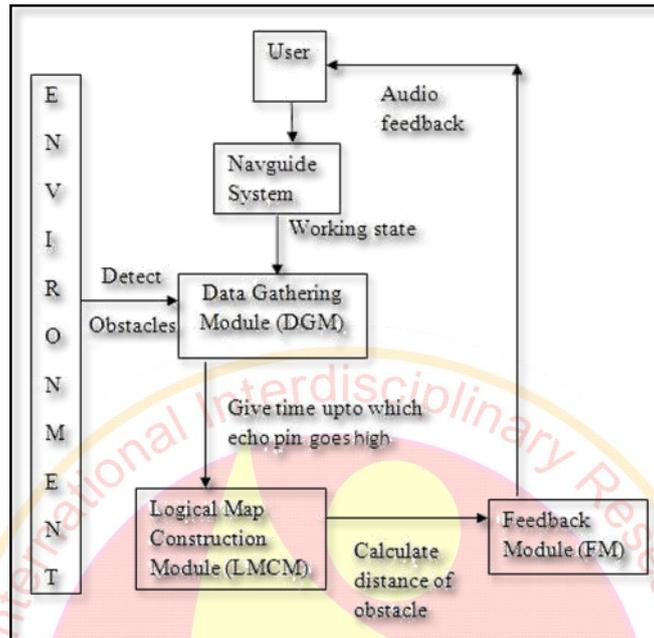
### IV.Proposed System Architecture

The proposed system consists of three main modules i.e. ICM- Information Collection Module, LMCM- Logical Map Construction Module, GFM- Generating Feedback Module.

**ICM** – This module consists of ultrasonic sensors to detect the obstacles present in the working environment at knee and ground level and also detect the staircase. Initially a trigger of 10ms is given to sensor after which it transmits the ultrasonic waves and after hitting wave from the object the reflected wave is back provided to sensor. The main function of the sensor is to calculate the time upto which the echo pin of sensor remains high.

**LMCM**- This module consists of micro controller unit i.e. arduino mega processor and a memory module. The output of ICM module is provided as input to this module which calculates the actual distance of the obstacle object from the system based on the inputted time provided by ICM module. The memory module stores a file which contains the audio pulses which need to be fired based on the distance of obstacles present in nearby area of the user.

**GFM-** This module[5] consists of speaker which is used to provide audio feedback to the user according to the conditions. Based on the audio pulses provided by memory module, this module selects the corresponding text from the stored memory file and gives the final output in the form of audio response to the user.



**Fig.2 Proposed system architecture**

In addition to this architecture, we also need an external toggle button to on and off the working state of the system.

**V. Features Of Smart Shoe System**

- This proposed system detects the obstacles present in the surrounding at knee level and ground level.
- Generates a logical map of the surrounding for detecting obstacles at left, right, bottom and back sides of the user.
- It also helps to detect the staircase.
- Audio response is given back to the user with help of speakers.

**VI. Results**

The smart shoe system after successful implementation provides the audio feedback to the visually impaired people in different conditions as shown in the following given table I.

Sr. No	Situation	Audio Feedback
1	Obstacle in front	Blocked front
2	Obstacle on left	Blocked left
3	Obstacle on right	Blocked right
4	Obstacle on left and front sides	Go right
5	Obstacle on right and front sides	Go left
6	Obstacle on left and right sides	Go straight
7	Obstacle on left, right and front sides	All blocked
8	Staircase detected	Stairs ahead

Fig.3 Table I

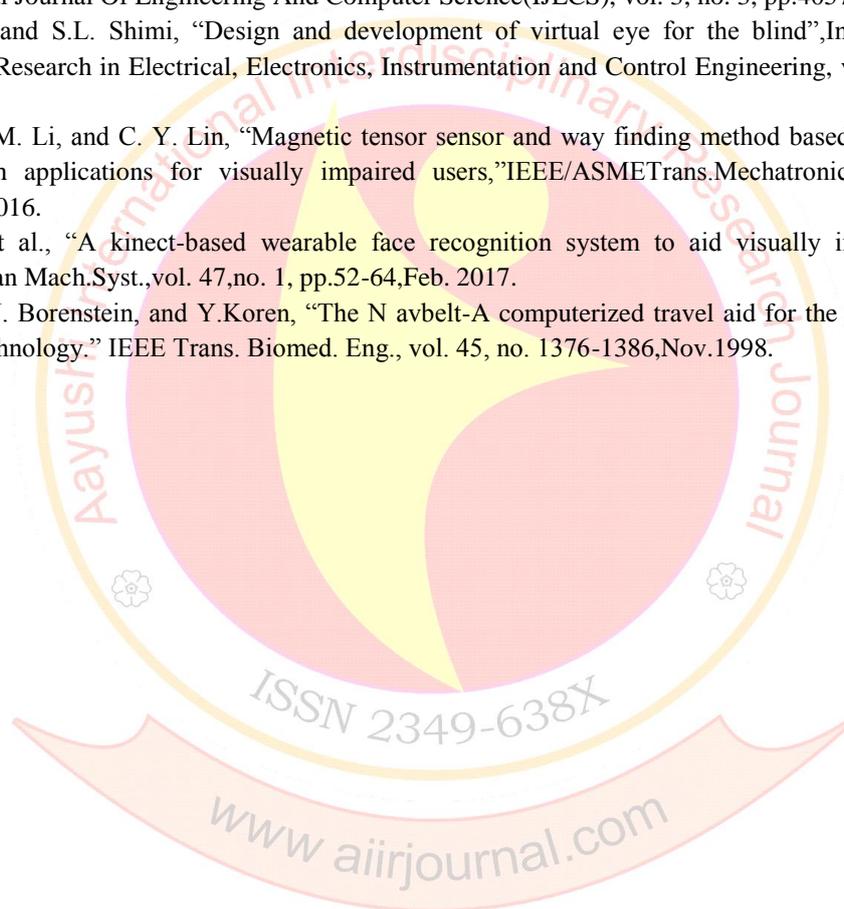
## VII. Conclusion

We designed a smart shoe for visually impaired people which provide directional solutions in walking independently. The Smart Shoe system overcomes shortcomings of existing system by detecting wet floors, floor level and knee level obstacles and providing prioritized information to a user's in tactile and auditory form. The system is easy to use.

In future the Smart Shoe system must itself guide the directional obstacle-less way to reach to the destination according to user by using GPS module.

## VIII. References

1. Vision impairment and blindness, World Health Organization, 2017. [Online]. Available: <http://www.who.int/mediacentre/factsheets/fs282/en>. [Accessed: 12- Oct-2017].
2. G. Gayathri, M. Vishnupriya, R. Nandhini and M.M. Banupriya, "Smart walking stick for visually impaired", International Journal Of Engineering And Computer Science(IJECS), vol. 3, no. 3, pp.4057-4061, 2014.
3. P. Sharma and S.L. Shimi, "Design and development of virtual eye for the blind", International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering, vol. 3, no.3, pp. 26-33, 2015.
4. K. M. Lee, M. Li, and C. Y. Lin, "Magnetic tensor sensor and way finding method based on geomagnetic field effects with applications for visually impaired users," IEEE/ASME Trans. Mechatronics, vol. 21, no. 6, pp. 2694-2704, Dec. 2016.
5. L.B. Neto et al., "A kinect-based wearable face recognition system to aid visually impaired users," IEEE Trans. Human Mach. Syst., vol. 47, no. 1, pp. 52-64, Feb. 2017.
6. S. Shoal, J. Borenstein, and Y. Koren, "The Navbelt-A computerized travel aid for the blind based on mobile robotics technology." IEEE Trans. Biomed. Eng., vol. 45, no. 1376-1386, Nov. 1998.



## Recent Trend in Information Technology

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### WHAT IS CRYPTOCURRENCY?

In simple words, Crypto currency is nothing but a type of financial exchange through internet as a medium by encrypting it or in other words using cipher text to protect it from cyber threats. Only the receiver who possesses the unlock key or password can decrypt it. Cryptography is used to protect emails, financial data, banking information of a single user of MNC's.



### **PROS:**

**Transactions:** One of the advantages of Crypto currency is that is paperless, there is no broker fee or any kind of commission between two personnel's or company's which makes it very efficient and easy to use. It is a straight forward transaction. This helps in cutting the middle man out and making the transaction a one-to-one deal/affair.

**Security:** Crypto currency makes the transaction encrypted from both sides. In other words it is End-to-End Encrypted process, which can only be decrypted by the authorized receiver. This makes it very secure and reliable. And keeps preying eyes away from our data.

**Confidential Transactions:** One great advantage of Crypto currency is that each transaction is unique in its own way. A user can only send only the necessary data that he wishes to send the recipient making it worry free.

**International Transactions:** Crypto currency is not subjected to the exchange rates, interest rates, transactions fees, or other taxes imposed by a specific country according to their rules and regulations making International Trading easy.

### **CONS:**

**Cybersecurity Problems:** One of the most important issue is Cybersecurity in which if the details fall into wrong hands of hackers, the data can be misused or manipulated and this will result in loss of millions if not billions of dollars. This will also expose the personal information of both the sender and receiver.

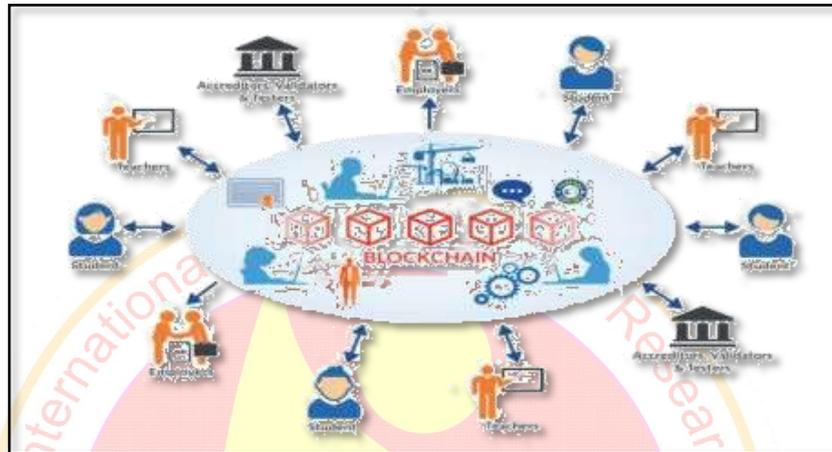
**Regulations:** There is a risk in investing in this emerging tech as it is not accepted by federal governments all around the world due to fear of getting hacked as its still developing. And after being completely developed there's no guarantee that it would be completely safe as hackers can find vulnerability someday somehow.

**Scalability:** As it is an emerging and still developing tech, it has to offer many unique features as safety precautions to be trustworthy as it is still being dwarfed by some major competitors like MASTERCARD, VISA. It should be fast and reliable to be in same level as the above competitors.

**Market Fluctuations:** Most of the users are using Crypto currency as a means to buy tickets houses or as a backup investment which is not helping it grow and kill the competition. This is happening because of one simple reason that is no guarantee or refund in case of any loss.

### **WHAT IS BLOCKCHAIN?**

It can be defined as a system which keeps the record of all the transactions made through bit coins or any crypto graphic manner. In simple words it's like a bank passbook which is paperless but with some perks and extra layers of online security.



### **PROS:**

**Distributed:** Block chain data is stored on different nodes of different network n different servers, which makes it more resistant to failure. There are no technical failures and malfunctions as the nodes are programmed to make a copy of each database to prevent it from getting deleted or lost.

**Stable:** The data is very stable and difficult to erase or change after its registered, this makes the block chain tech very reliable in storing financial data and banking informations. This helps in preventing fraudulent activities from its general employees.

### **CONS:**

**Data Modification:** As being stable is one of the major advantages of Block Chain, it's not always good. It is very difficult to modify or change the data once it is saved on the network. Thereby making it a twosided feature.

**Storage & Energy:** Block chain requires vast amount of storage as bit coin network is increasing every minute. Countries like Denmark, USA & some European countries a rapidly adopting block chain tech. normally block chain tech requires 200 Gigs of storage to run a store data efficiently. Due to the burst in its use it becomes harder for users to download the stored data as its size is increasing every second as of now.

### **WHAT IS CLOUD-COMPUTING?**

It is type of computing tech that mostly relies on shared computing resources as compared to local networking/computing resources to handle applications outside a company's firewall. Thereby making it web-based.



### **PROS:**

**On-Demand Service:** This means that cloud computing customers can sign-up, pay and use the cloud services without any sales or marketing agent in between.

**Broad Network Access:** As cloud computing is totally online, it gives the customer a large resource of servers and nodes to store and use the data.

**Low-Cost & Efficient:** Cloud computing is completely online based and makes it cost efficient as there is no agent in between.

**Anytime Anywhere:** Cloud data can be accessed anytime anywhere in the world making it very easy to access. For e.g.: The most trusted cloud service i.e.: Google Drive can be accessed anytime anywhere in the world after we enter our correct credentials. This makes its use very hassle-free.

**Availability:** Every major Tech-Giant like Microsoft, Google, Apple and Yandex have launched their cloud services. And as Android is the most popular OS around the world, this makes Google Drive the most used Cloud Service around the world.

### **CONS:**

**Network Connection:** Having an Internet Connection is a must to reap all the benefits of Cloud Computing. You need a strong network to send/receive, upload/download data & losing network connection would lead to loss of time and money. In some under-developed & developing countries having a speedy and reliable internet connection is little tough. So in order to take benefit of all the Cloud Computing services the network connection must be strong, speedy and very very reliable.

**Limited Features:** Not all cloud services provide all created with equally matching features. For e.g. Google provides 15 Gigs of cloud storage for free on the other hand Apple gives only 5 Gigs of cloud storage for free. And the cost to buy extra storage varies from provider to provider. Google allows users to upload data in original format with highest quality whereas other cloud service providers don't offer such service.

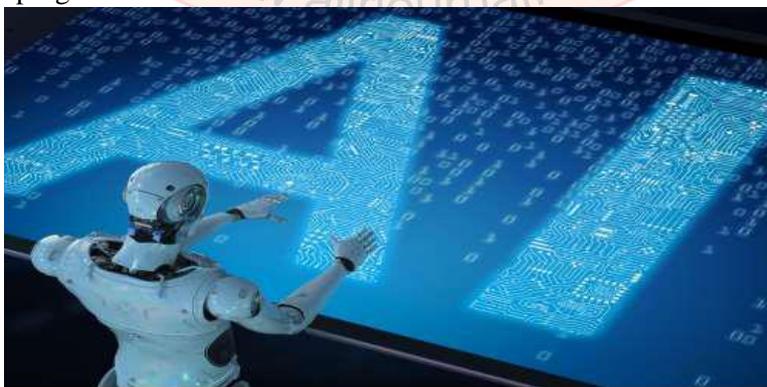
**Not in Control:** Basically we are trusting another party blindly to take care of our data, the data might be personal and very important and if it gets into wrong hands, there would be one or many consequences.

**Security:** Not all cloud service providers are as secure as they claim to be. We can't risk to lose our sensitive information fall into a wrong hands. Because of the popularity of Cloud Computing, it is targeted by hackers more often and these hacks have increased in the past few months. Who is to blame if such Mishap happens?

**Technical Issues:** Facing a technical issue is more common than being hacked, it may be due to natural cause or man-made cause. We have no other choice but to call the technical support of the cloud service provider for help. And some technical issues cannot be solved in house and some providers do not support in-house service that too around the clock.

### **A.I. (Artificial Intelligence):**

Building and creating smart machines & devices that typically require a human being, is known as A.I. In simple words A.I is programmed to think more or less like humans and mimic their actions.



### **Pros:**

**Less Human Error:** Humans make errors and mistakes from time to time as it's human nature to do mistakes. Computers don't do such mistakes or errors as they are programmed properly. With the help of A.I. certain decisions are taken by accessing previous data and by following few sets of pre-programmable algorithms. So errors are reduced and chances of having a successful outcome are much more.



**Complexity:** The process of designing, creating, maintaining and keeping this tech secure is a very tough and complex task and it requires an experienced employee and quick thinking and ever ready problem solving measures.

**Conclusion:**

In order to stay in the race of development we must update ourselves and develop our resources so that we won't fall behind. We humans should be the one to control tech and going with the flow is not an option. Learning new things gathering information having good relations with neighboring countries is a must to develop quickly and responsibly.

**References:**

1. A.I: [www.towardsdatascience.com](http://www.towardsdatascience.com), [www.futureoflife.org](http://www.futureoflife.org)
2. Cloud Computing: [www.centretechnologies.com](http://www.centretechnologies.com), [www.zapmeta.co.in](http://www.zapmeta.co.in) o Block chain: [www.binance.vision](http://www.binance.vision)
3. Crypto currency: [www.wall-street.com](http://www.wall-street.com), [www.prescouter.com](http://www.prescouter.com), [blog.finjan.com](http://blog.finjan.com)
4. IoT: [www.javatpoint.com](http://www.javatpoint.com)
5. Image Source: Google



## A Review Paper on Software Engineering Model

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### Introduction

Software expansion model is an appearance of the complete development of software Improvement, which expresses the core actions obviously to instruct the working responsibilities on Software advance that to be finalised. It is the mechanical outline of all the effort and responsibilities which are executed by system improvement, consecutively and conservation to diagonally the complete software life cycle, and the connection between the several stages of software advance Deeds are also given [1]. As we all know, there are various software development approaches that Defined and designed which are used or employed during development process of software [2]. These methods are also mentioned to software expansion models. However, each model surveys a Specific life cycle to confirm success in course of progress, and its benefit and difficulty are all occurred certainly. Software expansion cycle and software superiority will be artificial by software Increase model directly, and it is the important form of the organization and organization for Software plans in current IT enterprise.

### Waterfall Model

The Waterfall Model is developed by **Winston Royce**. This Waterfall Development Model is also known as a *classic life cycle*. The Waterfall Development Model proposes organised successive method for software engineering. It like a tea process i.e we need to go with process by process to create a software of good quality. When we use this Waterfall model then according to this model we need to test this project at every step of model. But, it's difficult to imagine every detail in advance in reality. Most projects start out with some uncertainty, and more details are learned **by way of** the project development The major disadvantage of model is that problems in system aren't be discovered until late in process(testing phase), but it leaves little time for modification, consequential in hypothetically calamitous which possessions on project agenda and budget . The application of this model in modern IT enterprise is little now.

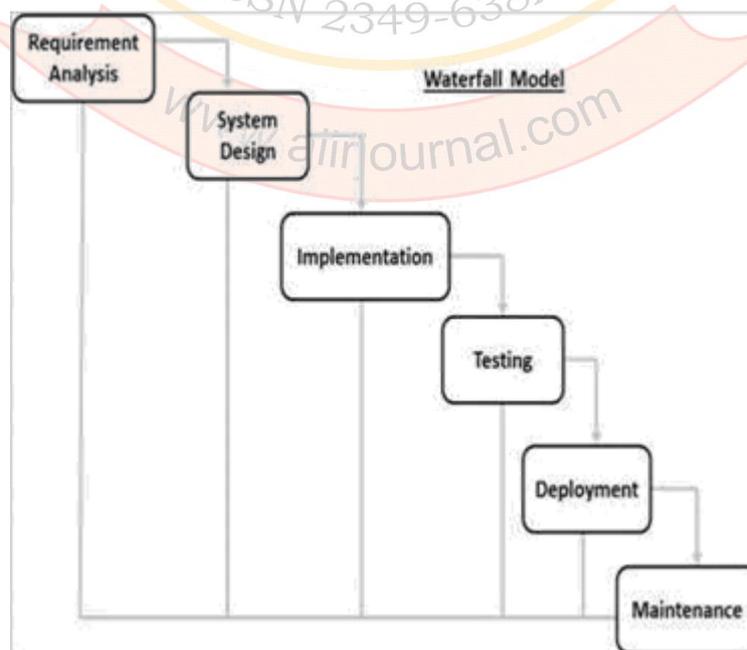
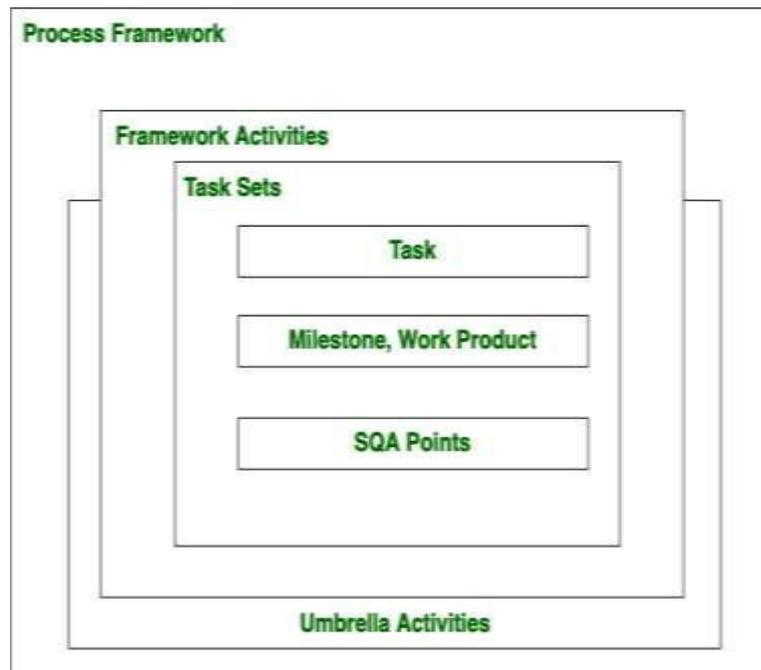


Figure 1. Waterfall Model

### Generic Process Model:-

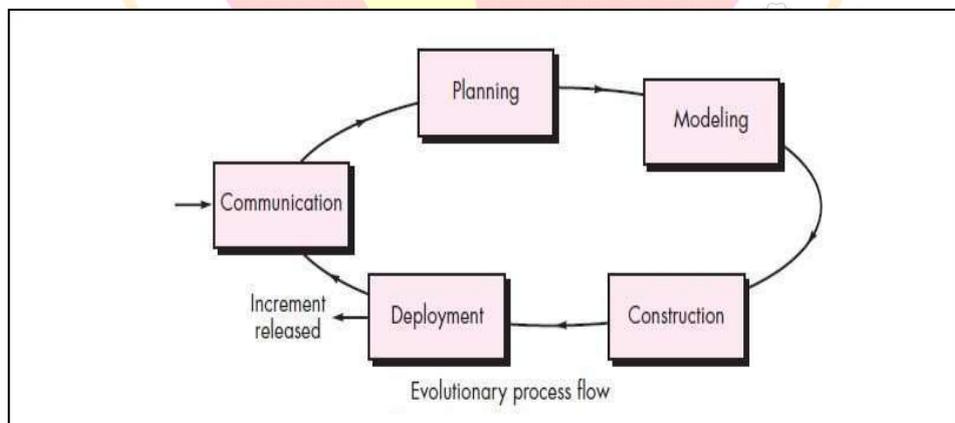
The Generic Process Model is defines a set of umbrella activity which are also a must for any software engineering process as shown in below figure –



**Figure 2. Software Process Framework**

In this Generic Process Model each activity contains a group of software engineering activities which is a collection of task that develops a major software product.

The projects or software which are developed by using the Generic Process Model are follows the following model –

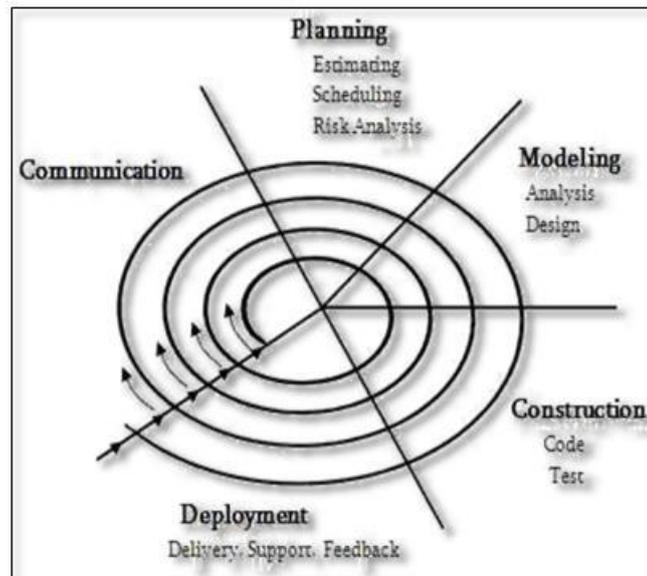


### 4.Spiral Model:-

**The Spiral Classical software course prototypical that couple the iterative countryside of prototyping.**

The Spiral Model is proposed by **Boehm**. The main objectives of Spiral Model are as follows –

- Spiral Model provides controlled of the linear sequential model to the developer.
- Spiral Model is also provide the systematic aspects of the linear sequential model to the user.
- Spiral Model uses potential of quick expansion of incremental version of the software which we create.
- Spiral Model finds all risks and the errors which are generating in the project during the development process.
- The Spiral Model also fined the risks which can be generating in the future.
- Spiral Model explain in following diagram –



### COCOMO Model:-

The COCOMO Model stands for Positive Charge Model. The COCOMO Model is one of the original charge copies broadly used by the rate assessing community. The COCOMO Model was formerly available in Software Manufacturing Finances by Dr. Barry Boehm in 1980. Cocomo) is a deterioration model grounded on LOC, . It is a practical charge approximation classical for software plans and frequently recycled as a course of unflinching foreseeing the numerous strictures associated with creation a project such as size, effort, cost, time and quality. It was planned by Barry Boehm in 1970 and is founded on the study of 63 projects, which type it one of the best-recognised models.

The key limits which define the quality of any software produces, which are also an outcome of the Cocomo are mainly Exertion & Schedule:

Effort: Quantity of labour that will be compulsory to comprehensive a assignment. It is unrushed in person-months units.

Schedule: Simply incomes the quantity of time obligatory for the conclusion of the job, which is, of sequence, proportional to the effort put. It is leisurely in the parts of time such as weeks, months

### References

1. Y.S.Zhang, X. Li, Software Development Models: a Survey, Journal of Computer Engineering and Applications, issue 3, pp.109-110, 2006.
2. J.J.Yu, A Short Course in Software Engineering, Tsinghua University Press, 2015.
3. Information on <https://www.Cnblogs.Com/wintersun/p/6828400.Html>, 2017.
4. S.M. Zhu, Software Testing (Second Version). Posts &Telecom Press, 2016.
5. X.H. Liu, Software Engineering and Project Management, Peking University Press, 2009.
6. S.J. Wu, Improvement on Quality Testing Project of SI Software Based on Agile Scrum Mode, MASTER'S THESIS of Southwest Petroleum University, 2015.
7. Y.M. Du, S.X. Li, Estimation Process Model for RUP Project, Journal of Computer Science, vol. 40, issue 6, pp.21-26, 2013.
8. J.X. Xia, Z. Liu, X.B. Liu, Y.Song and J.J.Yuan, Incremental Story Iteration Model Based on Rapid Application Development, Journal of University of Shanghai For Science and Technology, issue 6, pp.578-583, 2014.
9. R.M. Zhang, D. Yang and J. Li, Design of requirements negotiation tool based on WinWin theory, Journal of Computer Engineering and Applications, issue 1, pp.100-104, 2009.
10. Michael Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems (Third Version), China Machine Press, 2012.
11. X.Zou, Method of Construction: Modern Software Engineering, Posts & Telecom Press, 2018. [12] Z. Luo, S. Q.Yuan, J. L.Yuan and L. Li, Software Engineering. Posts &Telecom Press, 2017.
12. J.J. Yu, Research on designing and achievement on RUP improvement model of instructional software, Journal of E-education Research, issue 4, pp.76-81, 2012.

13. Z.L. Gu, Research on development model of multi-media teaching software base on CSCW, Journal of Computer Engineering and Applications, issue 9, pp.1628-1630, 2006.
14. S.J. Chen, Inverted A-Model for Stable Software Development, Journal of Software, vol. 37, issue 12, pp.07-11, 2016.
15. J.J. Ma, Three Triple Iterative Model Based on Agile, Journal of Electronic Technology & Software Engineering, issue 6, pp.52-54, 2017.
16. B.Lu, L.Liu, J.R. Li and L.M.Jiang, Artificial Intelligence and Its Application, Tsinghua University Press, 2017.



## Review of Tools and Techniques of Ethical Hacking

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### Introduction:

The term Hacker is an expert who finds the loopholes in a computer or networks to gain access into a system or group of systems. Hackers are programmers, who have expert knowledge of various programming languages, database and network security. Generally, a hacker is a person who is passionate about computers. They love discovering new methods and techniques to work with a computer.

**Hacker classifications:** Based on their knowledge and the activities performed on a computer, there are various types of hackers-

**White Hat Hackers:** White Hat Hackers are computer experts who gain access to a system to identify and weaknesses that exist in the system. They are also called ethical hackers. These security professionals are skilled hackers.

**Black Hat Hackers:** The Black Hat Hackers are computer experts who use their skills and knowledge to perform malicious activities.

**Grey Hat Hackers:** Grey Hat Hackers sometimes perform the act of hacking legally or illegally based on the situation. They do not hack the computer for personal gain or to destroy the system. Grey Hat Hackers are a combination of white hat and black hat hackers.

**Green Hat Hackers:** Green Hat Hackers are new to hacking and they have almost no knowledge about hacking. They are also known as neophytes.

**Red Hat Hackers:** Red Hat Hackers are similar to the white hat hackers. But, they do not report the malicious hacker instead they shut down the hacker by uploading viruses, or accessing his computer to destroy it.

The purpose of Ethical Hacking is to test a system and its resources for any security flaw within to prevent any attack by hackers. Ethical hacking is penetration testing with owner's permission, with an intention of securing and protecting the system. The use of ethical hacking is to identify various vulnerabilities within a system. Ethical hacker always tries to find loopholes within the system or network and comes out with the solution to protect the system. Ethical hacking would aid immensely in safeguarding a target system's security.

### Information Security:

Information Security is the privacy measures applied to a device or system in order to prevent any unauthorised access. It can protect important from being compromised or corrupted. It is essential aspect of IT for organisation of every size and type. Information Security is an essential part of any enterprise. It includes many infrastructure and security techniques that preserve key information from malware programs or internal and external attacks. The discuss elements involved in information security are:

**a) Confidentiality:**

It is guaranteed that information can only be accessed by authorised users. This helps in safeguarding personal information and gives an assurance that similar information will not be shared with any unauthorised user. Various security policies are used by organisations and associations to protect details of its users.

**b) Integrity:**

It guarantees that no unauthorised user can modify a resource or information. Attackers can damage the integrity of the data, mostly during the data transmission.

**c) Availability:**

It ensures that a system performs operations including storing, processing, and accessing of the data after instructed by the authorised user. It only allows authorised users to access information without any restriction.

**d) Authenticity:**

It provides a proof of originality for any digital information. It ensures that the information, whether received or sent, is original. Various technologies and tools such as digital signatures and smart cards are used to ensure the originality of data.

### Information Security Policies:

Information security policy includes the set of rules that are implemented by the organisation for ensuring that all networks or users, who come under the domain of the organisation. Information security policies include the framework associated with best practices that all the employees must ideally follow to protect sensitive data. The process of creating information security policies can help the organisation define information assets they own and involved the employees in securing those assets. These policies declared, both internally and externally, that information is a form of assets which belongs to the organisation and needs protection from destruction, disclosure, modification or unauthorised access.

The purpose of security policy in an organised is as follows:-

- Protecting information and people of that organisation.
- Helping the reduced risk of an attack, destruction or authorised access. Helping to track compliance as with legislation and regulations.
- Authorising the security personnel for investigation, probing and monitoring. Defining the company consensus baseline stance on the security.
- **Vulnerabilities:** Vulnerabilities was considered as a software or hardware bug which an attackers is likely to exploit. But today, the vulnerability is regarded more as a software or hardware bug, or a misconfiguration error which an attacker can exploit. The vulnerabilities can be referred by their CVE numbers. CVE stands for Common Vulnerabilities and Exposures. It is a list which contains standardised vulnerabilities naming. [4]
- **Security Threats:** Threats would constitute any software or technique that is potentially dangerous to the working of a computer or network system. Such element can break the security of a system and cause serious damage to it. Any software or hacking technique used by a hacker is considered to be a threat to the information framework of an organisation. They are categorised on the basis of the target and methods of attacks.
- **Malware:** Malware (short for malicious software) refers to various forms of harmful software such as viruses, worms, Trojan horses, rootkits adware, spyware and many others. They are designed to disrupt or damage operation in your computer. Malware can be considered as any affected or corrupted software that damages or disables computer systems and provides limited or full control over the target system.
- **Viruses:** A computer virus refers to a code or program that is used by a hacker to disrupt a system or a network. A virus consume most of the system available memory and corrupts the existing data and eventually leads to system crash. Viruses, in general, are a threat to any IT ecosystem. They can spread through various mediums such as email, and removable storage media.
- **Computer Worms:** A Worms is a self-replicating standalone malware that spreads rapidly on computer connected to a network. Worms keep replicating until the occupy all available resources such as memory, hard drive space, and network bandwidth. They do not require any interaction which makes them appear dangerous. Some worms may contain viral component to infect executable file.
- **Trojan Horses:** A Trojan horse is a piece of malware that contain malicious or harmful code. It usually hides inside another software. It does not replicate itself like viruses. A Trojan is any malicious computer program which hides its true intent from the user.
- **Rootkit:** A rootkit is a small software designed to hide files, registry entries or processes. This enables hackers to access a PC without being detected.
- **Spoofing:** When hacker tries gaining access to a computer or network by trusted source and fooling the hardware and software.
- **Penetration Testing:** Penetration testing is a method used to test a computer, network or any application for identifying possible vulnerabilities. Penetration testing can be performed manually or it can be automated.[3] In both these methods, a tester needs to collect information about the system before performing the test. The aim of these testing is identify security loopholes.

### Need of Penetration Testing:

Ethical hacking is one of the most effective ways for determining the vulnerabilities or weaknesses in any network system. Penetration testing can be helpful in examining the risks in internal security of the computer network through the external penetration testing done from different access point. Penetration testing is even useful in identifying the security risks in the wireless networks by accessing it through remote control or other wireless devices. It can be effective and useful for the business as the owner gets an idea of the locations where there is likelihood of a security breach. Penetration testing even test the network components such as routers and firewall, and even checks the vulnerabilities of passwords.[3]

### Types of Penetration Testing:

Depending upon the level of information on the target system, penetration testing can be classified into three primary categories-

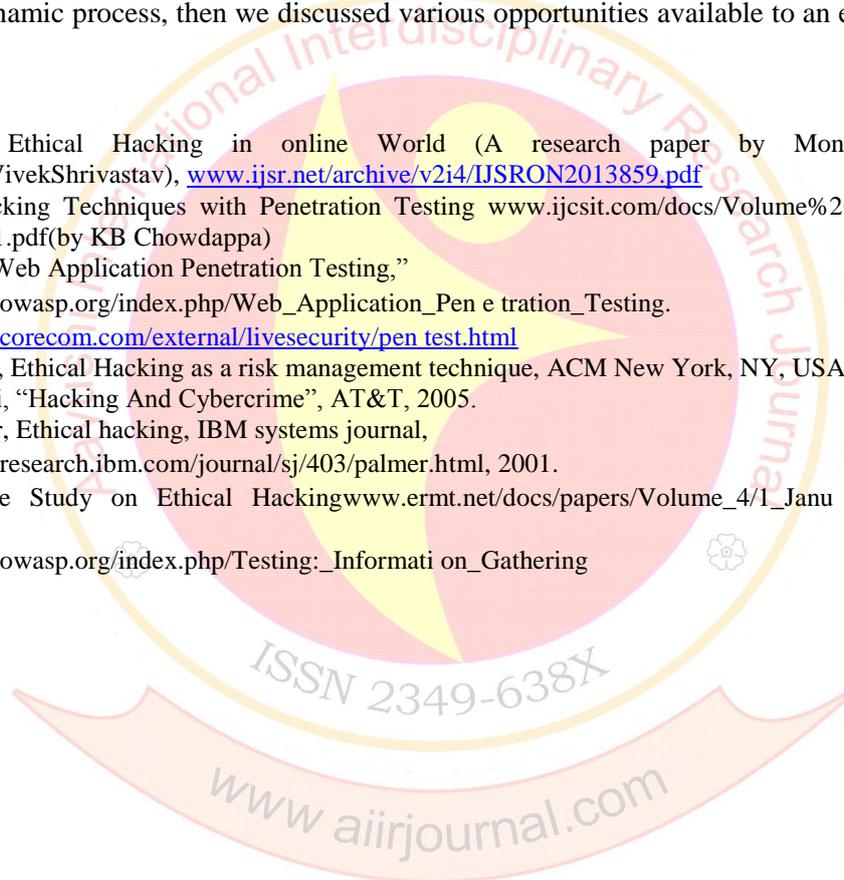
- **Black Box Testing:** In this type of testing, the tester does not get any technical information from the client. This type of test can be both functional and non-functional. The test cases are derived by analysing the specification of the system without knowing its internal structure.
- **Grey Box Testing:** It is also called as grey box analysis. In this testing, a tester tests the product with limited understanding of the internal design. The tester does not have permission to access the code of the program. The tester may know how components are interconnected without having the detailed knowledge of its functionality.
- **White Box Testing:** In this type of testing, the client provides full internal details and source code access to the tester. When a company needs to test every single line of code a detailed testing of the product, white box testing is useful.

### Conclusion:

In this paper firstly we introduced the concepts of system security, hacking, hacker, ethical hacking aka pen testing. Then in next section we discussed various tools, techniques and approaches which are normally constitutes weaponry of a seasoned hacker. In our paper we explained how ethical hacking is a continuous and dynamic process, then we discussed various opportunities available to an ethical hacker as a professional.

### References

1. Need of Ethical Hacking in online World (A research paper by Monika Pangaria&VivekShrivastav), [www.ijsr.net/archive/v2i4/IJSRON2013859.pdf](http://www.ijsr.net/archive/v2i4/IJSRON2013859.pdf)
2. Ethical Hacking Techniques with Penetration Testing [www.ijcsit.com/docs/Volume%205/vol5issue03/ijcsit20140503161.pdf](http://www.ijcsit.com/docs/Volume%205/vol5issue03/ijcsit20140503161.pdf)(by KB Chowdappa)
3. OWASP. "Web Application Penetration Testing," [http://www.owasp.org/index.php/Web\\_Application\\_Penetration\\_Testing](http://www.owasp.org/index.php/Web_Application_Penetration_Testing).
4. [http://www.corecom.com/external/livesecurity/pen\\_test.html](http://www.corecom.com/external/livesecurity/pen_test.html)
5. SA. Saleem, Ethical Hacking as a risk management technique, ACM New York, NY, USA, 2006.
6. N.B. Sukhai, "Hacking And Cybercrime", AT&T, 2005.
7. C.C. Palmer, Ethical hacking, IBM systems journal, <http://www.research.ibm.com/journal/sj/403/palmer.html>, 2001.
8. Compressive Study on Ethical Hacking [www.ermt.net/docs/papers/Volume\\_4/1\\_January2015/V4N1-117.pdf](http://www.ermt.net/docs/papers/Volume_4/1_January2015/V4N1-117.pdf)
9. [http://www.owasp.org/index.php/Testing:\\_Information\\_Gathering](http://www.owasp.org/index.php/Testing:_Information_Gathering)



## 5G Technology

Mr. Sachin S. Bhosale<sup>1</sup>, Dr. Rajendra Patil<sup>2</sup>, Miss. Kazima Tambe<sup>3</sup>

### Introduction

Mobile and wireless networks have made extraordinary development in the last few years. At the present time many mobile phones have also a Wireless LAN adapter. One may expect that near soon many mobile phones will have Wax adapter too, besides their 3<sup>rd</sup> Generation, 2<sup>nd</sup> Generation, Wireless LAN, Bluetooth etc, adapters. We are using Internet Protocol for both generations as 2.5<sup>th</sup> Generation or 3<sup>rd</sup> Generation Public Land Mobile Networks (PLMN) on one side and Wireless LAN on the other side, raised study on their integration. Concerning the 4<sup>th</sup> Generation, its focus is towards perfect incorporation of cellular networks such as GSM and 3G. Multi-mode purchaser workstations are seen as need for the 4<sup>th</sup> Generation, but security mechanisms and special operating system support in special wireless technologies remains a test. Nevertheless, integration among different wireless networks (e.g. PLMN and WLAN) is execute in implementation even nowadays. Although, different wireless networks from a only utmost used absolutely, i.e., there is no combining of separate wireless access technologies for a same session (e.g., FTP download). The anticipated Open Wireless Architecture (OWA) in is targeted to propose open baseband processing modules with open interface parameters. The OWA is related to MAC/PHY layers of future Generation mobiles. The 5<sup>th</sup> Generation terminals will have software defined radios and modulation scheme and new error-control schemes can be downloaded from the Internet . The enhancement is seen towards the consumer terminals as a focus on the 5<sup>th</sup> Generation mobile networks. The 5G mobile terminals will have access to separate wireless technologies at the same time. The 5G mobile workstation should be capable to blend special flows from different technologies. The network will be dependable for managing user. The 5<sup>th</sup> Generation workstation will make the ultimate selection among different mobile access network providers for a specified service. The paper gives the concept of intelligent Internet phone where the mobile can bring the great connections.

### Literature Survey

#### 1-CHALLENGES IN RELOCATION FROM 4<sup>th</sup> GENERATION:

- A. Multi-mode user terminals by means of 4G network, there will be a necessity to design a single user terminal that can operate in separate wireless networks and conquer the design issues such as restrictions on the size of the device, its cost and power utilization. These issues can be solved by using software radio proposition.
- B. Choice among different wireless systems. Every wireless system has its typical characteristics and roles. The choice of most proper technology for a particular service at a specific place and at particular time. This will be applied by making the choice according to the best possible fix of consumer QoS (Quality of Service) requirements.
- C. Security Reconfigure, adaptive and lightweight protection mechanisms should be designed.

Network infrastructure and QoS support Integrating the current non-Internet Protocol and Internet Protocol-based systems and providing QoS assurance for end-to-end services that engage various systems is a challenge.

Charging and Billing It is hard to assemble, handle and accumulate the Consumers account information from various service providers. In the same way Consumers billing is also a different-different task.

Data Encryption: If a Global Positioning System (GPS) receiver will communicate with the main transmitter then the communication link between these two is not hard to break and consumer must use encrypted data.

#### 2-Key terms of 5G Technology:

5G is a completed wireless communication with no limitation; somehow people called it's a REAL wireless world.

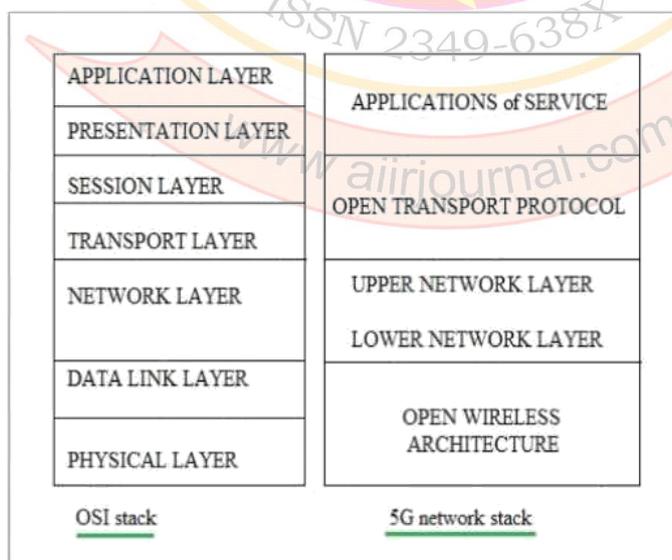
- Some additional features such as a Multimedia Newspapers, and also to watch a T.V programs with the clarity of an HD T.V.
- An this Generation We can send Data much faster than that of the previous generations.
- 5G will bring about perfect real-world wireless or called as" World Wide Wireless Web"(WWWW).
- Real wireless world with no more limitations to access.
- Wearable devices with AI capabilities.
- Internet protocol version 6 (Ipv6), where a visiting care-of mobile Internet Protocol (IP) address is assigned according to a location and the connected network.
- One unite global standard.
- Cognitive radio technology, are also known as smart radio.
- High Altitude stratospheric Platform Station (HAPS) systems.

### How 5G Works

As any other cellular network, 5G networks will consist of cells divided into sectors and send data through radio waves. Each cell is connected to a network backbone through a wired or wireless connection. 5G may transmit data over the unlicensed frequencies currently used for Wi-Fi. It promises as a smarter, faster, and efficient network. The goal of 5G is to have far higher speeds available, at higher capacity per sector, and at far lower latency than 4G. In order to increase network efficiency, the cell is subdivided into micro and pico cells. 5G will be a new mobile revolution as it is expected to provide gigabit-per-second data rates anytime, anywhere. In a 5G wireless network, every mobile phone will have an Ipv6 address depending on the location and network being used. 5G utilizes user-centric network concept World Wide Wireless Web (WWWW) instead of operator- centric as in 3G or service-centric as in 4G. WWWW will be capable of supporting applications and services and interconnected the whole world. 5G includes the latest technologies such cognitive radio, Internet of things, nanotechnology, and cloud computing.

### 5G technology has the following advanced features:

- Architecture will be device-centric, distributed, programmable, and cloud-based. High data rates.
- One to Ten Gbps connections to end points. One millisecond end-to-end round-trip delay. Low battery consumption.
- Better connectivity irrespective of location. Larger number of supporting devices.
- Lower cost of infrastructure development.



### Physical/MAC layer:

Physical and Medium Access Control layers i.e. OSI (Open System Interconnection) layer 1 and OSI layer 2, define the wireless technology and shown in Fig. For these two layers the 5<sup>th</sup> Generation mobile networks is likely to be based on Open Wireless Architecture (OWA).

**B. Network layer:**

The network layer will be IP because there is no competition today on this level. The Ipv4 (Internet Protocol version 4) is worldwide spread and it has various problems such as limited address space and has no real possibility for QoS support per flow. These issues are solved in Ipv6(Internet Protocol Version6), but traded with significantly bigger packet header. Then, mobility still remains a problem. There is Mobile IP level on one side as well as many micro-mobility solutions (e.g., Cellular IP, HAWAII etc.)

**C. Open Transport Protocol (OTA) layer:**

The mobile and wireless networks be different from wired networks regarding the transport layer. In all TCP (Transmission Control Protocol) versions the assumption is that lost segments are due to network congestion, while in wireless network losses may occur due to higher bit error ratio in the radio interface. Therefore, TCP (Transmission Control Protocol) moderation and conversion are proposed for the mobile and wireless networks, which retransmit the lost or damaged TCP segments over the wireless link only. For 5G mobile workstation will be suitable to have transport layer i.e. Possible to be downloaded and installed.

**D. Application layer:**

Regarding the applications, the ultimate request from the 5<sup>th</sup> Generation mobile workstation is to provide intelligent QoS management over a variety of networks. In This Days mobile phones, the users physically select the wireless interface for specific Internet service without having the possibility to use QoS history to select the best wireless connection for a given service.



5G mobile phone Design

Fig. shows 5<sup>th</sup> Generation mobile phone design. The 5<sup>th</sup> Generation is being developed to put up the QoS and rate needs set by the forth coming applications like wireless broadband access, MMS (Multimedia Messaging Service), video chats , mobile TV, HDTV content, DVB ( Digital Video Broadcasting) , minimum services like voice and data, and other services that make use of the bandwidth. The definition of 5<sup>th</sup> Generation is to provide sufficient RF coverage, more bits/Hz.

**Features**

1. 5G technology offers high resolution for cell phones user and bi- directional large bandwidth shaping.
2. The advanced billing interfaces of 5<sup>th</sup> Generation technology make it more attractive and effective.
3. 5G technology are also providing subscriber supervision tools for fast action.
4. The high-quality services of 5G technology based on Policy to keep away from error.
5. 5G technology is providing large broadcasting of data in Gigabit which supporting nearly 65,000 connections.
6. 5G technology offers a transporter class gateway with equal consistency.
7. The traffic statistics by 5G technology makes it more exact.
8. Through remote management offered by 5<sup>th</sup> Generation technology a user can get a better and faster solution.

9. The remote diagnostics also a feature of 5G technology.
10. The 5G technology is providing up to 25 Mbps (Megabytes per Second) connectivity speed.

### Challenges

The transition from 4G to 5G presents several transformational challenges which must be tackled to fully realize the 5G vision. There are challenges faced with the new technologies enabling 5G. There are also challenges with the integration of this technology to provide services in different application scenarios. Some have criticized 5G for its high projected cost and that it is incompatible with the previous generations. Just as 2G phones could not connect to 3G or 4G networks, 3G and 4G phones will not connect to a 5G network. One is forced to buy a new phone which is likely to be more expensive than 4G/LTE (Long Term Evolution) service. To address these challenges, we need a drastic change in the design of cellular architecture. We also need to meet 5<sup>th</sup> Generation system execution need such as Mfentocells, stringent latency, network scalability, very long battery life, and green communications. It is a challenge to satisfy these requirements and minimize costs at the same time.

### Applications

Some of the remarkable applications of 5G wireless technologies include:

Virtual reality/augmented reality/tactile Internet Autonomous driving/connected cars Wireless cloud-based office/multiple-person videoconferencing Unified global standard for all Network availability anywhere and anytime Blockchain 3D and ultra HD videos Smart gird Smart surgery and remote medical examination Mobile security In addition, 5G will allow one to pay all bills in a single payment with his/her mobile and vote from his/her mobile

### Future Scope

In this paper we have surveyed 5<sup>th</sup> Generation technology for mobile communication. The 5G technology is designed as an open policy on various layers, from the physical layer up to the application. Presently, the current work is in the modules that shall offer the best Operating System and lowest cost for a particular service using one or more than one wireless technology simultaneously from the 5G mobile. A new look of the 5<sup>th</sup> Generation technology is about to start because 5<sup>th</sup> Generation technology is going to give tough completion to normal computer and laptops whose marketplace value will be pretentious. There are lots of improvements from 1G to 5G (i.e. 1G, 2G, 3G, 4G , 5G) in the world of mobile communication. The new approaching 5G technology is available in the market at cheap rates, high peak expectations and much reliability than its foregoing technologies. 5G network technology will release tale age in mobile communication. The 5G mobiles will have access to various wireless technologies at the identical time and the workstation should be able to integrate various flows from different technologies. 5G technology offers high resolution for intense mobile phone consumer. We can watch an HD TV channel in our mobile phones without any dis. The 5G mobile phones will be a tablet, PC, Cell phones etc... Many mobile root technologies will be developed.

### References

1. Bria, F. Gessler, O. Queseth, R. Stridth, M. Unbehaun, J. Wu, J. Zandler, "4-the Generation Wireless Infrastructures: Scenarios and Research Challenges", IEEE Personal Communications, Vol. 8, No.6, December 2001.
2. Toni Janevski, "A System for PLMN-WLAN Internetworking", Journal of
3. Communications and Networks (JCN), pp. 192-206, Vol 7, No. 2, June 2005.
4. Janise McNair, Fang Zhu, "Vertical Handoffs in Fourth Generation Multinetwork Environments", IEEE Wireless Communications, June 2004.
5. Toni Janevski, "Traffic Analysis and Design of Wireless IP Networks", Artech House Inc., Boston, USA, May 2003.
6. Suk Yu Hui, Kai Hau Yeung, "Challenges in the Migration to 4G Mobile Systems", IEEE Communications Magazine, December 2003
7. Willie W. Lu, "An Open Baseband Processing Architecture for Future Mobile Terminals Design", IEEE Wireless Communications, April 2008.

8. Jivesh Govil, Jivika Govil, "5G: Functionalities development and an Analysis of Mobile Wireless Grid", First International Conference on Emerging Trends in Engineering and Technology
9. M. Hata, "Fourth Generation Mobile Communication Systems Beyond IMT-2000 Communications," Proc 5<sup>th</sup> Asia Pacific Conf. Commun. 4<sup>th</sup> Optoelect. Commun. Conf., vol. 1, 1999, pp. 765– 67.
10. M. Bhalla, A. Bhalla, "Generations of Mobile Wireless Technology: A Survey" International Journal of Computer Applications, Volume 5- No.4, August 2010
11. T. Janevski, "5G Mobile Phone Concept" – CCNC conference in Las Vegas, 2009.
12. Tudzarov, T. Janevski, "Design of 5G Mobile Architecture" International Journal of Communication Networks and Information Security, Vol. 3, No. 2, August 2011.
13. Sapana Singh, Pratap Singh "Key Concepts and Network Architecture for 5G Mobile Technology" International Journal of Scientific Research Engineering & Technology Volume 1 Issue 5 pp 165-170 August 2012
14. ABDULLAH GANI, XICHUN LI, LINA YANG, OMAR ZAKARIA, NOR BADRUL ANUAR "Multi-Bandwidth Data Path Design for 5G Wireless Mobile Internets" WSEAS TRANSACTIONS on INFORMATION SCIENCE and APPLICATIONS 5G Mobile Technology Available:<http://seminarprojects.com/Thread-5g-mobiletechnology-documentation-download?pid=116396#pid116396>
15. Vadan Mehta "5G Wireless Architecture" Available: <http://www.4gwirelessjobs.com/pdf/5g-Wireless-architecture.pdf>
16. 5G mobile Technology Abstract Available: <http://www.seminaronly.com/Labels/5g-Mobile-TechnologyAbstract.php>



## Acceptation of Big Data and Analysis of Student Achievement in Higher Education

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### Introduction (Big Data)

Big data is a combination of analytical, semi structured and indeterminate data collected by Institution that can be stored for information and used in machine learning projects, anticipating modelling and other advanced analytics applications. For instant education chief, one ongoing protest is to provide a quality learning experience for students while keeping the price of teaching affordable. Using the appropriate data, in the proper way, can help institutions and leaders keep up with this current challenge. As Universities of higher education collect large amount of data about their students, and as students' record databases have become more elaborated and available – we are entering a new span of using data to advance the student success, streamline processes, and more adequately handle assets. Once the data is figured out it ensures better student placing processes, exact admission budget, and early warning systems that identify and assist students at-risk of failing or dropping out.

### Objectives

The main goal of this paper is to help the Individual Learners to identify their Flaw and Achievements, to help Mentors to properly identify their Coaching Practices and to help the Administrators to identify Confinement, progress and Achievement factors of the Organization.

### Analysis in Higher Education

Education Academic analysis will be a crucial part of the future. It covers all the activities in higher education involving administration, research, resource allocation and management. Big data influence big hope for higher education some of which are pursuing to be achieved while rest are the areas to be analysed. It is for the sake of the several assets provided by the big data analysis. The higher education scanning and assessment are upper class and can be mostly split into two categories. The first category is to present the quality of education and teaching through information technology and the second category is nothing but the main frame of higher education forming a clear-cut relation among schools, teachers and association. Institutions are competing in analytics not because they can – Nowadays current business is flooded with data and data crunchers, but also because they should. Many organizations including institutions of higher education are awash with a lot of data and it has pinched interest in analysis. Quantitative analysis and statistical analysis have become prominent in analysis and big data research techniques.

The Big Data analysis lifecycle can be split into the following nine phases.

- Business Case Calculation
- Data Recognition
- Data Recovery & Filtering
- Data Abstraction
- Data Authorisation & Cleansing
- Data Gathering & Representation
- Data Analysis
- Data Visualization
- Usage of Analysis Result

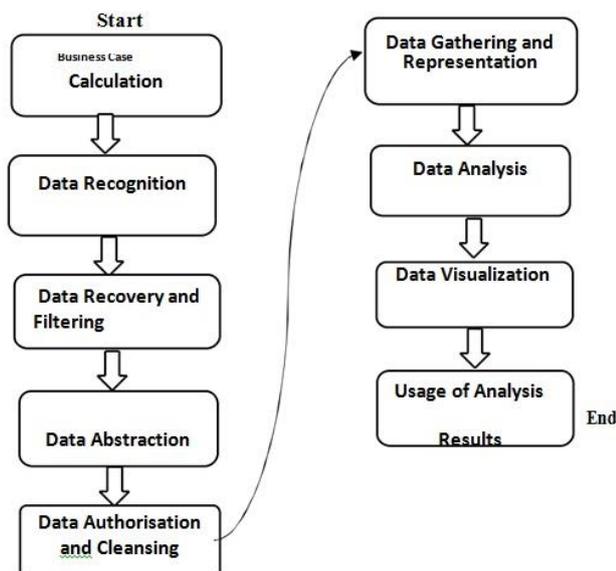


Fig: BIG DATA ANALYSIS LIFECYCLE PHASES

The Data Analysis phase shown in above Figure is dedicated to carry out the physical analysis task, which commonly involves one or more types of analysis. This phase can be constant in nature, especially if the data analysis is exploratory, in which case analysis is duplicated until the convenient Arrangement or Interrelationship is disclosed

#### IV. Conclusions

It is found that data and analysis can help Educational Institution to a better understanding among themselves, learned and proper knowledge of their own institutions. It's Important to build the strong university of the future. All Institutions should consider recommending an appropriate learning analysis system to Boost students support and Achievement. Big Data Analysis is a trend that will boost extensively in the coming span and will have a vast brunt on any educational institution due to the many asset. Institutions should diagnose appropriate big data analytics gadget to accumulate the benefits from the giant bulk of data and how Big Data Analytics gadgets.

#### Reference :

- 1) V.I.Pujari, Dr. R. B. patil, A REVIEW PAPER ON BIG DATA AND HADOOP, International, Volume 6. Issue Journal of Advance and Innovative Research I (XXXIX): January - March, 2019, ISSN 2394-7780
- 2) Vinayak Pujari, Dr. Yogesh K. Sharma and Rohan Rane, A REVIEW PAPER ON BIG DATA AND HADOOP International Journal of Advance and Innovative Research Volume 7, Issue 1 (VI): January - March, 2020 Part – 1, ISSN 2394 - 7780

## A Study on Artificial Intelligence and Its application

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### Introduction

#### A) What is intelligence?

Intelligence has the ability to choose one's behavior to proper new conditions. By define more definition, as the ability to observe information, and recalling the data to be more functional about adaptive behaviors within an environment. Intelligence are most considered in humans, which also observes the non-human animal's plants etc. Artificial intelligence is nothing but to implement ideas in machines. (i.e., software).The degree of intelligence in the ability to change the ideas into practically.

#### B) Human Intelligence:

Human intelligence is the ability of humans, divided by perception, consciousness, self-awareness, and volition. Human intelligence is the intellectual property of humans, which is used by complex cognitive feats and high levels of motivational and self-awareness. It allows humans to collect imageries of things and practice in upcoming behaviors. It is a reasoning process which allows humans to get knowledge and think .

#### In Animals:

The most focus is on intelligence researchers,were scientists endeavored to examine animal intelligence.It comprises several events of problem solving,as well as numerical and verbal reasoning abilities .

#### In Plants:

The actual meaning is Animals possess the ability to adapt to their surroundings by learning to change their habits and behavior .Some animals are highly adaptable mammals with a keen ability to learn new skills. Parrot have an incredible capability to identify different human faces and have a high aptitude for communicate.

### II. Artificial Intelligence:

A.I. with the construction of intelligent machines AI is a part of computer science, which accept new things that merge the computers to perform equal like humans [1].In newly AI can be defined as intelligent agents, that acts as environment and change the actions into win. Some of the actions which computers deal with artificial intelligence are designed includes following:

- Learning
- Reasoning
- Perception
- Problem solving
- Understanding

#### a)Learning:

Learning is define into many forms. The basic form of learning is trial-and-error. Trial and error is a fundamental method of problem solving It enables the learner to get better success in situations that is not earlier time encountered.

#### b)Reasoning:

Reasoning comprises drawing inferences which are applicable to the task or situation in hand. One of the hardest problems in challenging AI is that of giving computers the capability to separate the closely connected or not.

#### c) Problem Solving:

One of the common problem in Artificial intelligent is Problem solving, as like finding data .many types of problems can be solving in Artificial intelligent [4]. The problem solving can be divided into two form. They are: Special Purpose and General Purpose. A special-purpose method is also known tailor-made

which is used to solve only a specific problem, where the general purpose method solves the problem in a step by step process. General-purpose method is used to a wide variety of problems.

### III. Functions Of Artificial Intelligence:

The Artificial Intelligence has various functions like agent function, heuristic function and evaluation function.

#### a) Agent Function

AI acts as an analysis on computational agency. An agent is approximately the actions in an environment, which includes dogs, humans, robots, worms etc.... A computational agent is an agent where it results in actions which can be explained in terms of computation. Agent functions are placed in time where they receive sensory data in time and do actions in time. The function inputs are set to do work at a particular time.

#### b) Heuristic Function :

A Heuristic function helps to solve the problem which is not solve problems, even though there is no positive declaration that it will never lead to wrong direction. In order to practice them in a specific domain there are coupler with approximate domain heuristics. The domain can be divided into two ways- specific, heuristic information. The heuristic function, in rule themselves appraises individual problematic states and regulates how suitable they are: A heuristic function is a function which maps the problem state explanation to measures the action desirability, usually represented as number weights. The designed heuristic functions provides good estimate to consider the path desired is good or not

#### c) Programing function:

It uses the logical approach that used logical function or procedure within its programming structure.it define that programming is done with expression instead of statements.

### IV. Advantages And Disadvantages:

#### Advantages

##### Reduce human error:

This means that human being can make mistake as time to time .which is a problem ,to over come this problem the proper programming are made as we write proper program or statements the computers work properly and give us write answer.with artificial intelligent decisions are taken by previously collected information applying a certain set of algorithm.so error are reduce and reaching accuracy with a greater degree.

##### 2)Take risk instead of humans:

In some case we need to take risk and it is not possible for human at every time so for that situation we can create robot which can take that risk ,we can overcome the problem by developing an artificial intelligent robots which can help us in various hazardous situation and can do risky things for us which can be used either in natural disaster or man made.

##### 3) 24/7 available:

An human average work 7 to 8 hours in a day .human being are made as they want some time to refreshing their self and get ready to work on next day they have weakly of for their personal time and get away from their work for some time .we can used artificial intelligent robots for such work which is available 24 hours.

##### 4) Helping in repetitive task:

In our day to day life we can do many work like sending message thanking email, to verify certain amount of data etc. we can remove boring task for human and give them only task which they can perform happily

##### 5) Faster decision :

Using artificial intelligent we can make decision faster as compare to human .human can thing practically or emotionally and then take decision but computer can only work on programming ,using artificial intelligence technology we can make machine take decision faster as compare to human make decision.

6) New invention:

Artificial intelligence also help to create some new innovation .it create many invention in different fields which is helpful for us

**Disadvantages:**

1) High cost of creation:

In day to day life the software and hardware of artificial intelligence are updated so it need to update daily as updates are required .machine need update and maintenance it need huge cost which is not possible to every one

2) Making human lazy:

As all work is doing by artificial intelligence it make human so lazy .as its application are used in every filed so human are make so lazy. If it happen every time then it may effect on future generation .we not thing about them, they are make their future or their life very lazy

3) Unemployment:

As AI taking the place of human in every field which may effect on life of human ,many people are jobless due to replacement of their place by machine .many company are replace the minimum qualified people with artificial intelligence robots which effect the life of their people

4) No emotion :

As machine has no emotion they only work on their programming language only. there is no daunt that machine work more better than human but the problems with this is emotion .machine cannot create emotional bonding between the people as human create bonding when doing work with team management.

**Applications**

**Agricultural benefit:**

In agriculture artificial intelligence are used to improve their quality of product also used to improve the development of growing crops these advantages go on including crops and soil monitoring , agricultural robots etc.,

**b) Manufacturing:**

AI technologies remain into their technique into manufacturing. This development is similarly seen in can, the No.1 EMS in electronic industry, were 10,000 robots were developed in factories to balance the increasing labour cost in china. Fox can n is also silently employed with Google to speed up its robotics program, hopeful to convert itself into a high-tech manufacture focus on high margin and capital-intensive products. Japan is one of the leading country in robots. Changing the human with robot is a trend in manufacturing that we can't stop or avoid. Since this technology adopts the low cost, high-accuracy and efficiency of robot, which going to benefit the human society in a broad level. E.g.: Robotics.

**c) Finance:**

Artificial intelligence is used to protect the people by their financial loss and also to secure and prevent fraud detection. Banks customs are also used the artificial intelligence systems to establish some operations and capitalize in stocks, and get properties. Applications connected in end-user devices with financial institution servers that are accomplished of examine in enormous volumes of information, providing modified into financial advice, calculations. It helps to progress financial plans and methods to track their progress. It comprises several customized investment, opportunities, loans, rates and fees.

**d)Transport:**

Transportation is one of the challenging domain, because it has some beneficial characteristic complexity. It is moulded up by geographically and functionally circulated heterogeneous elements, both artificial and human, with dissimilar decision-making abilities having mutual or individual goals, constructing its dynamics slightly uncertain. The balanced usage of transportation infrastructure son which they interact with the location must be achieved on a maintainable basis.AI ensures the productivity by making enhanced use of existing transportation infrastructure, including them with smarter, greener, safer, and more efficient

technologies. The modern transportation systems are a natural ground to conceive, develop, test and apply AI techniques.

e) Military:

The main application of artificial intelligence is to enhance the command and control communication technology they used as for their better security and also perform some task which is necessary in military.

#### VI) Conclusion:

Artificial intelligence play a major role in our life but it also has some draw backs. Artificial Intelligence and the technology are unique lateral of the life which continuously make attention and wonder us with the innovative ideas, topics, innovations, products etc...AI plans can overtake the human experts. Nowadays the great challenge of AI is to the catch methods of demonstrating the consistent data and understanding that people can be enable to carry out daily actions such as holding a wide-ranging conversation, or finding their way along a busy street. Conventional digital computers may be accomplished of running such programs, or we may essential need to develop new machines that can support the difficulty of human thought. This is not the conclusion of AI, there is further to originate after it, who recognizes what the AI can do for us in the future, perhaps it will be an entire culture of robots.

#### References

1. [http://www.webopedia.com/TERM/A/artificial\\_intelligence.html](http://www.webopedia.com/TERM/A/artificial_intelligence.html)
2. [https://www.sciencedaily.com/terms/artificial\\_intelligence.htm](https://www.sciencedaily.com/terms/artificial_intelligence.htm)
3. <https://en.wikipedia.org/wiki/Intelligence>
4. [http://www.alanturing.net/turing\\_archive/pages/reference%20articles/What%20is%20AI.html](http://www.alanturing.net/turing_archive/pages/reference%20articles/What%20is%20AI.html)
5. [http://artint.info/html/ArtInt\\_36.html](http://artint.info/html/ArtInt_36.html)
6. <http://artificialintelligence-notes.blogspot.com/2010/07/heuristic-functions.html>
7. <https://www.britannica.com/science/evaluation-function>
8. <https://praveen1302.wordpress.com/2014/02/11/advantages-and-disadvantages-for-artificial-intelligence/>
9. <https://www.linkedin.com/pulse/pros-cons-artificial-intelligence-mike-fekety>
10. <https://www.advancedmp.com/artificial-intelligence>
11. <https://bpi.com/cto-corner-artificial-intelligence-use-in-financial-services/>
12. [http://www.epia2013.uac.pt/?page\\_id=791](http://www.epia2013.uac.pt/?page_id=791)

## Decision-Making: Theory And Practice

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### Introduction

Decision support systems (DSS) are executed in order to support supervisory in an institute. This assumes that the way in which decision-making actually takes place in the reminder is implicit. There are various prototypes of management characters with a background in measurement would commonly be exposed to rational decision-making policies, like Simon's (1977) four-step call model that comes with aptitude, design, miscellany and review. This process is often conveyed by the calculation of the subjective expected utility (SEU) or alternative tactic of level routes to make straightforward electing the best preference. It has been detected that the amount produced of decision support assignments, often packaged as decision support structures, are not used to support decision-making in the way that was future. This could imply some consistency between the administrative route that is being false or modelled and the way decision-making occurs in practice. In order to test assumptions about decision-making and the use of decision support know-how, the texts on decision-making was malicious and compared to the way that a number of managers make decisions in run through.

The red-top starts with the introduction of few theoretic models of decision-making. Ahead this, the results from seminars with a few plain decision-makers on the topic of decision-making are discussed. A comparison is done between the imaginary models and the scope to which they reflect the actual practices and sophisticated about decision-making by the decision-makers. Subsequently, general insights gained from the dialogs are shortened, such as on the topic of the process of decision-making and how to influence other decision-makers. Other topics that collect particular devotion are the use of technology in decision-making and the routine of order sustenance tools.

### Various models of decision-making

Different visions and ideas of decision-making may be initiate in the collected works. The succeeding list of visions, auxiliary theories and simulations is based upon classes provided by Keen and Scott Morton (1978), Huber (1981), and Das and Teng (1999). Das and Teng's list is, by the situation, a meta-classification. The last two items point out in the list below, namely naturalistic decision-making and the multiple angles methodology, are relatively new and did not perform in the revealed categorisations 2 few models of supervisory.

Various sights and theories of decision-making may be establish in the mechanism. Das and Tang's list is, by itself, a meta-classification. The last two items mentioned in the list below, namely lifelike decision-making and the multiple perceptions methodology, are relative. The behind list of views, supporting notions and models is based upon categorizations provided by Keen and Scott Morton (1978), Huber (1981), and Das and Teng (1999). Das and Teng'sly new and did not appear in the bring up labelling.

### The rational model

The balanced manager view assumes a balanced and totally informed decision-maker ("economic man") as labelled by neoclassical microeconomic theory around the middle of the preceding century. The process of balanced executive comprises a number of steps, such as those given by Simon (1977):

Intelligence: finding instances for making a decision;

Design: inventing, evolving and analyzing possible courses of action;

Choice: selecting a specific course of action from those offered; and

Review: evaluating past choices.

In traditional or flawless reasonableness, methods of decision analysis are used to accord numerical standards or services to each of the alternatives during the "choice" phase. The alternative with the highest value (or maximum subjective expected utility) is selected. When using the rational model in this fashion, it is expected that managers [11]:

"know of all possible alternatives;

know the significances of applying each alternative;

have a well-organized set of partialities for these significances; and

have the computational ability to compare imports and to determine which is chosen."

The model of bounded rationality

The "amuse," process-oriented view is predicated essentially on Simon's (1979) work on confined reasonableness, admitting that the balanced manager doesn't always have complete information, which optimal choices are not always compulsory. Rendering to Simon (as quoted by Chase et al. (1998)), "The soul normal act is formed by a

clippers whose two edge are the gathering of task environments and therefore the computational abilities of the actor." These scissors cut the problem space into a much smaller area that is viable to search. Bounded reasonableness is considered by the activities of searching and satisficing. Alternatives are searched for and evaluated chronologically. If an alternative satisfies certain implicitly or explicitly stated minimum conditions, it is said to "satisfice" and the search is done. The process of searching might be made easier by the identification of monotones in the task environment. Although Simon has been highly acclaimed for the idea of bounded reasonableness, it still describes (albeit constrained) normal behavior. For this reason, variety of researchers, like

Huber (1981) and Das and Teng (1999), don't differentiate between perfect and bounded reasonableness in their classification of decision-making models.

**The instrumentalist view**

The logical instrumentalist view involves a step-by-step process of incremental actions and keeps the strategy hospital adjustment. Under Lindblom's (1959) disjointed instrumentalism ("muddling through") marginal, feasible changes are made, performing from the established order to unravel existing problems rather than towards the goals. Another investigators describe a process of "spoiling with a purpose" [6].

**The administrative procedures view**

The administrative events view seeks to understand decisions as the output of standard operating procedures invoked by administrative subunits. March (1988) contributed to this theory. Huber [7] named this vision the "program model," representing that the results are pre-programmed in current procedures as well as the routinized thinking of the people involved. Das and Teng (1999) mention to it as the "avoidance mode" which views executive as a systematic process aimed at maintaining the status quo at the cost of invention. On the further hand, krabuanrat and Phelps (1998) amend this view during a positive light, exactly because the use of codified administrative experience.

**The political view**

The political opinion sees executive as a personalized trading process, driven by the agendas of participants rather than rational processes. People differ on the administrative goals, values and the similar information. The executive process never ends, but remains a continuous battle among different coalitions. After one group wins a round of the battle, other parties might recover or become even more determined to win the next round. Influence and power is employed in a deliberate manner and to further self-interest. The aim of the unions are defined by self-interest rather than by what is good for the administration as a whole. Select (1981) is one of the key contributors on politics and power in decision-making.

**TRIPARTITE: DECISION-MAKING**

While the court regularly exercises its statutory power to get skilled medical help, its decision-making is predicated on a three-way legal model, instead of a medical model. court selections square measure created by three-member panels, consisting of a member illustrative of staff, a member representative of employers, and a impartial vice chair.18 Panel members square measure lay adjudicators, within the sense that they're not appointed for his or her medical experience. However, in the course of their adjudicative activities, panel members are frequently exposed to healing evidence and theory, and develop expertise in assessing and weighing such evidence, and in directing further medical and scientific investigations. The tripartite structure provides the Hearing with a number of advantages in decision-making. While all adjudicators are required by law to render impartial decisions, representative members contribute a practical viewpoint and experience in the workplace, as well as a familiarity with issues of current concern to their communities.

The Tribunal's Members' Code of Specialized Responsibility<sup>19</sup> helps certify that the Board gets the full benefit of this tripartite structure. Members are committed to deciding each case on the real merits and justice based on the law and the evidence received in that case. They are also committed to approaching appeals with an open mind and to discussing issues fully with their panel colleagues. Considerable time is spent in assembly and in the drafting process trying to resolve issues of concern to all members. Where agreement is not possible, a dissent explaining the reasons for variance is written.

The panel members' commitment to these standards has produced a working environment where all three members fund to a decision as adjudicators, not as partisan advocates. The Tribunal refers towards this form of tripartism as "collegial tripartism".

**Models and Modes of Decision-Making**

Authoritarian schemes of decision construction say how judgments ought to be made if the decision producer requests to survey certain moralities of rationality (e.g., the attitude of transitivity). These schemes are part of controlling skill. They provide formal rules and procedures for structuring and processing the relevant information and, thus, provide support in complex decision situations. Descriptive theories aim to show how societies essentially make resolutions. Since the rational capacity is narrow, or at least is not everlastingly used capably, actual judgments are often suboptimal equaled with the decisions approved by strict schemes? The first eloquent model of decision assembly under incredibility was

offered by Edwards in 1954. The subjective equivalent utility (SEU) model assumes that folks attempt to maximize their subjectively expected utility. The SEU of an option is that the sum of the utilities of its consequences, weighted by the subjective probabilities of their occurrence. The choice maker is assumed to settle on the choice with the very best SEU value. In 1979, Kahn man and Tversky proposed prospect theory (PT) as an updated version of the SEU model. The idea sticks to the idea that decisions are determined by the values and probabilities of their consequences but takes under consideration the various observations of decision-making behaviors that don't concur with the SEU model. PT has convert identical persuasive, particularly within the economic and medical domain. In 2002, Kahn man was awarded the Nobel Award in financial side, primarily for this theory (Tversky had died in 1996). The essential elements of PT are the worth function and therefore the decision weight function. With reference to the worth factor, PT assumes that folks mentally code the potential outcomes of options in reference to a point of reference , that is, the established order or the aspiration level. Outcomes above the point of reference are coded as gains and outcomes below the point of reference are coded as losses. Gains and losses are evaluated consistent with a worth function that has two properties. First, the function is concave over gains and convex over losses; that's, additional gains please less, and extra losses hurt less. Second, the function is steeper over losses than over gains; that's , a loss of \$100 hurts quite a gain of \$100 pleases With reference to the probability factor, PT assumes that subjective possibilities of outcomes are transformed into weights that represent the importance of the occurrence of the result . As an example, many of us weigh the transition from a 0.99 probability to certainty (1.00) as heavier than a transition from a 0.41 probability to a 0.42 probability. PT provides explanations for variety of empirical phenomena that always are considered as irrationalities or anomalies, particularly in economics. Examples include the finding that preferences aren't invariant with reference to their description (i.e., framing effect) and therefore the finding that investors sell winner stocks too fast and hold loser stocks too long (i.e., disposition effect).An alternative theory, image theory, was proposed in 1990 by Beach. Image theory has become very popular in super vision and business schools. Beach assumed that people apply an optimizing policy like the one proposed in PT, only under very special conditions. More regularly, people survey whether a new route is attuned with their objectives and policies (called images) and accept and instrument the route if that is the item. If the option is not compatible and violates important features, other options are searched and explored. When people are confronted with a number of options, they first screen out the ones that are discordant with goals and plans, and only if more than one option remains do they try to identify the optimal one.

Other researchers have also pointed out that in real life, optimizing judgment assembly is the allowance quite than the instruction. Features of the problem and the situation are often more important than the potential consequences of a decision. For instance, the behavior of managers in organizations is strongly determined by rules. The decisions of consumers are often determined by affects. In ethical conflicts, decisions are primarily determined by basic ideals, such as morality and "do not harm," irrespective of the consequences.

Still another approach focuses on what is called naturalistic decision making, indicating the process by which people use their experience to make decisions in complex and dynamic environments, regularly above stage burden and involving high risks (e.g., pilot decisions on the flight deck). For such positions, in 1993, Klein suggested a blame clued-up decision prototypical that encompasses respect of cue forms that hints to rescue of a rejoinder route. Ongoing valuation of single possibilities is measured distinctive, and the first option that contests the decision producer's goals and the situational controls is picked.

Models of directorial resolution constructing describe decision making by both single and multiple actors in a logistic perspective. The normative sensible (classical) model adopts that the association follows a computational value-maximizing decision-making scheme. The model's efficacy is limited to a lesser set of conditions with explicit appearances (e.g., goals can be described in quantitative terms); consequently, alternative models were developed based more on the actual behavior of decision makers in organizations. For request, the (communication) logistic model centers on the partial information-processing aptitude of decision producers and advances an effect satisfying scheme. In tally, the waste can typical apprehends of societies as "organized anarchies" (e.g., having shifting goals). Universities are considered the prototype of such organizations that do not follow one specific decision-making strategy. Outcomes result from the variable participation of their various members and groups in constantly changing tasks. All of these models differ in their ability to crumble with altered units of improbability and encounter among interests.

## Methods

Decision researchers use a variety of calculable and qualitative techniques to survey how people make decisions. Experimental studies in the lab usually ask participants to make judgments about values and importance as well as about uncertainties and risks, to make choices among given options, and to evaluate options, search for information about options, or distribute goods. Return times, eye arrangements, and further negotiating data (including verbal reports) are also used as methods of the information-processing activity of participants. Outside of the lab, the inquiry form is the dominant method, where either decision problems are presented by the researcher, and applicants provide the required

responses (e.g., apprentices in a oration) or decision positions retire and the canvasser observes and histories partakers' behavior (e.g., pilots in a field).

### Conclusion

Approximately 50 years ago, the study of decision making started with lab tryouts examining how people make choices among monetary risks. Ever since then, the scope of educations has been stretched very, reflecting the aggregate importance of appreciative and successful decision making in our humanity as well as the evolution of methodology and model assembly within the inquiry municipal. However, the extension of the field has also eroded the idea of a general theory of decision making in favor of situation and domain-specific models and realistic research on the conditions under which the various modes and schemes are being applied.

### References:

1. Beach, L. R. (1990). *Image theory: Decision making in personal and organizational contexts*. Chi Chester, UK: Wiley.
2. Connolly, T., Arkes, H. R., & Hammond, K. R. (Eds.) (2000). *Judgment and decision making: An interdisciplinary reader*. Cambridge, UK: Cambridge University Press.
3. Edwards, W. (1954). The theory of decision making. *Psychological Bulletin*, 51, 380–417.
4. Flin, R., Salas, E., Strub, M., & Martin, L. (1997). *Decision making under stress: Emerging themes and applications*. Brookfield, VT: Ash gate.
5. Hastie, R., & Dawes, R. (2001). *Rational choice in an uncertain world: The psychology of judgment and decision making*. Thousand Oaks, CA: Sage.
6. Kahneman, D., Slovic, P., & Tversky, A. (Eds.) (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge, MA: Cambridge University Press.
7. Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263–291.
8. Kahneman, D., & Tversky, A. (Eds.) (2000). *Choices, values, and frames*. New York: Cambridge University Press.
9. Koopmans, P. L., Broekhuijsen, J. W., & Wierdsma, A. F. M. (1998). Complex decision-making in organizations. In P. J. D. Drenth, H. Thierry, & C. J. de Wolff (Eds.), *Handbook of work and organizational psychology*, Vol. 4: Organizational psychology (2nd ed., pp. 357– 386). Hove, UK: Psychology Press.
10. March, J. G. (1994). *A primer on decision making: How decisions happen*. New York: Free Press.
11. Messick, D. M., & Tenbrunsel, A. E. (Eds.) (1996). *Codes of conduct: Behavioral research into business ethics*. New York: Russell Sage.
12. Rasmussen, J. (1993). Deciding and doing: Decision making in natural context. In G. Klein, J. Orasanu, R. Calderwood, & C. E. Zsombok (Eds.), *Decision making in action: Models and methods* (pp. 158–171). Norwood, NJ: Ablex.
13. Shapira, Z. (Ed.). (1997). *Organizational decision making*. New York: Cambridge University Press.
14. Simon, H. A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics*, 69, 99–118.

## The Role of Digital Marketing in Consumer Behavior

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### Introduction

Using the internet, social media, mobile apps, and other digital communication technologies has become a part of billions of people's daily lives. For instance, the present number of internet users in India is about 323 Million and around 3.2 Billion on this planet. Earlier people—the next generation of mass consumers—have also high levels. People also spend collective time online. For example, in the India, an over the last period of the number of hours spent online by people has more than gathered, and now averages 20.5 hours per week.

Earlier people—the future generation of mass consumers—have likewise high levels

People also spend more time online. For example, in the UK, over the last decade the number of hours spent online by grown-ups has more than creased, and now arithmetic mean 20.5 hours per week

Social media has fuelled part of this growth: worldwide there are now more than 2 billion of peoples using social media and Facebook alone now has just about 1 billion vigorous users per day clearly, peoples are exposed themselves to more and more digital and social media. This is for many purposes, within their roles as consumers as they search for information about products,1 purchase and consume them, and communicate with others about their experiences.

Marketers have recognized to this foundational shift by increasing their use of digital marketing channels.

In fact, by 2017 nearly one-third of global advertising spending is estimate to be in digital channels Thus, the future purchaser marketing will largely be carried out in the digital settings, particularly social media and mobile.

It is there for essential for purchaser research to inspect and understand consumer behaviour in the digital environments.

This has been up-to-the-minute over the last decade, with increasing amounts of research focusing on digital consumer behaviour issues.

The works is still relatively promising, however, and more research is of course needed— particularly given the ever-changing nature of the digital/social media/mobile environments in which consumers are situated and interact with brands and each other. This article efforts to This can include specific products or services, as well as brands as a whole.

### Research Themes And Findings

Five separate investigation themes emerge in recent consumer research on digital marketing and social media. The five themes are consumer digital culture, advertising,impacts of digital environments, mobile, and online WOM and reviews.

The most popular themes are online WOM, which is enclosed by almost half of the trainings, and advertising, signified by slightly over one-quarter of the articles.

### Impacts of Digital Environments

A still-emerging refrain in current years is how digital/social media environments influence consumer behaviour [21-23]. The significances can be supposed of as environment-integral (i.e., digital environments influence behaviour in those environments) or environment-incidenta (i.e., digital environments influence behaviour in other, unrelated environments). It is inspiring to see how the some informational and social characteristics of digital/social environments, such as being exposed to other consumers' opinions (e.g., reviews) or choices (e.g., bids in online auctions), or even just to friends' lives over social media, can impact subsequent behaviours.

For occurrence, with respect to environment-integral significances, Lamberton et al. [21] and Norton et al. [22] considered learning from strangers in digital environments. They find that customers in inexpensive online settings infer relational difference and act destructively against unclear others (strangers) [21], and find that seeing online that others made the same choices as oneself can reduce, not increase, confidence in one's choices if others' explanations (e.g., in online reviews) are dissimilar [22]. Adopting a different perspective,

Wilcox and Stephen [23] inspected an environment-incident response with respect to how using Facebook artificial self-control. They create that when uncovered to closer friends on Facebook, consumers afterward exhibited lower self-control in choices related to, for example, healthy behaviours (e.g., choosing a cookie instead of a healthier granola bar).

### Mobile

Consumer behavior in settings is also increasingly important, as consumer use mobile devices more frequently. This is particularly interesting in shopping contexts. In an in-stock shopping setting, Hui et al. [24] studied how customers respond to mobile coupons in 8 physical stores, conclusion in a field trial that mobile offers requiring consumers to deviate from their intentional shopping paths can growth unplanned spending. In an online shopping setting, Brasel and Gips [25] attentive on shopping on mobile devices (e.g., tablets) and exactly, on how moving products (instead of clicking with a mouse) can increase feelings of emotional possession and endowment. This is a stimulating contribution because work on how consumers physically interface with mobile devices and how that influences decision making is scant but, as this article showed, important. Unconnected to shopping is work by Bart et al. [26] that cautious how mobile display ads—which are very small and carry very little (if any) information—influence customers' brand superiorities and purchase intentions. They newcomer that in countless product categories mobile display ads have no effect, but that they do lift attitudes and intentions for high-involvement, utilitarian products (e.g., financial services).

### Online WOM and Reviews

WOM is the greatest-represented topic in digital and social marketing investigation, which is unexpected given the reliance consumers appear to have on socially sourced online information.

A number of sub-themes were enclosed recently. First, a stimulating set of articles Measured language properties of online WOM and/or reviews [27-33], usually showing how judgements of reviews and how important they can depend on subtle language-based properties.

For instance, Kronrod and Danziger [27] showed that symbolic (vs. literal) language in online reviews positively pretentious customer attitudes and choice for hedonic goods. Moore [28] considered descriptive language in online reviews, outcome that whether customers explained actions or reactions artificial perceived evaluation helpfulness. Hamilton et al. [29] well-thought-out negative WOM, finding that using softening language when conveying negative opinions

### Recommendations For Future Research

The digital/social media customer behaviours works is fast-growing and largely focuses on marvels that are practically applicable and hypothetically interesting. Researchers have mostly considered how customers use information (e.g., online WOM, reviews) available to them in digital/social media environments. Future investigation should continue this method, although in a more long-drawn-out fashion. Consumers' behaviour's other than those related to online WOM/reviews should be considered, and other types of information originate (and inferences made) in online environments should be measured. For example, it would be stimulating to consider the complex interplay between spreader, receiver, linguistic/content, and context factors when it comes to backgrounds and significances of online WOM.

Another high-potential way for future investigation is to consider how several kinds of digital environments (including social media and mobile) impact a wide variety of customer outcomes, including psychological and economic constructs. Few trainings have done this, thought it is possible that a assembly of customer outcomes are influenced by the digital environments in which they are increasingly located. It is also possible that some adverse significances may be perceived, comparable to Wilcox and Stephen's [23] finding linking Facebook use to lower self-control. In adding to this, the ways that customers physically interact (i.e., interface) with digital environments need deeper examination, given what Brasel and Gips [25] found in terms of feelings of endowment when using touch-based boundaries to shop. In studying the impacts of digital environments on customers, it will also be essential to consider longer-term responses because these belongings may be subtle but cumulatively important. Thus, one-shot experimental studies should be complemented by longitudinal experiments and archival data capturing consumers' digital exposures, online social interactions, and behaviour's over time.

Finally, investigators should consider emerging important topics, particularly customer privacy issues in the situation of digital marketing and social media. Tucker [15] considered this to an extent, though a complete understanding of how consumers think about their privacy, what they need to do to keep it, and how they value (or devalue) digital media services that protect (or not) privacy is still needed.

In assumption, there has been much recent activity in the consumer behavior/psychology literature related to digital and social media marketing, and many important donations to knowledge have been made. To transfer this works forward, particularly given the fast-moving nature of numeral locations, research that

attempts to broaden our understandings of key phenomena, inspects brand-new phenomena, and develops theories in an area that lacks an established theoretical base will be most valuable.

## References

1. Pew Research Centre (2015), Internet Use Over Time: American Adults, <http://www.pewinternet.org/data-trend/internet-use/internet-use-over-time/> (accessed 09/15/15).
2. Pew Research Centre (2015), Internet Use Over Time: American Teens (12-17), <http://www.pewinternet.org/data-trend/teens/internet-use/> (accessed 09/15/15).
3. Ofcom (2015), Adults' Media Use and Attitudes Report, <http://stakeholders.ofcom.org.uk/market-data-research/other/research-publications/adults/media-lit-10years/> (accessed 09/15/15).
4. We Are Social (2014), Global Social Media Users Pass 2 Billion, <http://wearesocial.net/blog/2014/08/global-social-media-users-pass-2-billion/> (accessed 09/15/15).
5. Facebook (2015), Facebook Company Info: Stats, <http://newsroom.fb.com/company-info/> (accessed 09/15/15).
6. eMarketer (2015), Advertisers Will Spend Nearly \$600 Billion Worldwide in 2015, <http://www.emarketer.com/Article/Advertisers-Will-Spend-Nearly-600-Billion-Worldwide-2015/1011691> (accessed 09/15/15).
7. Berger, Jonah (2014), "Word of Mouth and Interpersonal Communication: A Review and Directions for Future Research," *Journal of Consumer Psychology*, 24 (4), 586-607.
8. Yadav, Manjit, and Pavlou, Paul A. (2014), "Marketing in Computer-Mediated Environments: Research Synthesis and New Directions," *Journal of Marketing*, 78 (1),20-40.



## Networking, Applications and Advantages and Disadvantages

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### Introduction

In Modern world probability is ever changing. Data Communication and network have changed the way business and other daily matters works. Now, they highly depend on computer networks and internet work .A set of devices often mentioned as nodes connected by media link is called a Network A node can be a device which is capable of source to destination data generated by other on the network like a computer, printer etc. This links connecting the electronics devices are called Communication channels. Computer network is a telecommunication channel using which we can transfer data with other computers or electronics devices, connected to the same network. It is also called Data Network. The best example of computer network is Internet. A networking is simply a group of two or more Personal Computers that are devoted together. There are many types of networking system, but there are two most common types of networks are follows as Local-Area Networks (LANs), and Wide-Area Networks (WANs).

A local area network (LAN) is a computer network that intercommunicate computers within a limited amount of area such as a school, laboratory, university campus or office building etc. but the a wide area network (WAN) not only covers a larger environmentally area distance, but also generally involves rented telecommunication circuits.

A computer network is a digital telecommunications network for distributing resources between intersection vertex or link, which are computing devices that use a common telecommunications technology. Data transmission between intersection node is supported over data links consisting of physical cable media, such as twisted pair or fiber-optic cables, or by wireless methods, such as wireless fidelity , microwave transmission, or free-space optical communication.

Network intersection are network computer devices that originate, route and conclude data communication.[1] They are generally identified by network addresses, and can include hosts such as personal computers, phones, and servers, as well as networking hardware such as routers and switches. Two such devices can be said to be networked when one device is able to transfers information a with the other device, whether or not they have a direct connection to each other. In most cases, application-specific communications protocols are layered payload over other more approximation communications protocols.

Computer networks support so much application such as services, such as access to the World Wide Web, digital video, audio, transfer the use of application and storage servers, printers, and fax machines, and use of email and instant messaging applications. Computer networks may be divides in by many criteria, for example, the transmission medium used to carry their signals, bandwidth, communications protocols to organize network traffic, the network's size, topology, traffic control mechanism, and organizational intent. The best-known computer network is the Internet. Computer communication links that do not support junk mails, such as traditional point-to-point telecommunication links, simply transmit data as a bit stream. However, the overwhelming majority of computer networks carry their data in packets. A network packet is a formatted unit of data (a list of bits or bytes, usually a few tens of bytes to a few kilobytes long) carried by a packet-switched network. junk mails are sent through the network to their destination. A longer message is packetized before it is transferred and once the junk mails arrive, they are then reassembled back into their original message.

Junk mails consist of two kinds of data: control information, and user data (payload). The control information provides data the network needs to deliver the user data; for example: source and destination network addresses, error detection codes, and sequencing information. Typically, control information is found in junk mails headers and trailers, with payload data in between.

With junk mails, the bandwidth of the transmission medium can be better shared among users than if the network were circuit switched. When one user is not sending junk mails, the link can be filled with packets from other users, and so the cost can be shared, with relatively little interference, provided the link isn't overused. Often the route a junk mails needs to take through a network is not immediately available. In that case, the junk mails is sequentially and waits until a link is free.

### Network Topology

A bus network: The all nodes are linked to a common medium along this medium. This was the hand over used in the original Ethernet, called 10BASE5 and 10BASE2. This is still a common topology on the data link layer, although modern physical layer variants use point-to-point links instead.

A star network: The all nodes are linked to a special central node. This is the typical layout found in a Wireless LAN, where each wireless client linked to the central Wireless access point.

A ring network: The each node is linked to its left and right neighbour node, such that all nodes are linked and that each node can reach each other node by traversing nodes left- or rightwards. The Fiber Distributed Data Interface (FDDI) made use of such a topology.

A mesh network: The each node is linked to an approximat number of neighbours in such a way that there is at least one traversal from any node to any other.

A fully connected network: The each node is linked to every other node in the network.

A tree network: The nodes are arranged in arrayed.

### Advantages of Networking

#### 1. It enhances communication and availability of information.

Networking, especially with full access to the web, allows ways of communication that would time and send files to other people wherever they are in the world, which is a large benefits for businesses. Also, it allows access to a huge amount of useful information, including traditional athority substance and timely facts, such as news and current events.

#### 2. It allows for more convenient resource sharing.

This utility is very important, particularly for larger amount of companies that really need to produce vast numbers of resources to be shared to all the people. Since the technology involves computer-based work, it is confidentially that the resources they wanted to get across would be entirely shared by linked to a computer network which their audience is also using.

#### 3. It makes file sharing easier.

Computer networking allows easier availability for people to share their files, which greatly helps them with saving more time and acheivement, since they could do file sharing more accordingly and successfully.

#### 4. It is highly flexible.

This technology is known to be very adjustable, as it gives users the great chance to explore everything about crucial things, such as software without modifying their functionality. Plus, people will have the obtainability to all information they need to get and share.

#### 5. It is an inexpensive system.

Installing networking software on your device would not have to pay too much, as you are assertive that it lasts and can beneficially share information to your equally. Also, there is no need to change the software regularly, as mostly it is not required to do so.

#### 6. It increases cost capability.

With computer networking, you can use a lot of software products reachable on the market which can just be stored or installed in your system or server, and can then be used by various workstations.

#### 7. It enhancement storage capacity.

Since you are going to share information, files and resources to other people, you have to certify all data and content are properly stored in the system. With this networking technology, you can do all of this without any disagreement, while having all the space you need for storage.

## **Disadvantages of Networking**

### **1. It lacks independence.**

Computer networking involves a process that is operated using computers, so people will be relying more of computer work, alternatively of applying an achievement for their tasks at hand. Aside from this, they will be dependent on the main file server, which means that, if it breaks down, the system would become useless, making users idle.

### **2. It poses security problems.**

Because there would be a large number of people who would be using a computer network to get and share some of their files and resources, a certain user's security would be always at risk. There might even be unauthorized activities that would happen, which you need to be careful about and aware of it.

### **3. It lacks validness.**

As previously stated, if a computer network's main server breaks down, the complete system would become unusable. Also, if it has a bridging device or a central linking server that fails, the entire network would also come to a standstill. To deal with these problems, large networks should have a powerful computer to serve as file server to make setting up and maintaining the network easier.

### **4. It permit for more presence of computer viruses and malware.**

There would be instances that stored files are corrupt due to computer viruses. Thus, network administrators should managing regular check-ups on the system, and the stored files at the same time.

### **5. Its light policing utilization encourage negative acts.**

It has been observed that providing users with internet linking has fostered unacceptable behavior among them. Considering that the web is a minefield of interruption—online games, hilarity sites and even porn sites—workers could be induce during their work hours. The large amount network of machines could also encourage them to engage in illicit practices, such as instant messaging and file sharing, ratherly of working on work-related matters. While many organizations draw up certain policies on this, they have proven problems to enforce and even engendered resentment from employees.

### **6. It requires an logical handler.**

For a computer network to work logically and optimally, it requires high technical skills and know-how of its operations and administration. A person just having basic skills cannot do this job. Take note that the authority to hold such a system is high, as assingning permissions and passwords can be discouraging. Similarly, network configuration and connection is very uninteresting and cannot be done by an average technician who does not have advanced knowledge.

### **7. It requires an high costly set-up.**

Though computer networks are said to be an low cost system when it is already running, its initial set up cost can still be high depending on the number of computers to be linked. the high costly devices, such as routers, switches, hubs, etc., can add up to the cost. Aside from these, it would also need network interface cards (NICs) for workstations in case they are not built-in.

## **Limitation of Networking**

In theory, we should say that network marketing does not require publicizing. However, in actuality, it is not possible for any producing to recommending 'brand-building' and 'brand-loyalty', in the absence of publicizing. When, therefore, network marketing is coupled with a publicizing, the advantage of lower marketing overheads may be considerably decreasing.

Because of multi-level system of marketing, sales divining is a difficult.

A insecurity associated with multi-level marketing is that dealers (who often become largest customers) may take over control of the company.

## **Future scope of Networking**

Growing Chance – Every sector requires networking in some or the other way. In the business sector, networking is applicable from producing to business processing. As establishment and institutions invest in domains like technology, cloud computing, big data, etc they all depend on a workforce with networking skills

to make the most of this technology. Today the supply of networking workforce does not match with the demand, due to which in the future these professionals will determine chance for the growing economy.

Automation – Technology is undergoing continuous automation. Automation plays an important role during cost reduction, productivity, performance. Automation is becoming the base of networking. Automating the configuration, deployment, maintenance, and troubleshooting has now become a part of automation. Everyday network tasks like these grow the scope of networking. There is a myth that automation might take away jobs in the near future which is not true. It will simply add skill sets to the work profile of a network engineer.

Innovation – Companies expand with the help of innovation. Due to this Innovation is no more an option for companies but an chance to grow. The change could be external for a better provision of products and services to the clients or internal for the better performance of the internal networks. If you are an innovator, you have a huge opportunity to take up your career to another level.

**IV. Job Opportunities** – The networking domain is vast the sub-domains like routing and switching, security, service provider, collaboration, etc. Let's consider some examples. Routing and Switching is the pillar of networking. The professionals working in this domain handle the basics of networking. Every company will require routing and switching professionals to handle their networks. Same is available in the security domain. Every network set up in companies will need security to protect their sensitive data. Hence the job opportunities in this domain multiply day by day.

You will go places all over the world – Networking transfers an international standard. It means that the world recognizes your knowledge and skills in networking. Especially, a Cisco certified professional may travel to global corporations around the globe. Networking professionals work in a lot of domains. They support small businesses, schools, industries and every place where networking is available.

### Conclusion

While the age-old concept of the network is understructure in virtually all areas of society, Computer Networks and Protocols have forever changed the way humans will work, play, and communicate. Forging powerfully into areas of our lives that no one had expected, digital networking is further empowering us for the future. New protocols and standards will emerge, new applications will be conceived, and our lives will be further changed and upgrade. While the new will only be better, the majority of digital networking's current technologies are not cutting-edge, but rather are protocols and standards conceived at the dawn of the digital networking age that have stood solid for over thirty years

### Reference

1. <https://www.ijsr.net>
2. <https://www.networkworld.com/article/2159706/lan-wan-25-of-today-s...>
3. [https://www.papermasters.com/networking\\_engineer.html](https://www.papermasters.com/networking_engineer.html)
4. <https://www.engpaper.com/network-security-research-paper-12.htm>  
[www.seminarsonly.com/.../Computer/Research-Topics-in-Computer-Networking.php](http://www.seminarsonly.com/.../Computer/Research-Topics-in-Computer-Networking.php)

## The Impact of Social Media on Academic Performance of Selected College Students

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### Introduction

Today the Internet has taken a hard place in people's lives. It is very difficult to imagine a young man who at least once a day did not check for updates in social networks and did not leaf through the news lines. The modern real world needs us to stay in touch and keep side by side of the latest news and trends. However, does this trend influence the performance of the students?

When social media such as Facebook, YouTube and Twitter etc. become visible, our world was divided into online and offline. Social media are online skill stages that help to connect people composed far and near. It is used to physique connection among people [18]. With their help, we can communicate with each other, even on various continents, listen to music, read books, look at photos and much more. Social media have significantly basic our lives and tightly tied to ourselves [17].

During the time expended determining those for connections, youngsters go into various connections and get the chance to speak with a relatively boundless number of individuals and quality gatherings, with an extensive range of identities, take in a significant measure of stories, have the opportunity to trade possibilities and talk about matters important to them. Therefore, operators of social networks, in greatest belongings, are a representative of the younger generation.

International Journal of Advanced Information Technology (IJAIT) Vol. October 2018 According to the scientists, social networks are particularly unsafe for youngsters, as they form a bad impression that love and friendship are easy to overcome and just as easy to destroy [5]. In adding, young people who are acquainted with the fast stream of Internet life, the truth may seem to be disproportionately dull, and they can have a go at, making it impossible to "restore" it by making foolish activities. Some are factions of the use of social media. They claim that the latter provide access to knowledge and help students exchange information rapidly. Others contemplate that students' use social media primarily to communicate about everything except studies and that they only distract students from the learning process. The use of social media by students helps to have access to basic the information as quick as possible [18].

Many universities and schools around the world check the access to social networks within its buildings. They excuse this by helping students concentrate on their studies. On the other hand, they reject students the occasion to use the numerous materials available on these resources, such as scientific videos on YouTube [8].

The background of study is the one of the colleges in eastern province of Saudi Arabia, the Jubail University College (JUC). JUC is an associated of the Royal Commission for Jubail & Yanbu. It was recognized in 2006 to achieve the aims of the Royal Commission, in developing human resources and to provide the Saudi manpower with high education and training so that they can appropriately manage the Kingdoms' growing economy in its numerous sectors [7]. The purpose of this study is to find out the impression of social media on academic performance of selected college students. To reach this, existing studies will be analysed, as well as survey among defendants will be directed. Respondents are the sixty (60) students who are aggressively using social media.

### Concepts And Literature Reviews

To shack bright on the both, positive and negative sides of using social media in over-all, as well as discover its possessions on students' academic performance, present studies were revised.

Studies instigate out that academic result of students who spent most of their time cooperating using social media are positive because they were able to share and create ideas and thoughts related to their studies. They also use these sites for having a fun as these social media sites are helpful in their academic work [3].

A comparable study exposed that online social media had enhanced the communication between the faculty member and students which enable the communication of the correct information and recover understanding and the expansion of the ideas and the courses. Based on the information composed, it is visible to say that the use of the social media during the lecture time is not recommended [1].

Mensah & Nizam [10] decided in their study that social media stands have an important effect on students' academic performance in Malaysia tertiary institutions. Nevertheless, among the six variables used in their study, time suitability and health dependence have a stronger significant impact on students' academic performance. This is because time management plays an important role in determining the success and failure of an individual. Thus, students who deficiency time management can easily decrease prey to the bad impact of social media.

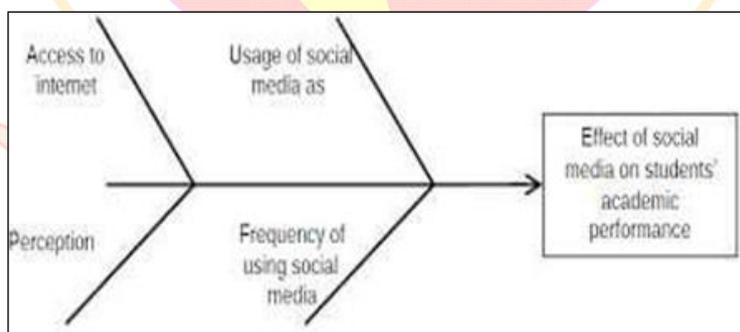
Likewise, health and dependence, students who are occupied with social media stages ends up skipping meals which has health impact.

Another study shows that students who are not only pretentious by social media, employees and employers too. A U.K. firm released a study showing that people who use Facebook, Twitter and other social networks while at work abstracts a heavy cost on their employers [14].

According to Kolan and Dzadza [8], the nature of social media as a useful domestic but a dangerous master and a two-edge foil has been exposed in the conclusions of the study. In the face of the benefits that students can bind from social media networks such as sharing of information, building relationship, contribution in group discussion, there is to some extent addiction and interruption of attention caused by the use of social media which could have serious moments on the academic life of students. One of the undesirable effects of social media is piracy. The primary motivator for Australians of all ages illegally downloading movies and TV shows is that it is free [13].

According to Landry [9], social media a tool that could be used for good or bad, it all depends on the person. Social media has its sheets of good and bad. Yes, it is easier to remember the bad rather than the good but, social media sites have twisted occasions for people all over the world.

### Conceptual Paradigm



**Figure 1: Paradigm of the study**

International Journal of Advanced Information Technology (IJAIT). October 2018 The model of this study approved the Shikawamodel, also known as fishbone diagram. Shikawa model is fundamental diagram developed by Kaoru Ishikawa that shows the causes of an exact event [19]. The variables of social media that may affect the students' academic performance are: access to internet; usage of social media; their perception on social media; and their incidence of using it. Through these variables, the current study will recognize the impression of using social media to the academic performance of the defendants and will be able to draw references that may improve the learning process and reduce the bad impact of social media.

### Statement Of The Problem

This paper objects to find out the both positive and negative power of social media on students' academic performance. Specifically, it sought to answer the following:

What is television and why students use it?

How much time prepare students put on using social media?

What is the effect of social media on students' academic performance?

The present study that will evaluate the outcome of social media on students' academic routine supposes the following:

Students use social television to interconnect and study.

On regular, students occupy at least on hour a day for social media use.

The impact of social media on academic routine could be both positive or negative at the same time.

### Scope And Delimitation

The study was steered to evaluate the effect of social media on students' academic performance. Sixty (60) students who are aggressively using social media are the accused of the study. It was directed during the summer semester of academic year 2017-2018. The study limited only on variables of social media that the investigators expected that has properties of defendants' hypothetical presentation. These variables are respondents 'access to internet, usage, awareness on social media, and their occurrence of using it.

### Significance Of The Study

Social networks are fetching more popular among university students and are a new way of expenses free time and serve as a discrete channel for finding the required information, both educational and entertaining. Therefore, it is urgent to examine the question of what outcome social networks have on their users, in specific, how the use of social networks touches the academic success of students. This study will discover this information, giving the researchers an occasion to explore and improvement new knowledge. Furthermore, it can be used for future studies.

### Research Design, Sources Of Data, Instrumentation And Data Collection, And Tools For Data Analysis

The study used the measurable as well as qualitative methods of research. Expressive research design was applied to gain correct profile of situation [16].

To support the study, information relevant to the study were gained from both primary and secondary data. Primary data were developed from the accused of the study, sixty students accused. On other hand, secondary data were obtained from previous studies, words, books, documents, and electronic materials related to the existing study.

The gadget for data collection was the review questionnaire, observations, review of previous studies and analysis. To fold data for the three research questions, survey, review of works and analysis were used. Survey surveys were floated to the respondents. It is a tool comprising several questions to gather information from the accused. The review questionnaire contains clear and simple questions that enable the accused to provide exact information. Each item in the survey questionnaires are intended to answer the research sub-problems. Google Form was used to create the questionnaire for the respondents. Google Forms are remarkable tool that is free and powerful, it is model for anyone who needs to pucker information about nearly anything. Google Forms is suppressed within Google Drive right under the word processor, database and performance apps [21].

The data that were composed were collected, matched and tabularized. These data were obtainable in graphs were analysed and interpreted for the readers to appreciate better the results obtained. To determine the suitable sample size, Slovin's formula was used [6]. There are 71 students aggressively using social media that are members of section's WhatsApp group. Slovin's formula is written as:

$$n = N / (1 + N e^2)$$

Where:

n = number of models

N = total people

e = error tolerance (0.05)

thus,  $n = N / (1 + N e^2)$

$$= 71 / (1 + (71 \times ((0.05)^2)) = 71 / 1.1775 = 60.3$$

To answer the three research questions, statistical tools were recognized. For first and second research question, aside from fiction evaluation, mode was used. For the third research questions, typical weighted mean was utilized.

The collected data were used to analyse the impact of social media on students' academic performance.

### Conclusion, Recommendation And Direction For Future Research

Based on the discoveries, social media becomes an important part of the student's full life, took up most of his extra time. The time spend by the accused on social media stressed that the impact on their academic routine ends up negative.

So, the social media, which also has a acquainted name as a social networks or web, chooses students as its possible dead. All kinds of computer technologies, mobile phones have suggestively expanded the scope of both positive and negative factors of the divine and intellectual development of the younger generation.

Thus, it can be absolute that social media have a dual outcome on the student achievement, and it is necessary to slant teenagers' use of social networks with ultimate responsibility. In no case should we forget about the negative consequences that extreme social infatuation could have. Based on the finding and expectations drawn, the following endorsements are hereby offered: Organizations should focus on making pleasant things useful - promoting social networks as a tool not individual for communication and entertainment but also for learning.

Social networks should allow their users to of your own accord restrict attendance on certain days, for example, to students during a session.

Finally, students themselves must realize all the potential harm from extreme use of social networks, and responsibly approach the learning process and academic results.

### References

1. Abousaber, I., Oueder, M. (2018). A Study on the Impact of Social Media Usage on Student Academic Performance: University of Tabuk an Example. American Scientific Research Journal for Engineering, Technology, and Sciences (ASJETS), 40(1), pp. 77-88
2. Alwagait, E., Shahzad, B. (2014). Impact of social media usage on students' academic performance in
3. Saudi Arabia, Computers in Human Behavior, <http://dx.doi.org/10.1016/j.chb.2014.09.028> [3] Amin, Z., Mansoor, A., et.al (2016). Impact of Social Media of Student's Academic Performance. International Journal Business and Management Invention, 5(4), pp. 22-29
4. Asemah, S., Okpanachi, R. (2013). Influence of social media on the academic performance of the undergraduate students of Kogi State University, Anyigba, Nigeria, Research on Humanities and Social Sciences, 3(12), pp. 90-96
5. East, S. (2016). Teens: This is how social media affects your brain. CNN. Retrieved from <https://edition.cnn.com/2016/07/12/health/social-media-brain/index.html>.
6. Ellen, S. (2017). Slovin's Formula Sampling Techniques. Sciencing. Retrieved from
7. <https://sciencing.com/slovins-formula-sampling-techniques-5475547.html>
8. Jubail University College (2018). About Jubail University College. Retrieved on 20/2/2018 from
9. <http://www.ucj.edu.sa/en/about/Pages/About-Jubail-University-College.aspx>
10. Kolan, B., Dzandza, P. (2018). Effect of social media on academic performance of students in Ghanaian Universities: A case study of University of Ghana, Legon, Library Philosophy and Practice (e-journal), <https://digitalcommons.unl.edu/libphilprac/1637>
11. Landry, T. (2014). How Social Media Has Changed Us: The Good and The Bad. Retrieved from
12. <https://returnnonnow.com/2014/09/how-social-media-has-changed-us-the-good-and-the-bad/>
13. Mensah, S., Nizam I. (2016). The impact of social media on students' academic performance – a case of Malaysia Tertiary Institution. International Journal of Education, Learning and Training, 1(1), pp. 14-21
14. 34 International Journal of Advanced Information Technology (IJAIT) Vol. 8, No.4/5, October 2018
15. Newspoll. (2013). Like, Post, Share Young Australians' Experience of Social Media. Australian Communications and Media Authority. Retrieved from <https://www.acma.gov.au/-/media/mediacomms/Report/pdf/Like-post-share-Young-Australians-experience-of-social-media-Quantitative-research-report.pdf?La=en>.
16. Owusu-Acheaw, M., Larson, A. (2015). Use of social media and its impact on academic performance of tertiary institution students: A study of students of Koforidua Polytechnic, Ghana, Journal of Education and Practice, 6(6), pp. 94-101
17. Research into the online behaviour and attitudes of Australians in relation to movie and TV piracy (2013). Intellectual Property Awareness Foundation. Retrieved from <https://www.aph.gov.au/DocumentStore.ashx?id=1bff7481-b92a-4bc7-a2e7>

## Influence of Gis in Tourism Management System

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### Introduction

In traditional method, an individual goes to visit a place where they may have never been before. So they would go and talk to the localities in-order to find the information about the tourist spots and the way to get there. While communicating to the localities an individual may face a basic, know problem of speaking in different languages i.e. it is possible that the localities may not know to speak and/or recognize the language you are trying to communicate in with them. [6] So to overcome this problem a new business area is developed (i.e. tourism agencies) focusing on tourism and travelling for tourists. Here's an individual becomes a guide(agent) for tourists and the agent would do all the required arrangements (tourist spots, best route, place to stay and etc.) for the tourists and gets paid for it. Here the tourism agencies would itself have to find the tourists spots, best route, and etc. before making a package for the tourists and for this they would require all the information about the place and have to analyse everything, also by considering the weather. In addition, for collecting, analysing, storing, displaying, etc. the agent needs a good software, which would simplify this work largely. Therefore, here is the concept of using GIS geographic Information System for tourism. [10]

### what is GIS?

Geographic Information System is an "Information System" that stores all the information about the geography of all the places around the world and visualizes this geographic information on a map as a data to an individual.

Components of GIS: Hardware, Software, Data and People, and the types of GIS statistics are Raster Data and Vector Data. The geographic records are described explicitly in phrases of geographic coordinates (i.e. Latitude and Longitude or some coordinates) or implicitly in terms of postal code, avenue cope with, and so forth. GIS has the capacity to translate implicit geographic records into an express map location. [4]

How GIS works: Visualizing Data- The geographic information this is saved within the databases are displayed inside the GIS software program. Combining Data- Layers are combined to shape maps of choice. The Query- To search the price in the layer or creating a geographic query. [9] Using GIS in tourism Management Company, the company can easily collect the information of the places to visit for tourists, can store this information as their data for future use, can analysis this data as required and can display this data gathered after analysing in a map format for better understanding for the tourists. GIS maps is commonly used by visitors and vacationers to finalize their region to go to on the idea of the unique appeal of that vicinity and its culture and is used by the tour's and journey organizations for their clients (vacationers).

### The concept of TGIS

The most basic reason of tourism is that tourists leave their residence in search of novelty. Most of the journey records and statistics have geographical attributes, which gives a foundation for the establishment of TGIS. The complete description of this concept is as follows: On the premise of geographic statistics database for tourism, TGIS makes use of strategies and idea of statistics technology and system engineering to collect, replace, manipulate, display, question, analyse the cartographic output tour records. It is the tour provider machine that places enter controls and applications into one machine. [3] The research objects of TGIS is those records and information which are associated with the tourism geographic information, including transportation's, lodging's, enjoyment, purchasing and subculture traits and functions. The ultimate **goal of TGIS:** to offer correct, timely and handy services to meet the unique needs of various customers. The improvement and layout of TGIS need to be guided with the aid of the regulations of tourism enterprise and must be regular with the exploring idea of tourism planners that very well considers the tourism economics,

advertising, awesome, psychology and other factors in order that it could meet the necessities of an extensive variety and forms of purchasers. [2] Therefore, with the tremendous growth of the web, a broad spectrum of tourism information is already spread/distributed over various web sites. To fulfil the visitor request for an extensive records series it is far inevitable to make gathered information from exceptional resources available. Besides this problem, tourists are also confronted with differences regarding information of tourist places, etc. presented on different web sites. [5] The solution to this problem is using maps to represent information in an effective and creative way so that it would be easy for the tourist to understand about the place before planning to visit that place. Maps are the herbal means of indexing and presenting tourism related statistics. Travellers are using maps to navigate for the duration of their travels and for making ready their routes. Moreover, maps exploit the two dimensional abilities of human imaginative and prescient and gift the facts in a compact and "easy to study" way. One of the example of this solution is the maps installed in Malls at each floor representing the names of shops and the path to get there, customers at mall can go and read the map as it is easy to read and understand.

### **Benefits Of Gis For Travels And Tourism**

Following are some of the benefits offered by (GIS) Geographic Information System to travels and tourism region:

#### **Visualization of Tourist Spots**

Travels and Tourism is one of the extensive and important industry that unfolds over all nook of the world. When you are visiting to a brand new place's it is the duty of the travels and tourism enterprise holder, to welcome their visitors by way of making them go to each travellers spot. However, for that we want to know the traveller spot of that vicinity. Therefore, in such cases GIS maps are very beneficial. GIS maps facilitate in marking and finding out the visitor area and thru GIS customers can visualize the ones spots they are planning to visit.

#### **Tourist Location**

GIS helps in locating the traveller region to the travels and tourism enterprise holders and their clients. With the assist of GIS they are able to visualize the vicinity without problems at the same time as sitting at domestic and can even plan a tour to it, with the proper planning of your tour.

#### **Route Planning**

So, if you were planning a tour to a new state, then how would you be travelling there? How are you going to reach there? and etc. Therefore, for that we need not only navigation but also proper and efficient route. In such cases, GIS maps are very useful, as they permit you to in making the proper path for your excursion. With the assist of GIS, you may plan your route via making the quality efficient routes and may pick certainly one of them that is greater possible to you.

#### **Accommodation**

Travelling to a new venue, this is so exhilarating however, you get caught in terms of the food and live, which means approximately your accommodation. GIS maps allow you to out with this foremost problem. As we recognize, now we are able to look for the resorts and eating-places of any venue very effortlessly over Maps. Hence, you do now not want to worry about the lodging facility. All you want to do is just use GIS maps and get the high-quality lodging facility to live in step with your options, which is close by to the traveller spots you will visit.

#### **Cultural Events and Special appeal**

We tour to explore new locations and the way of life and special appeal of that place. So, for finalizing your excursion you can use GIS maps. GIS maps, typically used by the travellers and tourists to finalize their vicinity to go to on the premise of the unique attraction of that place and its culture. With GIS possible effortlessly look for the cultural activities and precise attraction furthermore; the enterprise holders also can replace such locations in the map. These are the some primary advantages, which GIS presents to Tour and travels enterprise.

If you recognize any other such benefits of the GIS for excursions and travels industry, do allow us to know via commenting below within the remark box of GIS for travels and Tourism enterprise. [8]

## Conclusion

The development of tourism no longer simplest needs its personal facts control and change, however also adapts to the monetary improvement and statistics wishes of the entire society. The GIS applied to the tourism management is the inevitable call for tourism control and tourism development. The development of modern information generation continuously gives new demanding situations to tourism control. In this case, it's far a completely crucial trouble that the way to make complete use of the GIS inside the tourism management to make tourism control better adapt to the desires of Information development. It needs an ongoing in-intensity discussion and research. [7]

## References

1. Pallavi U. Pandagale Dept. of CS and IT, Dr. B. A. M. University, Aurangabad "Geospatial Technology for Tourism Management in Aurangabad City", 2014
2. Mohan Lalit, Dhawan S. C., Krishna A. P. "Web Based Tourism Information System Using Geographical Information System (GIS) - A Case Study".
3. Vladimir Bacik "Creating thematic maps online using PHP, KML and Google Earth, an example of visualizing selected indicators for the Slovak republic".
4. Jovanović, V., "Ocena karakteristika razvoja turističke destinacije Zlatibori Zlatar - Master plan", The Faculty of Tourism and Hospitality Management, Singidunum University, Belgrade, Serbia, 2007.
5. Njegus, A., "Tourism destination management information systems", Tourism Education Project, Ministry of Trade and Services & Faculty of Tourism and Hospitality Management, Singidunum University, Belgrade, Serbia, 2007.
6. Thomas, C., and Ospina, M., Measuring up (the Bussines Case for GIS), ESRIpres, Redlends, California, 2004.
7. De-hui Liu, "The application of GIS in tourism: discussion on tourism GIS and its research development and prospect," Geomatics & Spatial Information Technology, vol. 31, no. 1, pp. 90-95, February 2008.
8. <https://www.igismap.com/gis-for-travels-and-tourism/#visualization>
9. <https://grindgis.com/what-is-gis/what-is-gis-definition>
10. [https://en.wikipedia.org/wiki/Geographic\\_information\\_system](https://en.wikipedia.org/wiki/Geographic_information_system)

## A Study of Data Storage Security Issues in Cloud Computing

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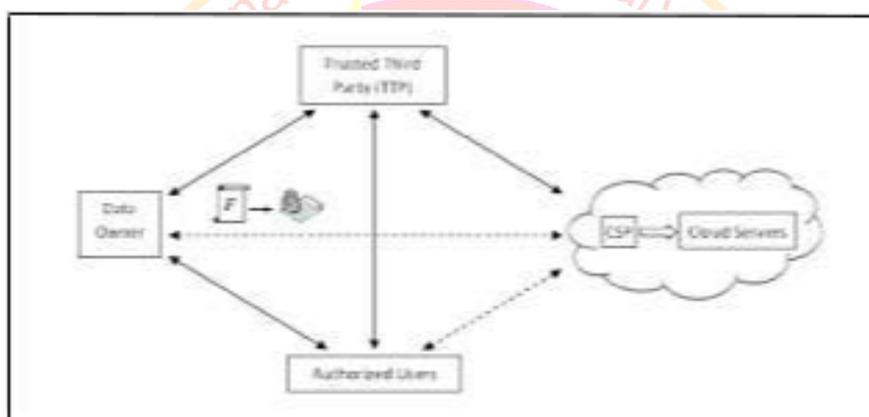
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### I. Introduction

Cloud computing is the combination of many pre-existing technologies that have matured at different rates and contexts. The purpose of cloud computing is to allow all users to take benefit from all these technologies. Many organizations are move towards cloud because it allows the users to store their data on clouds and can access at anytime and anywhere. Data breaching is a possible way in cloud environment, since data from various users and business organizations lie together in cloud. By uploading the data to the cloud, the data owners transfer the control of their data to a third person that may raise security problems. Cloud user are place their confidential or sensitive data, it includes personal health records, emails and government sensitive files.



**CLOUD DATA STORAGE MODEL**

A simple solution is to encrypt the data before uploading onto the cloud. In cloud computing the data are not visible to external users and cloud administrators but has the limitation that plain text based searching algorithm are not applicable. In this paper, we will discuss the security flaws in data storage and the mechanisms to overcome it.

### II. Cloud Storage

In cloud computing cloud storage is the primary user. Cloud storage as a storage of the data online in the cloud. The cloud computing does not provide control over the stored data in cloud data center. The cloud service providers have control over the data, they can perform any malicious tasks such as copy, destroying, modifying, etc. Distributed data center include a cloud storage system, which is typically use cloud-computing technologies and offers some kind of interface for storing and accessing data. When storing data on cloud, then the data is stored in a particular place with specific name.

*There are four main types of cloud storage:*

#### **Personal Cloud Storage:**

It is also called as mobile cloud storage. In personal cloud storage individual data is stored in the cloud, and he may access the data from anywhere.

#### **Public Cloud Storage:**

It is the enterprise and storage service provider are separate and they have not any cloud resources stored in the enterprise's data centre. Public cloud storage fully manages the cloud storage provider.

#### **Private Cloud Storage:**

It is the enterprise and cloud storage provider are integrated in the enterprise's data centre. In this storage, the storage provider has infrastructure in the enterprise's data centre that is typically managed by the storage provider. Private cloud storage helps resolve the potential for security as well as performance.

### Hybrid cloud storage:

It is a combination of public and private cloud storage, where some critical data resides in the enterprise's private cloud while other data is stored and accessible from a public cloud storage provider.

### III. Characteristic Of Cloud Computing : There are the five characteristics of cloud computing: ->

- The first characteristics is on-demand self-service, which means a consumer of services is provided the needed resources without human intervention and interaction.
- The second one is broad network access, where resources can be accessed from anywhere through a standard mechanism by thin or thick client platforms such mobile phone, laptop, and desktop computer.
- Third one is Resource pooling which means the resources are pooled in order for multi-tenants to share the resources.
- The fourth one is Rapid elasticity which means that resources are dynamically increased when needed and decreased when there is no need.

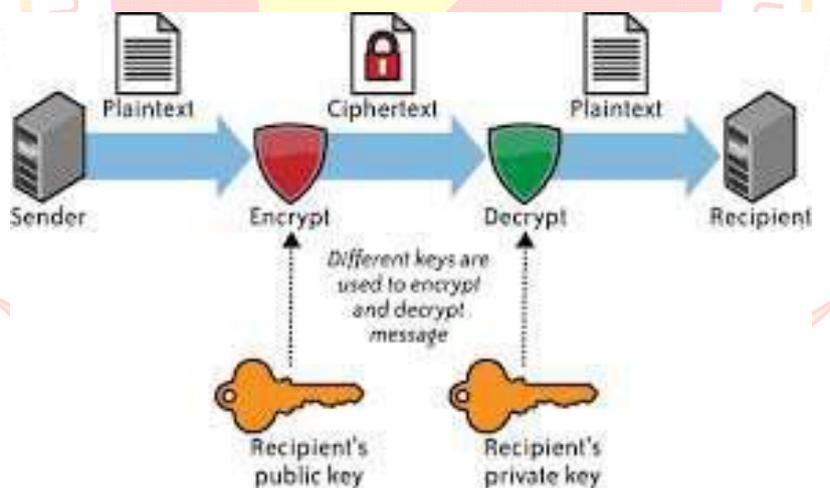
### IV. Encrypted Data Storage for Cloud

Data in the cloud is placed anywhere, it is important that the data can be encrypted. We are using the secure co-processor as part of the cloud infrastructure to enable efficient encrypted storage of sensitive data. The secure co-processor is tamper resistant, one could be tempted to run the entire sensitive data storage. Pushing the entire data storage functionality into a secure co-processor is not feasible due to many reasons.

Another issue is that the software running on the SCP must be totally trusted and verified. This security requirement implies that the software running on the SCP should be kept as simple as possible. We can encrypt the sensitive data sets using random private keys and to alleviate the risk of key disclosure.

### V. Security and Privacy Issues in Data Storage

Cloud Computing allows the users to store their data on the storage location maintained by a third party. Once the data is uploaded into the cloud the user loses its control over the data and the data can be tampered by the attackers. The attacker may be an internal (CSP) or external.



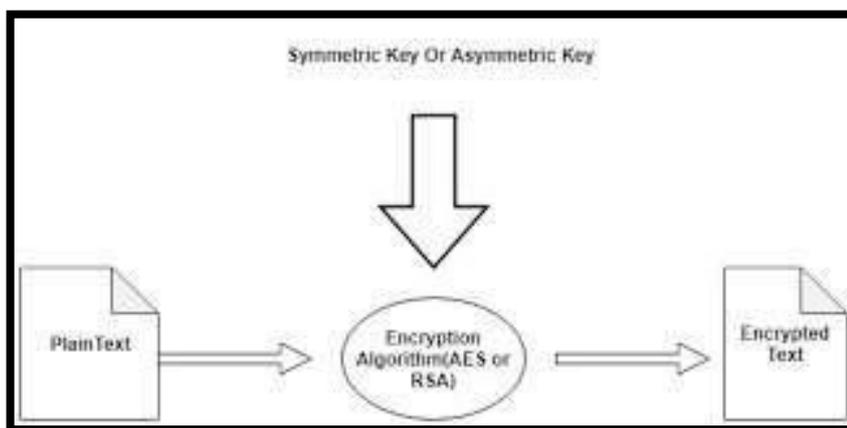
## DATA SECURITY AND STORAGE

The protection of information arises the following challenges: The security and privacy issues related to data storage are **confidentiality**, **integrity** and **availability**.

### A. Confidentiality

The major dispute in cloud computing is confidentiality. Data confidentiality means accessing the data only by authorized users and is strongly related to authentication. In another way confidentiality means keeping users data secret in the cloud systems. As we are storing the data on a remote server and transferring the control over the data to the provider here arises the questions such as:

For ensuring confidentiality, cryptographic encryption algorithms and strong authentication mechanisms can be used. Encryption is the process of converting the data into a form called cipher text that can be understood only by the authorized users. Blowfish is a fast and simple encryption algorithm.



## B. Integrity

Another serious problem faced by cloud computing is integrity. Integrity of data means to make sure that the data has not been changed by an unauthorized person or in an unauthorized way. It is a method for ensuring that the data is real, accurate and safeguarded from unauthorized users. As cloud computing supports resource sharing, there is a possibility of data being corrupted by unauthorized users. Digital Signatures can be used for preserving the integrity of data. The simple way for providing integrity is using Message Authentication Code (MAC).

## C. Availability

Availability refers to being available and accessible to authorized users on demand. The aim of availability in cloud computing systems is to ensure that its users can use them at any place and at any time.

## VI. Contractual and Legal issues

After moving to cloud computing environment, there are many issues in geographic regulatory law, performance assurance, contract enforcements, etc. The issues are comes under the legalities, Service Level Agreements and data location in data centers.

### Service level agreements

The Service Level Agreement (SLA) can be described as a protocol, it specifies set of conditions and terms among user and Cloud service provider. The SLA should specify the following: Actions that CSP will taken when data breach happened, remedial actions and performance level at minimum level.

### Legal issues

The legal issues arise because that the presence CSP resources in geographically conflicting various legal jurisdictions. If the user is migrated to one geographical to other, an issue will occur because of different legal jurisdictions. For a movement data is distributed over a various data center, those are owned by CSP those have different laws and security guidelines. This scenario may takes into the serious issue in cloud computing.

## VII. Data backup

The data backup is an important when accidental and/or intentional disasters. The CSP has to perform regular backups of stored to ensure the data availability. In fact, the backup data should be keeping with security guidelines to prevent malicious activities such as tampering and unauthorized access.

## VIII. Conclusion

Cloud computing enables users to store their data in remote storage location. But In cloud computing data security is major threat. Due to this many organizations are not willing to move into cloud environment. To overcome this, confidentiality, integrity, availability should be encapsulated in a CSP's Service-Level Agreement (SLA) to its customers. Effective auditing mechanisms also can be used for providing data integrity.

## IX. References

1. V. Nirmala, R. K. Sivanandhan, Dr. R. Shanmuga Lakshmi, "Data Confidentiality and Integrity Verification using User Authenticator scheme in cloud", Proceedings of 2013 International Conference on Green High Performance Computing (ICGHPC 2013). March 14-15, 2013, India.
2. P. Mell, T. Grance, The NIST definition of cloud computing (draft), NIST Special Publ. 800 (145) (2011) 7.

3. Arjun Kumar, Byung Gook Lee, HoonJae Lee, Anu Kumari, "Secure Storage and Access of Data in Cloud Computing", 2012 International Conference on ICT Convergence (ICTC), 15-17 Oct. 2012.
4. Mr. Prashant Rewagad, Ms.Yogita Pawar, "Use of Digital Signature with Diffie Hellman Key Exchange and AES Encryption Algorithm to Enhance Data Security in Cloud Computing", 2013 International Conference on Communication Systems and Network Technologies.
5. Uma Somani, Kanika Lakhani, Manish Mundra, "Implementing Digital Signature with RSA Encryption Algorithm to Enhance the Data Security of Cloud in Cloud Computing", 1st International Conference on Parallel,Distributed and Grid Computing (PDGC - 2010).
6. M. AlZain, E. Pardede, B. Soh, and J. Thom, "Cloud computing security: From single to multi-clouds," in System Science (HICSS), 2012 45th Hawaii International Conference on, Jan 2012, pp. 5490–5499.
7. I. Gul, M. Islam et al., "Cloud computing security auditing," in Next Generation Information Technology (ICNIT), 2011 The 2nd International Conference on. IEEE, 2011, pp. 143–148.
8. S. Ramgovind, M. M. Eloff, and E. Smith, "The management of security in cloud computing," in Information Security for South Africa (ISSA), 2010. IEEE, 2010, pp. 1–7.



## A Review on Impact of Smartphone Usage

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### Introduction

The wireless revolution was concocted in the year 1880 by Alexander Graham Bell and Summer Tainted when first time the photo phone was created [1]. Originally phone was globally used for communication. Later few features are added which is useful for day to day life such as FM radio, massage service, etc. Almost a decade ago, smartphone jumped in market which change the whole world. Now the smartphone market is growing and become the unstoppable. Everyday there is number of smartphone throwing. Deliver better feature than other. Product can't be stable in market because every day it get new competition of new and well once. Mobile phones became the basic need of human being. Digital world become easier and less time consuming, to handle this manageable gadget is smartphone. Better features and pocket friendly cost are the fascination of the smartphones. Smartphones are available in approximately Rs. 2000 to lacs and more. Digitizing the banking system, educational system is less time consuming and more popular in generation. Every technology comes with it's advantages and disadvantages. Smartphones are making are work easy and portable but it also have some adverse effect on living being and atmosphere.

### 2. Evolution Due To Smartphone

Wireless communication makes the world associated. The best intermediate for it is mobile. Mobile means handy communication or can say wireless communication. We can carry mobile all over because of its compact design, lightweight, and portability. More last few decades mobile become smarter that it can simplify many works and help the human in a more accurate way. This smart device we now know as 'Smartphone.' The smartphone is beneficial in many fields such as education, banking, and finance, agriculture, communication, social, marketing, etc. Traditional education is limited to classrooms, books, and libraries. Attending the lectures in the classroom, carrying heavy books, visiting the library for supplementary stuff is the traditional way. But now due to digitization, virtualization and the smartphone's world of knowledge is open to everyone. Books are now available online as we can download it for free or very less amount. The vast library of the book is available irrespective of language, field, author, type, etc. Carrying a heavy book is not a good option. Some times books are not available physically to particular geographic locations. But now with online book books are available on the internet and we can use it without any geographical constraint. digital book are easy and very much portable to carry with the support of smart devices. The online classroom is where lectures are recorded as audio or video and available to a student who is not able to travel or present in a particular geographical location. Many other kinds of stuff of education such as calculator, compass, dictionary are also provided by smartphones. Communication was the main goal initially behind launching the mobile. The Internet make the world smaller. Low prices for communication and data subscriptions are attracting the customer. Communication is not limited to audio or massages but now we can video call a person and only one but can call multi[le person called as video conferencing. Similarly, we can conference the audio call and multiple participants can add who is at a different geographical location. Now we can not only pass the massages but also multimedia like audio, video, documents, etc. Social media is the most attractive platform for every generation but especially for the young generation. People can socially be connected via the internet. Social media and the OTT platform become the new language for entertainment.

OTT platforms are growing rapidly such as Netflix, Amazon, iTunes, etc. Songs, movies, and other entertainment stuff is available on a smartphone so we anytime anywhere can start our entertainment with our smartphone. The era of digitization also make banking and finance sector digitized. Now we can use banking facilities online with online banking using smart devices more preferably smartphones. Transferring the money, balance checking is digitized with saving the time to go to the bank and perform the task as well as reduce the usage of paper with is very good for the environment. We can carry many financial documents very easily in the smartphone with the help of the smart wallet.

Marketing is growing with smartphones as we can buy anything from online marketing websites or applications. Buying and selling become portable easy and convenient with the help of the smartphone. In the agriculture field, many mobile application is available for farmers for the betterment of land and their knowledge. Weather forecasting is easily available. A farmer can sell their product directly in the market without any middle parties. Many videos or information is available about product, farming techniques. All these features are available in a smartphone which is easy to understand with different local language support and better understanding user interface. Also, the smartphone is a portable and low-cost solution.

### III. Adverse Effect Of Mobile

Every technology has more or fewer drawbacks. Mobile became the basic need, but this need is becoming our addiction which is not at all good. Addiction of mobile degrading the human physically, psychologically, economically and socially. The wireless device contains some radiation which has a frequency range of 3 kHz to 300 GHz. Wireless device such as smartphones, computers, wireless router (WiFi), etc. These gadgets contain radiation which may cause many diseases. These devices generate harmful radiations which can cause too many harmful diseases such as Brain Tumour, Male Infertility, and effect on the fetus, Alzheimer's disease, Ear Hearing Impairment, asthma, insomnia, high blood pressure, rheumatoid arthritis leukemia, birth defects, Immune system, and Heart trouble.[8] Radiations are also shown up of some symptoms which are: headache, sleep disruption, tiredness. In serious cases, DNA damage can also happen because of radiation produced by wireless devices like which given off by mobile phone devices during the receiving and sending process of the data.[8]

The psychological effect is difficult to detect in early stage. This happened due to the excess use of smartphones. A user becomes addicted to a smartphone to the extent that he/she forgets the real world and starts living an imaginary world. Sometime customers may go to depression mostly because of social media. Social media show the world very fascinating. Depression may cause mental illness and some times suicide. Smartphone also changes or manipulate the mind-set, this sometimes leads to criminal mind-set. Games are also affecting human psychology. There are many cases of depression and suicide just because of excess gaming. A smartphone is now an easy and convenient way for banking but with banking, a major issue is a raise that is 'security'. Is mobile devices are secure enough? The data that is stored in your mobile device is must be protected with legal antitheft or antivirus. Data can be a steal from devices. There are many ways such as a virus that may break the firewall or corrupt the data, malicious inside that leak or altered the data that is shared or stored. Many cases are registered for fraud. This fraud can be done via stealing your data or by fake calls that asked for your personal information. Banking or other passwords that stores some sensitive information. Many of customer faces the fraud messages or scams. When mobile is steal or lost the major concern is the data that is present in the mobile. This all factors of smartphone security may lead to major economic fraud. Human is social animal. But smartphone is breaking that social connectivity in humans. Every public place most of the public is on smartphone. Conversations become less, emotional connectivity is missing. Mobile main aimed was communication but social media and other platform decreases that communication. Call prices and data subscription prices are decreased and become pocket friendly but social connectivity and awareness is also decreasing.

### IV. Outcomes

1. A smartphone is a better device to carry and access documents easily.
2. Smartphones proved many features of communications like video call, conference call from anywhere anytime irrespective of the geographical location.
3. A smartphone is an alternative to many devices such as calculator, scientific calculator, compass, weather forecast, laptop, storage device, radio, mp3/mp4 player, etc.
4. Costomers are more interested in features rather than price.
5. Smartphones and the internet allow working from a smartphone.

As per the requirement, internet speed is increasing. From 3G to now 4G and WiFi is a new medium of internet. Usage of the smartphone during driving and walking has increased the lead to a more number of accidents.

- Increasing the frequency of the internet causes many diseases.
- Smartphone usage caused many psychological diseases.
- Antivirus and antitheft software make customers assured about security while using the smartphone.
- Antivirus and antitheft gives the confidence to use net banking and other third party services.

## V. Conclusion

Digitization and compact, portable design of smartphone it is very simple and convenient way to carry many documents and books. Many work can be done using smartphone without being physically present to the location such as billing banking, etc. Communication and transfer of data became very easy. Smartphone has many advantages but excess gaming, social media decrease the concentration and memorizing power in humans. Students are distracting due to other application of smartphone than the educational and social purpose. Many diseases are accruing due to radiation of smartphone. Many financial frauds are done. Smartphone is a great invention of the generation but we have to know the limits of this. Use the smartphone as needed and legal usage.

## Reference

1. Ellis H Marconi, masculinity and the heroic age of the science: wireless telegraphy , British Association conference at Dover in 1899. Hist Technol 32: 120-136.
2. Rakhi Thakur, Customer usage intention of mobile commerce in India: an empirical study, Journal of Indian Business Research Vol. 5 No. 1, 2013
3. Ms. S. Kundhavi , Dr. K. Sumathi and , Mrs. N. Selva Lakshmi, Reviewing the Impact of the Smartphone Usage On Academic Performance Among Students, International Journal of Applied and Pure Mathematics Volume 118 No. 8 2018
4. ThaeMin Lee, The impact of the perceptions of interactivity on transaction intentions and consumer's trust in mobile commerce , Journal of Electronic Commerce Research, VOL. 6, NO.3, 2005
5. Jonathan Lee, Janghyuk Lee, Lawrence Feick, The impact on customer satisfaction-loyalty due to switching costs on the link: mobile phone service in France, Journal of services marketing, vol. 15 no. 1 2001
6. Parul Maurya, Yogita Penuli, Ashutosh Kunwar, Hemlata Lalia, Versha Negi, Anjana Williams, Vandana Thakur, Impact of the Mobile Phone Usage on Psychosocial Wellbeing of Student, IOSR Journal of Health Science and Nursing, Volume 3, Issue 6 Ver. I
7. Dr. Alpana Vaidya, Vinayak Pathak , Ajay Vaidya, Mobile Phone Usage among Youth, International Journal of Studies and Applied Research, April 2016, Volume V, Issue 3
8. Abbasi SK, Suhag AK, Larik RS, Khan M, Mangi GZ, Impact of Excessive Mobile Usage on Human, J Comput Sci Syst Biol 9: 173-177. doi:10.4172/jcsb.1000235
9. Akshat Dewan, Dr. Varsha Khattri, Implication of mobile usage on its user, Global journal of mobile application and development (volume-4, issue-3, September-December 2019).

ISSN 2349-638X

www.aiirjournal.com

## The Market Opportunities of Big Data Technologies

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### 1.0 Introduction

The present universal public exceeds 7.2 billion, and more than 2 billion of these individuals are using the Internet in day to day life. Moreover, 5 billion people are using diverse cell phones, as indicated by McKinsey. Because of this innovative transformation, many individuals are producing huge measures of information or data through the extended utilization of such devices. Specifically, those devices produce a lot of diverse or mixed data that are either structured or unstructured. This is known as Big Data. Huge Data is described by three angles:

- The data are innumerable,
- The information can't be sorted into ordinary social databases, and
- Information is produced, fixed, and prepared rapidly.

Large Data is promising for business applications and is quickly expanding as a section of the IT business. It has produced a significant interest in different fields, including the production of medicinal services machines, banking exchanges, online networking, and education. Generally, information is put away in a profoundly organized configuration to boost its educational substance. In any case, current information volumes are driven by both unstructured and semi-structured information. Subsequently, start to finish handling can be obstructed by the interpretation between organized information in social frameworks of a database the board and unstructured information for examination.

#### This study offers:

1. A complete survey of massive information technologies;
2. A discussion of the technologies for analysis and management of the large Data;
3. A list of the problems and challenges connected with the massive information.

This paper explains basic ideas and describes the information volume, it describes the opportunities and challenges; and concludes the paper.

### 2.0 Background

Big data can be described by the following characteristics:

**Volume** : Volume in big data means the dimensions of the data. Volume refers to the amount of data generated through websites, portals, and online application. Volume encompasses the available data that are out there which need to be assessed for relevance.

**Velocity** : Velocity in big data is the speed in which the big data are generated and the speed at which the data needs to be processed. If the data is not processed at the required speed, it loses its significance. Due to data streaming in form of social media sites, sensors, and monitoring it is important for organization to speedily process data both when it is on move and when it is static.

**Variety** : The information created from different gadgets and sources pursues no fixed organization or structure. Contrasted with content CSV or RDBMS information shifts from content documents, log records, gushing recordings, photos, and different other unstructured organization. variety is about the capacity to characterize the approaching information into different classifications.

**Veracity** : It is the all-encompassing definition for huge information, which alludes to the information quality and the information esteem. The information nature of caught information can change extraordinarily, influencing the precise investigation.

Source	Production
Youtube	Users transfer 100 hours of new recordings every moment. Each month, more than 1 billion novel clients get to YouTube. Over 6 billion hours of video are observed every month, which compares to nearly 60 minutes for each individual on Earth.
Facebook	Every moment, 34,722 Likes are enrolled 100 terabytes (TB) of information are transferred day by day. Currently, the site has 1.4 billion clients The site has been converted into 70 dialects.
Twitter	The site has more than 645 million clients The site produces 175 million tweets for each day
Google	The site gets more than 2 million hunt inquiries for every moment Consistently, 25 petabytes (PB) are handled
Tumblr	Blog owners publish 27,000 new posts per minute
Instagram	Users share 40 million photos per day
WordPress	Users upload 3,125 new photos per minute Bloggers publish near 350 new blogs per minute
LinkedIn	2.1 million groups have been created

### 3.0 Big Data Technologies

The main components and network of big data as follows:

- Techniques for investigating information, for example, A/B testing, AI and characteristic language handling
- Big information advancements, similar to business insight, distributed computing and databases
- Visualization, for example, outlines, charts and different showcases of the information.

To extricate information from Big Data, different models, programs, virtual products, durable goods and advancements have been structured and proposed. They attempt to guarantee progressively exact and dependable outcomes for Big Data applications. Be that as it may, in such condition, it might be tedious and testing to pick among various developments. Truth be told, numerous parameters ought to be considered: innovative similarity, sending unpredictability, cost, effectiveness, execution, unwavering quality, backing and security dangers. The Multidimensional data can be represented as OLAP Data Cubes. Array Database system provide the memory storage and high level query support on mathematical data type. Apache Hadoop, NoSQL, MongoDB are the data integration tool which allows big data analysis.

#### Apache Hadoop

Apache Hadoop is an outstanding Big Data innovation that has a significant supporting network. It has been intended to maintain a strategic distance from the low execution and the unpredictability experienced when provide the memory storage and high level query support on mathematical data type. Apache Hadoop, NoSQL, MongoDB are the data integration tool which allows big data analysis. preparing and breaking down Big Data utilizing customary advancements. One primary preferred position of Hadoop is its ability to quickly process huge informational collections, because of its parallel groups and disseminated document framework. Truth be told, not normal for conventional advances, Hadoop don't duplicate in memory the entire far off information to execute calculations. Rather, Hadoop executes undertakings where information are put away. In this way, Hadoop calms system and servers from an impressive correspondence. Another bit of scope of Hadoop is its capacity to run programs while guaranteeing adaptation to internal failure, ordinarily experienced in appropriated condition. To ensure that, it avoid information misfortune by reproducing information on servers. The power of Hadoop platform is based on two main sub-components : the Hadoop Distributed File System (HDFS) and the MapReduce framework.

#### HBase

HBase is a conveyed non social database based on the highest point of HDFS. It empowers quick record queries (and updates) for enormous tables. HBase inside places the information in listed "StoreFiles" that exist on HDFS for fast queries. HBase is worked for Low Latency tasks. HBase gives access to single lines from billions of records.

## HDFS

HDFS is a dispersed document framework fitting to store huge records. HDFS is certifiably not a broadly useful document framework. It doesn't give quick record query in documents. HDFS stores enormous documents (gigabytes to terabytes in size) crosswise over Hadoop servers. HDFS is appropriate for High Latency tasks cluster handling. Information is principally gotten to through MapRe-duce.

## NoSQL:

While the customary SQL can be adequately used to deal with enormous measure of organized information, we need NoSQL (Not Only SQL) to deal with unstructured information. NoSQL databases store unstructured information with no specific mapping. Each line can have its very own arrangement of segment esteems. NoSQL gives better execution in putting away enormous measure of information. There are many open-source NoSQL DBs accessible to study enormous Data.

## 4.0 Opportunity On The Market

As indicated by McKinsey, the viable utilization of Big Data benefits economies and introduces another flood of gainful development. Benefiting from important information past Big Data is the essential focused system of current ventures. New contenders must have the option to pull in representatives who have basic aptitudes in taking care of Big Data. By outfitting Big Data, organizations increase numerous favorable circumstances, including operational efficiency, informed strategic direction, improved customer service, new products, and new customers and markets.

### 4.1 Marketing opportunity

Marketing Decisions Process is very complex. Different choice are available to decision maker which result in multiple objectives and countless alternative actions. The marketing strategy aim to initiate, strengthen, intensify, and preserve overtime their relationship between a company and its stakeholders, represented primarily by its customers and involves the analysis, planning, execution, and evaluation of the activities carried out to pursue these objectives. Relational marketing become popular in late 1990 increasing customer satisfaction to get competitive advantage. The increased flow of information and the introduction of ecommerce have enabled global comparison customers can use Internet to compare features, prices and opinion on products and services offered by various competitors. The number of competitors using advanced techniques for analysis of marketing data has increased. The systematic gathering of sales transaction provide a large amount of data that can be transformed into knowledge and then into effective and targeted marketing actions.

### 4.2 Challenges

It is easy to get caught up in the hype and opportunity of big data. However one of the reason big data is so underutilized is because it may also present challenges. One survey found that 55% of big data projects are never completed. As more and more data is gathered, digitized, and moved around the globe the policy and compliance issue become more and more important. Accessing data for consumption is a challenge for big data projects. Some of the data may be available to the third party and gaining access can be a legal contractual challenges. New tools and techniques built specifically to address the need of big data must be leve lagered, rather than trying to address the aforementioned issues through legacy system. The inadequacy of legacy system on one hand and lack of experienced resources in new technologies is a challenge.

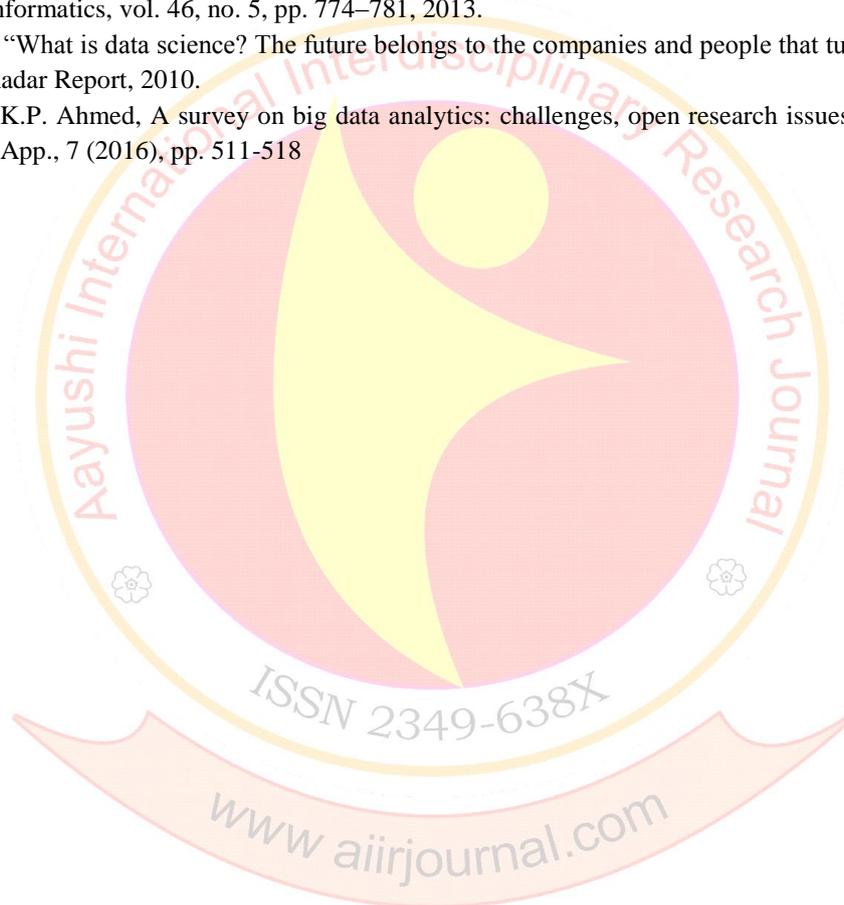
## 5.0 Conclusion

This paper concludes the fundamental concept of Big Data and it's technologies. This concept include the importance or role of big data in today's technologies. Big Data is everywhere and it can help organization any industry in many way. he massive knowledge has become too complicated and too dynamic to be ready to analyze and manage with traditional data tool. Regardless of the significant advancements in Big Data field, we can see through our examination of different innovations, that many weaknesses exist. More often than not, they are identified with embraced designs and methods. In this way, further work should be done in a few zones, for example, information organization, domain explicit devices and platform tools so as to make cutting

edge Big Data infrastructure. Consequently, mechanical issues in numerous Big Data zones can be additionally contemplated and establish a significant research topic.

### References

1. future of robots .Nawsher Khan, Ibrar Yaqoob, Ibrahim Abaker Targio Hashem, et al., "Big Data: Survey, Technologies, Opportunities, and Challenges," The Scientific World Journal, vol. 2014, Article ID 712826, 18 pages, 2014.
2. "Siddharth Singh, Survey on Big Data Using Data Mining". International Journal of Engineering Development and Research. 2015.
3. D. Che, M. Safran, and Z. Peng, "From Big Data to Big Data Mining: challenges, issues, and opportunities," in Database Systems for Advanced Applications, pp. 1–15, Springer, Berlin, Germany, 2013.
4. K. Douglas, "Infographic: big data brings marketing big numbers," 2012,
5. O'Driscoll, J. Daugelaite, and R. D. Sleator, "Big data', Hadoop and cloud computing in genomics," Journal of Biomedical Informatics, vol. 46, no. 5, pp. 774–781, 2013.
6. M. Loukides, "What is data science? The future belongs to the companies and people that turn data into products," An O'Reilly Radar Report, 2010.
7. D. Acharjya, K.P. Ahmed, A survey on big data analytics: challenges, open research issues and tools Int. J. Adv. Comput. Sci. App., 7 (2016), pp. 511-518



## Artificial Intelligence Attacks and Its Security

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### Introduction:

The extremist of the 21st century will not essentially need bombs, uranium, or biological weapons. He will require only electrical tape and a decent pair of walking shoes. Placing a limited small piece of tape unnoticeably on a stop sign at a connection, he can mysteriously convert the stop sign into a green light in the eyes of a self-driving vehicle. Done at one sleepy connection, this would affect a misfortune. Done at the main intersections in primary metropolitan zones, it would convey the shipping system to its knees. It's hard to argue with that type of return on a \$1.50 investment in tape.

Regardless of their use, AI attacks are different from the cybersecurity problems that have dominated recent headlines. These attacks aren't bugs in a program that can be fixed—they are intrinsic in the heart of the AI processes. As an outcome, exploiting these AI liabilities wants no "hacking" of the directed system. In fact, attacking these dangerous structures does not even always involve a PC. This is a new set of cybersecurity problems, and cannot be solved with the existing cybersecurity and policy toolkits governments and businesses have assembled. Instead, addressing this problem will require new approaches and solutions.

Around five zones most directly affected by artificial intelligence outbreaks: content filters, the military, law enforcement, traditionally human-based tasks being replaced by AI, and civil society. These areas are striking targets for attack, and are rising more susceptible due to their increasing acceptance of artificial intelligence for dangerous tasks.

This strategy will develop the safety of the community, military, and expensive in the face of artificial intelligence attacks. But for policymakers and stakeholders alike, the first step towards realizing this security begins with understanding the problem, which we turn our attention to now.

### Overview of Artificial Intelligence Attacks:

An artificial intelligence attack (AI attack) is the purposeful manipulation of an AI system with the end goal of causing it to malfunction. These attacks can take changed methods that attack at different weaknesses in the essential algorithms:

**Input Attacks:** operating what is fed into the AI method in direction to alter the output of the system to serve the enemy's objective. Because at its core every AI system is a simple machine—it takes an input, performs some calculations, and returns an output—manipulating the input allows attackers to affect the output of the system.

**Poisoning Attacks:** corrupting the procedure during which the AI structure is created so that the resulting system malfunctions in a technique preferred by the attacker. One direct way to execute a poisoning attack is to corrupt the data used during this process. This is because the state-of-the-art machine learning methods powering AI work by

"learning" how to do a task, but they "learn" from one source and one source only: data.

**Cause Damage:** the attacker wants to cause damage by having the AI system malfunction. An example of this is an outbreak to effect a separate vehicle to ignore stop signs. By attacking the AI technique so that it incorrectly identifies a stop sign as a diverse sign or symbol, the attacker can cause the separate vehicle to ignore the stop sign and crack into other vehicles and pedestrians.

**Hide Something:** the attacker wants to evade detection by an AI system. An example of this is an attack to cause a content filter tasked with blocking terrorist propaganda from being posted on a social network to malfunction, therefore letting the material propagate unencumbered.

**Damage Faith in a System:** the attacker wants a machinist to lose trust in the AI system, leading to the structure being shut down. An example of this is an attack that causes an automated security alarm to misclassify regular events as security threats, triggering a barrage of false alarms that may lead to the system being taken offline. For example,

attacking a video-based security system to classify a passing stray cat or blowing tree as a security threat may cause the security system to be taken offline, therefore agreeing a correct risk to then evade revealing.

### **Impacted Systems:-**

For production and policy causes, the five most pressing susceptible areas are content filters, military systems, law enforcement systems, traditionally human-based tasks being replaced with artificial intelligence and civil society.

### **Content Filters:**

Content filters are society's digital resistant systems. By removing foreign resources that are risky, illegal, or against the terms-of-service of a particular application, they preserve platforms healthy and root obtainable infections. Content filters are also uniquely eligible to police content at the scale the Internet wants. The content uploaded to the Internet each minute is a staggering quantity growing at a staggering frequency. Over three billion imageries are shared each day on the Internet. AI-based contented filters have arisen as the prime, if not only, tool able to operate at this scale, and have been usually adopted by industry.

### **Military:**

A second foremost AI attack is the military. Military applications of AI are probable to be a critical factor of the next major war. The U.S. Department of Defence has freshly made the integration of artificial intelligence and machine learning into the military importance with its formation of the Joint Artificial Intelligence Centre (JAIC). Adversaries may capture the physical equipment, including drones and armament systems, on which AI systems spirit live. The loss and capture of this kit will be tedious in future conflicts, and the risk poses to AI structures will grow up as AI-enabled systems are used in the arena or on equipment that can be caught by an adversary.

The military's unique domain necessitates the creation of similarly exclusive datasets and tools, both of which are likely to be shared within the military at-large. Finally, the military looks the challenge that AI attacks will be tough, if impossible, to detect in combat conditions. Detecting AI attacks in the face of their rare application would focus on two methods: detecting intrusions into systems holding assets used to train models, and analysis of model performance.

### **Law Enforcement:**

A third major attack is application of Artificial Intelligence to law enforcement. The National Institute of Justice argues that "Artificial intelligence has the potential to be a stable part of our criminal justice [system]" over its usage to "copy...social competence in software algorithms and computer hardware." The applications of AI for law prosecution are both already deployed and being dynamically studied. Amazon has recently launched a facial recognition system that is being piloted by police departments in the US.

The system seeks to match target facial images against a large database of criminal mug shots. Beyond just its usage in keeping pace with growing amounts of contented, AI can be used to provide livelier policing and criminality prevention by identifying criminal warning signs earlier and catching suspects faster. As these AI-based law enforcement systems become more widespread, they will naturally become attack targets for criminals.

### **Commercial Artificial Intelligence of Human Tasks:**

A fourth outbreak is the commercial AI of conventionally human-based jobs. Although some of these applications are inside application and facilities where attacks would not have serious societal moments, attacks on other apps could prove very risky. Self-driving vehicles and trucks rely heavily on Artificial Intelligence to drive carefully, and attacks might expose millions to danger on a everyday. Some commercial applications also have ramifications for law enforcement. Automated identity showing and customs kiosks at airports that are constructed and activated by private businesses also trust on AI, and attacks could jeopardize the safety of the skies and national borders.

### **Civil Society:**

Just as not all usages of AI are "good," not all AI outbreaks are "bad." Although AI in a Western context is mainly observed as a positive power in society, in many further contexts it is employed to more nefarious finishes. Countries like China and other repressive regimes use AI as a technique to track, switch, and intimidate their people. As a result, "attacks" on these schemes, from a US-based policy opinion of helping human rights and free expression, would not be an "outbreak" in a destructive logic of the word.

### **AI Security Compliance as a Policy Solution for AI Attacks:-**

This report proposes the creation of "AI Security Compliance" programs as a foremost public policy mechanism to defend against AI attacks. The goals of these compliance programs are to 1) reduce the risk of attacks on AI structures 2) decrease the effect of successful attacks.

Compliance programs will accomplish these goals by encouraging stakeholders to adopt a set of best practices in securing their systems and making them more robust against AI attacks. These best practices

manage the entire lifecycle of AI systems in the face of AI attacks. In the *planning* stage, they will force stakeholders to consider attack risks and surfaces when planning and deploying AI systems. In the *implementation* stage, they will encourage adoption of IT-reforms that will make attacks more difficult to execute. The AI system taking steps to secure other preparation activities, such as dataset collection.

#### **AI Suitability Tests:**

"AI Suitability Tests" that measure the risks of current and upcoming applications of AI. These tests should effect in a decision as to the satisfactory level of AI use within a given software. These tests should check the application's vulnerability to attack, the importance of an attack, and the obtainability of alternative non-AI-based techniques that can be used in place of AI systems.

#### **Review and update data policies:**

Review and update data policies and sharing follows to protect beside data being weaponized against AI systems. This contains formal authentication of information collection practices and restricting information sharing. AI handlers must analyse and secure their data gathering and sharing policies. These reviews must be formal, identify emerging ways data can be weaponized against structures and be usage to shape data gathering and use practices.

These reviews are required for data may emerge as a potent weapon in the age of AI outbreaks, and steps must be taken to have stakeholders realize the dangers data can now pose. This is especially important because this new danger is in stark contrast with data's current reputation in society: data is currently regarded pervasively as "digital gold" within the private sector, government, and military.

#### **Restrict Data Sharing:**

Critical AI systems must limit how and when the data used to develop them is shared in demand to make AI outbreaks more tough to execute. For critical systems, as a rule data should not be shared. Exceptions must well-reasoned. The causing data sharing strategies should be clearly written and followed.

#### **Mitigation Stage Compliance Requirements:-**

Mitigation stage compliance requirements focus on ensuring stakeholders plan responses for when attacks inevitably occur. This includes creating particular response strategies for likely attacks, and learning how the compromise of one AI system will affect additional systems.

#### **Create attack response plans:**

Regulate how AI attacks are probably to be used, and craft reply plans for these scenarios. Stakeholders must determine how AI outbreaks are likely to be used against their AI application, and then craft response tactics for mitigating their outcome. In determining what assaults are most likely, investors should look to existing threats and see how AI attacks can be used by adversaries to accomplish a similar goal. For example, for a social network that has seen itself mobilized to spread extremist content, it can be expected that input attacks aimed at deceiving its content filters are likely. After this, response plans should be designed. Response plans should be constructed on the finest efforts to answer to outbreaks and control the quantity of loss. Response plans may also need real-world stroke to be taken.

#### **Rapid Shared Vulnerability Mapping:**

Create maps which shows how the compromise of one asset or system affects all other AI systems. Representatives should need AI system operators to map how the concession of a specified asset or system would affect all other structures. Characteristics of the AI area make these shared susceptibilities common.

Organizations should have vulnerability maps that document the assets their different AI systems share. For example, one such map would document which systems utilized the same training datasets. If this dataset was later compromised, administrators would instantly know what other applications are vulnerable and need to be addressed. These shared vulnerability maps should be combined also into the attack response plans as well.

#### **Conclusion:**

For hundreds of years, humans have been suspicious of inscribing human knowledge in technical conceptions. With machine learning and artificial intelligence, we take a step nearby to this fear. It is the fear of the unidentified of a creation. In the future, technical progressions may one day help us to better recognize how machines can learn, and even learn how to insert these important abilities in technology.

But today is not that day. The current set of state-of-the-art artificial intelligence algorithms are, at their essence, pattern matchers. They are intrinsically vulnerable to manipulation and poisoning at every stage of their use: from how they learn, what they learn from, and how they operate. This is not an accidental mistake that can be easily fixed.

In high-risk application areas of AI, such as government and critical manufacturer's use of AI, obedience can be mandatory and prescribed by the appropriate controlling bodies. In low-risk application areas of AI, compliance can be optional in order to not strangle innovation in this rapidly changing field.

The world has learned a figure of raw lessons from the unencumbered and careless enthusiasm with which technologies with serious vulnerabilities have been deployed. Connected infrastructure has led to outbreaks with hundreds and lots of dollars of economic loss. The warning marks of AI attacks may be written in bytes, but we can understand them and what they indicate. We would be wise to not ignore them.

#### References:-

1. Attacking Artificial Intelligence AI's Security Vulnerability and What Policymakers Can Do about It by Marcus Comiter.
2. Barika.F, K. Hadjar, and N. El-Kadhi, "ANN for mobile IDS solution," in Security and Management.
3. B. Iftikhar, A. S. Alghamdi, "Application of artificial neural network within the detection of dos attacks", 2009.
4. B. Mayo, E. Tyugu, J. Penjam. Constraint Programming. Alignment ASI Series, v. 131, Springer-Verlag. 1994.
5. E. Tyugu. Algorithms and Architectures of Artificial Intelligence.IOS Press. 2007.
6. "Logic Programming for Engineering", Bratko,I, AddisonWesley, 2001.
7. NabaSuroor and Syed Imtiyaz Hassan, "Identifying the factors of modern day stress using machine learning".
8. P. Norvig, S. Russell. "Artificial Intelligence: fashionable Approach", 2000.
9. Reinventing Cybersecurity with Artificial Intelligence The new frontier in digital security by Capgemini.
10. TF. Lunt, R. Jagannathan. A Prototype Real-Time Intrusion-Detection Expert System.Proc.



## A Review on Best Practices in Mobile Application Development

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### Abstract

Now-a-days there is a fast growth in mobile application development in industries. There are numerous challenges like acceptance of GUI, understand ability of the facilities delivered, compatibility with varying Smartphone architecture, ease of navigation, aesthetics and flow of controls and menu, portability, security, reliability, etc. that are to be considered with seriousness in order to avoid any kind of vulnerability or failure. Mobile applications are of great importance as they are providing various features which are of great use for us like-use of navigation for finding particular location, online shopping, online movie tickets booking, etc. There are various challenges that are to be faced during these applications development. In this paper, we will focus on covering up all those challenges and the best practices that can be performed in order to tackle those challenges.

Keywords: Mobile application, Mobile Application Development, development challenges, best practice.

### I. Introduction

Nowadays users are expecting from their mobile phones to function almost similar to that of desktop computer systems. But due to the complex methodologies of mobile application development, it makes it more challenging than the desktop computer system. Mobile Application Development is a process of building up application software for mobile phone devices & for doing so development environment with specialized integration is used which are Android Studio or Eclipse is required. But while doing this, there are various parameters like OS, Processing Power, memory, compatibility, etc. are to be considered firstly. These apps should be interactive, easily downloadable through various platforms such as Google Play Store and iOS App Store.

There are various challenges like reliability, availability, security, robustness, and usability which are of major concern while developing and deploying an application. There is a scarcity in the methodology adopted w.r.t the advancement in mobile application development due to a lack of research methods and analysis of challenges that might occur during the mobile application development process.

V. Rahimian and R. Ramsin[1] look through the challenges in mobile application development by considering the current state of mobile development techniques. Leigh Williamson listed unique challenges for Mobile Application Development like- form factors, user input technology, usability, and user interaction designs [2]. Similarly, J. Dehlinger & J. Dixson found 4 major challenges for mobile application development engineering. These challenges were found by them while the creation of universal users interfaces while trying to enable software reusability via various platforms, while context-aware designing a mobile app and in agility balancing and requirement uncertainty[3].

This research paper focuses on the challenges faced during mobile application development & ultimate practices to overcome those challenges.

### Best Practices In Mobile Application Development

There should be more focus on "what not to do" rather than "what to do" while developing an application. Some of the challenges are discussed in this paper along with their best practices in order to overcome those challenges.

#### A. Improper Resource Estimation

It occurs in the beginning phase of mobile application development. If the business is not aware of required requirements and resources, it will easily deviate. It is considerably challenging for few developers to analyse these requirements and resources.

BEST PRACTICES-There should be proper business plans and logics to be discussed in a and recorded according to customer's requirements and feedbacks. This approach requires proper and better user communication, partial resource operations and repetition of assessments to be followed in each interval of time.

## **B. Scheduling of Time and Cost**

Due to low budget and funding there are many mobile apps projects which became unsuccessful. Many people think that developing a mobile application is not that costly, but it actually depends upon the application and its features. A developer working on a lower or limited budget tends to deliver a low quality product. This is similar w.r.t time too. If a developer isn't given a proper time for developing an application, there is a high chance of getting an incomplete or poor quality product. BEST PRACTICES-Proper plan should be made according to the appropriate time and cost over each activities to be executed. All the features or enhancements to be made are to be noted and accordingly necessary plans are to be made.

## **C. Selection of Target User**

Before developing mobile application, a group of target user is to be considered. Lack of analysis and foresight will make the application to be of lower value in the market. According to the target user interest the application is to be made. If there is lack in this selection, the development is already going in the wrong direction.

BEST PRACTICES-Users feedback is the best way to overcome this challenge. This will enable us to not all know the target user but also will tell us which features the target users are interested in. This will help us to know the features to be needed in our application.

## **D. User Interface**

User interface is one of the important things in mobile application development. The front end design should be compatible with all the devices screen resolution. Generally a developer forgets about user interface and focuses moreover the features to be needed. This makes the application hard for user to understand and handle, which indirectly reduces its value in the market.

BEST PRACTICES-Developers team should avoid using too many resources, rather analyse those resources and build up a simple and clear design for the mobile application.

## **E. Performance vs Battery Life**

Performance and Battery life is one of the main challenges for developers while developing mobile application. Developers generally focuses on better performances of an application, which generally ends up with mobile getting heated up due to lots of power consumptions because of application performances. This generally lets to user's switching better and similar application which reduces the power consumption and heating of mobile phones.

BEST PRACTICES-Developers needs to consider the battery life applicable for most of the devices. According to that battery life, application performance should be decided, rather than just focusing over the performances and ignoring devices battery life.

## **F. Memory Space**

More the features, more the application size increases. Developers generally try to implement and integrate multiple features in one application, avoiding the main objective features. This lets to maximization of application size and application occupying lots of devices memory space.

BEST PRACTICES-The best way to overcome this challenge is to focus over the main objective features of an application, rather than adding too many features into it. While updating of an app, the old data should be completely replaced with the new data, rather than keeping unwanted old data attached to the new updated application which results in increase in application memory space.

## **G. Security & Privacy**

Importance of security and privacy is increasing day-by-day. There is a chance of device being used by an unauthorized user. This is the a bit challenging as there are many devices along with its operating system. Developers generally end up making the privacy terms and conditions complex to user understanding. Data transmission as well as servers of application should be preserved and protected for securing user data.

BEST PRACTICES- Privacy terms and conditions should be displayed to the user in proper and simple designs, using simple language, make it easy to access. Data transmission and servers of an application should be protected using appropriate security measures and guarantee user's accountability.

## H. Data Synchronization and Access

Mobile devices are good enough to access data, either from the application or from the browser. Application built should be created which can keep track of data being accessed from application database and should understand the connection being built via database. If the connection is disconnected, it should be able to reconnect to its last existing data and update the application data accordingly.

BEST PRACTICES-Proper synchronization of data is necessary when we are dealing with application data being send via network. Encryption is the best possible way to overcome this challenge along with proper synchronization of data in order to update and access the application data.

## I. Methods for Providing Input

It is difficult to provide an input via a keypad to the user. Also not many users are good with using keypad keys efficiently. Hence providing a method for an input is not that easy challenge to deal with. BEST PRACTICES-We can enable user to give proper input via using a touch gesture rather than keypad. This will make it easier and attractive for the users to use the application easily and efficiently.

## J. Problems in Testing

It is challenging for developers for testing mobile application because of various operating systems, platforms, it makes it very difficult to perform testing. Various factors like VPN dropping, wireless network connectivity, and application altering process are also to be considered while testing. It is necessary to find whether there is any problem with hardware of the device or with the network connectivity of that device by testing all of these above factors.

BEST PRACTICES-Testing is to be performed in every phase of development in order to avoid errors or problems in further phases. Testing should be performed on every platform and also in different locations for different browsers verifications. If all of these factors are accomplished we can say that the app is ready and effective for deployment process.

## III. Conclusion

Mobile applications nowadays offer various functionalities that it has become a part of our life. There is a tremendous rise in mobile application which makes it more challenging to make a bug free, efficient, user friendly and useful application. Developers should follow all the best practices discussed in this paper in order to overcome the challenges. This paper has discussed real challenges and best practices generally occurred to mobile application developers. If this best practices are properly implemented for the given set of challenges, it will provide a best product from it.

## Reference

1. V. Rahimian and R. Ramsin, "Designing an agile methodology for mobile software developments: A hybrid method engineering approach" in Proceeding of Second International Conference on Research Challenges in Information Science, RCIS (2008), Marrakech, 2008, pp. 337-342.
2. Leigh Williamsons, "A mobile application development primer. A guide for enterprise teams working on mobile application projects". IBM Whitepaper, 2012.
3. J. Dehlinger and J. Dixon,"Mobile Application Software Engineering: Challenges and Researches Directions", Workshops papers. Oct 2011.
4. Prof. K.D. Tamhane, Mr. Wsim T. Khan, Mr. Sagar R. Tribhuvan, Mr. Akshay P. Burke, Mr.
5. Sachin B. Take," Mobile Learning Application", International Journal of the Scientifics and Research Publication, Volume 5, Issue 3 March 2015
6. A.M. Vainieo, T. Tuunannen, P. Abrahamsens, "Developing Software Product for Mobile Market: Needs for Rethinking Developmental Models and Practices", in Proc. of the 38th Hawaii International Conference on Systems Science (HICSS'05), Jan. 2005.
7. M. Palmierii, I. Sing, and A. Cicchetti,"Comparisons of cross-platform mobile development tools," in Intelligence in Next Generations Network (ICIN), 2012 16th International Conference on, 2012, pp. 179 – 186.
8. S.B. Kalel, "Applying Agile Methodology in Mobiles Software Engineering: Android Application Developments and its Challenge", 2013.

## Artificial Intelligence to Improve Education Challenges

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### 1. Introduction

Artificial Intelligence can point out spaces where courses need to increase. Lecturers may not always be conscious of gaps in their lectures and learning resources that can leave students confused about certain concepts. Different scholars have different learning styles, aptitudes, welfares and needs. One instructor in a classroom of 30 students will hardly be able to provide to each of those needs. Exercise and classes could be modified based on a student profile, interests can be refined and enhanced by exposing scholars to diverse courses and content. [2] Artificial Intelligence deals a way to solve that problem. For an instance, Coursera, a massive open online course supplier, is previously putting this into practice. When a huge number of learners are found to submit the incorrect answer to a homework assignment, the scheme alerts the lecturer and gives future learners a modified message that offers hints to the correct answer. This type of system helps to fill in the gaps in clarification that can happen in courses, and helps to confirm that all learners are building the same theoretical foundation. Rather than waiting to hear back from the lecturer, scholars get instant feedback that helps them to appreciate a concept and remember how to do it properly the next time around. Here are just a some of the ways those tools, and those that will follow them, will shape and describe the learning experience of the future.

### 1. Artificial intelligence can automate basic activities in education, like grading.

In college, grading exercise and tests for huge lecture courses can be deadly work, even when TAs divided it between them. Even in lower grades, lecturers often find that classifying takes up an important amount of time, time that could be used to cooperate with scholars, prepare for class, or work on specialized development. While AI may not always be able to truly replace human grading, it's getting attractive close. It's now possible for teachers to systematize grading for nearly all types of multiple-choice and fill-in-the-blank testing and automatic grading of student writing may not be far late. Today, paper grading software is still in its beginning and not quite up to par, yet it can (and will) advance over the coming years, permitting teachers to emphasize more on in-class activities and student interface than grading.

### 2. Learners could get additional support from AI tutors.

While there are clearly things that human teachers can offer that machines can't, at least not yet, the coming could see more scholars being taught by tutors that only exist in zeros and ones. Some instructing programs based on artificial intelligence previously exist and can help students through basic mathematics, writing, and other subjects. These agendas can teach scholars fundamentals, but so far aren't ideal for helping scholars learn high-order thinking and inspiration, something that real-world educators are still essential to simplify. Yet that shouldn't rule out the option of AI tutors being able to do these things in the future. With the quick pace of technological progression that has marked the past few periods, advanced teaching systems may not be a pipe dream.

### 3. AI-driven curriculums can give scholars and teachers helpful feedback.

AI can not only help lecturers and scholars to skill courses that are modified to their needs, but it can also deliver feedback to both about the achievement of the course as a whole. Some schools, specially those with online offerings, are using AI systems to monitor scholar development and to alert lecturers when there might be an matter with scholar performance. These kinds of AI systems permit scholars to get the provision they need and for lecturers to find areas where they can advance teaching for scholars who may fight with the subject matter. AI programs at these schools aren't just contribution information on individual courses, however. Some are working to grow systems that can help scholars to choose majors based on areas where they

prosper and fight. While scholars don't have to take the information, it could mark a courageous new world of college main selection for future scholars.

#### **4. AI could revolution the role of instructors.**

There will continually be a part for instructors in teaching, but what that role is and what it involves may vary due to new technology in the procedure of intelligent computing systems. As we've already deliberated, AI can take over errands like classifying, can help scholars improve learning, and may even be an additional for real-world teaching. Yet AI could be modified to many other aspects of education as well. AI systems could be programmed to provide knowledge, portion as a place for scholars to ask questions and find information or could even possibly take the place of trainers for very basic course resources. In most cases, however, AI will shift the role of the trainer to that of organizer. Trainers will addition AI lessons, assist students who are stressed, and deliver human interaction and hands-on experiences for scholars. In numerous ways, technology is previously driving some of these changes in the classroom, specially in schools that are online or grip the tossed classroom model.

#### **5. AI can make trial-and-error education less threatening.**

Trial and error is a dangerous part of education, but for many scholars, the idea of fading, or even not significant the answer, is paralyzing. Some simply don't like being put on the spot in obverse of their peers or expert figures like a instructor. An intelligent computer system, planned to help scholars to learn, is a much less intimidating way to deal with trial and error. Artificial intelligence could suggestion scholars a way to trial and learn in a comparatively judgment-free environment, specially when AI instructors can offer solutions for improvement. In fact, AI is the perfect format for supporting this kind of education, as AI systems themselves often learn by a trial-and-error technique.

#### **6. AI may change where scholars learn, who teaches them, and how they obtain basic skills.**

While main changes may still be a few periods in the future, the truth is that artificial intelligence has the possible to fundamentally change just about all we take for decided about education. [2]

Using AI systems, software, and provision, scholars can study from anywhere in the world at any time, and with these kinds of programs taking the place of assured types of classroom instruction, AI may just replace lecturers in some instances (for better or worse). Instructive programs powered by AI are already helping scholars to study basic skills, but as these programs grow and as developers study more, they will likely offer scholars a much wider range of services.

### **2. Problem Statement**

In a coaching and learning atmosphere, scholars' active participation with lessons as well as the use of learning methods that help scholars remember what they learn is significant sizes. Effective learning methods grow the quality of learning. Scholars learn best by doing and experiencing. To be effective and efficient, science coaching programs need to be student-centered and based on research and examination and should contain experimental actions. In a supportive education approach, students and teachers are in a state of dynamic communication in the classroom.

Each scholar' have different learning skill. One example of a topic clarified by an instructor can be understood by scholar in one go or it will take more than two or three examples of the same topic to understand the topic. Sometimes, it might ensure that the scholar was absent from the earlier class. Sometimes, the instructor is not able to give a suitable example which is easily sufficient to understand by each and every student in a classroom.

### **3. Recognizing Designs**

Instructors who are able to grip technology as a foundation for their instruction plan can reap the welfares of automatic data capture shaped from their scholars' assignation. The big advantage of digital information systems is their skill to store and quickly process enormous amounts of information in a short space of time.

Collective with dedicated algorithms, these systems are able to classify and make sense of student assignation and behavior patterns that appear in a instructor's class and report these findings to the instructor.

The ability for instructors to be assisted by technology in the management of their lessons means that they can pass less time pencil-pushing and extra time gaining useful visions from their classroom AI tools to deliver higher standards of instruction.

#### 4. The Process Of Learning And Teaching

To study and instruct is the main problem of a knowledge-oriented civilization, and its process to solve can touch the future of each country. Best solving of coaching and learning must be done, based on leading culture. Numerous models have accessible, including Keller learning model (ARCS). Keller believes that motivation is under the consequence of individual, ecological, specialisms and learning materials. Keller, in his motivational, instructive designing, composing theories and motivational events with instructive designing and forms an application result that causes students to do more struggle to achieve educational goals. EQ emotional model. This model emotion or sensation has many effects on learning Sam 2009. After making emotional memory as and values in the civilization. The model of instruction and education must pose as appropriate as with society associate with text reports, that vital motive comes manifest the emotional model of human is, as a positive range of emotions like joy, desire, hope and compassion, and negative range consist of sadness, anger, fear displeasure, and aggressiveness, emotion in the procedure of teaching must be in positive spectrum and rather must be in the form of lively and numerous of learning model which must take care to archive goals.

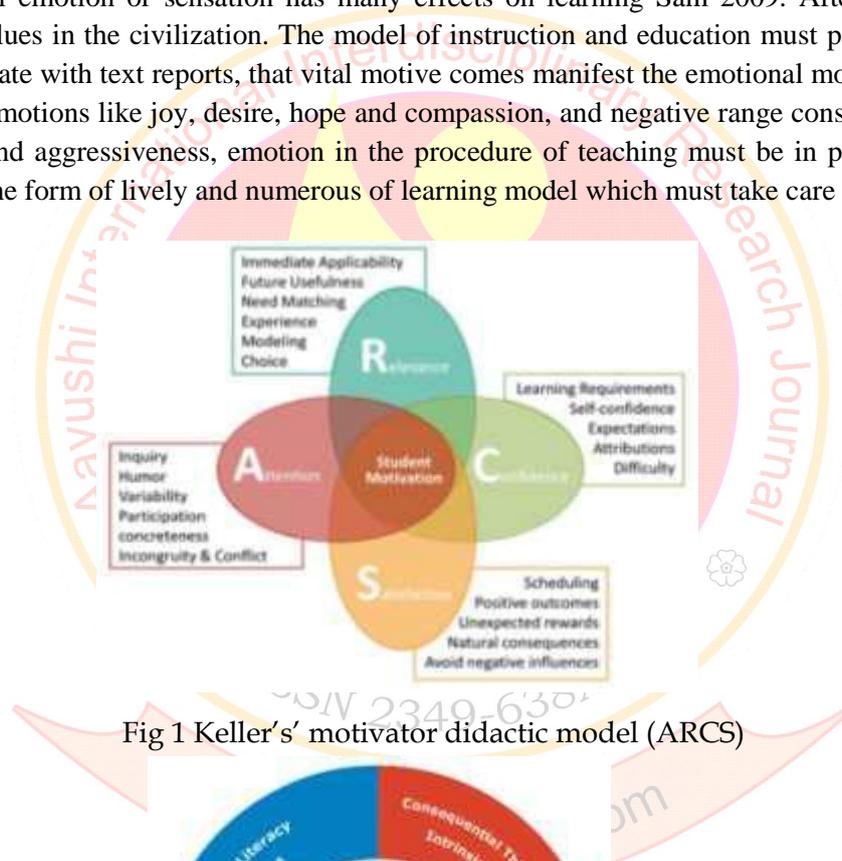


Fig 1 Keller's' motivator didactic model (ARCS)

Fig 2 Excitement Model (EQ) [5]

#### 5. The Ai Process

An example scenario of a teacher's interaction with their classroom AI tools could be as follows:

**Teacher:** Show me the scholars who have difficulty understanding portions.

**AI:** I have found 14 scholars who show three categories of difficulty in understanding portions. [Shows list of students]

**Teacher:** Why does Vikas not understand portions?

**AI:** My analysis shows that Vikas missed the first lesson where portions were explained. His connections advises that he doesn't understand the concept of portions.

**Teacher:** What actions are suggested for Vikas's difficulty in portions?

**AI:** You should ask your coaching associate to deliver Vikas with the information from the first lesson at the initial occasion, followed by the delivery of homework item A12. [Click this to review] **Teacher:** Which other scholars can these actions be applied to?

**AI:** Vinayak and Rakesh were also absent from the first portions lesson, but they are showing better abilities in understanding the subject.

**Teacher:** Is tomorrow's lesson plan suitable for these scholars?

**AI:** No, because none of the identified scholars are showing a full understanding of portions at present. [2]

## 6. Conclusion

The capability for information systems to deliver this level of vision not only saves time, but can deliver the level of detail that may not be clear or possible for instructors to identify at face value. Classroom AI tools have abilities in analyzing numerous sources of data and comparing them to known designs. This can identify the root causes for problems, and also drive towards more reliable outcomes across different classes, irrespective of the experience of coaching staff.

## 7. References

1. [http://www.growingscience.com/ijiec/Vol7/IJIEC\\_2015\\_32.pdf](http://www.growingscience.com/ijiec/Vol7/IJIEC_2015_32.pdf)
2. <https://daisygroup.com/resource/how-artificial-intelligence-will-improve-teaching-and-learning/>
3. <http://www.teachthought.com/the-future-of-learning/10-roles-for-artificial-intelligence-in-education/>
4. <http://www.sciencedirect.com/science/article/pii/S0898122185900549>
5. <http://airccse.org/journal/ijscai/papers/3114ijscai01.pdf>
6. [https://www.stottlerhenke.com/papers/TTS\\_using\\_AI\\_to\\_improve\\_training\\_performance\\_and\\_ROI.pdf](https://www.stottlerhenke.com/papers/TTS_using_AI_to_improve_training_performance_and_ROI.pdf)
7. <http://gettingsmart.com/2015/11/8-ways-machine-learning-will-improve-education/>
8. [http://www.cse.iitm.ac.in/~ravi/papers/Sarma\\_HOIT\\_07.pdf](http://www.cse.iitm.ac.in/~ravi/papers/Sarma_HOIT_07.pdf)
9. <https://www.aaai.org/ojs/index.php/aimagazine/article/viewFile/2482/2373>

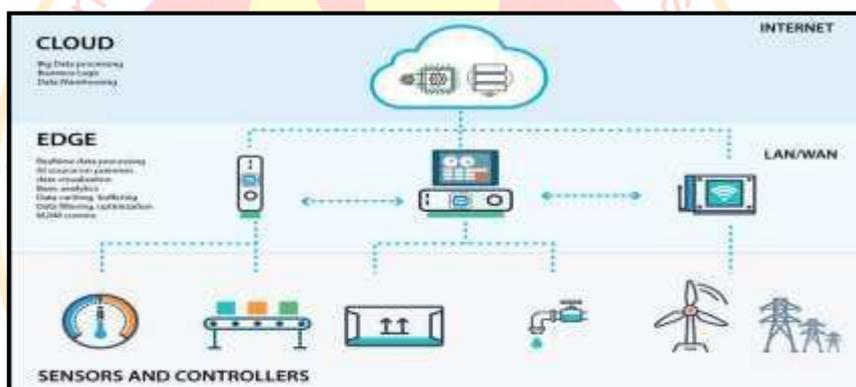




The IoT and big data share a close connection, and nowadays, we see a lots of new devices that are selected for the producing a fair share of the data. Cloud is well-thought-out to be accomplished of controlling the analytic supplies and storage; it lacks some particulars while working with bigger data and so IoT needs to work on their big-data connection from now on.

## 2. Data Processing with Edge Computing

The basic weakness that IoT has is that it adds up devices behind schedule the firewall of the network. Securing the devices may be easy but securing the IoT devices needs a lot more. We are mandatory to combine the security between the network connection and the software applications which links to the devices.



IoT gets the best success by their cost-effectiveness and effectiveness while processing data. Faster processing of data is projecting in all the smart devices such as the self-driving vehicles and the intelligent traffic lights. Authority computing is said to be the solution to this anxiety of this Internet of Things Trends.

Authority computing usually outpaces the Cloud when it comes to speed and cost. We all know about that faster processing means lower latency, and that is what Authority Computing does. Data processing with the Authority Computing will happen with the Cloud for the betterment of IoT.

## 3. Greater Consumer Adoption

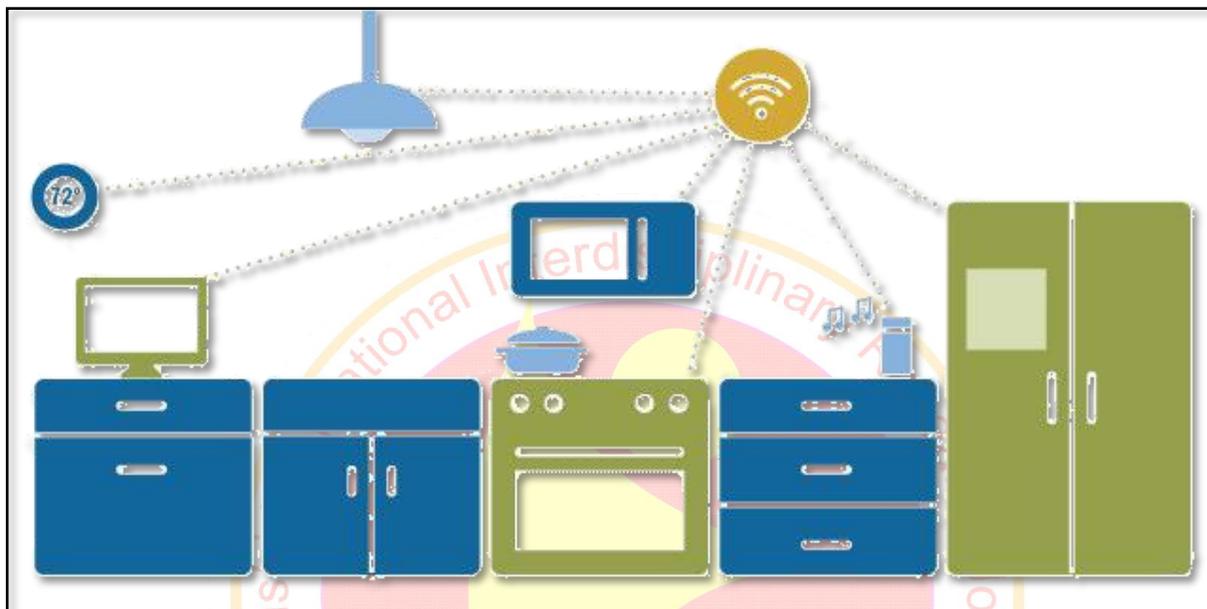
In the next ten year, we will get to see a huge change in IoT when the shift away will happened from the Consumer-based IoT just like the market flops of Lily Robotics. The capital growth of the consumer-based IoT will decrease, and the future will be the year for the industrial. This Internet of Things Trends will require time to grow.



Better View and therefore the Swift Route finding, companies like this that are supported the Industrial-IoT are going to be seen building of IoT architecture, and it'll solve the difficulties in insurance, transportation, agriculture or telecommunication, and a vivid reduction will be seen in the capital expenditure

#### 4. "Smart" Home Demand Will Rise

In the past, we have seen the IoT apps have flowed with the idea of smart home technology, and this will be continual shortly so that home can get more interactive. People will not direct the devices; instead of that devices will tell the people of the house what they should do.



There will be a short-tempered growth; this year, we will get to see steady growth in place of the companies of these days are facing security and disintegration matters. Keen Household Internet of Things Trends or IoT Trends is the hot topic in this present time.

#### 5. The Healthcare Industry Embraces IoT

Where a vendor is seen taking profits of the capability of interacting with the customers, wearable devices are being used by the healthcare sectors, and these sectors will be face by steady but stable development.



You can visualize all the medical devices using the Cloud and storing the images for Intelligent Systems? This will be approximately to note down that in this way, the government will get the best advantage out of it.

#### 6. Auto-ML (Machine Learning) for Data Security

In present days, we see that the developers are focus on the fresher methods in which people can share data securely by the use of technology. Nowadays, many of the industrial companies will learn to trust and

accepting the machine learning model prediction and will acclimatize their operations for averting the downtime by output models.



Machine learning standard physical activity will be identical automated, just like the auto-ML toolset, and it will become more popular. Companies resolve by increasing the substantial capitals assets that are associated with the Cloud (by 3-5x) as it is one of the top-ranked IoT Trends.

### 7. IoT – Massive Growth Coming

In compared to the other type of technology, the IoT devices usually get more data and information about the devices and users, and by 2020, there will be IoT devices in the world about 31 billion.



As per the IoT Trends, we can easily accept that it will increase to the fullest. IoT is usually getting or collecting so many data, and there is Artificial Intelligence (AI) to take out the essential data. Shortly, We will get to see the IoT devices to work for doing activities, and they will also support the technicians in providing discerning suggestions.

### 8. Blockchain for IoT Security

A wide range of entrepreneur, financial and government processes, customer and industrials will get decentralized, self-governing, self-healing, and smart. Some of the start-ups are seen building up their terrain on top of the IOTA's Tangle (IOTA is a distributed ledger crafted for recording and executing transactions among devices in the IoT ecosystem) for developing modules and additional components for the enterprises without the cost of SaaS and Cloud.



We should get ready to see the centralized and massive computing models breaking apart into the jobs and micro-services that will be disseminated to the decentralized devices and machines. Someday, the IoT will

diffuse into governance, health, transaction, financial, and additional disciplines which people of these days cannot be think. This kind of IoT Trends are going to create significant effective differences for us.

### 9. Better Data Analytics

The upcoming years will be surprise us with the most protruding trend, which will be between the connected world and the IoT. Now, how the world and the IoT get combined with AI for fetching a decision-making assistant for all the business and individuals and that's all we are looking forward to.

AI that can be quickly identify the trends. IoT Trends will bring up better data analytics and make it easier to precaution them. It is also collecting insights from the considerable data for making a better decision for our lives.

### 10. Smart Cities to Become Mainstream

In the past, we have seen that the states were progressing out more technologies and sensors for taking the profits of available data collection tools. Shortly, we will see the IoT Trends where the forward-thinking cities will invest in ground-breaking data exchanges which will afford the access and the combination of the data between the private and public association along with the citizens.



We will get the occasion to see the translation of thinking from the smarter cities. The IoT integration with the approachable cities will decrease traffic congestion, unlock sustainable development, and improve safety.

### Future of the IOT network

SDN can be used to virtualize the different services of the switch to use it according to the user need, support APIs, object control. SDN like Open Flow provide functionalities like a Network layer: Responsible for reliable transfer of content between different types of end nodes. flow table with entries of process flows, a secure channel between the controller and switch etc. to provide a network where new protocols can be applied and tested. The connection Device layer: Embedded actuators, sensors and controlling of devices in an IOT network should be an automatic process mechanism. in which the unique identification numbers are to be allocated There is also a kind of a virtual layer associated with this structure which is responsible for security as the devices producing and storing data are highly immune to be used wrongly for acquisition and manipulation of data.

automatically (plug-and-play mechanism). The future network will be based on IPv6 networking where in two types of addresses, namely, Unique Local Address (ULA) for local naming of devices and communication in a network with no internet and Globally Unique Address (GUA) will be able to Current network: The network definitely needs a identify the devices in the vast network. Mapping of GUA to centralized data store for consistent source of data. Most of the ULA will be easier leading to more efficient networking but proposed architectures are based on the WSN fundamentals, scalability might still pose a problem. but the architecture needs to be changed with changes in the number of devices connected and customization in services. SOA (Service oriented network) helps solve the problem with Content distribution network (CDN). It is based on distributed client-server architecture where copies are stored on the server but is linked in a peer-to-peer connection for better exchange throughput.

The proposed systems support wide range networking but involve a lot of costs for supporting low power usage and chips that need to be used. So instead, we need gateways to support heterogeneous networks and collect data from all these networks. Also, grouping the devices according to the service needs is also important. Physical grouping is based on the physical proximity of the devices and is managed by a device SDN acts as a control manager that can change the network manager, and Logical grouping is based on the services these configuration according to the current status, act as a software devices are providing. All the devices, even if they belong to counterpart for doing the controlling functions for hardware different networks, that are serving the same application are put and create a virtual space between the control and data centres.together in a group. This solves most of the problem. To support scalability, physical add-ons are replaced by Network Function IOT is all about communication between devices. Security thus becomes an important issue to be addressed.

### Security Concerns in IoT Devices and Software's

The main object of IoT is to minimize human intervention and solely depending on the machines to function on their own. IoT and Artificial Intelligence go hand in hand, bringing intelligent objects (those which work minus human instructions) to the surface.

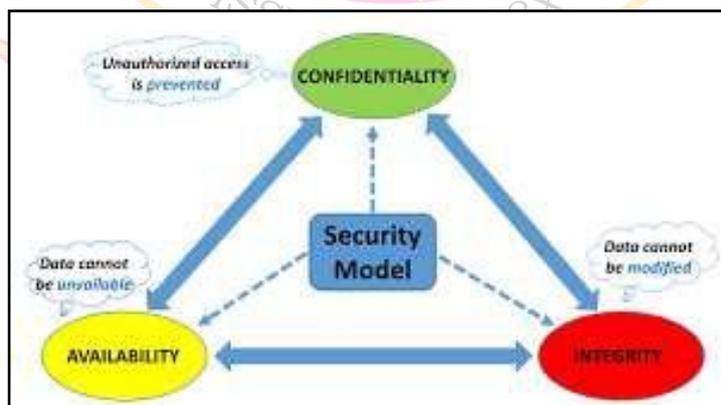
As it is a new field that has unfolded, it is vast and enormous to expand, thus, its architecture plays an important role in bringing clarity to the audience.

There are three main notches that constitute the entire functioning of IoT.

1. Perception Layer: It is how the system perceives its surroundings using various sensors such as RFID, it gets hints from its environment as to how the object must be designed and how it should respond.
2. Network Layer: It acts as a mediator between the perception layer and the application layer. It plays an essential role in migrating all the necessary information collected at the perception level to the application layer to generate output.
3. Application Layer: This is the top-notch layer that is responsible for performance as a whole. It aids the user with the best services and intelligent object for The main purpose of IoT is to minimize human intervention and solely depending on the machines to function on their own. IoT and Artificial Intelligence go hand in hand, bringing intelligent objects (those which work minus human instructions) to the surface.

There are additionally three more layers that act as sides to the existing main layers.

4. Middleware Layer: It exists just below the application layer and is used to store the collected information in the database and retrieves the same for processing it and passing it on to the application layer.
5. Support Layer: Combines both network and application layer, besides acting as a base for an intelligent setup to be used by the application layer.



### Applications of Blockchain in IOT:

**Supply chain management:** Blockchain based on IOT can play a major role in secure upstream and downstream supply chain management and transactions. It can be filler for the gap created by vulnerabilities between seamless operations on the World of IOT will absolutely be connected undecidedly, where trust will play a major role in communication between devices. Inspire of verification of devices before connection, security still remains an irony for a transparent world of IOT. It is believed that block chain will be able to transform the upstream.

**Identity management:** It can be support Public Key Infrastructure (PKI) which involved management, revocation, updating and registration of keys. security part of this field by automizing and decentralizing

transactions and mechanisms. Block chain makes definite that no block or set of data is altered with as all the blocks are chained, wherein, if content of any one block is changed.

**Data storage management:** Blockchain can provide control on access of data, record logs of events which cannot be tampered with.

**Trade of goods and services:** Purchase of goods, to know of the unwanted action taken upon it. Since IOT also sensors, devices can be supported. demands automatic transactions that need to be completed privately and securely, blockchain will be of definite help. All devices communicate in a decentralized fashion using blockchain and do not store all of its data on a central cloud. To build a standard for an implementing blockchain based IOT, firms like BOSCO, Cisco are teaming up.

**Challenge-response technique in audit firms:** Periodically, a challenge is sent over to the host for it to return a hash value that is matched with the initial hash value calculated over a transaction. If they don't match, it means that it has encountered some change and security has been compromised. It can be used to provide a smooth flow of operations in supply chain management.

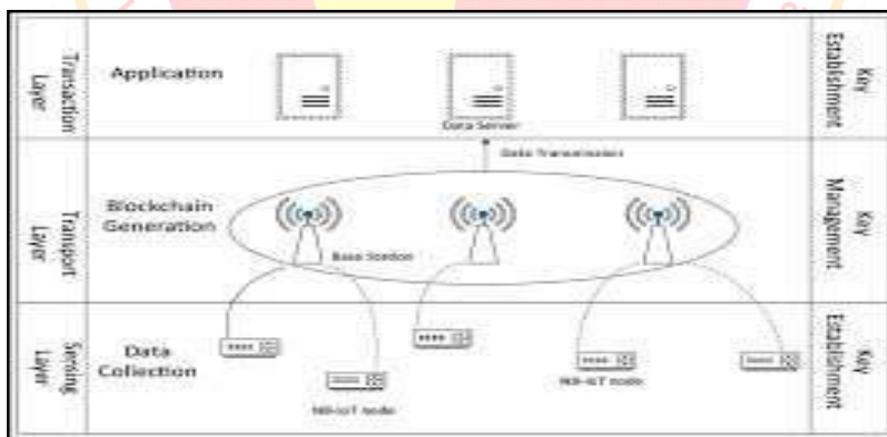
**Autopay:** Authorised payment generation through card on availing any service (only for the owner).

**Travel/Tour:** Blockchain based on IOT can also be used supporting identity and access management systems.for trusted automatic foreign currency exchange.

Problems in IOT that blockchain can address: Everything in an IOT network is connected to a cloud.

**Integrity:** With new blockchain architecture, internet. But this poses certain problems like Assimilation of different consensus becomes difficult these devices themselves can prove to be a bottleneck and increase traffic, hence affecting efficiency and resulting in network failure rates,With other problems like misbehaving miners etc.

**Anonymity:** Mixed protocols should be used to - less immunity to manipulation due to centralized Address this issue. All the possible way in which any functioning, communication links the same user should be avoided.



### Architecture of block chain in iot

This architecture can be comprehensive for all the IOT networks. Though it solves a lot of problems and lays the base for further development, a lot of future work on improvising the security aspects even more and handling the resource-limited IOT network is the needed.

### Conclusion

To totality up and about all the study that has been carried out, we have come up with the following conclusion:

**People-centric sensing:** Here, the users are the come up with the following conclusion which explains the use producers as well as the consumers of the actions that unfold of trends for modern IoT technologies: Admitting the fact that, that is, they themselves demand it and utilise it. We are wanting in the proficiency on the technology side of this.

**Ubiquitous sensing:** Acquiring data from every possible place in order to generate a fruitful action.

**Location aware sensing:** The data attributing to a particular location or place is collected, analysed and stored. Potential domain. There is a need for a standardized business model from which, an object specific model for different IoT applications can be derived. This model needs to be based on the three main components: hardware, software and connectivity. On the hardware side, it should fulfill the need

**Participatory and Opportunistic sensing:** Here, in for complex embedded sensor architecture, whereas on the participatory, the user gets the privilege to share the needful software side it should also support deployment of the modern data as per the privacy concern, whereas in opportunistic technologies like Artificial Intelligence and Block-chain. In sensing the system senses even, the confidential information order to combine both hardware and software, utilization of and the user remains oblivious of this fact. High speed and scalable connectivity need to be done with

**Contextual:** Comprises of sensing from the very proximity or nearby environment

**Machine learning:** Adding intelligence to the raw source of data collected through machine learning algorithms and mining.

Hence, in the upcoming years even though, with a bit complication, not only will IOT flourish imbibing itself into the lives of people, but majorly machine learning aided sensing will also soar high and be the reason of the amalgamation of intelligent objects into IOT.

Upgraded protocols like IPv6 and SDN. In IoT related applications, the most important parameter is data which is very much vulnerable to attacks. Data should always be secured on all layers of process, making IoT more secure and safe. Considering this evolving phase of IoT technology, we can't define trends which can last forever but, in this paper, we've tried to identify and explain those trends which are derived from the essential components of the IoT domain and most suitable for today's IoT driven world. And hence in the upcoming ages also, the trends might vary but they will be relying on the study carried out in this paper.

## References

1. Jindal, F., Jamar, R., & Churi, P. FUTURE AND CHALLENGES OF INTERNET OF THINGS.
2. Khan, R., Khan, S. U., Zaheer, R., & Khan, S. (2012, December). Future internet: the internet of things architecture, possible applications and key challenges. In *Frontiers of Information Technology (FIT), 2012 10th International Conference on* (pp. 257-260). IEEE. carried out by same survey, a person who is seeking to do job
3. Carlos Morales , "Top M2M Trends for 2014" , <https://iot.telefonica.com/blog/top-m2m-trends-for-2014> last accessed : Aug 11, 2018
4. "2014 Technology Trends: The Internet of Things" <http://www.netsynergy.com/blog/2014-technology-trends-the-internet-of-things.html> , last accessed : Aug 11, 2018
5. Da Xu, L., He, W., & Li, S. (2014). Internet of things in industries: A survey. *IEEE Transactions on industrial informatics*, 10(4), 2233-2243.
6. Whitmore, A., Agarwal, A., & Da Xu, L. (2015). The Internet of Things—A survey of topics and trends. *Information Systems Frontiers*, 17(2), 261-274.
7. Shannon Kempe , "2015 Trends for the Internet Of Things" , <http://www.dataversity.net/2015-trends-internet-things/> , last accessed : Aug 11, 2018.
8. Drew Hendricks , Trends in IoT Investing for 2015, <https://tech.co/trends-iot-investing-2015-2015-09> , last accessed : Aug 11, 2018.
9. THE CONNECTED CONSUMER: Top Trends in IoT, [http://www.parksassociates.com/bento/shop/whitepapers/files/ParksAsso\\_c-ConnectedConsumer-TopTrends-in-IoT-2015.pdf](http://www.parksassociates.com/bento/shop/whitepapers/files/ParksAsso_c-ConnectedConsumer-TopTrends-in-IoT-2015.pdf) , last accessed : Aug 11, 2018.
10. Ray, P. P. (2016). A survey on Internet of Things architectures. *Journal of King Saud University-Computer and Information Sciences*.
11. David Curry , "Here are the 6 major trends for IoT in 2016" , <https://readwrite.com/2016/12/27/major-trends-iot-2016-dl4/> , last accessed : Aug 11, 2018.
12. Thor Olavsrud , Top 5 internet of things trends of 2016
13. <https://www.cio.com/article/3153446/internet-of-things/top-5-internet-of-things-trends-of-2016.html> , last accessed : Aug 11, 2018.
14. Peter Daisyme, Five IoT Trends To Consider In2017,<https://www.forbes.com/sites/theyec/2017/03/15/five-iot-trends-to-consider-in-2017/#500d27d64f36> , last accessed : Aug 11, 2018.

## An Introduction to the Internet of Things

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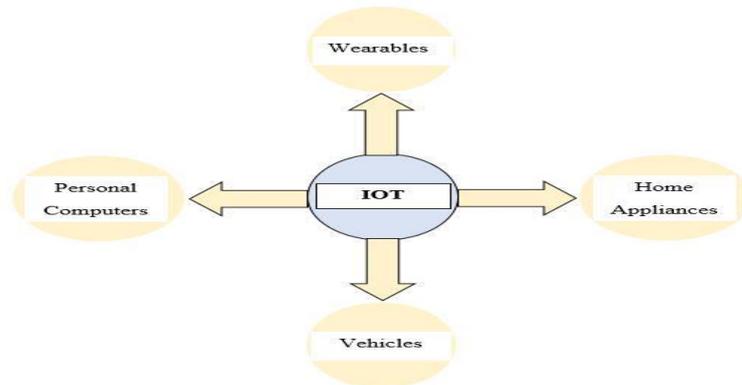
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### Introduction:

The term "Things" within the Internet of Things refers to anything and everything in day to day life which is accessed or connected through the web. The internet of things (Iot) is a network of physical objects that objects contain devices, vehicle, buildings and other items connected to the electronics, software, sensors and network connectivity that enables these objects to gather and exchange data. In this technology we connect the objects to the internet to get the desired output. For example, when cars are connected to the internet to provide facilities and to improve safety this system is known as connected cars system in Iot. And this is the one of the most important flavour of Iot.

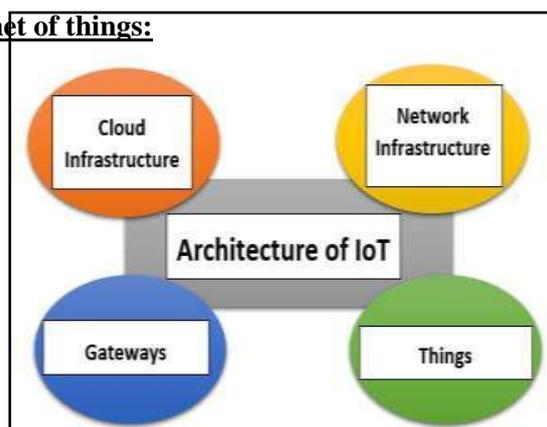


In 1980's machine to machine technology began with wired connections for SCADA (Supervisory control and data acquisition) in the factory, home and in business security system. After that in 1990's machine to machine technology began moving towards wireless technology. At that time actually the revolution of internet of things is started. The term Internet of Things is 16 years old. But the particular idea of connected devices had been around longer, a minimum of since the 70s. Back then, the thought was often called "embedded internet" or "pervasive computing". But the actual term "Internet of Things" was coined by Kevin Ashton in 1999 during his work at Procter and Gamble. Ashton who was working in supply chain optimization, wanted to draw in senior management's attention to a replacement exciting technology called RFID (Radio Frequency Identification) because the web was the newest trend in 1999 and because it in some way made sense, he called his arrangement Internet of Thing.

The internet of things refers to the various futuristic things like wearables, home appliances, vehicles and Personal computers etc. The IoT will make all practical life things are very simple. In other words we will say that we are going to connect the things to internet for easy and reliable use of that things. We all know that internet application development demand is very high so IoT is a very useful technology by which we can produce various useful internet applications. By using IoT technology we will get remotely access on network infrastructure.

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### Architecture of internet of things:



### **Cloud Infrastructure -**

Cloud infrastructure refers to the hardware and software components like servers, storage and Network and virtualization software. It works as a virtual storage for various structures of IoT. The generates vast amount of massive data and this puts huge strain on cloud infrastructure. Cloud infrastructure provides necessary tools to make IoT applications. Cloud helps in achieving efficiency, accuracy and speed in implementing IoT applications. Cloud helps in IoT application development but IoT isn't a cloud computing.

### **Network Infrastructure –**

Modern Network Infrastructure provides a summary of and insights into modern network infrastructures, methods and approaches to style and evaluate these infrastructures, also as an outline of techniques that are needed enablers of future IoT systems. A special focus is placed on particular techniques that allow distributed entities to talk and collaborate efficiently in both cooperative and non-cooperative environments. An IoT network refers to a set of interconnected devices that communicate with other devices without the necessity for human involvement, like autonomous cars, smart appliances, and wearable tech. The network infrastructures most related to IoT networks are 4G LTE and 5G which are built to support the resource demands of the IoT.

### **Gateways –**

An Internet of Things (IoT) gateway may be a physical device or software database that is the joining point between the cloud and controllers, sensors and intellectual devices. All data moving to the cloud, or the other way around, goes through the gateway, which may be either a fanatical hardware appliance or software program. An IoT gateway can also be mentioned as an intelligent gateway or an impact tier. Some sensors generate tens of thousands of knowledge points per second. A gateway provides an area to preprocess that data locally at the sting before sending it on to the cloud. When data is aggregated, summarized and tactically analysed at the sting, it minimizes the quantity of knowledge that must be forwarded on to the cloud, which may have a large influence on response times and network transmission costs. Another advantage of an IoT gateway is that it can provide additional security for the IoT network and therefore the data it transports. Because the gateway accomplishes documents occupation both directions, it can keep data moving to the cloud from leakages and IoT devices from being negotiated by hateful outside attacks with features like tamper detection, encryption, hardware random number generators and crypto engines.

### **Things –**

IoT isn't complicated in conception, but its complex in its execution. What is important to know is that albeit new hardware and software are still under development, we already have all the tools we need now to start making IoT a reality. Thing is an embedded computing device (or embedded system) that transmits and receives information over a network (need not be ready to interface with internet directly) for the aim of monitoring another device or interrelating with a user. A Thing is also a microcontroller—or microprocessor-based device. Hence an easy chair, tv, fan, microwave, fridge, sprinkler, bulb etc. (the list goes on) on their own can't be called "Things". Why you ask? Most of day to day things don't have any embedded systems E.g. bed, chair, fan, and bulb. Albeit they are doing have embedded systems inbuilt, they are doing not have the capabilities to transmit and receive information over a network. E.g. washing machine, microwave, electric stoves.

### **Features of Iot:**

1. **Connectivity** - connectivity refers to establish a proper connection between all things of Iot by using a platform of server or cloud. After connecting the Iot devices, it requires high speed of communication between the devices to get the desired output as early as possible.
2. **Analysing** – After connection of all the devices of Iot it is required to the real time analysing of data collected and use that data to get a desired output. If connected devices gathered the data and use it properly or as per need then we can call this system as a smart system.
3. **Integrating**- IoT integrating the various models to improve the user experience as well.
4. **Artificial Intelligence**- IoT makes things smart and enhances life through the utilization of knowledge. For example, if we've a coffee machine whose beans have getting to end, then the coffee machine itself order the coffee beans of your choice from the retailer.

- 5 **Sensing-** The sensor devices used in IoT technologies detect and measure any change in the environment and report on their status. IoT technology brings passive networks to active networks. Without sensors, there couldn't hold an efficient or true IoT environment.
- 6 **Active Engagement-** IoT makes the connected technology, product, or services to active engagement between each other.
- 7 **Endpoint Management:** It is important to be the endpoint management of all the IoT system otherwise, it makes the complete failure of the system. For example, if a coffee machine itself order the coffee beans when it goes to finish but what happens when it orders the beans from a retailer and that we are not present reception for a couple of days, it results in the failure of the IoT system. So, there must be a requirement for endpoint management.

## **Flavors of IoT-**

### **1. Smart Home**

With IoT creating the joys, 'Smart Home' is that the foremost searched IoT associated feature on Google. But, what's a wise Home? Wouldn't you're keen on if you'll activate air con before reaching home or cut lights even after you've left home? Or unlock the doors to friends for temporary access even once you're not reception. Don't be surprised with IoT taking shape companies are building products to form your life simpler and convenient. Smart Home has become the innovative stepladder of accomplishment within the domestic spaces and its projected Smart homes will become as common as smartphones. The cost of owning a home is the foremost important expense during a homeowner's life. Smart Home products are promised many to avoid wasting", many to avoid wasting", to save many lots of lots of time, energy and money. With Smart home companies like Nest, Eco bee, Ring and August, to call a couple of of, will become household brands and are getting to deliver a never seen before experience.

### **2. Wearables**

Wearables have experienced an explosive demand in markets everywhere the earth. Companies like Google, Samsung have financed severely in building such devices. But, how do they work? Wearable devices are installed with sensors and software's which collect data and knowledge about the users. This data is later pre-processed to remove vital insights about user. These devices almost cover fitness, health and entertainment necessities. The pre-requisite from internet of things technology for wearable applications is to be highly energy efficient or ultra-low power and tiny sized.

### **3. Connected Cars**

The motorized digital technology has engrossed on enhancing vehicles internal functions. But now, this consideration is rising towards enhancing the in-car experience. A connected car could also be a vehicle which is during a position to optimize its own operation, maintenance also as comfort of passengers using on board sensors and internet connectivity. Most large auto makers also as some brave start-ups are working on connected car solutions. Major brands like Tesla, BMW, Apple, and Google are working on bringing subsequent revolution in automobiles.

### **4. Industrial Internet**

Industrial Internet is that the new buzz within the economic sector, also termed as Industrial Internet of Things (IIoT). It's empowering industrial engineering with sensors, software and enormous data analytics to form brilliant machines. According to Jeff Immelt, chief executive, GE Electric, IIoT might also be a "lovely, required and investable" benefit. The powerful philosophy behindhand IIoT is that, smart machines are more precise and reliable than humans in interactive through data. And, this data can support company's choice disorganizations and difficulties sooner. IoT holds great potential for control and sustainability. Applications for tracking goods, real time information exchange about inventory among suppliers and retailers and automatic delivery will increase the supply chain efficiency. Consistent with GE the event industry productivity will generate \$10 trillion to \$15 trillion in GDP worldwide over next 15 years.

### **5. Smart Cities**

Smart city is another great application of IoT creating interest among world's population. Smart exploration, automatic shipping, smoother energy management systems, water circulation, city security and environmental monitoring all are examples of internet of things applications for smart cities. IoT will solve

major problems faced by the people living in cities like pollution, holdup and lack of energy supplies etc. Goods like cellular communication allowed Smart Middle trash will send warnings to municipal service station when a bin must be deflated. By installing sensors and using web applications, citizens can find free available parking slots across the town. Also, the sensors can detect meter tampering issues, general malfunctions and any installation issues within the electricity system.

#### 6. IoT in agriculture

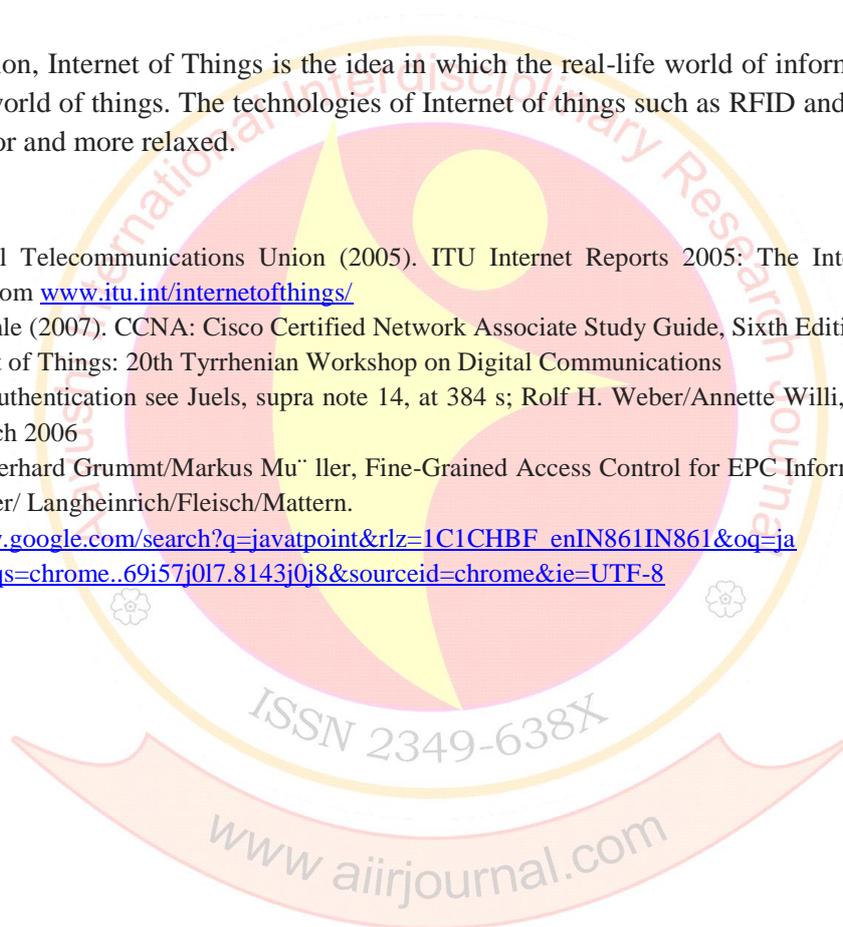
With the constant rise in world's population, demand for food quantity is tremendously raised. Governments are helping farmers to use advanced techniques and research to extend food production. Smart farming is one among the fastest growing field in IoT. Farmers are using meaningful insights from the info to yield better return on investment. Identifying for soil moisture and nutrients, monitoring water usage for plant development and defining custom compost are some modest uses of IoT.

#### Conclusion –

In conclusion, Internet of Things is the idea in which the real-life world of information technology linked to the real world of things. The technologies of Internet of things such as RFID and Sensor make our life become superior and more relaxed.

#### References-

1. International Telecommunications Union (2005). ITU Internet Reports 2005: The Internet of Things. Retrieved from [www.itu.int/internetofthings/](http://www.itu.int/internetofthings/)
2. Todd Lammle (2007). CCNA: Cisco Certified Network Associate Study Guide, Sixth Edition.
3. The Internet of Things: 20th Tyrrhenian Workshop on Digital Communications
4. For RFID authentication see Juels, supra note 14, at 384 s; Rolf H. Weber/Annette Willi, IT-Sicherheit und Recht, Zurich 2006
5. See also Eberhard Grummt/Markus Müller, Fine-Grained Access Control for EPC Information Services, in: Floerkemeier/ Langheinrich/Fleisch/Mattern.
6. [https://www.google.com/search?q=javatpoint&rlz=1C1CHBF\\_enIN861IN861&oq=javatpoint&aqs=chrome..69i57j0l7.8143j0j8&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=javatpoint&rlz=1C1CHBF_enIN861IN861&oq=javatpoint&aqs=chrome..69i57j0l7.8143j0j8&sourceid=chrome&ie=UTF-8)



## कास पठार - जैवविविधतेवर पर्यटनाच्या परिणामांचा भौगोलिक अभ्यास

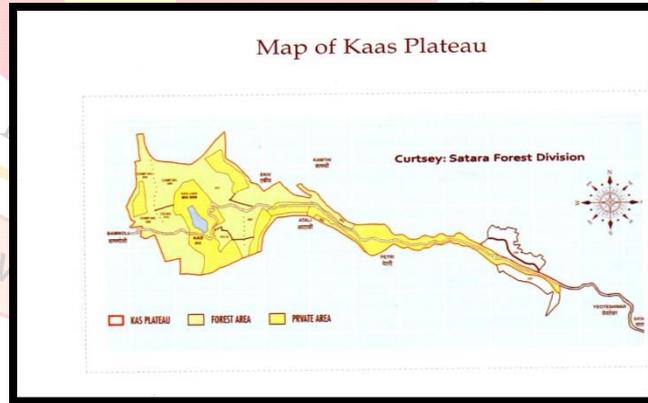
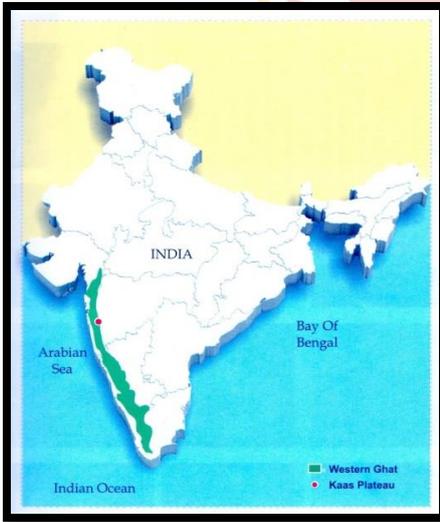
राहुल शांताराम पवार,  
सहाय्यक प्राध्यापक

### प्रस्तावना -

महाराष्ट्रातील सातारा जिल्ह्यात कास पठारावर ऑगस्ट, सप्टेंबर, ऑक्टोबर, आणि नोव्हेंबर महिन्यात निसर्गाचा एक चमत्कार पहावयास मिळतो, तो म्हणजे कास पठारावर फुलणारी विविध बहुरंगी फूले. या पठारावर लाल मातीचा बारीक थर, सच्छिद्र जांभा खडक, पर्जन्य, आर्द्रता, तापमान इ. भौगोलिक घटक वनस्पतीच्या वाढीस पोषक आहेत. येथे बहुतांश वनस्पती सपुष्प आढळतात. जागतिक वारसा स्थळ म्हणून जाहीर झाल्यापासून कास पठारावर पर्यटकांच्या संख्येत दिवसेंदिवस वाढ होत आहे. पर्यटनामुळे स्थानिक गावांच्या विकासाला चालना मिळत असली तरी प्रत्यक्ष जैवविविधतेने अतिशय संवेदनशील असलेल्या कास पठारावर त्याचा विपरित परिणाम होत आहे.

**अभ्यास क्षेत्र** - कास पठार हे महाराष्ट्रातील सातारा जिल्ह्यात, सातारा शहरापासून 23 किमी अंतरावर आहे.

- कास पठार - अक्षवृत्तीय विस्तार १७अंश ४२ मि. ते १७अंश ४५मि. उत्तर रेखावृत्तीय विस्तार ७३अंश ४७ मि. ते ७३अंश ५६ मि. पूर्व.



कास पठार १७९२ हेक्टरवर पसरलेले असून त्यापैकी ११४२ हेक्टर वनखात्याची तर ६५० हेक्टर खाजगी क्षेत्राची मालकी आहे. समुद्रसपाटीपासून उंची १२१३ मी. आहे. सरासरी पर्जन्य ३००० ते ३५०० मीमी आहे. तर सरासरी किमान १० अंश से. ते कमाल ३० अंश से. तापमान आहे. हे पठार कातळ खडकाचे, कमी माती व अन्य द्रव्य असलेले आहे.

### उद्दिष्टे-

- कास पठारावरील जैवविविधता अभ्यासणे.
- कास पठारावरील पर्यटनाचा आढावा घेणे.
- कास पठारावर होणाऱ्या पर्यटनामुळे जैवविविधतेवरील परिणाम अभ्यासणे.

## संशोधन पद्धती-

### महितीचे संकलन

- सदर माहिती ही प्राथमिक व द्वितीय माहिती स्रोतांवर अवलंबून आहे. प्राथमिक माहितीसाठी पर्यटक व कासपठार सुरक्षा समितीच्या कर्मचाऱ्यांच्या मुलाखती, अनुसूची इत्यादीचा वापर केला.
- 150 अनुसूचीद्वारे प्राथमिक माहिती गोळा करण्याचा प्रयत्न केला.
- प्रत्यक्ष निरीक्षणे केली.
- वर्तमानपत्र, मासिके, विविध लेख, पुस्तके, इंटरनेट इ. च्या माध्यमातून दुय्यम माहितीचे संकलन केले.

### विश्लेषण व सादरीकरण

माहितीचे विश्लेषण व सादरीकरण विविध तक्ते, स्तंभालेख, विभाजित वर्तुळे इ. च्या आधारे केले आहे.

### कास पठारावरील जैवविविधता

#### वनस्पती विविधता



सोनकी

रानहळद

कावळा

आभाळी



तेरडा



टोपली कार्वी



मंजिरी

- 70 % गवतवर्गीय, 6 % झुडुपे, 12% झाडे आणि 12% वेलींचे प्रमाण आहे. कासपठारावरील अनेक फुले दुर्मिळ आहेत. सोनकी, आभाळी, रानहळद, तेरडा, कावळा ही काही प्रमुख फुले यावर्षी फुलली आहेत.
- काही फुले सात, नऊ तर काही बारा वर्षांनी फुलणारी आहे. उदा. सात वर्षांनी फुलणारी टोपली कार्वी आहे.

➤ प्राणी विविधता-

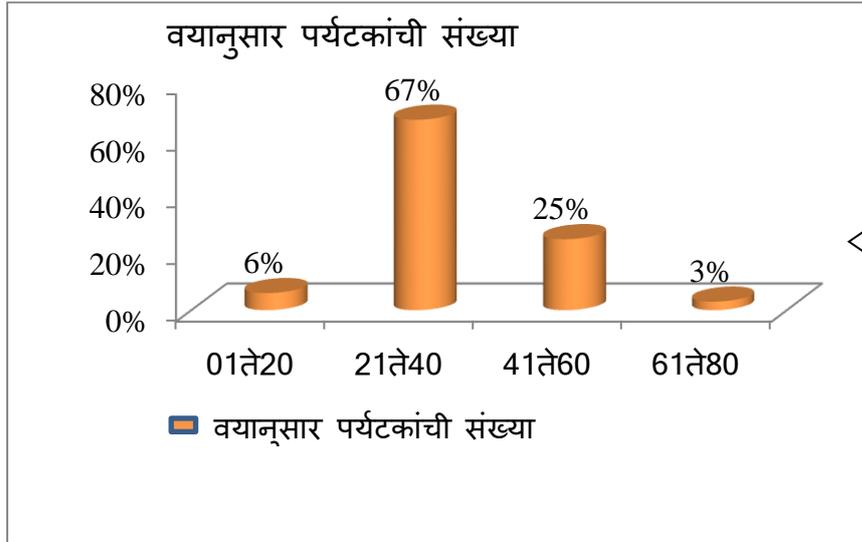


- 11 प्रजाती पैकी 47 जाती धोक्यात, पैकी 6 अतिशय धोक्यात आहेत.
- विविध फुलपाखरांच्या 32 प्रजाती.
- पक्षांच्या 30 प्रजाती.
- सरपटणा-या प्राण्यांच्या 19 प्रजाती आहेत.
- सस्तन प्राण्यांच्या 10 प्रजाती - ससा, शेकरू, डुक्कर, गवारेडा, बिबट्या, इ.

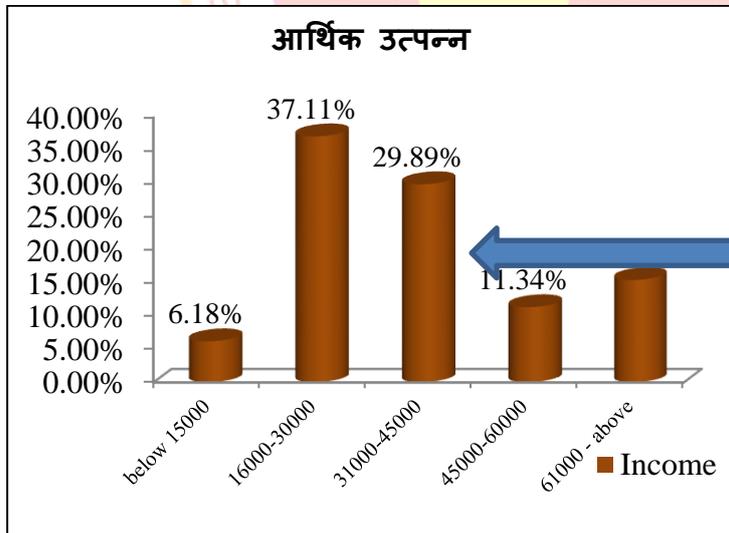
कास पठारावरील पर्यटन -

- युनेस्कोने जागतिक वासरा स्थळ म्हणून जाहिर केल्यानंतर कास पठारावरील पर्यटनात गेल्या चार वर्षात वाढ झाली आहे.

- शनिवार, रविवार व शासकिय सुट्ट्यांच्या दिवशी 3000 ते 4000 पर्यटक भेट देतात. इतर दिवशी 1000 ते 1500 पर्यटक येतात.
- एक बहाराच्या काळात सरासरी 60000 पेक्षा जास्त पर्यटक भेट देतात.
- 100 रु प्रतीव्यक्ती प्रवेश फी तर 50 ते 100 रु वाहनतळ कर आकारला जातो. यातून 4 ते 5 कोटी रूपयांचे उत्पन्न उपलब्ध होते.
- आर्थिक उत्पन्नाच्या 50% रक्कम स्थानिक गावांच्या विकासासाठी वापरली जाते.



सर्वसाधारण २१-४० वयोगटातील युवा पर्यटकांची संख्या सर्वाधिक

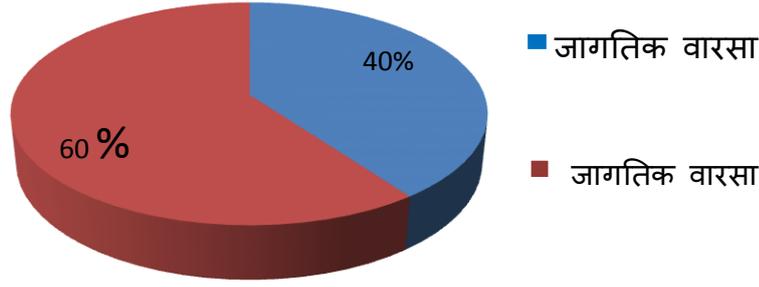


16000 & 45000 आर्थिक उत्पन्न असणाऱ्या पर्यटकांची सर्वाधिक संख्या

### जागतिक वारसाची माहिती

भेट देणारे बहुतेक पर्यटक केवळ मौज मजा करण्यासाठी येतात यापैकी कित्येक पर्यटकांना कास पठार हे जागतिक वारसा स्थळ म्हणून युनेस्को ने जाहिर केले आहे याची माहिती देखील नसते.

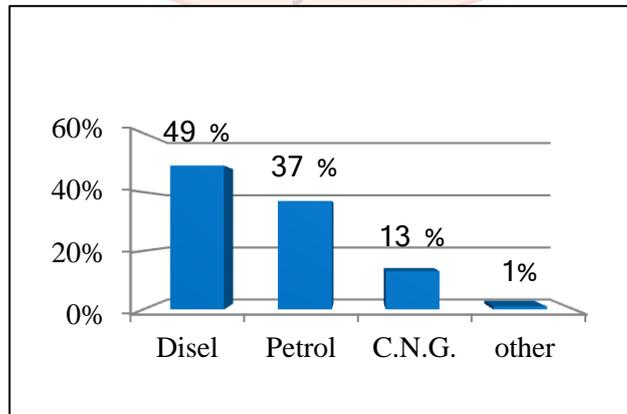
### जागतिक वारसाची माहिती



### कासपठारावरील पर्यटनाचे परिणाम

- कास पठारावर रोज हजारो लोक भेटी देतात, त्यांच्या श्वासोच्छ्वासातुन निर्माण होणारा कार्बनडायऑक्साइड फुलांसाठी घातक ठरतो.
- पर्यटकांच्या शरीरावरील रासायनिक सुगंधी द्रव्यांचा घातक परिणाम फुलांवर होतो.
- पर्यटकांना फोटो काढण्याचा मोह आवरता येत नाही आणि ते फुलझाडांना तुडवत, त्यावर झोपून फोटो काढतात.
- गुटखा, तंबाखू, सिगारेट इ. पदार्थांच्या सेवन व थुंकण्यामुळे फुलांवर परिणाम होतो.
- पर्यटकांच्या नैसर्गिक विधीतुन निर्माण होणारा अमोनिया वायू फुलांचा बहार गळण्यास कारणीभूत ठरतो.
- पर्यटकांच्या गाड्यांतून कार्बन मोनाक्साइड, कार्बनडायऑक्साइड व नाइट्रस डाय ऑक्साइड वातावरणातील बाष्पात मिळून आम्ल पर्जन्याची निर्मिती करतात. यात प्रामुख्याने डिझेल गाड्यांमुळे होणारे प्रदुषण अधिक आहे.

डिझेल	पेट्रोल	सी. एन.जी.	इतर
49 %	37 %	13%	1%



पर्यटकांच्या अतिवावरामुळे कितकभक्षक वनस्पती आपले अन्न मिळवू शकत नाहीत. कारण कितक वनस्पतींवर बसत नाहीत. उदा. डधंसेरा

पर्यटकांची गर्दी आणि त्याच्या वाहनांमुळे वाढणाऱ्या तापमानाने कास पठारावरील फूले कोमेजून जात आहेत.

### निष्कर्ष -

- कास पठारावरील पर्यटनाचे चांगले वाईट परिणाम होत आहेत.
- पर्यटन व्यवसायामुळे स्थानिकांना रोजगार उपलब्ध होत आहे.
- पर्यटनाच्या निधीतून मिळणारा पैसा स्थानिक पाच गावांच्या विकासासाठी वापरला जातो.
- कास पठारावर येणारे बहुतांश पर्यटक युवा वर्ग, उच्चशिकक्षित, सधन आहेत परंतु कास पठाराच्या जैवविविधतेची फारशी माहिती नसणारे आहेत.

कास पठारावरील पर्यटनामुळे आर्थिक फायदा होत असला तरी वाढते प्रदूषण, बेजबाबदार आणि असंवेदनशील पर्यटक यामुळे जैवविविधतेला अत्याधिक धोका निर्माण झाला आहे.

### उपाय -

- गर्दी कमी करण्यासाठी भेट देणाऱ्या पर्यटकांच्या संख्येवर नियंत्रण ठेवणे ऑनलाइन बुकिंग सक्तीची करावी, व नियमांचे काटेकोर पालन करणे.
- ताजमहल व अजिंठा लेणीच्या धरतीवर वाहन तळ कास पठाराच्या अलीकडे कमीत कमी 3 कि.मी दूर असावे. 10 कि.मी अगोदर गाड्यांची पी.यु.सी. तपासणी करावी.
- वाहनतळ ते पठार जाण्यासाठी विद्युत गाड्यांचा वापर करावा.
- सुरक्षारक्षकाच्या संख्येत वाढ करून पर्यटकांच्या वर्तणुकीवर नियंत्रण ठेवणे.
- पर्यटकांच्या बॅग व वस्तु ठेवण्यासाठी व्यवस्था करावी जेणेकरून खाद्यपदार्थ व इतर कचरा होणार नाही.
- गुटखा तंबाखू चघळणा-या पर्यटकांच्या प्रवेशावर सक्तीने निर्बंध घालावेत.

थोडक्यात कास पठाराच्या संवर्धनासाठी युनेस्को आपल्यापरीने प्रयत्न करेलच परंतु भारतातील या जैवविविधतेचे खरे मुल्य समजून त्याच्या संवर्धनासाठी प्रत्येक पर्यटकाने, नागरीकाने तेवढाच हातभार लावणे आवष्यक आहे. तरच कास पठार जागतिक वारसा म्हणून पुढच्या पिढीला पहावयास मिळेल.

## जलसाक्षरता काळाची गरज

डॉ. विष्णु जायभाये,  
सहाय्यक प्राध्यापक

### प्रस्तावना-

जे पाण्याचा विचार करतात , ते जीवनाचा विचार करतात. कारण पाणी म्हणजे जीवन आणि जीवन म्हणजे पाणी, एवढे अनन्यसाधारण महत्व असलेले हे पाणी म्हणजे पंचमहाभूतांपैकी एक, आग विझवणारे पाणी. पण आता पाण्यासाठी माणसांची माने पेटू लागली तर विझवायची कशी? थोडक्यात पाणी टंचाई आणि त्या मुळे तंटे असेच वाढत राहतील आणि होणारे तिसरे महायुद्ध पाण्या साठीच असेल असेही म्हटले जाते.

पाण्याअभावी भविष्यात निर्माण होणा-या जल संकटावर मत करण्यासाठी पाण्याबाद्दक जेव्हा ज्ञान लोकांपर्यंत पोहचविता येईल तेव्हा पोहचविले पाहिजे. ज्ञानामुळे समस्या सुटतात अज्ञानातून प्रश्न निर्माण होतात.

पाण्याबद्दल लोकांना ज्ञान कमी आहे का? ज्ञान कमी आहे असे म्हणणेही योग्य वाटत नाही. लोकांमध्ये सामाजिक बंधीकीचे विस्मरण होत उपलब्ध पाण्याचे वारेमाप शोषण होत आहे. त्याच साठी जल साक्षरतेची प्राधण्याने गरज आहे. उपलब्ध पाण्याचा वापर चुकीच्या पद्धतीने होत असून वारंवार दुष्काळाचाही फेरा सुरु आहे. यावर मत करण्यासाठी सामाजिक जल साक्षरता नितांत गरजेची ठरते. आचरणास विचारांची जोड देऊन; आचारातून सवयी आणि सवयीतून स्वभाव बदल आणि त्यातून एकूण व्यक्ति बदल अशा विचारधारेवर अधारीत संस्कार शिंपण करीत जल साक्षर समाजाचीनिर्मिती करावी लागेल.

शुद्ध पाणी ही एक दुर्मिळ नैसर्गिक देणगी आहे. एकूण उपलब्ध पाण्याच्या ९७% पाणी समुद्राचे खारे पाणी आहे तर उरलेल्या ३% पाण्यापैकी २% पाणी हिमनद्या व ध्रुवीय प्रदेशातील बर्फामध्ये आहे. म्हणजेच फक्त १% पाणी मानवी उपयोगासाठी उपलब्ध असून त्यापैकी ६२% पाणी सहज उपलब्ध असून ३८% पाणी भूमिगत आहे.

जागतिक उपलब्ध पाण्या पैकी २% पाणी भारताच्या वाट्याला आले असून; जगाच्या एकूण पृष्ठभागाच्या ४% जमीन तर एकूण लोकसंख्ये च्या १७% लोकसंख्या आणि जगाच्या तुलनेत १५% गुराढोरांची संख्या भारतात आहे. त्यामुळे भूमीवरील जाल्स्त्रोतांवर प्रचंड दबाव पडतो. भारतात सरासरी ११७० मिमी पाऊस पडतो आणि तो पुरेसा असल्याचे भासते. मात्र पाऊस पडण्याच्या वेळा, कालावधी, प्रमाण आणि क्षेत्र यात भिन्नता आहे. पाऊस पडण्याची शक्यता ही देखील बेभरवश्याची असून ती लहरी हवामान वर अवलंबून आहे.

भारतात दरवर्षी दर माणसी ४०० दशलक्ष हेक्टरपाणी पावसा द्वारे मिळते. वाढत्या लोकसंख्येमुळे आणि पाणी उपलब्धता कमी होत असल्याने दर माणसी १९०० घनमीटर पाणी वाट्यास येते.

पाणी उपलब्धता आणि वितरण तक्ता क्र.-१

सन	लोकसंख्या (कोटीमध्ये)	पाण्याची उपलब्धता (घनमीटर मध्ये)
१९५१	३६.१	५१७७
१९९१	८४.६	२२०७
२००१	१०२.७	१६२०
२०२५	१४१.४ (अंदाजित)	१३४१
२०५०	१६४.० (अंदाजित)	११४०

ज्या ठिकाणी दरडोई एकहजार घनमीटर पेक्षा कमी पाणी आहे किंवा शेतीच्या संधर्भात दे हेक्टरी ३ घनमीटर पेक्षा कमी पाणी आहे; तेथील जल व्यवस्थापण समाधानकारक स्तरावर आणणे काहीसे कठीण आहे. महाराष्ट्र राज्याचे क्षेत्रफळ ३०.७ लाख हेक्टर असून जलसंपत्ती सुमारे सुमार ४३५० लाख टी.जी.एम.आहे; कोकणात महाराष्ट्राच्या १०% क्षेत्रफळ असून महाराष्ट्राच्या जलसंपत्ती पैकी ४६% पाणी पावसाद्वारे मिळते.

कोकणात पडण्याचे पावसाच्या ५% पाण्याचा वापर होतो. या करिता सामाजिक, प्रशासकीय नेतृत्व जबाबदार असून; येथे ख-या अर्थाने जल साक्षरतेची गरज आहे. शास्त्रीय पद्धतीने जल व्यवस्थापण केल्यास तसेच जमिनीची झीज टाळत हरित अच्छादन वाढविल्यास; लोकसंख्या नियंत्रित करून पाण्याची कमतरता टाळणे शक्य आहे.

देशाच्या भावी पिढीची पाण्याची गरज ओळखून खालील स्वरूपाचे धोरण राबविणे आवश्यक आहे.

१. पाणी ही राष्ट्रीय तसेच नैसर्गिक संपत्ती आहे हे आक्रमक पणे ठसवून; तिची मालकी आणि सम प्रमाणात ती वापरण्याचा अधिकार देशातील सर्व लोकांचा आहे.
२. पियाच्या पाण्याची टंचाई, तसेच दुष्काळावर मत करण्यासाठी पावसाचा थेंब न थेंब अडविणे व मुराविणे यासाठी शास्त्रोक्त पाणलोट विकास कार्यक्रम राबविणे हा एकमेव मार्ग आहे. वाचवून
३. पाण्याचा प्रत्यक्ष वापर करणा-यांकडून पाणी वापराचा योग्य तो अधिभार वसूल करता यावा ; या साठी लाभधारकांच्या पाणी संस्था स्थापन करण्यात याव्यात.
४. शेतीसाठी पाणी वापर करताना तुषार अथवा ठिबक प्रणालीचा वापर बंधनकारक असावा.
५. भू-गर्भातील जलसाठ्याचे पुनर्भरण न करता पाणी उपसणे हा गंभीर गुन्हा समजण्यात यावा.
६. पाणीसाठ्याची बाष्पी भवनाने होणारी हानी कमी करणे खर्चिक असेली तरीही ती प्राधान्याने करण्यात यावी.

७. डॉंगरमाथ्यावरून पायथ्याकडे वाहणारे पाणी अडविण्यासाठी सोपे आणि योग्य उपाय योजने गरजेचे आहे.
८. पावसाळ्याच्या अखेर उघड्या नाल्यातून वाहणारे पाणी अडविण्यासाठी वनराई अगर तस्तम बंधारे उपयुक्त आणि किफायतशीर ठरतात.

तक्ता क्र.२- पाणी अपव्यय टाळण्यासाठी उपाय योजना

वापराचा प्रकार	पाण्याचा अपव्यय	उपाययोजना
दात घासण्यासाठी	बेसिन मधील नळाचा वापर केल्यास ४/५ लिटर अपव्यय	मग/ग्लासचा वापर केल्यास ३/४ लिटर पाणी बचत
दाढी करण्यासाठी	बेसिन मधील नळाचा वापर केल्यास १० ते २० लिटर अपव्यय	मग/ग्लासचा वापर केल्यास २ ते लिटर पाणी वापर
स्नानासाठी	शॉवर मुळे ८० लिटर अपव्यय तर टब बाथ घेतल्यास १०० ते १५० लिटर अपव्यय	बदली वापरल्यास २० लिटर वापर. शॉवर चा नियोजन बद्ध वोर केल्यास २५/३० लिटर पाणी वापर
हात धुण्यासाठी	बेसिनमधील नळाचा वापर केल्यास २ लिटर	मगचा वापर केल्यास अर्धा लिटर
कपडे धुण्यासाठी	वॉशिंग मशीन वापरल्यास २६० लिटर वाहता नळ वापरल्यास २४० लिटर	बादलीचा वापर केल्यास ४० लिटर
हॉटेल्स कॅटीन मध्ये	ग्लास भरून पाणी दिले जाते पाणी उष्टे होऊन राहिलेले पाणी वाया जाते .	आवश्यक तेवढे घोटभर पाणी ओतून घेणे, म्हणजे पाण्याची बचत.

९. लोकसंख्या १२५ कोटीवर स्थिर व्हायला, तसेच अनुत्पादक गुरांची संख्या नियंत्रित करण्यासाठी राष्ट्रीय मतैक्य घडवून आणणे.
१०. विलासी राहणीमानामुळे होणारा पाण्याचा गैरवापर रोखून, साधी संयमित आणि स्वच्छ राहणीमान अंगीकारण्यास समाजाला प्रेरित करणे.
११. पाण्याचा थेंब न थेंब साठवून पिण्या साठी छपरावर पडणाऱ्या आणि इतर कामांसाठी वाहून जाणा-या पाण्याचे प्रभावी जतन करणे व त्यासाठी देशव्यापी मोहीम राबविणे.
१२. पाण्याच्या घरगुती अगर शेती कामासाठी पुनःवापराचा नियम करणे.

‘पाण्यासारखा पैसा खर्च झाला’, या सारख्या उक्तीतून समाजाची पाण्याविषयीची मानसिकता दिसून येते. या करिता दृष्टीकोनात बदल आवश्यक असून त्याला अनुसरून आचरण सुधारण्याची गरज आहे.

जल साक्षरतेच्या माध्यमातून खालील गोष्टींचे ज्ञान लोकांपर्यंत पोहचविले पाहिजे.

१. ग्रामिण भागात पिण्याच्या पाण्यासाठी येणाऱ्या अडचणी व त्यावरील उपाय.
२. शहरीभागात पाण्याचा होणारा अपव्यय व त्यावरील उपाय.
३. शेतीची सध्याची प्रचलित सिंचन पध्दती, त्यामुळे होणारे नुकसान, सुधारीत सिंचन पध्दतीचे फायदे व त्यातून उत्पादादन वाढ या विषयी चे प्रशिक्षण.

४. औद्योगीकरणामुळे होणारा पाण्याचा अवाजवी वापर, जल प्रदूषण आणि त्यावरील उपाय.
५. बशिपभावानामुळे होणारी पाणी पातळीतील घट आणि त्यावर उपाय.
६. व्यक्तिगत पाणी वापरावर नियंत्रण.
७. पाणी पुनर्भरण, पाणी अडवा -जिरवा आणि साठवा धोरण
८. लाखो, करोडो कुटुंबे सकाळी अब्जावधी लिटर पाणी शिळे झाले म्हणून गटारात सोडून देतात, मात्र जलाशयात महिनो महिने साठवलेले पाणी ताजेच असते हे शिकविणे म्हणजेच जल साक्षरता होय.
९. दगडाचे देव धुतल्या शिवाय स्वच्छ होत नाहीत हा भ्रम आहे हे संत गाडगेबाबा किर्तनातून सांगतात, मात्र आजही त्या साठी करोडो लिटर पाणी वाया घालवले जाते.
१०. रस्त्याच्या कडेला सार्वजनिक जागेतील वाहता नळ बंद करण्याची सवय म्हणजेच 'सुजल संस्कृत जल साक्षरता होय'.
११. 'ज्याच्या शेतात पाणी नाही, त्याच्या डोळ्यात पाणी', अशा सहज समर्पक आणि सोप्या शैलीत जलसाक्षर करणाऱ्या म्हणी समाजात रूढ करणे म्हणजेच जलसाक्षरता.
१२. मंदिरात प्रवेश करताना जर पाण्याचा नळ असेल तर हातपाय धुण्याच्या सबबी खाली प्रति स्नान उरकले जाते. त्यावाजी वाहता झरा ठेवल्यास फक्त पाय भिजवून पुढे जातात.
१३. आडवी-सरळ करावयाची तोटी काढून, केवळ तोटी दाबल्यावरच पाणी येईल अशी वाव्यस्था केल्यास हजारो लिटर पाणी वाचू शकते.
१४. सकाळी बेसिन मध्ये अखंड सुरु असणारा नळ, बाथरूम मध्ये कपडे धुताना वाहणारा नळ या सवयी बदलल्या तरी लाहो लिटर पाण्याची बचत होवू शकते.

या बाबी अंगभूत सवयीमध्ये रूपांतरीत होणे म्हणजेच जलसाक्षरता होय.

- ग्रामिण भागांमध्ये हातपंपातली गळती, पाणी पुरवठा करणाऱ्या पाईप लाईन मधील गळती या बाबी आपत्ती मानून त्या वर तातडीने उपाय करण्याचे धोरण म्हणजेच जल साक्षरता होय.
- पिकांना त्यांच्या गरजे नुसार तुषार किंवा ठिबक पद्धतीने पाणी देण्याच्या तंत्राचा वापर करणे म्हणजे जलसाक्षरता होय.
- पाण्याचा पुनर्वापर याच धोरणावर उद्योग प्रकल्पांची उभारणी झाली पाहिजे.
- एकीकडे पाण्याच्या अतिवापरामुळे जमीन क्षारयुक्त/चिबड होत असताना दुसरीकडे तृषार्त होऊन भेगा पडलेल्या जमिनी हे दृश्य नियोजनाच्या अभावावर प्रकाश टाकणारे आहे. ही परिस्थिती बदलण्यासाठी केले जाणारे प्रयत्न म्हणजेच जलसाक्षरता होय.

संदर्भ :

१. संपूर्ण पर्यावरण शास्त्र -प्रा. चौधरी पी. ए.
२. पर्यावरण समस्या निराकरण व क्षेत्र -डॉ. श्रीकांत कार्लेकर
३. पर्यावरण शिक्षण-डॉ. घोर्मोडे यु.के.
४. पर्यावरणीय समस्या -समाधान की चुनौती-राम सिंह
५. आपत्ती व्यवस्थापन संकल्पना आणि कृती- मराठे प्र. प्र.
६. पर्यावरण शास्त्र - विठ्ठल धारपुरे
७. पर्यावरण विज्ञान -प्रा. अहिरराव र. वा.
८. लोकराज्य- जुन २०१८

## पश्चिम घाट- जैवसंपत्तीचे धोके व संवर्धनाची गरज

डॉ.पुजा मोहिते,  
सहाय्यक प्राध्यापक

### प्रस्तावना –

भारतात पश्चिम घाटाचे अस्तित्व अतिशय महत्वाचे आहे मात्र पश्चिम गहातातील उर्जा प्रकल्पांमुळे अनेक जैवविविधता धोक्यात येत आहे. अनेक विकास योजनांमुळे जसे धरणे, रस्ते, खाणी, जंगलतोड यामुळे जैव विविधता धोक्यात येवू लागली आहे. जगात कोठेही न आढळणाऱ्या प्राणी पक्षांच्या जाती पश्चिम घाटात आढळतात त्यामुळे पश्चिम घातला जागतिक वारसा लाभला आहे. अशा या घाटाचे महत्व जाणून घेणे मानवाच्या दृष्टीने आणि पर्यावरणाच्या दृष्टीने हितावह आहे.

### ध्येय उद्दिष्टे –

पश्चिम घाटातील जैवविविधतेचे महत्व अभ्यासताना खालील उद्दिष्ट्ये प्रामुख्याने अभ्यासली जाणार आहेत.

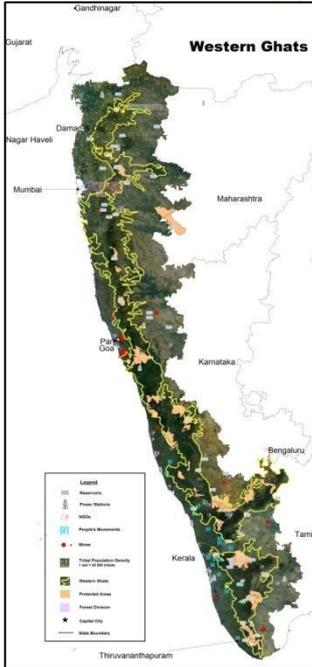
1. पश्चिम घाटातील जैवविविधतेचे महत्व अभ्यासणे.
2. पश्चिम घाटाच्या -हासाची कारणे अभ्यासणे.
3. जैवविविधतेच्या संवर्धनासाठी उपाय

### अभ्यास पद्धती –

शोध निबंधासाठी प्रस्तुत केलेली माहिती प्राथमिक व द्वितीय स्त्रोताच्या आधारे केली आहे. सदर माहिती वर्तमान पत्रे, स्थानिक मासिके ,अहवाल, विकिपीडिया, विविध पुस्तके, शोधनिबंध व इंटरनेटचा वापर केला आहे . तसेच निरीक्षण व पाहणीतून अभ्यासले गेले आहे.

### पश्चिम घाटाची भौगोलिक ओळख –

भारताच्या पश्चिम किनार्याला समांतर असा उभा उत्तर दक्षिण पसरलेला पर्वत म्हणजे सहयाद्री पर्वत किंवा पश्चिम घाट होय. तापी नदीच्या दक्षिणेकडून महाराष्ट्र व गुजरातच्या सीमेजवळ पश्चिम घाटाला सुरवात होते. ह्या पर्वताची लांबी 1600 किमी आहे. पश्चिम घाटात महाराष्ट्र गोवा कर्नाटक केरळ आणि तमिळनाडू या राज्यांचा समावेश होतो. या घाटाची रुंदी 100 किमी च्या दरम्यान आहे. तसेच याची ऊंची सरासरी 1200 मी इतकी आहे. पश्चिम घाटात अनेक उंच उंच शिखरे आहेत.



पश्चिम घाटातील हवामानात सुद्धा बदल आढळतो. पश्चिम घाटातील उंचीनुसार हवामानात बदल होताना दिसून येतो. जास्त उंचीवर ३-४ अंश से.ग्रे. तापमान आढळते तर कमी उंचीच्या प्रदेशात तापमानाचा दर १५ अंश से.ग्रे. आढळते. अतिउंच भागात कायम धुके असते व हिवाळ्यात येथील तापमानात प्रचंड घट होऊन दक्षिण व उत्तर भागात तापमानात विविधता दिसून येते. पश्चिम घाटात पर्जन्याच्या वितरण मध्येही विविधता आढळते. कोकणात सरासरी ३००० ते ४००० मिमि. तर देशावर ८०० ते १००० मिमि. असे पावसाचे प्रमाण दिसून येते तर विषुवृत्ताजवळील घट प्रदेशात थोडाच पाऊस पडतो पण वर्षभर पाऊस पडतो.

पश्चिम घाटाच्या व उत्तर व दक्षिण भागात पानझडी व सदाहरित वृक्ष आढळतात. घाटाच्या उत्तरेला कमी आर्द्रता असल्याने कमी उंचीवर पानझडी वृक्ष आढळतात व जास्त उंचीवर सदाहरित वृक्ष आढळतात.

### अभ्यासाचे महत्व-

जैवविविधतेने नटलेल्या पश्चिम घाटाचा जागतिक वारसा यादीत समावेश करण्यात आल्याने सार्या जगाचे लक्ष वेधून घेतले आहे. पश्चिम घाटातील अनेक विकास प्रकल्पांमुळे पश्चिम घाटातील पर्यावरण व जैवविविधतेला धोका निर्माण झाला आहे. या भागात असंख्य प्राण्यांच्या प्रजाती, दुर्मिळ, संकटग्रस्त, स्थानिक वनस्पति आहेत. यातील काही वनस्पति आणि प्राणी यांच्या प्रजाती जगाच्या पाठीवर कोठेही सापडत नाहीत. त्यामुळे पश्चिम घाटाला हॉट स्पॉट रिजन म्हणून ओळखले जाते. या संवेदनशील प्रदेशातील जैवविविधतेचे महत्व अभ्यासून जैवविविधतेच्या संवर्धनासाठी उपाययोजना सुचवणे.

### जैवविविधता म्हणजे काय ?

ब्राझिल मध्ये इ.स. 1982 मध्ये वसुंधरा शिखर परिषद संपन्न झाली. त्यावेळेपासून जैवविविधता हा शब्द प्रचलित झाला. मानवाचा वाढता विकासाचा प्रभाव वनस्पति प्राणी यावर होऊ लागले आणि त्यातूनच जैवविविधतेच्या संवर्धनासाठी व व्यवस्थापनासाठी लक्ष देण्याची गरज निर्माण झाली आणि त्यातून जैवविविधतेच्या संदर्भात व्याख्या केल्या गेल्या आहेत त्या खालील प्रमाणे आहेत.

1. "पृथ्वीतलवार अस्तित्वात असणाऱ्या वनस्पति, प्राणी, सूक्ष्मजीव, पाळीव प्राणी, वृक्ष इ. जैविक घटकांची विविधता म्हणजे जैवविविधता होय."
2. वाल्टर.डी. रोसेन यांच्या मते "एकाच परिसंस्थेत किंवा परिसंस्थेशी संबंधित क्रियांमध्ये भिन्न जातीच्या भिन्न संख्येच्या सजीवांचे एकत्रीकरण म्हणजेच जैवविविधता होय."
3. "विविध परिसंस्थेतील जैविक घटकांमधील विविधता व प्रकार म्हणजेच जैवविविधता होय."

भारतामध्ये जवळजवळ दहा जैवविविधता असलेली भौगोलिक क्षेत्रे आहे. त्यामध्ये अनेक प्रकारच्या वनस्पतीच्या जाती आहेत. प्राण्यांच्या जाती आहेत त्यांना महत्व आहे. हयातीलच एक महत्वाचे क्षेत्र म्हणजे पश्चिम घाट आणि पश्चिम घाटातील जैवविविधतेमुळे त्याला अतिसंवेदनशील प्रदेश म्हणून ओळखले जाते.

### पश्चिम घाटातील जैवविविधता :-

पश्चिम घाटातील पर्यावरण दृष्ट्या संवेदनशील असलेल्या ३९ जागांना यूनेस्कोने जागतिक वारसा दर्जा दिला आहे. डॉ. राजेंद्र शेंडे यांनी जैवविविधता जपण्यासाठी युनेस्कोच्या बैठकीत जागतिक वारसा देण्यासाठी प्रयत्न केले. जागतिक वारसा लाभल्याने या पश्चिम घाटातील जैवविविधतेचे प्रकार कोणते आहेत ते पाहूया

- **पश्चिम घाटातील वनसंपदा-** पश्चिम घाटात विविध प्रकारची वनसंपदा आढळून येते. भारताच्या एकूण वनसंपदाच्या ५% भाग या घटने व्यापला असला तरी यातील पानझडी व सदाहरित वृक्ष या सारखी वनसंपदा अतिशय महत्वाची आहे. या वनसंपदेचे वितरण पुढील प्रमाणे.

1. पश्चिम घाटात जवळपास विविध प्रकारच्या ४५०० प्रजाती आहेत, त्या पैकी १७२० अत्यंत दुर्मिळ गटातील आहेत.
2. पश्चिम घाटात वृक्षांच्या ४०९ प्रजाती आहेत त्या पैकी ३०८ दुर्मिळ गटातील आहेत.
3. ऑर्किड च्या २४५ प्रजाती आहेत त्या पैकी ११२ या स्थानिक आणि दुर्मिळ प्रजाती आहेत.
4. रान तेरडा वनस्पतीच्या ७२ प्रजाती तर कंदीफुलांच्या ४६ प्रजाती दिसून येतात.
5. कारवीच्या १८ प्रजातींची नोंद या घाटात केली गेली आहे.



भारत सरकारने पश्चिम घाटातील अनेक जंगले संरक्षित केली आहेत. त्यात २ राष्ट्रीय उद्याने, १३ जैविक क्षेत्र आणि अनेक अभयारण्ये आहेत. केरळ मधील सायलंट व्हॅली इत्यादींचा समावेश होतो.

● पश्चिम घाटातील प्राणिसंपदा

पश्चिम घाटात हजारो प्रकारची प्राणी संपदा आढळते ती जगात इतरत्र कुठेही आढळत नाही. यातील महत्वपूर्ण प्राणी संपदा पुढील प्रमाणे.

1. सस्तन प्राणी – पश्चिम घाटात सस्तन प्राण्यांच्या १३९ प्रजाती आहेत त्यातील निलगिरी जैविक क्षेत्रात हत्ती मोठ्याप्रमाणात आढळतात तर कर्नाटकातील ब्रम्हगिरी व पुण्यगिरी या अभयारण्यात ही हत्तींचे मोठ्या प्रमाणात वास्तव्य आहे. ही संख्या जवळपास ६००० पेक्षा अधिक आहे. भारतात सापडणा-या एकूण वाघांपैकी १०% वाघ याच भागात दिसून येतात. यातील सर्वात जास्त वाघ कर्नाटक, तामिळनाडू आणि केरळच्या जंगलात आहेत तर रानगाई तसेच सांभर, माकडे, हरणे, बिबट, काळा चित्ता, रानमांजर इ. जंगली प्राणी तसेच गाय, म्हैस, मांजर, कुत्री इ. पाळीव प्राणी ही या घाटात आढळतात.



2. सरपटणारे प्राणी – पश्चिम घाटात सरपटणा-या १६५ प्रजाती



आहेत त्यातील ८९ स्थानिक प्रजाती आहेत. यामध्ये सापांच्या विविध जाती त्यात किंग कोब्रा हा सापांचा राजासुद्धा पश्चिम घाटातच आढळतो. गांडूळ प्रकारचे प्राणी सुद्धा पश्चिम घाटात आहेत. मंडली, गोगलगाय, कसरंड, घोरपड. सरडा, इतर सरपटणारे किडे पश्चिम घाटात मोठ्या प्रमाणात आढळतात.

उभयचर प्राणी – जगामध्ये आढळणा-या जगामध्ये आढळणाऱ्या उभयचर प्राणांच्या १७९ प्रजाती आहेत त्यापैकी ८०% प्रजाती पश्चिम घाटात आढळतात. 179 उभयचर प्राणांच्या प्रजातीपैकी सुमारे 80% प्रजाती पश्चिम घाटामध्ये

आढळतात. त्यातील 89 प्रजाती या स्थानिक प्रकारच्या आहेत. यामध्ये बेडूक जगात कोठेही सापडत नसलेल्या बेडकच्या प्रजाती पश्चिम घाटात आढळतात. कासव या उभयचर प्राण्याच्या सुद्धा अनेक जाती पश्चिम घाटात आढळतात



**जलचर प्राणी** – पश्चिम घाटात जलचर प्राण्यांची सुद्धा मोठ्या प्रमाणात वस्ती स्थाने आढळतात. पश्चिम घाटात माश्यांच्या 104 जाती आढळतात. त्यात खेकडे, झिंगा, मासे असे प्रकार आहेत. तसेच पश्चिम घाटात पानसप पाणघोडा यांचेही प्रकार आढळतात. अनेक छोट्या मोठ्या जलप्रजाती पश्चिम घाटात आहेत.

### **पश्चिम घाटातील पक्षी व कीटक संपदा –**

पश्चिम घाटातील जैवविविधतेतील पक्षी व कीटक संपदे मध्ये मोठ्या प्रमाणात –हास झालेला दिसून येतो पश्चिम घाटात पक्ष्यांच्या 508 जाती आहेत. त्यात कबुतर, बगळा, मैना, पोपटच्या विविध जाती गिधाड, गरुड, घार, कावळा, चिमण्या, मोर, कोकिळा, रानकोंबडी, घुबड इ. अनेक पक्षी पश्चिम घाटात अस्तित्वात आहेत. तसेच पश्चिम घाटात कीटकांमध्ये सुद्धा 450 प्रकारचे कीटक आहेत. त्यात मुंग्या, डोंगळे, भुंगे इ. अनेक प्रकारच्या प्रजाती पश्चिम घाटात आढळतात.

पश्चिम घाटात अश्या विविध प्रकारची जैवविविधता आढळून येते.



### **पश्चिम घाटातील जैवविविधतेचे महत्व –**

पश्चिम घाट हा जैवविविधतेने भरपूर समृद्ध आहे. अनेक प्रकारचे प्राणी, पक्षी, कीटक तसेच घाटातील जैवविविधतेचे मानवाच्या उपभोक्ता, उत्पादकता, सामाजिकता व नैतिकता इ. दृष्टीने महत्व पुढील प्रमाणे सांगता येईल.

1. **औषधी वनस्पति** – पश्चिम घाटातील जैवविविधतेमध्ये अनेक वनऔषधी वनस्पति आढळतात. त्यात कडूलिंब, तुळस, कोरफड, जांभूळ, दूर्वा, म्हाका, आवळा, चिंच, अडुळसा, लवंग, दालचिन, ज्येष्ठमध इ. अनेक वनौषधी पश्चिम घाटात असल्याने मानवाला त्या औषधांचा उपयोग विविध आजारावर करता येतो.
2. **धार्मिक महत्व** – भारतीय संस्कृतीमध्ये पुष्कळ वनस्पति व वृक्षांना महत्वाचे स्थान आहे. वड, पिंपळ, तुळस, दूर्वा, रुई, बेल या हिंदू धर्मात देवपूजेसाठी महत्वाच्या मानल्या जातात. तसेच विविध कार्यासाठी आंब्याच्या पानांचा व विविड फुलांचा उपयोग धार्मिक कार्यासाठी केला जातो. तसेच बैल व गाय यांची पूजा केली जाते. डुक्कर हा प्राणी मुस्लिम लोकांचा दैवत मानले जाते. तसेच हत्ती व कासवलाही धार्मिक दृष्टीने महत्व आहे. तसेच मोर, कावळा या पक्षांनाही धार्मिक दृष्टीकोणातून महत्व आहे.
3. **अन्न पुरवठा** – पश्चिम घाटातील अनेक वनस्पतिपासून मानवाला अन्न उपलब्ध होते त्यात आंबा, काजू, चिकू, फणस, करवंद, कोकम, पेरू, अळू, तोरण इ. फळे तसेच मसाल्याची झाडे आणि रानातील भाज्या ज्यात भारगा कुडा, टाकळा अश्या अनेक भाज्या मानव ग्रहण करतो तसेच अनेक प्रकारची कंदमुळे मानव आपल्या आहारात वापरतो. त्यामुळे मानवाला अन्न पुरवठा करण्यासाठी पश्चिम घाटातील जैवविविधता अतिशय महत्वाची आहे.
4. **रोजगार उपलब्धता** - पश्चिम घाटातील जैवविविधतेवर आधारित अनेक व्यवसाय आज मानवासमोर आहेत. त्यात वनातून मध संकलन, भाज्या, फळे, औषधी वनस्पति यांच्या संकलनातून रोजगार उपलब्ध झाला आहे.

5. **बीज प्रसारासाठी** – पश्चिम घाटातील प्राणी व पक्षी यांचा उपयोग वनस्पतींची बीजे पसरविण्यासाठी मोठ्या प्रमाणात होत आहे. प्राणी व पक्षी वनस्पतींची फळे खावून स्वताच्या विष्टेद्वारे वनस्पतीच्या बियांची दूरवर पखरण करतात. पाऊस पडल्यानंतर मातीशी झालेल्या संयोगातून या बियानन अंकुर फुटतात व जंगल समृद्ध होण्यास मदत होते.
6. **धूप नियंत्रण** – पश्चिम घाटातील वनस्पतीमुळे पश्चिम घाटात पडणार्या पर्जन्यामुळे जी जमिनीची धूप होते ती वनस्पतींच्या अछादानामुळे नियंत्रित ठेवली जाते. वानास्पतीची मुळे खोलवर जावून मुदला घटत चिटकून राहतात त्यामुळे मुद सैल होत नाही आणि त्यामुळेच तिची धूप कमी होण्यास मदत होते.
7. **मृदेची सुपीकता** – पश्चिम घट जैव विविधतेने नटलेला आहे. अनेक प्राणी, पक्षी व वनस्पती यांच्या संपन्नतेमुळे मृदेची सुपीकता वाढण्यास मदत होते. वनस्पतींचा पालापाचोळा, प्राण्यांची विष्ट तसेच मृत प्राणी व कुजलेली फळे-फुले मृदे मध्ये मिसळून तिला सेंद्रिय घटकांचा पुरवठा करतात या सेंद्रिय घटकांमुळे मृदेची सुपीकता वाढते व त्याचा शेतीला ही फायदा होतो.
8. **इंधन उपयुक्तता** – पश्चिम घाटातील वनस्पतींचा वापर मान्वाद्वारे इंधनासाठी मोठ्या प्रमाणात केला जातो. या जंगलातील लाकडांचा ज्वलनासाठी वापर केला जातो तसेच त्या द्वारे मोठ्या प्रमाणात कोल्ह्याची निर्मितीही केली जाते. तसेच, जंगल वैविध्य मुळे पाळीव जनावरांचा वापर केला जातो आणि त्यांच्या विष्टे द्वारे जैविक गॅस ची निर्मिती इंधन हेतूने केली जाते.

● **मानवी कृती व जैवविविधतेस धोके / -हास –**

पश्चिम घाटात विविध सजीवांच्या जाती प्रजाती संख्या विपुल असून त्या सजीवांच्या जाती प्रजातीनं मानवी क्रियांमुळे धोके निर्माण झाले आहेत ते धोके पुढील प्रमाणे.

1. वाढत्या वसाहती.
2. वाढती लोकसंख्या.
3. मानवाचा पर्यावरणावर वाढता हस्तक्षेप.
4. नैसर्गिक संसाधनांचा अतिरिक्ता वापर.
5. लाकूडतोड व वनसंकलन
6. औद्योगीकरण
7. खाणकाम
8. वाढते वाहतूक मार्ग
9. व्यापारी शेती.
10. मानवी कृतीमुळे वणवे लागणे.
11. शिकार
12. ऊर्जा प्रकल्प

पश्चिम घाटातील जैवविविधतेवरील वाढते धोके लक्ष्यात घेता जैवविविधतेच्या संवर्धनाची गरज निर्माण झाली आहे.

● **जैवविविधतेचे संवर्धनासाठी मानवाची जबाबदारी –**

मानवाच्या विविध कृतींमुळे जैवविविधतेला धोका निर्माण झाला आहे. ही जैविकसंपदा पर्यावरण दृष्ट्या तसेच मानवाच्या दृष्टीने अतिशय महत्वाची आहे. त्यामुळे तीचे संवर्धन होणे गरजेचे असून त्या बाबतीत मानवाची भूमिका महत्वाची ठरते.

1. जंगलतोड थांबविणे
2. शिकार थांबविणे
3. नैसर्गिक संसाधने नियोजनपूर्वक व आवश्यक तेवढीच वापरणे
4. वन्यप्राण्यांचे संवर्धन करणे.
5. वृक्ष लागवड करणे.
6. संरक्षित जंगले व अभयारण्ये यांची निर्मिती करणे.
7. उद्याने व प्राणी संग्रहालये निर्माण करणे.
8. आवश्यक तेथील प्राणी संग्रहालये दत्तक घेणे/ सांभाळणे.
9. अतिरिक्त उद्योग व वाहतूक मार्ग यांना आळा घालणे.
10. पर्यावरणीय कायद्यांचे पालन करणे.

● **निष्कर्ष -**

पश्चिम घाट भारतातील जैव विविधतेसाठी अनुकूल क्षेत्र आहे. या क्षेत्रात जवळपास ३१५ जातींचे पृष्ठवंशीय प्राणी आढळतात. भूचर, जलचर तसेच सरपटणारे प्राणी, किटक यांच्या स्थानिक जातींनी संपन्न असलेला हा प्रदेश पर्यावरण समतोल राखण्याच्या दृष्टीने महत्वाचा असून येथील जैविक विविधता संरक्षित करण्यासाठी शासकीय व अशासकीय स्तरावरून विविध संस्थांद्वारे प्रयत्न सुरु आहेत. व्याघ्र प्रकल्प, राष्ट्रीय उद्याने, अभयारण्ये, इत्यादी द्वारे जैविविधतेला संरक्षण दिले जात आहे. वनस्पती व वृक्षांच्या विविध जातींचे संवर्धन करण्याच्या हेतूने स्वतंत्र प्रकल्प राबविले जात आहेत. मात्र पश्चिम घाटातील सद्य परिस्थिती पाहता वरील सर्व योजनांची अंमलबजावणी प्रामाणिकपणे होत असल्याचे दिसून येते नाही. नागरीक, अधिकारी आणि कर्मचारी तसेच समाजातील प्रत्येकाने हे आपले कर्तव्य आहे असे समजून पश्चिम घाट वाचविण्यासाठी प्रयत्न केल्यासच पश्चिम घाटातील ही समृद्धता टिकून राहील.

**संदर्भ साहित्य-**

1. Environment Geography–Savindar Sing.
2. पर्यावरण भूगोल - डॉ. सुभाषचंद्र सारंग
3. पर्यावरणशास्त्र - डॉ. व्ही. जे. पाटील व प्रा. एस. व्ही. ढाळे
4. [www.westernghat.in](http://www.westernghat.in)
5. Wikipedia

## कृषी पर्यटन कोकणातील लोकसंख्येचे स्थलांतर रोखण्याचा नवा आधार

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सहाय्यक प्राध्यापक

### प्रास्ताविक:

भारतीय अर्थव्यवस्थेतील ग्रामीण अर्थव्यवस्थेचे स्वरूप आणि कृषीक्षेत्राचे महत्त्व समजून घेऊन सुमारे १५० वर्षांपूर्वी आपल्या देशाच्या राष्ट्रपित्याने म्हणजेच महात्मा गांधी यांनी भारतीय जनतेला खेड्याकडे चला हा महत्त्वपूर्ण संदेश दिला होता.परंतु स्वातंत्र्योत्तर कालखंडात देश विकासाच्या संदर्भात आखाण्यात आलेल्या वेगवेगळ्या पंचवार्षिक योजनांमध्ये औद्योगिक क्षेत्रावर मोठ्या प्रमाणावर लक्ष दिल्यामुळे उद्योगधंद्याचा मोठ्या प्रमाणात विकास झाला आणि हे उद्योगधंदे देशच्या काही भागात केंद्रित होऊन देशांमध्ये प्रादेशिक असमतोल निर्माण झाला त्याचा परिणाम म्हणून भारताचे शहरी भूगोलीय विभाजन अशा दोन भागात विभाजन झाले. या विभाजनालाच अलिकडच्या काळात इंडिया आणि भारत असे संबोधण्यात येत आहे. शहरीभागात उद्योगधंदे आणि सेवाक्षेत्राचा विकास होऊन एक प्रकारची संपन्न जीवनशैली निर्माण झाली. तर ग्रामीण भाग प्रामुख्याने कृषी आणि कृषीक्षेत्राशी संबंधित असणारे व्यवसाय यांवर अवलंबून राहिला. भारतीय शेतीचे एक महत्त्वाचे वैशिष्ट्य म्हणजे भारतीय शेती ही मान्सूनचा जुगार समजली जाते म्हणजेच भारतीय शेती ही पावसावर अवलंबून आहे आणि पावसाच्या अनिश्चिततेमुळे दरवर्षी देशाच्या अनेक भागात दुष्काळाची तर काही भागात पूरग्रस्त परिस्थिती निर्माण होते त्याचा परिणाम म्हणून शेती उत्पन्नात अनिश्चितता निर्माण होते.त्यातून बेकारी, दारिद्र्य यासारख्या समस्या निर्माण होतात आणि या समस्यांवर मात करण्यासाठी ग्रामीण भागातील अनेक लोक उत्पन्न मिळवून चरितार्थ भागविण्यासाठी शहरीभागाकडे स्थलांतर करतात अलीकडील काळात स्थलांतराचे हे प्रमाण कोकणातील म्हसळा,श्रीवर्धन,तळा,मुळुड जंजिरा आणि माणगाव तालुक्यांमध्ये वाढलेले आहे परिणामी कोकणातील या तालुक्यातील अनेक खेडी माणसाच्या अभावी ओस पडत चालली आहेत शाळा बंद पडत आहेत ओसाड जमिनीचे प्रमाण वाढलेले आहे त्याचा परिणाम जो शेतकरी आपल्या शेतजमीनीत पिकविणारा तांदूळ अन्नासाठी वापरत होता तो शेतकरी दुकानातील तांदूळ विकत घेऊन अन्न म्हणून वापरत आहे शेतजमीन विक्रीचे प्रमाण वाढलेले आहे या समस्येवर कृषी पर्यटन हा प्रभावशाली उपाय ठरू शकेल का? याचा अभ्यास करण्याचा प्रयत्न या शोध निबंधाच्या आधारे करण्याचा प्रयत्न केला आहे.

### संशोधनाचे उद्देश -

- १.पर्यटन संकल्पनेची व्याख्या आणि व्याप्ती समजून घेणे.
- २.कृषी पर्यटनाचा आर्थिक व सामाजिक विकासावर होणारा परिणाम अभ्यासणे
- ३.कृषी पर्यटन केंद्र संकल्पना समजून घेऊन ते निर्माण करण्यासाठी अवश्यक असणा-या पोषक परिस्थितीचा अभ्यास करणे.

### अभ्यासपद्धती व मर्यादा -

प्रस्तुत शोध निबंधासाठी प्रामुख्याने प्राथमिक आणि दुय्यम माहिती साधनांचा उपयोग करण्यात आला असून शोध निबंधामध्ये प्रामुख्याने म्हसळा, श्रीवर्धन,तळा आणि माणगाव या तालुक्यांतील लोकसंख्या

स्थलांतराचा आर्थिक,सामाजिक, शैक्षणिक घटकांवर होणा-या परिणामांचा आढावा घेण्याचा आला आहे ही प्रस्तुत शोध निबंधाचा व्याप्ती व मर्यादा आहे.

### पर्यटन संकल्पना अर्थ व व्याप्ती -

कोणत्याही वस्तूचे उत्पादन न करता विविध लोकांना विविध प्रकारच्या रोजगाराच्या संधी उपलब्ध करून देणारा आणि २१ व्या शतकात अतिशय वेगाने विकसित होणारा, देशाच्या आर्थिक विकासांमध्ये कृषी व उद्योगक्षेत्रापेक्षा आधिक योगदान देण्याचे सामर्थ्य असणारा व्यवसाय म्हणजे पर्यटन व्यवसाय ओळखला जातो. या व्यवसायाची १९४२ मध्ये प्रा.हुझीकेर आणि केप यांनी व्याख्या करताना असे म्हटले की, "पर्यटन म्हणजे कायम स्वरूपाची वस्ती न करण्याच्या हेतूने अनिवासी व्यक्तीच्या सहवसातून आर्थिक उत्पादनाशिवाय असलेली भ्रमंती होय." तर प्रा.व्ही एस हर्मन यांच्या मते "एखाद्या देशात परदेशी व्यक्तीचे आगमन होऊन भ्रमंती करणे आणि परत स्वगृही जाणे म्हणजे पर्यटन होय". यावरून आपणास असे म्हणता येते की, पर्यटन ही बहुक्षेत्रीय प्रणाली असून या प्रणाली मध्ये पर्यटकाने एखाद्या विशिष्ट ठिकाणी भेट देण्याचे निश्चित केल्यापासून त्या ठिकाणाला भेट देऊन परत घरी येईपर्यंत घडलेल्या वेगवेगळ्या क्रियांचा समावेश होतो.अलिकडील काळात हा व्यवसाय अनेक भागात विभागला असून कृषी पर्यटन, आरोग्य पर्यटन, धार्मिक पर्यटन,राजकीय पर्यटन, सांस्कृतिक पर्यटन, क्रिडा पर्यटन, असे पर्यटनाचे विविध प्रकार उदयास आलेले दिसतात."जागतिक पर्यटन व प्रवास परिषदेच्या" अहवालानुसार जगातील १८५ देशांच्या सहभाग असलेल्या या संस्थेत भारत तिस-या स्थानावर असून २०१८ मध्ये पर्यटन व्यवसायाने भारताचे स्थूल देशांतर्गत उत्पादनात २३४ अब्ज डॉलर म्हणजे एकूण जीडीपीच्या ९.४ % एवढी भर घातली आहे.

आजचे जग म्हणजे एक ग्लोबल व्हीलेज झालं आहे असं म्हटलं जात कि पर्यटनाच्या जोरावर ज्यांनी अगदी कमी वेळात आपली प्रगती साध्य केली अशी अगदी छोटी गावं जशी आहेत तसेच ब्राझील ऑस्ट्रेलिया न्युझीलंड यासारखे विकसित देशही आहेत थोडक्यात अगदी लोकल ते ग्लोबल अशा सर्व ठिकाणी पर्यटन हा व्यवसाय महत्त्वाची भूमिका बजावत आहे पर्यटन व्यवसायात सातत्याने नवनवीन प्रवाह येत असतात कृषी पर्यटन हा असाच एक नव्याने विकसित होत असलेला व्यवसाय आहे "शेतकऱ्यांने स्वतः च्या फळत्या फुलत्या शेतात शहरी पर्यटकांना ग्रामीण जीवन ,शेतकऱ्यांची जीवनशैली याविषयी दिलेलं आनंददायी शिक्षण म्हणजे कृषी पर्यटन होय "अशी ढोबळ व्याख्या कृषीपर्यटनाची करता येते आज सुमारे ७०० पेक्षा जास्त कृषी पर्यटन केंद्रे महाराष्ट्रात उभी आहेत.

पुर्वेकडील सहयाद्री पर्वत रांगाचा प्रदेश ,किना-यालगतचा खलाटीचा प्रदेश व पुर्वेकडील डोंगराळ भाग यांच्या मधील मैदानी प्रदेश अशी रायगड जिल्ह्याची भौगोलिक रचना असून उल्हासा, पातळगंगा, भोगावती, अंबा, कुंडलिका, काळ व सावित्री या जिल्ह्यातील प्रमुख नद्या आहेत श्रीवर्धन ,म्हसळा, अलिबाग, माणगाव, मुरुड जंजीरा, पेण, पनवेल, कर्जत, रोहा या तालुक्यात अधिक प्रमाणात जंगले आहेत त्यामध्ये साग, खैर,आंबा, चिंच, अंजनी, अर्जुन, ऐन ,कांचन ,किंजळ, कुडा गेळा, जांभूळ, निलगिरी, सावर यासारखे ७०० प्रकारचे वृक्ष तर बिबटे, भेकर, वाघ, कोल्हे ,रानडुक्कर ,सांबर यासारखे १८प्रकारचे प्राणी तसेच मोर, बुलबुल ,दयाळ, भारव्दाज, तितर, गरुड घर, पोपट, सुतार ,कोतवाल, बहिरी ससाणा ,शहाबाज इत्यादी १५० पेक्षा जास्त जातीचे पक्षी आणि ९० पैक्षा जास्त जातीची रंगीत फुलपाखरे आढळतात महाराष्ट्राच्या पश्चिम किनारपट्टी वर वसलेल्या या रायगड जिल्ह्यातील १६ तालुक्याचे दोन भागात विभाजन होते त्यातील काही तालुके उत्तर रायगड मध्ये तर

काही तालुके दक्षिण रायगड मध्ये येतात अभ्यासासाठी घेतलेले म्हसळा,श्रीवर्धन,तळा,मुरुड जंजिरा आणि माणगाव यातालुक्याचा समावेश दक्षिण रायगड मध्ये येतो हे तालुके डोंगर द-यामध्ये समुद्राच्या, नदीच्या व खाडीच्या किनारी वसलेले औद्योगिक दृष्टीने पूर्णतः मागासलेले परंतु नैसर्गिक दृष्टीने समृद्ध असूनही कृषी पर्यटनाच्या नकाशावर आपली जागा आणि ओळख अद्यापही करू शकलेले नाहीत यातालुक्याचा अभ्यास करताना असे आढळून आले कि कृषी पर्यटन च्या अनेक संधी या तालुक्यात आहेत या संधीचा विकास केला तर हे तालुके पर्यटन आणि कृषीपर्यटन क्षेत्रात खुप मोठी प्रगती करू शकतील

### **कृषीपर्यटन केंद्रे विकसित होण्यासाठी पोषक संधी**

तालुक्यातील भौगोलिक आणि सामाजिक परिस्थिती चा अभ्यास करताना असे आढळते कि या तालुक्यातील भौगोलिक आणि सामाजिक स्थिती कृषी पर्यटन केंद्र स्थापन करण्यास अनुकूल आणि संपन्न अवस्थेतील आहे अश्या अनुकूल आणि पोषक परिस्थिती घेतलाला आढावा खालील प्रमाणे

### **आंबा,काजूच्या मोठ्या बागा आणि सुपारी नारळच्या मोठ्या वाड्या**

या तालुक्यात अनेक शेतकऱ्यांच्या शेतजमीन बरोबरच आंबा काजू याच्या मोठमोठ्या बागा तर काही शेतकऱ्यांकडे शेतजमीन बरोबरच नारळ सुपारी यांच्या पिढी जात मोठमोठ्या वाड्या आहेत तर काही शेतकरी अश्या बागाची आणि वाड्याची नव्याने निर्मिती करत आहेत याठिकाणी उत्पादीत होणारा आंबा "रत्नागिरी हापूस" च्या प्रकारातील आणि उच्च गुणवत्ता असलेला आढळतो त्यामुळे त्याला शहरात आणि परदेशात खुपमोठी मागणी आहे तर येथे काजू उत्पादन आणि विक्रीची मोठे व्यापारी केंद्र असून येथील ओल्या काजू ला स्थानिक बाजारपेठेत मोठ्या प्रयत्न मागणी असते तर सुपारी मध्ये प्रसिद्ध असलेल्या "रोठा" सुपारीचे उत्पादन याच तालुक्या होते या बागामध्ये पर्यटकांना आवश्यक असलेल्या सोयीसुविधा उपलब्ध करून दिल्या आणि आंब्याच्या हंगामात "झेल्यात" आंबे काढणे ते झाडावरून खाली सोडणे आंब्याची आडी लावणे ,पेटी भरणे तर काजूच्या बागेत काजूच्या फळापासून काजूची बी वेगळी करणे ,ओल्या काजूची बी फोडणे, ओला काजू भाजणे सुपारीच्या बागेत सुपारी गोळा करणे, सोलणे नारळाच्या बागेत नारळ प्रत्यक्ष झाडावरून काढताना पाहणे आणि त्याच ठिकाणी त्याचे मधुर आणि आरोग्य वर्धक पाणी पर्यटकांना दिल्यास समुद्र किनारी मौजमजा करायला आलेला पर्यटक आपला मुक्काम वाढवेल आणि कृषीपर्यटनाच्या माध्यमातून तालुक्यामधील अनेक शेतकऱ्यांना उत्पन्न प्राप्त होऊ शकेल

### **फणस,कोकम,करवंद,जांभूळ,आवळा यांचे उत्पादन -**

तालुक्यामधील अनेक शेतकऱ्यांच्या शेतामध्ये फणस, कोकम, जांभूळ, आवळा यांची झाडे तर बांधावर करवंद व मेंदीच्या झाडांची कुंपणे असतात याचाही वापर कृषी पर्यटन केंद्रासाठी करता येऊ शकतो फणसाच्या झाडावरून फणस कसा काढतात, कापा व बरका फणस या दोन फणसामध्ये असणारा फरक कसा ओळखावा, फणस कसा कापावा गरे कसे काढावे या विषयी प्रत्यक्ष हाताळणी करण्याची संधी पर्यटकांना दिली तर तो त्याच्या माहितीत भर घालणारा भाग असेल तसेच कोकमचे झाड कसे असते,, कच्चे कोकम पक्के कोकम यामधे असणारा फरक, कोकमचा रस कसा काढतात, रस काढून शिल्लक राहिलेले कोकमचे साल आमसुल म्हणून कसे वापरले जाते, त्याचे असणारे आहारातील महत्त्व. जांभूळच्या झाडावरून जांभूळे कशी काढतात आणि काट्याच्या असणाऱ्या करवंदाच्या जाळीमधून करवंद गोळा करण्याची संधी जर पर्यटकांना मिळून दिली तर नक्की त्यांना आनंद होईल त्याचबरोबर आंबे ,काजू, फणस,फणसपोळी, कोकम सरबत,

आवळा सरबत, जांभूळ सिरप यांच्या उत्पादनास बाजारपेठ प्राप्त होऊन शेतकऱ्यांच्या उत्पन्नात भर घालण्यात हे कृषी पर्यटन उपयोगी पडेल.

### मत्स्यशेती

तालुक्यातील अनेक भागातील शेतकरी शेती बरोबरच खा-या पाण्यातील आणि गोड्या पाण्यातील शेती करतो या मत्स्य शेतीचा वापरदेखील कृषी पर्यटन व्यवसायासाठी करता येतो आलेल्या पर्यटकांना प्रत्यक्ष मासेमारीची संधी दिली माश्यांना अन्न देण्याचा आनंद त्यांना दिल्यास अन्न खाण्यासाठी पाण्यात एकत्र जमा होणारे मासे पाहण्याचा तसेच प्रत्यक्ष हातात मासे पकडण्याचा अनुभव देऊन पर्यटकांना खूष करता येते तर शेतावरच त्यांच्या समोर ताजी मच्छी काढून त्याचे कालवण आणि चुलीवर शेकलेली तांदळाची किंवा नाचणी ची भाकरी पर्यटकाला तृप्त करते आणि तो पर्यटक त्यापर्यटन केंद्राचे नाव सर्वदूर पसरवतो यासाठी पर्यटकांच्या संपूर्ण दिवसाचे व्यवस्थित नियोजन केल्यास आलेल्या पर्यटकांचे पर्यटनाचे दिवस वाढविण्यासाठी करता येतो.

मोठी जंगले, नद्या, डोंगर, गड किल्ले विस्तीर्ण व स्वच्छ समुद्र किनारे, दुधडी भरून वाहणाऱ्या नद्या, वेगवेगळ्या खाड्या तालुक्याला विस्तीर्ण आणि स्वच्छ समुद्र किनारा लाभलेला आहे तसेच सहा ते आठ महिने दुधडी भरून वाहणाऱ्या नद्या आणि वेगवेगळ्या खाड्या मोठी जंगले, डोंगर, गड किल्ले आहेत त्याचाही वापर कृषी पर्यटनासाठी करता येऊ शकतो कृषी पर्यटन केंद्रात आलेल्या पर्यटकांच्या संपूर्ण दिवसाचे योग्य नियोजन केल्या पर्यटकांच्या समुद्र सफारीचे नियोजन करता येते आणि खोल समुद्रातील प्रवासाचा अनुभव त्याला देता येतो तालुक्यात अनेक भागात शेतकऱ्यांच्या जमीनीला लागूनच मोठी जंगले आहेत त्यांचा वापर जंगल सफारी आणि त्यातून पक्षी, वनस्पती, प्राणी निरीक्षण करण्यासाठी तर डोंगर दऱ्याचा वापर साहसी खेळांसाठी गडकोट आणि किल्ल्याचा वापर ऐतिहासिक गोष्टींचा उलगडा करून देण्यासाठी करता येऊ शकतो

### सांस्कृतिक परंपरा आणि कला

तालुक्यातील अनेक गावे सांस्कृतिक दृष्टीने समृद्ध असून येथील अनेक बुवा भजनम्राट म्हणून प्रसिद्ध आहेत बाल्या नृत्य शक्तीतुरा नृत्य करणारे अनेक नामवंत कलाकार याठिकाणी आहेत तसेच रंगकर्मी, शिल्पकार, हस्तकारागीर, कोकणी गीते गाणारी महिलामंडळे, आग्री आणि कोकणी भाषेतून नाटक आणि कविता सादर करणारे हौशी कलावंत याभागात आहेत त्यांचा वापर कृषी पर्यटन केंद्रात वेगवेगळे सांस्कृतिक कार्यक्रम सादर करण्यासाठी होऊ शकतो.

### आदरतिथ्य करण्याची पिढीजात सवय

कोकणी माणसांची आर्थिक परिस्थिती जरी बेताची असली सडेतोड बोलण्यात जरी तो परिचित असला तरी मनाने हळवा आणि प्रेमळ असतो त्यामुळे कोकणी माणसाला नेहमी फणसाची उपमा देतात फणस जसा बाहेरून काटेरी आणि आतून गोड असतो तशी कोकणातील माणसं देखील बाहेरून कितीही रागीट तापट वाटत असली तरी मनातून प्रेमळ असतात आणि आपल्याकडे आलेल्या पाहुण्यांचे आदरतिथ्य करण्यात त्याची सरबाई करण्यात ते वाकबगार असतात या त्यांच्या स्वभावाचा फायदा त्यांना पर्यटन केंद्र चालवताना होऊ शकतो त्यांच्या या स्वभावाने पर्यटक याठिकाणी नेहमीच आकर्षित होतील यात शंका नाही गरज आहे काहीप्रमाणातील व्यापारी प्रशिक्षणाची

अशाप्रकारे नैसर्गिक वरदहस्त लाभलेल्या या तालुक्यात जर पर्यवरणाचा, कृषकाचा आणि त्यांच्या कल्पक बुद्धी चा वापर केला गेला तर या तालुक्यामध्ये इको टुरिझम आणि ग्रामीण पर्यटनाचे अनोखे केंद्र उभे

राहु शकते आणि ही केंद्रे तालुक्यातील ग्रामीण अर्थव्यवस्थेला उभारी देण्याचे काम करू शकतात त्यातून आपोआप च गावातून रोजगाराची संधी शोधण्यासाठी गेलेला किंवा जाण्यासाठी इच्छुक असणारा तरुण स्थानिक पातळीवरच आपआपल्या क्षेत्रात उत्तम योगदान देऊन उत्पन्न प्राप्त करू शकतो आणि त्याचा परिणाम म्हणून येथील दारीद्रय बेकारी आणि लोकसंख्या स्थलांतर यासमस्यावर मात करत येऊ शकेल

### संदर्भ साहित्य:

१. www.mpscworld.com

२. अर्थ संवाद जानेवारी मार्च २०१३ खंड ३६ अंक १४ पान नंबर ३९४ ते ३९९

३. साप्ताहिक सकाळ ४ जानेवारी २०२० कृषी पर्यटन

४. द. सकाळ वर्तमानपत्र शुक्रवार २१ फेब्रुवारी २०२० सकाळ टु डे पान ५ जैवविविधतेवर संकट श्री अमित गवळे यांचा लेख

५. विकिपीडिया

६. रायगड गॅझेट



## आजच्या युगात पर्यटन एक उदयोन्मुख उद्योग

डॉ. पराग वसंतराव पिंपळापुरे,  
सहाय्यक प्राध्यापक

### प्रस्तावना :

भारत एक विशालकाय देश आहे, जो विविध पर्यावरणीय वैशिष्टांकरिता प्रसिद्ध आहे. भारतात प्रत्येक वर्षी भारतातील एका राज्यातून दुसऱ्या राज्यात, एका प्रदेशातून दुसऱ्या प्रदेशात जाणाऱ्या पर्यटकांची संख्या दिवसागणिक वाढतच चालली आहे. एवढेच नाही तर परदेशी पर्यटकांचे भारतात पर्यटनाकरिता येण्याचे प्रमाण मोठ्या प्रमाणात वाढले आहे. ट्रॅव्हल अँड टुरिझम कॉम्पिटिटिव्हनेस रिपोर्ट २०१९ अनुसार भारत हा पर्यटन क्षेत्रात जगातील १४० देशात ३४ व्या स्थानावर आहे. वल्ड इकॉनॉमिक फोरमच्या अहवालानुसार पर्यटन क्षेत्रात आशिया-पॅसिफिक मध्ये तिसऱ्या क्रमांकावर भारत पोहचला आहे. पर्यटन उद्योगामुळे भारताला मोठ्या प्रमाणात विदेशी धन प्राप्त होते. या कारणामुळेच भारत सरकारचे पर्यटन मंत्रालय सातत्याने प्रयत्न करीत आहे. यात नवनवीन पर्यटन स्थळे शोधणे, नविन पर्यटन स्थळांची निर्मिती करणे, उदा. गुजरात मध्ये जगातील सर्वात उंच १८२ मीटर सरदार वल्लभभाई पटेल यांचा पुतळा तयार केला व त्या परिसराचा फार सुंदर विकास केला आहे. उत्तर प्रदेशातील गंगा, यमुना तटावरील घाटांचे सुशोभीकरण करण्यात येत आहे इत्यादी., जे पर्यटन स्थान पूर्वीपासून अस्तित्वात आहे त्याचा विकास केल्या जात आहे. पर्यटन स्थळापर्यंत पर्यटक सहजतेने जाऊ शकतील याकरिता रस्ते विकास, रेल्वे विकास, वायुमार्ग विकास तसेच जलमार्गाचाही विकास अत्यंत वेगाने केल्या जात आहे.

भारत सरकारचे अतुल्य भारत तसेच अतिथी देवो भव या पर्यटनविषयक अभियानाने स्थानिक तसेच विदेशी पर्यटकांचे लक्ष भारताकडे तसेच भारतातील विविध पर्यटन स्थळांकडे आकर्षित केले आहे. पर्यटकांना स्थानिक लोक तेथील संस्कृती, तेथील खानपान, तेथील भाषेबाबत अवगत करीत आहेत. पर्यटनामुळे आंतरराष्ट्रीय बंधुभाव तसेच सहयोगाला चालना मिळते.

पर्यटनाचा अर्थ काय? पर्यटन म्हणजे अशी यात्रा जी करमणूक किंवा फुरसतीच्या वेळी आनंद मिळविण्याच्या दृष्टीने केली जाते. या सर्व बाबींवरून असे लक्षात येते कि पर्यटन उद्योग हा दिवसागणिक वाढतच चालला आहे आणि भविष्यात देशात रोजगार निर्मिती तसेच देशाच्या आर्थिक विकासात पर्यटन उद्योगाचे मोठे योगदान होऊ शकते. या संशोधन पत्रिकेत याच विषयाचे विश्लेषण करण्यात आले आहे, ज्यात आजच्या व्यस्त जीवनपद्धतीत पर्यटन उद्योग एक उदयोन्मुख उद्योग म्हणून पुढे येत आहे.

### संशोधन कार्याचा उद्देश

१. पर्यटनाच्या विविध प्रकारांची माहिती जाणून घेणे.
२. पर्यटनाचे महत्व जाणून घेणे.
३. पर्यटन उद्योगाचे लाभ तसेच नुकसान जाणून घेणे.
४. पर्यटन हा एक उदयोन्मुख उद्योग भविष्यात होऊ शकतो याचे विवेचन करणे.

**संशोधन पद्धती :-** या संशोधन पत्रिकेत सामान्यतः माहिती संकलनाकरिता द्वितीयक स्रोतांचा उपयोग करण्यात आला आहे. यात माहिती संकलनाकरिता मासिके, वृत्तपत्र, सरकारी अहवालाचा उपयोग केला आहे. तसेच

विषयाशी संबंधित विविध संशोधन पत्रिका, शैक्षणिक साहित्य, विभिन्न पत्रिकांचा सहभाग आहे. अभ्यासाच्या उद्देशानुसार या संशोधन पत्रिकेत संशोधनाकरिता वर्णनात्मक संशोधन पद्धतीचा उपयोग करण्यात आला आहे.

### पर्यटन क्षेत्राची व्याप्ती

१. **नैसर्गिक पर्यटन** : नैसर्गिक पर्यटनाचा अर्थ नैसर्गिक स्थानांचा अनुभव घेणे. ज्यात पक्षी दर्शन, फोटोग्राफी, लांब पायी यात्रा, जंगल सफारी, शिकारी, मासेमारी. नैसर्गिक पर्यटन हे ग्रामीण लोकांकरिता उपयुक्त आहे. नैसर्गिक पर्यटनामुळे वन्यजीव तसेच नैसर्गिक संसाधनांचे रक्षण करणे तसेच त्याची गुणवत्ता वाढविणे यांचा समावेश आहे. उदा कॉम्बेट नॅशनल पार्क, ताडोबा उद्यान, चंद्रपूर, पेंच प्रकल्प.
२. **साहस पर्यटन** : भारतात साहस पर्यटनाकरिता वेगवेगळे भाग आहेत. पर्यटक ट्रेकिंग करिता लडाख, सिक्कीम, हिमालय पर्वत, हिमाचल प्रदेश, जम्मू आणि काश्मीर इत्यादी स्थानांवर जाणे जास्त पसंत करतात. पांढऱ्या पाण्यातील राफटींग करिता पर्यटक उत्तरांचल, आसाम तसेच अरुणाचल प्रदेशात जातात. साहस पर्यटनाचे उदाहरण डोंगरावर चढणे, स्कीइंग, उंटाची सफारी, पॅराग्लायडिंग तसेच स्कुबा डायविंग जे सिंधुदुर्ग-मालवण मध्ये करता येते.
३. **वन्यजीव पर्यटन**: वन्यजीव पर्यटनाला मुख्यतः अशा स्थानांची यात्रा असा केला जातो ज्यात यात्रा करण्याचा मुख्य उद्देश्य हा स्थानिक वन्यजीवांचे रक्षण करणे आहे. वन्यजीव पर्यटनात पक्षी निरीक्षण करणे, समुद्रातील जिवसृष्टीचा शोध घेणे. उदा, डॉल्फिन, व्हेल, वाघ यासारखे वन्यप्राणी रात्रीच्या वेळी बघणे, यात पनवेलजवळील कर्नाळा पक्षी अभयारण्य, मालवणच्या समुद्रातील डॉल्फिन दर्शन यांचा समावेश होऊ शकतो.
४. **तीर्थयात्रा पर्यटन** : तीर्थयात्रा पर्यटन हे धार्मिक दृष्टिकोनातून तसेच विविध रूढी परंपरांच्या सिद्ध करण्याकरिता केल्या जाते. उदा, महाराष्ट्रातील कोंकण विभागात प्रत्येक वर्षी जत्रा आयोजित केल्या जातात. उज्जैन, अलाहाबाद येथे कुंभमेळा होतो, महाराष्ट्रातील अष्टविनायकाच्या दर्शनाकरिता हजारो लोक येतात. लाखो लोक चार धामची यात्रा करतात.
५. **सांस्कृतिक पर्यटन** : सांस्कृतिक पर्यटन हे कोणत्याही देश किंवा संस्कृतीशी संबंधित पर्यटनाचा एक प्रकार आहे, प्रामुख्याने विशिष्ट भौगोलिक क्षेत्रातील लोकांची जीवनशैली, त्यांचा इतिहास, त्यांची कला, वास्तुकला, जुने राजवाडे, गड-किल्ले, हस्तकला, वारली पेंटिंग इत्यादी. सांस्कृतिक पर्यटनाचे विविध उदाहरणे दिल्या जाऊ शकतात. ज्यात अलिबाग महोत्सव, गंगा-यमुना तटावरील गंगा आरती, सरकारच्या कला आणि सांस्कृतिक विभागातर्फे विभिन्न राज्यात आयोजित सांस्कृतिक महोत्सव, २६ जानेवारी ला दिल्लीच्या राजपथवर विविध राज्यांची झांकी तसेच पारंपरिक नृत्य इत्यादी कार्यक्रम बघण्याकरिता देश-विदेशातून मोठ्या प्रमाणात पर्यटक येतात.

याशिवाय पर्यटनाचे इतरही प्रकार आहेत ज्यात कल्याणकारी पर्यटन, व्यापार पर्यटन, विरासत पर्यटन, फुर्सती पर्यटन, या सर्व पर्यटन प्रकारांच्या माध्यमाने मोठ्या प्रमाणात लोक प्रवास करित असतात. यामुळे हॉटेल व्यवसाय वाढीस लागतो तसेच पर्यटन स्थानाचा विकास होण्यास मदत होते.

### पर्यटनाचे महत्व

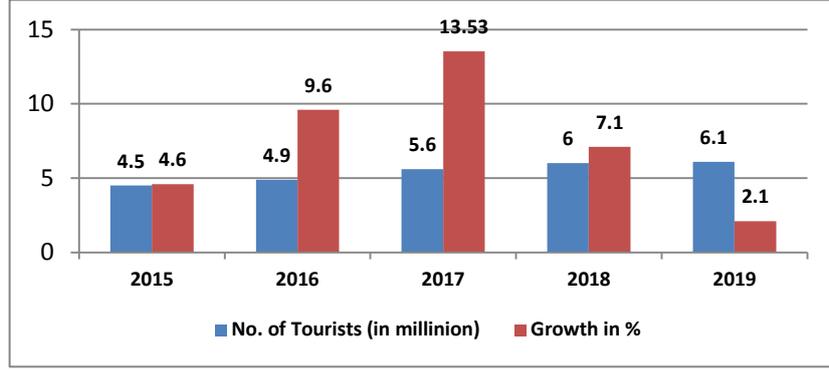
आज देशात पर्यटनाच्या क्षेत्राची वाढ करण्याकरिता विविध उपाय करण्यात येत आहेत. ज्याचे मूळ कारण भारतातील पर्यटन क्षेत्राचे वाढलेले महत्व. भारतातील पर्यटन क्षेत्राचे वाढलेले महत्व सिद्ध करणारे काही मुद्दे पुढे दिले आहेत.

१. **आर्थिक दृष्टीने पर्यटनाचे महत्व** : पर्यटनामुळे विदेशी मुद्रा प्राप्त होते, सरकारच्या उत्पन्नात वाढ होते, यामुळे प्राथमिक सुविधा निर्माण करण्यात मदत होते परिणामतः स्थानिक अर्थव्यवस्था बळकट होते.
२. **सामाजिक आणि सांस्कृतिक दृष्टीने पर्यटनाचे महत्व** : सामाजिक आणि सांस्कृतिक पर्यटनामुळे संस्कृती टिकून राहण्यास मदत होते. पर्यटक नव-नवीन स्थानावर जात असतात त्यामुळे त्यांच्यामध्ये एक-दुसऱ्याप्रती सम्मान, सहिष्णुता तसेच प्रेमाची भावना निर्माण होते. पारंपरिक कला, शिल्पांचा पुनरुद्धार, सभ्यता तसेच सांस्कृतिक गौरव तसेच ओळख निर्माण होते. सांस्कृतिक आदान-प्रदान होते तसेच स्थानिक वस्तूंची मागणी वाढते.
३. **पर्यावरणाच्या आधारावर पर्यटनाचे महत्व** : पर्यटन आणि पर्यावरण यात परस्पर क्रिया होते, पर्यटकांमध्ये पर्यावरण जागृती निर्माण होते, वन्यप्राण्यांचे रक्षण होते, पर्यावरणासंबंधी समस्यांचे जवळून आकलन करता येते तसेच जैवविविधतेचे रक्षण करणे शक्य आहे.

### पर्यटन उद्योगाचे लाभ

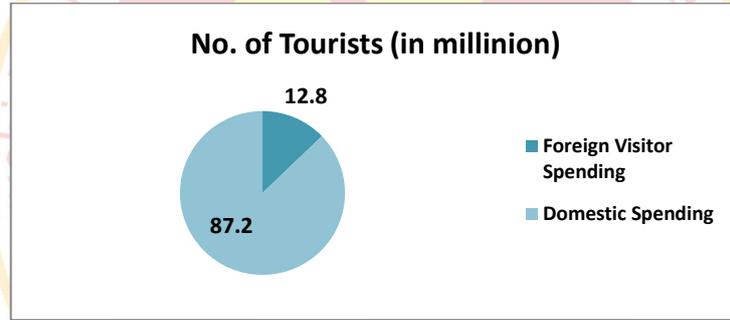
१. **रोजगार प्राप्ती** : पर्यटन उद्योगामुळे स्थानिक लोकांना रोजगारांच्या संधी उपलब्ध होतात. इंडियन एक्सप्रेस नुसार २०१९ मध्ये पर्यटन क्षेत्रात १३.९२ लाख एकूण रोजगार निर्मिती निर्मिती झाली होती ती एकूण रोजगार निर्मितीच्या ८.७८ टक्के आहे. यावरून असे लक्षात येईल कि भारतात पर्यटन उद्योगाची वाढ खूप जास्त प्रमाणात आहे.
२. **सेवा क्षेत्राचा विकास** : सेवा क्षेत्राचा एक भाग हा पर्यटन क्षेत्र आहे. सेवा क्षेत्राशी संबंधित कितीतरी व्यवसाय आहेत ज्यात हॉटेल, वाहतूक, जल परिवहन, वायू परिवहन, रस्ते परिवहन इत्यादी पर्यटन उद्योगाच्या विकासासोबत वाढत जातात. उदा. मुंबई ते गोवा या दरम्यान जलेश हे मोठे जहाज सुरु करण्यात आले आहे ज्यामध्ये एकावेळी २००० पर्यटक प्रवास करू शकतात. अशा प्रकारच्या विविध जहाजांमुळे पर्यटन क्षेत्राचा विकास होण्यास मदत होते.
३. **विदेशी मुद्रेची प्राप्ती** : २०१७-२०१८ मध्ये विदेशी पर्यटकांकडून २८.७ बिलियन यु.एस. डॉलर प्राप्त झाले. तसेच २०१८-१९ मध्ये २७.७ बिलियन यु. एस. डॉलर प्राप्त झाले.
४. **मनोरंजन** : भारतात देश-विदेशातून सुट्टीच्या कालावधीत पर्यटनाकरिता लोक येत असतात. त्यामध्ये मुख्य उद्देश हा करमणूक किंवा मनोरंजन हा आहे. वातावरणातील बदलामुळे पर्यटक आपले शरीर, मन तसेच आत्म्याला जणू रिचार्ज करण्यासारखा अनुभव प्राप्त होतो.
५. **आर्थिक विकास** : पर्यटन देशाच्या अर्थव्यवस्थेच्या विकासात मदतगार सिद्ध होत आहे. भारतात एकूण घरगुती उत्पादनात पर्यटन क्षेत्राचे योगदान ६.२३ टक्के आहे.जेव्हा पर्यटक सुट्टी मध्ये पर्यटनाला जातात त्यावेळी स्थानिक लोकांना याचा आर्थिक लाभ प्राप्त होतो.
६. **सांस्कृतिक आदान-प्रदान** : पर्यटन हे विभिन्न संस्कृतीच्या लोकांना एकत्रिकेने येण्याकरिता संधी प्रदान करते. भारतात अनेक जाती धर्माचे लोक राहतात. प्रत्येक जाती-धर्माची वेगवेगळी संस्कृती-रूढी-परंपरा दिसून येते. पर्यटनामुळे विभिन्न संस्कृतीचे लोक एकत्र येतात. प्रत्येकजण आपल्या रूढी-परंपरा-संस्कृतीचे दर्शन इतरांना देत असतात. त्यामुळे एकदुसऱ्याप्रती सम्मान करण्याची एक संधी प्राप्त होते. यामुळे सांस्कृतिक सद्भाव निर्माण होण्यास चालना मिळते.
७. **स्वास्थ्य तसेच कल्याण** : काही लोक रोगाच्या उपचाराकरिता, तब्येतीमध्ये सुधार करण्याच्या दृष्टीने वेगवेगळ्या स्थानांवर जातात. याला स्वास्थ्य पर्यटन असे म्हणतात. अशा प्रकारच्या पर्यटनाचा प्रमुख उद्देश मानसिक, शारीरिक तसेच मनोवैज्ञानिक कल्याण प्राप्त करणे आहे. स्वास्थ्य सुधार करण्याकरिता लोक योग, निसर्गोपचार, मेडिटेशन, एरोबिक्स, झुंबा, तथा अन्य उपचार याकरिता भारतात वेगवेगळे सेन्टर्स आहेत त्या ठिकाणी जातात.

## पर्यटन एक उदयोन्मुख उद्योग



### पर्यटन मंत्रालय अहवाल २०१९

वरील स्तंभालेखानुसार २०१५ ते २०१९ पर्यंत आपल्या भारत देशांत पर्यटकांच्या संख्येत किती टक्के वृद्धी झाली. ला आलेखानुसार पर्यटकांची संख्या सर्वात जास्त २०१७ मध्ये आहे. तर सर्वात जास्त पर्यटकांच्या संख्येत वाढ हि सुद्धा २०१७ मध्येच दिसून येते. सर्वात कमी पर्यटक संख्या हि २०१५ मध्ये दिसून आली.



### पर्यटन मंत्रालय अहवाल २०१९

वरील आलेखानुसार भारतात आलेल्या एकूण पर्यटकांपैकी १२.८ टक्के पर्यटक हे विदेशातून आलेले होते तर ८७.२ टक्के पर्यटक हे आपल्याच देशातील होते.

२०१९ पर्यंत भारताने पर्यटन क्षेत्रात ४.२ करोड नोकऱ्या निर्माण केल्या आहेत ज्या एकूण रोजगाराच्या ८.१ टक्के आहे.

द वर्ल्ड ट्रॅव्हल अँड टूरिझम कौन्सिल च्या नुसार सन २०१८ जी.डी. पी. च्या वाढीत पर्यटन क्षेत्रात जगातील १८५ देशात भारत तिसऱ्या क्रमांकावर आहे. तर २०२८ पर्यंत भारताला पर्यटन क्षेत्रापासून मिळण्याच्या उत्पन्नाचा आकडा ३०.५ बिलियन डॉलर पर्यंत जाणे अपेक्षित आहे.

नोव्हेंबर २०१९ पर्यंत इ टुरिस्ट व्हिसा घेऊन भारतात येणाऱ्या पर्यटकांची संख्या २३.८ टक्के वाढीबरोबर २.५५ लाख झाली आहे. डिसेम्बर २०१९ पर्यंत १६९ देशांना इ विजा ची सुविधा प्रदान करण्यात आली.

जानेवारी ते डिसेम्बर २०१९ या कालावधीत विदेशी पर्यटक जे भारतात आले होते त्यांची संख्या ९६,६९,६३३ होती.

केंद्र सरकारच्या स्वदेश दर्शन योजनेअंतर्गत ७७ योजनांमध्ये ६०३५.७० कोटी रुपयांची गुंतवणूक करण्यास मंजूरी देण्यात आली.

केंद्र सरकारने चिकित्सा पर्यटनाला प्रोत्साहन देण्याकरिता मेडिकल विजा किंवा एम-विजा देण्याची ही एक नवीन श्रेणी सुरु केली आहे.

केंद्र सरकारने पर्यटकांना पर्यटनासंबंधी आपले अनुभव सामायिक करण्याकरिता अतुल्य भारत मोबाईल ॲप्लिकेशन सुरु केले आहे.

भारत सरकारच्या माहितीनुसार २०१९ मध्ये गुजरात स्थित स्टॅचू ऑफ युनिटीला २९ लाख पर्यटकांनी भेट दिली.

पर्यटन क्षेत्राची वाढ होण्याच्या दृष्टीने केंद्र तसेच राज्य सरकार सकारात्मक प्रयत्न करीत आहे, ज्यात पर्यटन स्थानांवर स्वयंचलित मार्गाची निर्मिती करणे. उदा. महाराष्ट्रातील नाशिक जिल्ह्यातील सप्तशृंगी येथे रोप ट्रेन सुरु करण्यात आली. रायगड किल्ल्यावर जाण्याकरिता रोपेवे सुरु करण्यात आला इत्यादी. पर्यटन स्थानांवर विविध सुविधा निर्माण करण्याकरिता १०० टक्के प्रत्यक्ष विदेशी गुंतवणुकीला परवानगी देण्यात आली आहे.

केंद्र सरकारच्या पर्यटन मंत्रालयातर्फे एक वेब आधारित सार्वजनिक सेवा वितरण प्रणालीची सुरुवात करण्यात आली ज्यात ऑनलाइन हॉटेल बुकिंगची सोय करण्यात आली. पर्यटन मंत्रालयाद्वारे पर्यटनास प्रोत्साहन देण्याकरिता स्वदेश दर्शन अंतर्गत मोठ्या प्रमाणावर पर्यटन सर्किटचा विकास केल्या गेला आहे.

केंद्र सरकारच्या बजेट २०१९-२०२० च्या अनुसार भारतात १७ प्रतिष्ठित पर्यटन स्थानांना विश्वस्तरीय पर्यटन स्थळ म्हणून विकसित करण्याचे निश्चित केले आहे.

केंद्र सरकार घरगुती तसेच विदेशी पर्यटकांकरीता अध्यात्मिक पर्यटनाची सोय करण्याकरिता मान्यता दिली आहे.

## निष्कर्ष

उपरोक्त माहितीच्या आधारे पुढील निष्कर्ष काढण्यात आला आहे.

१. भारत सरकार पर्यटन उद्योगाला प्रोत्साहन देण्याकरिता विभिन्न प्रयत्न करीत आहे.
२. भारतात नव-नवीन पर्यटन स्थान निर्माण होत आहेत जे पर्यटकांकरिता आकर्षणाचे केंद्र होत आहे.
३. भारतीय रेल्वेद्वारे टुरिझम सर्किट ट्रेन सुरु करण्यात आली आहे. ज्यात प्रामुख्याने महाकाल एक्सप्रेस, रामायण एक्सप्रेस आहे, ज्यामुळे पर्यटकांना पर्यटन स्थानांवर जाण्याकरिता सोयीचे होत आहे.
४. पर्यटकांना आकर्षित करण्याकरिता इ टुरिझम विजा, मेडिकल विजा देण्यात आला आहे.
५. भारत सरकारनी पर्यटन व्यवसायाला प्रोत्साहन देण्याकरिता मोठ्या प्रमाणावर वार्षिक अंदाजपत्रकात पैसे गुंतविण्याचे प्रावधान केले आहे.
६. पर्यटनात वाढ होण्यासोबतच स्थानिक लोकांना, हॉटेल व्यावसायिकांना, बस सेवा देणाऱ्यांना मोठ्या प्रमाणावर फायदा होत आहे.
७. या सर्व तथ्यांचा विचार केला असता असे दिसून येते कि भविष्यात भारत पर्यटन क्षेत्रात एक अग्रणी देश होईल.

## उपाययोजना

१. देशात अजूनही असे खूप स्थान आहेत ज्याला चांगले पर्यटन स्थळ म्हणून विकास करता येणे शक्य आहे अशा स्थळांबाबत व्यवस्थित नियोजन करून त्यांच्या विकासाबाबत योजना आखणे आवश्यक आहे.
२. ज्या पर्यटन स्थळांना भारतीय पुरातत्व विभागाने पर्यटन स्थळ म्हणून आपल्या ताब्यात घेतले आहे अशा पर्यटन स्थळांच्या विकासाची गती मंद आहे ती वाढवायला हवी. उदा. महाराष्ट्रातील रायगड किल्ला, जंजिरा किल्ला.

३. महाराष्ट्राला लागून असलेली पश्चिम किनारपट्टीचा विकास केला तर ते चांगले पर्यटन स्थान होऊ शकते.
४. पर्यटन स्थानावर जाण्या-येण्याकरिता आवश्यक मात्रेत परिवहन व्यवस्था होण्याची गरज वाटते.
५. पर्यटन स्थानावर नोव्हेंबर ते मार्च आणि मे व जून या महिन्यात हॉटेल मालक आपल्या हॉटेलचा दर वाढवितात. हा दर सर्वसामान्य जनतेला परवडण्यासारखा नसतो, त्यामुळे हॉटेल व्यवसायावर सरकारचे नियंत्रण असणे आवश्यक वाटते.
६. बहुसंख्य पर्यटन स्थान हे पहाडावर असतात. अशा ठिकाणी रोपे वे सुविधा असावी असे वाटते.

### संदर्भ सूची

1. पर्यटन मंत्रालय, २०१६
2. इंडियन टुरिझम अँड हॉस्पिटॅलिटी रिपोर्ट, डिसेंबर २०१९
3. [En.wikipedia.org](http://En.wikipedia.org)
4. <https://www.incredibleindia.org/>
5. <https://www.ibef.org/industry/tourism-hospitality-india.aspx>
6. <http://tourism.gov.in/>
7. Tourism\_Industry\_-\_A\_Sunrise\_Sector\_for\_Emerging\_India
8. <https://www.incredibleindia.org/>
9. <http://www.incredibleindia-tourism.org/>
10. <https://data.gov.in/sector/travel-and-tourism>
11. <https://pib.gov.in/>
12. <https://economictimes.indiatimes.com/news/>
13. <https://shodhganga.inflibnet.ac.in/>



## सिंधुदुर्ग जिल्ह्यातील खाणकाम व्यवसायातून होणाऱ्या आर्थिक उलाढालीचा अभ्यास

प्रा. डॉ. पी.डी. गाथाडे,  
सहाय्यक प्राध्यापक

### प्रस्तावना

पूर्वी पेन्शन वर अवलंबून असणाऱ्या जिल्ह्यात आता खाण व्यवसायामुळे मोठी आर्थिक उलाढाल होतेय. अनेक लोकांच्या हाताला कामधंदा मिळाला. डंपर चालक मालक ते यंत्र निर्माण करणारे उद्योजक, त्यांची देखभाल दुरुस्ती करणारे कामगार, बँका, दुकानदार, छोटे मोठे व्यावसायिक, वॉचमन, हॉटेल चालक त्यातील कामगार या सर्वांना खाणकाम उद्योगामुळे रोजगार मिळाला आहे. त्यातूनच करोडोची उलाढाल होतेय. त्यामुळे अनेक मोठमोठ्या उद्योजकांचे पाय हळूहळू सिंधुदुर्ग जिल्ह्यातील सहयाद्रीच्या कडेकपारीत लपलेल्या गावाकडील डोंगराकडे वळताना आढळतात. या कुबेराचे पाय ज्यांच्या गावाला लागतात त्या गावकऱ्यांना स्वर्ग जवळ आल्याचे स्वप्न पडतात. तर ज्यांच्या गावात खाणी चालू झाल्याने त्यातले अनेकजण तोंड झाकून रडतात.

### अभ्यासाचे उद्देश

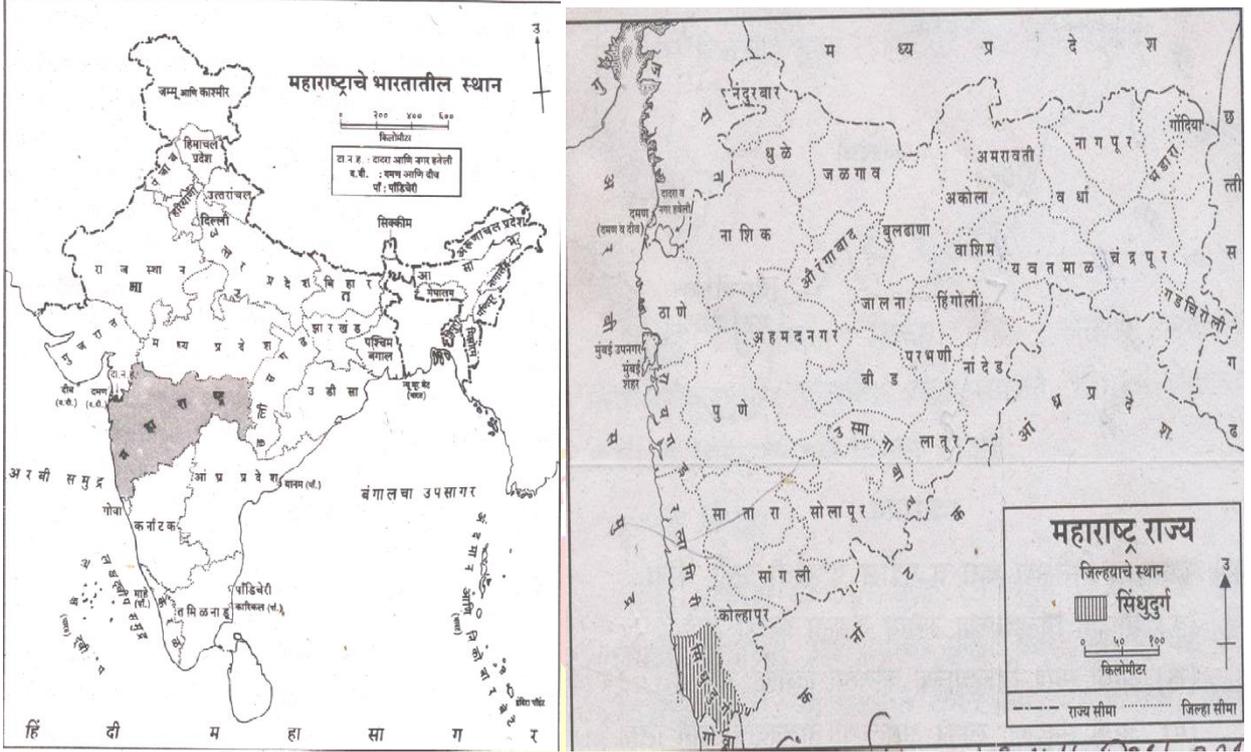
1. सिंधुदुर्ग जिल्हातील खनिज संपदेचा अभ्यास करणे.
2. खनिज संपदेतून मिळणाऱ्या उत्पन्नाचा अभ्यास करणे.
3. खनिज संपदेतून होणाऱ्या आर्थिक उलाढालीचा अभ्यास करणे.
4. खनिज व्यवसायामुळे कोणत्या घटकाला रोजगार.
5. खाणकामामुळे होणाऱ्या चांगल्या वाईट बदलाचा अभ्यास करणे व त्यावर उपाय सुचविणे.

### अभ्यास पद्धती

सदर शोध निबंधासाठी प्राथमिक व द्वितीय स्त्रोताद्वारे माहिती मिळविण्यात येणारे असून सर्वेक्षण प्रश्नावली व प्रत्यक्ष मुलाखतीद्वारे प्राथमिक माहिती प्राप्त केली जाणार आहे. तपशीलवार माहितीसाठी संदर्भ ग्रंथ, मासिके, दैनिके, सिंधुदुर्ग जिल्हा खाणकाम विभाग, जिल्हाधिकारी कार्यालय रेडी कळने येथील खाणकाम विभाग सिंधुदुर्ग जिल्हा गॅझेट, कृषि, तहसील व पंचायत समिति कार्यालये, यांच्याकडून मिळविण्यात आली आहे. दोडामार्ग

### अभ्यास क्षेत्र

महाराष्ट्राच्या पश्चिम किनारपट्टीवरील अगदी दक्षिणेकडील जिल्हा. पूर्वेस सहयाद्री पर्वताच्या रांगा व त्यालगत कोल्हापूर जिल्हा पश्चिमेस अरबी समुद्र, दक्षिणेस गोवा व कर्नाटक राज्य उत्तरेस रत्नागिरी जिल्हा. तर पश्चिमेस अरबी समुद्र उत्तरेस शुक नदी, पूर्वेस सहयाद्री पर्वत रांगा, दक्षिणेस तेरखोल नदी यांनी सिंधुदुर्ग जिल्ह्याची नैसर्गिक सीमा स्पष्ट केली आहे. या जिल्ह्यास 121 किमी लांबीचा समुद्र किनारा लाभला आहे. राज्याच्या एकूण भौगोलिक क्षेत्राच्या 1.70 % इतके अत्यल्प क्षेत्र या जिल्ह्याच्या वाट्याला आले आहे.



### खनिज संपदा

सिंधुदुर्ग हा एक निसर्ग संपन्न जिल्हा आहे. जिल्ह्यात खनिज संपत्ति मुबलक आहे. जिल्ह्यात लोहखनिज म्याग्नीज, सिलिका, बॉक्साईड, कोनाइट, ग्राफाईट, गार्नेट, सिलिकॉन, खनिजांचे साठे मुबलक आहेत. वेंगुर्ला तालुक्यातील रेडी येथे लोहखानिजाच्या खाणी आहेत. कणकवली तालुक्यात कोमाइट चे साठे आहेत. सावंतवाडी तालुक्यातील आंबोली येथे बॉक्साईड, कणकवली, कुडाळ तालुक्यात अभ्रक, फोंडा घाट परिसरात चुनखडी आणि सिलिकॉन खनिज सापडते. मालवण परिसरात चिकणमातीचे साठे आहेत. कणकवली, कुडाळ मालवण, वेंगुर्ला परिसरात शिरगोळा दगड सापडतो. त्याचा उपयोग रांगोळी तयार करण्यासाठी होतो. यावरून सिंधुदुर्ग जिल्हा हा खनिज उपलब्धतेच्या दृष्टीने समृद्ध आहे हे स्पष्ट होते.

महाराष्ट्रातील इतर जिल्हयांप्रमाणेच सिंधुदुर्ग जिल्ह्यात कमी अधिक प्रमाणात सर्वच महत्वाची खनिजे मिळतात हे यावरून स्पष्ट होते. तर काही खनिजांचा नव्याने शोध घेणे चालू आहे. जिल्ह्यात वेंगुर्ला तालुक्यातील रेडी, सावंतवाडी तालुक्यातील झाराप, दोडामार्ग तालुक्यातील कळणे बरोबरच देवगड, फोंडा या परिसरात लोहखनिज, मॅगनेज, बॉक्साईड, ग्रेनाइट, सिलिका व सोने यांसारखी खनिज सापडली असून त्यातील अनेक ठिकाणी प्रत्यक्ष उत्खनन चालू आहे. या व्यवसायामुळे अनेक ठिकाणची जंगले,डोंगर सपाट झाले, जैवविविधता नष्ट झाली तरी या व्यवसायातून मोठा आर्थिक फायदा होत असल्याने अशा घटनेकडे लक्ष दिले जात नाही.

जिल्ह्यात तालुकानिहाय खनिज क्षेत्राचा अभ्यास करताना सावंतवाडी तालुक्यात बांदा, तांबोळी, डेगवे, तळवणे,सातार्डा, डोंगरपाल, गाळेल या गावामधून लोहखनिज तांबे, निकेल, सोने या स्वरुपाचे खनिज मिळतात. दोडामार्ग तालुक्यातील उगाडे, झोळंबे, आयी, आडाळी, तळकट, वझरे या परिसरात लोहखनिज मिळते. देवगड तालुक्यात काटवन, गिर्ये, कोटकमते, नरिंगे, सौदाळे, छहीबाब, विजयदुर्ग, रामेश्वर, फणसे येथे लोहखनिज, बॉक्साईड मिळते. कणकवली तालुक्यातील कणकवली, बिडवाडी, हुंवरणे येथे कोमाइट, तांबे, निकेल, सोने ही खनिजे मिळतात. कुडाळ तालुक्यातील निरुखे येथे लोहखनिज वेंगुर्ला तालुक्यातील टाक, रेडी, सोनसुरे येथे

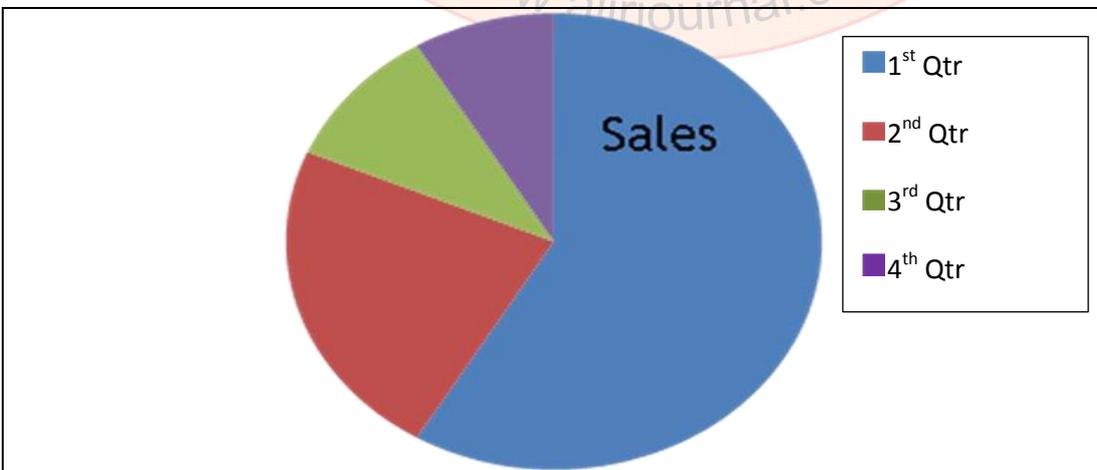
लोहखनिज ग्राफाईट मिळते. तर मालवण तालुक्यातील श्रिखंडे, वझरे गावात लोहखनिज मायका ही खनिजे आढळतात. जिल्ह्यात तालुकानिहाय खनिज साठे व खनिजाचे प्रकार खालील प्रमाणे आढळून येतात.

जिल्ह्यातील तालुकानिहाय खनिजाचे क्षेत्र हेक्टर मध्ये

अ. क्र.	तालुक्याचे नाव	लोहखनिज	लोह मॅगेनिज	सिलिका वाळू	सिलिका स्टोन	ग्रेनाइट	जांभा	एकूण
१	दोडामार्ग	४७३३.०१	-	-	-	१३३५.१	-	६०६८.११
२	सावंतवाडी	४३६३.५	३७७.६६	-	-	२५.६८	९२.००	४८५८.८४
३	वेंगुर्ला	११२.९	२६१.०९	४९७.७४	७८३.२९	-	-	१६५८.०२
४	कुडाळ	-	-	१०२.१८	-	५०.३८	१२.२५	१६४.८१
५	मालवण	-	-	१४१.८७	-	-	८०.००	२२१.८७
६	कणकवली	-	-	३५५.३७	७३.७५	-	१७.७४	४४६.८६
७	देवगड	-	-	२७३.९५	-	-	१५.००	२८८.९५
८	वैभव वाडी	-	-	४७.६१	-	-	८२.००	१२९.६१
		९२०९.४१	६३८.७५	१४१८.७२	८५७.०४	१४११.१६	२८९.९९	

जिल्ह्यातील तालुकानिहाय खनिज साठे खालील प्रमाणे

अ. क्र.	तालुक्याचे नाव	एकूण खनिज साठे
१	दोडामार्ग	६०६८.११
२	सावंतवाडी	४८५८.८४
३	वेंगुर्ला	१६५८.०२
४	कुडाळ	१६४.८१
५	मालवण	२२१.८७
६	कणकवली	४४६.८६
७	देवगड	२८८.९५
८	वैभववाडी	१२९.६१
	एकूण	१३८३०.०७



जिल्ह्यातील खनिज संपत्तीचा तालुकानिहाय साठ्याच्या अभ्यास केल्यास असे आढळून येते की दोडामार्ग सावंतवाडी वेंगुर्ला तालुके खनिज साठ्याच्या दृष्टीने समृद्ध असून जिल्ह्यात इतरत्र लोहखनिज लोह मॅगेनिज, सिलिका, वाळू, स्टोन, ग्रेनाइट, जांभा प्रकारचे खनिज आढळून येतात. कुडाळ, मालवण, कणकवली,

वैभववाडी या परिसरात अनेक प्रकारच्या खनिजाचे साठे मुबलक असल्याने या तालुक्यातून लाखो रुपये किमतीच्या खनिजाचे दररोज उत्खनन केले जाते. या खनिज विक्रीतून व त्यातून मिळणाऱ्या रॉयल्टी मधून जिल्ह्यास मोठ्या प्रमाणावर अर्थ प्राप्ती होते.

**जिल्ह्यात खालील प्रमाणे खनिज साठे आढळतात.**

अ. क्र.	खनिजाचे नाव	एकूण साठे
१	लोहखनिज	९२०९.४१
२	मॅंगेनिज	६३८.७५
३	सिलिका, वाळू	१४१८.७२
४	सिलिका, स्टोन	८५७.०४
५	ग्रेनाइट	१४११.१६
६	जांभा	२९८.९९
	<b>एकूण</b>	<b>१३८३४.०७</b>

**लोहखनिज**

सिंधुदुर्ग जिल्हा निर्माण होण्यापूर्वी म्हणजे १९६० पासून येथे खाणकाम व्यवसाय केला जातो. वेंगुर्ला तालुक्यातील रेडी येथे मे गोगटे मिनरल्स बेळगाव व मे न्यू इंडिया कार्पोरेशन लि. मुंबई यांच्या सुमारे १५ ते २० खानी आहेत. या ठिकाणच्या मातीमध्ये ६० ते ६२ % लोहखनिज आहे. १९६० ल चालू झालेल्या या खाणीतून १९९३ पर्यंत लोहखनिज उत्पादन केले जात होते. १९९३ ते २००३ या कालावधीत या खाणी काही कारणांमुळे बंद होत्या त्यानंतर त्या पुन्हा चालू झाल्या असून या ठिकाणच्या खनिजाची निर्यात प्रामुख्याने चीन, जपान, रशिया इत्यादी देशांना होते. रेडी प्रमाणेच दोडामार्ग तालुक्यातील कळणे येथेही लोहखनिजाची खाण असून येथून मोठ्या प्रमाणात लोहखनिजाचे उत्खनन केले जाते.

**सिलिका**

फोंडा घाट परिसरात सुमारे २५ कोटी टन सिलिका खनिजाचे साठे आहेत. या परिसरात किमान सहा ठिकाणी सिलिकाचे उत्खननाच्या खाणी आहेत. तेथून दररोज ७५ ते १०० ट्रक सिलिकाचे उत्खनन करून कोल्हापूर, बेळगाव, सातारा या ठिकाणी कंपनीला निर्यात केले जाते.

**सिलिका सॅंड**

सिलिका सॅंड हे खनिज जिल्ह्यातील फोंडा, कासाई, वाघोरी, निवरे, तेंडोली, वालावल, चंदवन, कणकवली, अचिर्णे, वैभववाडी येथे आढळते. महाराष्ट्र राज्य खनिकर्म महामंडळ नागपुर, एस्मो ट्रेडिंग कार्पोरेशन कोल्हापूर कासाई को ऑपरेटिव्ह सोसायटी सिंधुदुर्ग खनिज उद्योग लोरे केमिकल्स कोल्हापूर या कंपन्यांद्वारे खाणकाम व्यवसाय सुरू आहे.

**चिरे खाण उत्खनन**

महाराष्ट्रमध्ये ज्याप्रमाणे दगडखाणी आहेत त्याच प्रमाणे जिल्ह्यात जांभा दगडाच्या खाणी आहेत. या दगडापासून बांधकामासाठी तयार केलेल्या विशिष्ट दगडास स्थानिक भाषेत चिरे असे म्हणतात. जिल्ह्यात अश्या दगडाच्या खाणी देवगड, मालवण, कणकवली, कुडाळ, दोडामार्ग तालुक्यात आहेत. जिल्ह्यातील लिंगडाळ, तळेबाजार, असरोडी, चौके, मसुरे, कुदे या ठिकाणचे चिरे बांधकामासाठी प्रसिद्ध आहेत. जिल्ह्यातील बांधकामाची गरज पूर्ण करून कोल्हापूर, सांगली, बेळगाव येथे हे चिरे निर्यात केले जातात.

**आर्थिक उलाढाल**

आपल्या जिल्ह्यात आज घडीला लहानमोठ्या म्हणजे मायनर आणि मेजर मिळून वेगवेगळ्या खनिजांचे उत्खनन करणाऱ्या ११० खाणी अस्तीत्वात आहेत. या मध्ये सर्वात मोठ्या म्हणजे मेजर तीन खाणी

असून रेडी, कळणे, तळवडे या ठिकाणच्या खाणीचा यामध्ये समावेश होतो. या खाणीतून खनिजाचे मोठ्या प्रमाणात उत्खनन केले जात असून दरवर्षी ४२ कोटी रुपयाचे वार्षिक उत्पन्न मिळण्याचे उद्दीष्ट ठेवण्यात आहे आहे. परंतु सरकारी आकडेवारी नुसार दरवर्षी या खाणीतून १३ कोटी ४५ लाख रुपयाचे उत्पन्न मिळते असे सांगितले जाते. या वर कोणाचा विश्वास बसत नाही. जिल्ह्यात आज घडीला मेजर खाणीचा बोलबाला अधिक होत असला तरी मध्यम आणि लहान खाणी मोठ्या प्रमाणावर असून यामध्ये जांभा दगड म्हणजे चिरेखाणीची संख्या ४४ एवढी आहे. या बरोबरच कशर म्हणजे दगडखाणीची संख्या ४३ एवढी तर ग्रेनाइट उत्पादन करणाऱ्या खाणीची संख्या दोन एवढी असून या खाणींना गौण खाणी म्हणून ओळखले जाते. या खाणी मधून वर्षाकाठी ४७ कोटी रुपये उत्पन्न मिळण्याचे उद्दीष्ट ठेवण्यात आले असले तरी वर्षाकाठी त्यातून ३६ कोटी ३९ लाख रुपयाचे उत्पन्न मिळते, असे सांगितले जात असले तरी त्यावर सर्व सामान्यांचा विश्वास बसत नाही. तरी हे उत्पन्न कमी नाही.

आज जिल्ह्यात मेजर खाणी बरोबरच मायनर मधील दगडखाणी चिरेखाणीची संख्या मोठी मोठी आहे. या खाणीवर अनेकांचा रोजगार अवलंबून आहे. दगडखाणी चिरेखाणी यावर रस्तेबांधी, इमारती, गटार, घरे बांधणीचे कामकाज चालते. त्यावर अनेक उद्योजक व्यापारी कर्मचारी व कामगाराचे जीवन आणि रोजीरोटी अवलंबून आहे. म्हणून हा उद्योग अनेकांना रोजगार आणि हाताला काम उपलब्ध करून देतो.

आपल्या जिल्ह्यात आजही ९९.९९ टक्के लोक घरबांधणीसाठी चिऱ्याचा वापर करतात. शहरात कुठे तरी अत्यल्प प्रमाणात माती व सीमेंट च्या विटा वापरल्या जातात. पण सर्वत्र घर बांधणी साठी चिऱ्यांचाच वापर होतो. म्हणून चिरे उत्खनन मोठ्या प्रमाणावर होते. त्यातून शेतकरी, शासन यांना आर्थिक लाभ होतो. कामगारांना काम मिळते, घर बांधणाऱ्याला चिरे मिळतात. म्हणून या खाणीवर अनेकांचे हितसंबंध आणि रोजगार रोजीरोटी अवलंबून आहे. या बरोबरच या खाणीवर काम करणारे बुद्धिजीवी म्हणजेच खनिज संशोधक, अभ्यासक, शासकीय स्तरावरील अधिकारी कर्मचारी, खाणमालक, ठेकेदार याशिवाय ट्रक टेम्पो मालक, चालक किरकोळ व्यावसायिक, खडीकसर कामगार, हमाल, जे.सी.पी. पोकल्यान चालक, मालक इतर मशीनवर काम करणारे कर्मचारी या सर्वांचा रोजगार व उदरनिर्वाह आणि रोजी रोटी याच व्यवसायावर अवलंबून आहे. या व्यवसायातून अनेकांच्या हाताला रोजगार मिळाला व जिल्ह्यात आर्थिक उलाढाल वाढली एवढे मात्र खरे.

### खाणकाम व्यवसायाच्या समस्या

- १ धुळीचे साम्राज्य
- २ अपघात
- ३ वाहतुकीला अडथळे
- ४ रस्त्यावर खड्डे
- ५ संपूर्ण डोंगराचे सपाटीकरण
- ६ जैवविविधतेचा हास
- ७ पाणीपातळी खालावली
- ८ शेतजमिनी गेल्याने शेतकरी त्रस्त
- ९ उत्पन्नाचे साधन नष्ट झाले.
- १० शिवारात मोठमोठ्या खड्याची निर्मिती अनेक गुरांचा मृत्यू

## कृषी पर्यटनाचा भौगोलिक अभ्यास

प्रा.अनिल नि.शिंदे

डॉ.सी.डी.देशमुख महाविद्यालय रोहा.

ता.रोहा. जि.रायगड.

### गोषवारा :

कृषी पर्यटन सध्या मोठ्या प्रमाणात नावारूपस येत आहे. या व्यवसायामुळे शेतकरी शेतीतून मिळणाऱ्या पैशा पेक्षा या व्यवसायाच्या माध्यमातून मोठ्या प्रमाणात तो पैसा उभारू शकतो. त्यामुळेच कृषी पर्यटनाला वाव मिळावा या हेतून शासनाने विविध योजना आणि भविष्यातील या क्षेत्रातील वाढती मागणी याची दखल घेऊन आपल्या कडील प्रत्येक शेतकऱ्याने कृषी पर्यटनास सुरुवात करावी या उद्देशाने शासकीय स्तरावर मोठ्या प्रमाणात योजना राबवल्या जात आहे. खरंतर कृषी पर्यटन ही परदेशी संकल्पना आहे. ब्राझील, न्यूझिलंड, ऑस्ट्रेलिया या देशात ती खूप लोकप्रिय आहे. आपल्या देशातही आता ही संकल्पना मोठ्या नावारूपास येत आहे. मात्र योग्य नियोजन आणि दूरदृष्टीने या गोष्टीकडे पाहिले तर महाराष्ट्र हे कृषी पर्यटनात एक प्रमुख राज्य म्हणून उदयास येण्यास जास्त वेळ लागणार नाही. आजच्या या धकाधकीच्या जीवनात रोज वेगवेगळे प्रश्न, समस्या व वाढत जाणाऱ्या जबाबदाऱ्या, पैसा कमावताना येणारे वेगवेगळ्या प्रकारचे तणाव, भीती, इत्यादींना सतत सामोरे जावे लागते. सततची रहदारी, प्रदूषण, बदललेली जीवनशैली व त्यामुळे येणारे वेगवेगळे आजार, रोजचा झगमगाट व आयुष्यातील गरजा पूर्ण करताना होणारी दमछाक, या सर्वांमधून मुक्तता मिळण्यासाठी पुन्हा निर्विकारपणे निसर्गाजवळ जाऊन त्याच्याशी हितगुज करणे व नेहमीच्या कामांमधून थोड्या वेगळेपणातून शांतता मिळविण्यासाठी कृषी पर्यटन हा अतिशय उत्तम पर्याय आहे. यातून शेतकऱ्यांना जादा कमाई तर शहरी लोकांना निसर्ग सानिध्यात जाण्याची संधी मिळते.

### प्रस्तावना :

“शेती, ग्रामीण जीवन आणि पर्यटन यांचा समन्वय म्हणजे कृषी पर्यटन होय”

कृषी पर्यटन म्हणजे शेतावरील फेरफटका, आपल्या संस्कृतीची ओळख, आनंद, शहरी जीवनशैलीचा उबग आलेल्या लोकांनी काही दिवस शेतकऱ्यांच्या शेतावर जाऊन राहणे व शेतकऱ्याने शहरी लोकांचा सशुल्क पाहुणचार, आदरातिथ्य करणे म्हणजे कृषी पर्यटन होय. कृषी पर्यटनातून ग्रामीण विकास आणि ग्रामीण विकासातून महाराष्ट्राचा विकास या ब्रीद वाक्याला साजेसे कृषी पर्यटन. शेती व्यवसाय जोड व्यवसायाची साथ देऊन उत्पादनांत भर घालता येणारा प्रकल्प म्हणजे कृषी पर्यटन होय. कृषी पर्यटन या व्यवसायाची सुरुवात जगात ऑस्ट्रेलिया येथे सुमारे ६५ वर्षांपूर्वी झाली. तर महाराष्ट्रात प्रथम बारामती येथे कृषीतज्ञ स्व.आप्पासाहेब पवार यांनी केली शेतीमधील नवीन्यापूर्ण प्रयोग, कृषी संशोधन पाहण्यासाठी येणाऱ्या लोकांना निशुल्क राहण्याची, भोजनाची सोय याच ठिकाणी

केली जात होती. मात्र आता शुल्क आकारून प्रवेश दिला जात आहे. यालाच कृषी अभ्यास दौरा म्हणून सर्वत्र ओळखले जाते. सध्या सर्वात मोठा व्यवसाय म्हणून लोक पर्यटन या व्यवसायाकडे वळत आहे. त्यात प्रामुख्याने महाराष्ट्रात विविध ठिकाणी कृषी पर्यटन व्यवसाय मोठ्या नावारूपास येत असल्यामुळे अनेक लोक या पर्यटनास पसंती देत आहे. त्यामुळेच सर्वत्र कृषी पर्यटन हा एक नवीन व्यवसाय उदयास येत आहे.

राज्यातील दुष्काळग्रस्त परिस्थिती, गारपीट, वादळ, भूकंप यासारख्या नैसर्गिक आपत्तीमुळे, शेती व शेतीशी संबंधित रोजगारांमध्ये घट होताना दिसून येत आहे. येत्या काळात कृषी पर्यटन हा शेतकऱ्यांसाठी पर्यायी उत्पन्न मिळवून देणारा मार्ग ठरेल. शेती उद्योगाला लागून करता येणारा पण, अलीकडेच विकसित होत असलेला पूरक उद्योग म्हणजे कृषि पर्यटन उद्योग. सध्या सगळीकडेच पर्यटन व्यवसाय वाढत चालला आहे पण तसा तो कृषि व्यवसायाशी जोडूनही करता येतो. शेतातली हवा मोकळी आणि निरोगी असते पण नेहमी त्याच हवेत राहणाऱ्या शेतकऱ्यांना त्या हवेचे काहीच अप्रुप वाटत नाही. शहरातल्या कोंदट हवेत राहून उबगून गेलेल्या शहरी लोकांना या हवेचे कौतुक वाटते कारण त्यांना ही हवा कधी मिळत नाही. शहरातले लोक थंड आणि मोकळ्या हवेला आसलेले असतात. त्यासाठी ते हवा पालटायला लोणावळा, महाबळेश्वर अशा थंड हवेच्या ठिकाणी जात असतात. आता या थंड हवेच्या ठिकाणीही गर्दी वाढू लागली आहे. वाहनांची लगबग सुरू झाली आहे. गर्द झाडांची जागा आता सिमेंटच्या जंगलांनी घेतली आहे. हवा प्रदूषित झाली आहेच पण या जागांना शहरांचे रूप येऊन त्यांचे वैशिष्ट्य नष्ट झाले आहे. अशा ठिकाणी आता पूर्वीप्रमाणे थंडावा राहिलेला नसल्याने आपण शेतातली थंड हवा या लोकांना पुरवू शकतो. शेतीचे क्षेत्र प्रचंड विस्तारलेले आहे. त्यामुळे थंड हवा, विरंगुळा आणि विश्रांती यासाठी आपण त्यांना शेतात आणू शकतो. शेतात कितीही लोक आले तरीही शेतात गर्दी होणार नाही. महाबळेश्वर सारख्या ठिकाणी लॉज आणि हॉटेलांच्या मालकांनी धंदा करून पैसा कमावला आहे पण त्यांनी या नादात थंड हवा गमावली आहे. तशी स्थिती शेताची होणार नाही. पर्यटक महाबळेश्वरच्या ऐवजी शेतात राहणे पसंत करायला लागले आहेत. तिथे त्यांना काहीही नको आहे त्यांना केवळ शांतता, थंड नैसर्गिक हवा आणि रानातले वातावरण हवे आहे. त्यांना ते देऊन आपण पैसे कमावू शकतो. शहरातल्या वातावरणाचा कंटाळा आला आहे का, तर शेतात या, झोपडीत रहा, झाडाखाली निसर्गाने दिलेली थंड हवा खात झोपा, पाण्याच्या कालव्यातून चाला, विहिरीत उड्या मारा, पाण्यात डुंबा, झाडाला टांगलेल्या झोक्याचा आनंद लुटा, हाताने डहाळे तोडून खा, हुरड्याचा आस्वाद घ्या, शेतातल्या गोठ्यातच चुलीवर भाजलेल्या गरम गरम भाकरीची आणि झणझणीत पिठल्याची चव चाखा, महाबळेश्वर पेक्षा किती तरी छान. हेच तर आहे कृषि पर्यटन.यात पर्यटकांना महाबळेश्वरच्या मानाने कितीतरी कमी पैसे लागतील पण त्यांच्याकडून जे पैसे मिळतील ते शेतकऱ्यांसाठी किती तरी मोलाचे ठरतील. आता हा व्यवसाय अनेक शेतकरी करायला लागले आहेत. यात फारशी गुंतवणूक नाही. मिळणारा पैसा मात्र जास्त आहे. शेतकरी निसर्गाने झटका

दिला की संकटात सापडतो आणि तसे झाले की हवालदिल होतो. त्यासाठी कृषि पर्यटनासारखा व्यवसाय किती तरी चांगला ठरतो. मुंबईत करण्यात आलेल्या पाहणीत, ४० ते ५० टक्के लोकांचा शेतीशी काहीही संबंध आलेला नाही, असे दिसून आले आहे. या लोकांना वर्षातून एक दोन दिवस शेतात येऊन राहणे आवडते. त्याचा फायदा शेतकऱ्यांनी घेतला पाहिजे. शहरांपासून जवळ असलेल्या शेतकऱ्यांना तर हा व्यवसाय चांगलाच किफायतशीर आहे.

### उद्दिष्टे

- 1) महाराष्ट्रातील कृषि पर्यटनाचे महत्व अभ्यासणे.
- 2) महाराष्ट्रातील कृषि पर्यटनाचा अभ्यास करणे.
- 3) महाराष्ट्रातील कृषि पर्यटन विकासासाठी शासकिय योजनांचा आढावा घेणे.

### विषय विवेचन :

2015 साली केलेल्या पाहणी अहवालानुसार काही महत्वपूर्ण माहिती उपलब्ध झालेली आहे. त्यामध्ये महाराष्ट्रातील कृषि पर्यटन करणारे शेतकरी कुटुंबाच्या उत्पन्नात कृषि पर्यटनाच्या माध्यमातून 40 टक्के अधिक आर्थिक उत्पन्न मिळाले आहे. तसेच शेतावर आधारित अनेक रोजगाराच्या संधीही उपलब्ध झालेल्या असल्याचे आढळून आले आहे. कृषि पर्यटनाचे महत्व आणि गरज सर्वच स्तरावर आहे. महाराष्ट्रात कृषि पर्यटनामध्ये साधारणतः 69 टक्के कृषि पर्यटन चालक शेतकरी पदवीधर आहेत. 20 टक्के कृषि पर्यटन चालक जन्माने शेतकरी नसले तरीही व्यवहारिक ज्ञान खूप आहे. 1 टक्के कृषि पर्यटन चालक शेतकरी उच्च पदवीधर असून 10 टक्के कृषि पर्यटन चालक शेतकरी सातवी पर्यंत शिकलेले आहेत. 58 टक्के कृषि पर्यटन केंद्रांना शाश्वत सिंचन सुविधा उपलब्ध आहेत. 30 टक्के कृषि पर्यटन केंद्रांच्या जवळ गड किल्ले आहेत. त्यातून इतिहासाची माहिती मिळते आहे. 75 टक्के कृषि पर्यटन केंद्रावर कौटुंबिक सहली येतात. तसेच 20 टक्के कृषि पर्यटन केंद्रावर शाळेच्या सहली येतात. 5 टक्के कृषि पर्यटन केंद्रावर सर्व सहली येतात. उदा. शाळा, कॉलेज सहली, कंपनी सहली, कौटुंबिक सहली इत्यादी.

कृषि पर्यटनातून ग्रामीण विकास आणि ग्रामीण विकासातून महाराष्ट्राचा विकास, यासाठी व शेतकऱ्यांच्या हितासाठी महाराष्ट्रात कृषि पर्यटन करणाऱ्या शेतकऱ्यांनी व कृषि पर्यटन संस्थांनी एकत्र येऊन एक महासंघ स्थापन केला आहे. त्याचे नाव 'महाराष्ट्र स्टेट ऍग्री ऍण्ड रूरल टुरिझम को-ऑप. फेडरेशन लि.(MART) असे असून मध्यंतरीच्या काळात महाराष्ट्राच्या प्रमुख शहरात 'मार्ट'ने केलेल्या सर्व्हेक्षणानुसार सुमारे ४२ टक्के लोकांना ग्रामीण भागात एकही नातेवाईक नसल्याचे सिद्ध झाले आहे.

शेतकऱ्यांमध्ये होणारी जागृती, शेतीपूरक उत्पन्नाचे साधन म्हणून याकडे बघितले जात असल्याने दिवसेंदिवस कृषि पर्यटन व्यवसाय चांगलेच मूळ धरून बहरू लागला आहे. उपलब्ध साधनसामग्रीत अगदी कमी भांडवली खर्चात केला जाणारा हा पूरक व्यवसाय आहे. शहरी पर्यटकांना

ग्रामीण जीवनाची ओळख करून देणे व त्यायोगे शहरी पैसा ग्रामीण भागाकडे वळविणे, हा उद्देश साध्य होतो.

### कृषी पर्यटनाची आवश्यकता आणि फायदे -

आज शेतीच्या पुनरुज्जीवनासाठी व वाढीसाठी, कृषी व ग्रामीण पर्यटनाची गरज आहे. कृषी पर्यटनामुळे शेतकऱ्यांसाठी स्थानिक बाजारपेठ व इतर रोजगाराची संधी उपलब्ध होईल. तसेच शेतीसोबत जोडधंदा आणि त्यातून पर्यायी व अतिरिक्त उत्पन्न शेतकऱ्यास मिळेल. ग्रामीण व स्थानिक रोजगारामध्ये वाढ होऊन, बेरोजगार, कुशल व अकुशल श्रमिकांना स्थानिक परिसरामध्येच काम व मोबदला मिळेल. गावातील सोयी-सुविधांच्या गुणवत्तेमध्ये वाढ होईल. शेतकरी व गावाच्या सर्वांगीण विकासासोबत लोकांचा अभिमान वाढेल आणि स्थानिक वारसा, इतिहास, चालीरिती इत्यादीबद्दल सर्वांना माहिती होईल. शिवाय लघुउद्योग-कुटिरोद्योगास दीर्घकाळ चालना मिळेल.

पर्यटकांसाठी शेती व शेतीविषयक कार्याचे आकलन होण्यासाठी व त्याचा प्रत्यक्ष अनुभव घेण्यासाठी कृषी पर्यटन हा उत्तम पर्याय आहे. पुस्तकांत किंवा चित्रपट व सोशल मिडियामध्ये दिसणाऱ्या शेतीतील गोष्टींना स्वअनुभवाने आत्मसात करता येईल. लहान मुलांना झाडावर चढणे, आंबे व फळे काढणे, म्हशीच्या पाठीवर बसून फेरफटका मारणे, शेतातील भाजी काढणे, पक्षी-प्राणी निरीक्षण करणे, पाटातील पाण्यात किंवा पाळीव प्राण्यांसोबत मनसोक्त खेळणे यासारख्या गोष्टींचा अनुभव घेता येईल. शिवाय मोठ्यांना चुलीवरचे जेवण, ताजी भाजी-फुले-फळे, शुद्ध हवा, मानसिक शांतीसाठी आवश्यक अशी शांतता, झाडाखाली सावलीतील किंवा मचाणावर झोप, विहारीतील अंघोळ अशा ग्रामीण जीवनशैलीचा उपभोग घेता येईल.

### शेतकऱ्यांसाठी फायदे

- मध्यस्थाशिवाय शेतकऱ्यांच्या हातात आगाऊ रक्कम पडेल.
- दरवर्षी उत्पन्नात वाढ होत जाईल.
- आपल्या मालाचे दर शेतकऱ्याला स्वतः ठरवता येतील.
- स्थानिक रोजगार उपलब्ध होईल.
- नापीक, बरड, पाणथळ जमिनीवर प्रोजेक्ट उभा करता येतो.
- कमीत कमी भांडवलात व्यवसाय उभा करता येतो.

### पर्यटकांसाठी फायदे

- धकाधकीच्या तणावपूर्ण जीवनातून आगळावेगळा विरंगळा मिळतो .
- निखळ ग्रामीण मनोरंजनाचा आनंद घेता येतो.
- सुंदर व साधी राहण्याची व्यवस्था अनुभवता येते.
- ग्रामीण महाराष्ट्राची खरी ओळख होते.
- आयुष्यभर जतन करता येतील अशा सुखद आठवणी मिळतात.

## कृषी पर्यटनाच्या ठिकाणी उपलब्ध होणाऱ्या सुविधा

१. शेतातील साहित्यांचे प्रदर्शन व शेतातील प्रात्यक्षिके
२. शेतातील दुकान( ऍग्री मॉल )
३. शेतातील दुकानाच्या ( ऍग्री मॉल ) माध्यमातून शेतमालाची विक्री
४. शेतातील सफर: घोडा, म्हैस, बैलगाडी, ट्रॅक्टर, लहान ट्रेन
५. पक्षी निरीक्षण
६. मासेमारी
७. गुलाब बाग , फुलपाखरु बाग
८. पाण्यात खेळण्यासाठी जागा
९. साहसी पर्यटन( एडवेंचर टूरिझम )
१०. निवांत बसण्यासाठी जागा : आमराई, वडाचे झाड.
१२. शालेय विद्यार्थ्यांसाठी शैक्षणिक सहल (उन्हाळी व हिवाळी शिबिरे)
१३. वर्कशॉप
१४. विविध सण
१५. रेस्टॉरंट: ग्रामीण चविचे जेवण
१६. टूरिंग टॉकीज( हवेशीर थिएटर )
१७. मेडिको टूरिझम
१८. राहण्याची उत्तम सोय : टेन्ट्स, झाडावरची घरे, पाण्यातील घरे, डॉर्मेटरीज, बांबूची घरे, पक्षी निरीक्षणासाठी मचान,मातीचीघरे, लाकडाचीघरे.
१९. स्वच्छ स्वच्छतागृह
२०. २४ तास सुरक्षा

## कृषी पर्यटनात घ्यावयाची काळजी -

कृषी पर्यटन करताना पर्यटकांनी खास काळजी घेणे आवश्यक आहे, कारण शहरी व ग्रामीण जीवन यामधील कार्यप्रणाली मध्ये खूप मोठा फरक असतो. तो फरक लक्षात घेऊन, आपल्याला इजा-दुखापत होणार नाही याची काळजी घेऊनच पर्यटनातील उपक्रमामध्ये पर्यटकांनी समाविष्ट व्हावे. शेतकऱ्याच्या अथवा तेथील ज्ञात व्यक्तीच्या देखरेखीखालीच सर्व गोष्टींचा आनंद घ्यावा. झाडावर चढ उतार करताना काळजी घ्यावी, तसेच शक्ती वापराची कामे योग्य प्रमाणात करावीत. झाडे, प्राणी, पक्षी, शेतकी अवजारे, शेतकरी, त्याचे कुटुंबीय व स्थानिक लोकांना आपला त्रास होणार नाही याकडे विशेष लक्ष द्यावे.

ज्याप्रमाणे पर्यटकांनी काळजी घेणे आवश्यक आहेत, त्याप्रमाणे कृषी पर्यटन केंद्र चालकांनीही पर्यटकांची काळजी घेणे आवश्यक आहे. पर्यटकांसाठी मुलभूत सुविधांची उपलब्धता आणि स्वच्छता अधिक महत्त्वाची असते. केंद्र चालकांनी आधुनिक सुविधांपेक्षा नेहमीच्या राहणीमानाप्रमाणेच केंद्राची मांडणी ठेवावी. स्विमिंग पुल बांधण्यापेक्षा विहीर, नदी, पाण्याचे पाठ, त्यांची सुरक्षा याकडे लक्ष द्यावे.

गरजेव्यतिरिक्त आधुनिक सुविधा, शहरी खेळ, परदेशी खाद्यपदार्थांचा अवलंब करणे टाळावे. आपल्या केंद्राची नोंद MTDC कडे करणे गरजेचे आहे, त्यामुळे अश्या केंद्रांना सरकारी योजनांचा लाभ घेता येईल व पर्यटकांना सुरक्षेची हमी मिळेल.

सध्या ५०० हून अधिक कृषी पर्यटन केंद्रे महाराष्ट्रात आहेत, असे कृषी पर्यटन विकास मंडळाने (ATDC) नमूद केले आहे. कृषी पर्यटनाचे दिसणारे सकारात्मक परिणाम महाराष्ट्राच्या आर्थिक, सामाजिक, धार्मिक आणि सांस्कृतिक वाढीसही नक्कीच पूरक ठरतील अशी आशा आहे.

### कृषी पर्यटन केंद्र उभारणीसाठी कृषी विभागाच्या फायदेशीर योजना-

कृषी पर्यटन हा शेतीस उत्कृष्ट जोड व्यवसाय आहे. मुंबई, ठाणे, पुणे, नाशिक, औरंगाबाद, नागपूर, नांदेड, लातूर, अमरावती, कोल्हापूर व अन्य ठिकाणी मोठ्या प्रमाणावर शहरांची वाढ होत आहे. शहरी लोकांचा कृषी पर्यटनाकडे कल वाढीस लागल्यामुळे राज्यात सध्या ५०० हून अधिक कृषी पर्यटन केंद्रे सुरू आहेत. कृषी पर्यटन केंद्र उभारताना कृषी विभागाच्या विविध योजनांच्या माध्यमातून मदत मिळू शकते. त्यापैकी काही ठळक बाबी व योजना पुढीलप्रमाणे आहेत.

### जमीन सुधारणा-

कृषी पर्यटन केंद्रामधील जमीन सुधारणे अंतर्गत शेतीस जैविक बांध, सलग समतल चर, कंपार्टमेंट बंडिंग, अनघड दगडी बांध, माती व सिमेंटचे बंधारे आणि वळण बंधारे, शेततळे या बाबींसाठी शासनामार्फत 100 टक्के खर्च करण्यात येतो. मात्र, त्यासाठी सदर पर्यटन केंद्र हे शासनाच्या विविध पाणलोट क्षेत्र विकास योजनांमधील गावात असावे आणि तांत्रिकदृष्ट्या सदर जागा योग्य असावी.

### शेततळे -

राष्ट्रीय फलोत्पादन अभियान योजनेअंतर्गत सामुदायिक शेततळ्यासाठी 500 घन मी. ते 10,000 घन मी. पाणीसाठ्याच्या तळ्यासाठी 65,500 ते 7,53,000 रुपयांपर्यंत 100 टक्के अनुदान हे शेततळे खोदाई व प्लॅस्टिक अस्तरीकरणसाठी असते. मात्र, ही शेतक-यांनी समूहाने करावयाची बाब असून, त्यांच्याकडे फळपिकाखाली कमीत कमी 0.50 हे. ते 10 हे.पर्यंत क्षेत्र असावे.महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार हमी योजनेअंतर्गत विविध आकाराची शेततळी असून, त्यासाठी 18,577 रुपये ते 2,78,000 रुपयांपर्यंत शेततळ्याच्या आकारमानानुसार व क्षेत्रानुसार 100 टक्के अनुदान आहे. या व्यतिरिक्त गतिमान पाणलोट व इतर पाणलोट विकास कार्यक्रमांतर्गत देखील शेततळ्यासाठी 22,329 ते 1,18,118 रुपयांपर्यंत शेततळ्याच्या आकारमानानुसार अनुदान देय आहे.

### फळबाग लागवड -

यासाठी महाराष्ट्र शासनाच्या रोजगार हमी योजनेअंतर्गत आंबा, काजू, चिकू, पेरू, डाळिंब, चिंच, लिची, सुपारी, जोजोबा, तेलताड, रबर, पानपिंपरी, औषधी वनस्पती इ. अनेक वृक्ष लागवडीसाठी प्रत्येक शेतकऱ्याला भौगोलिक विभागास निश्चित केल्याप्रमाणे कमीत कमी 0.10 हेक्टर ते कमाल 4

ते 10 हेक्टरपर्यंत फळबाग लागवडीसाठी 25,020 ते 1,95,640 रुपयांपर्यंत 100 टक्के अनुदान काही अटी व शर्तीवर देय आहे.

### महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार हमी-

योजनेअंतर्गत वैयक्तिक शेतकऱ्यास सलग फळबाग अथवा वृक्षलागवड आणि बांधावर फळपीक लागवडीसाठी आंबा, काजू, चिकू, पेरू, डाळिंब, संत्रा, मोसंबी, लिंबू, नारळ, बोर, सीताफळ, आवळा, चिंच, कवठ, जांभूळ, कोकम, फणस, अंजीर, सुपारी, बांबू, जट्रोफा, साग, गिरिपुष्प, कडुलिंब, शिंदी, शेवगा, हातगा, कढीपत्ता, सोनचाफा आणि औषधी वनस्पती लागवडीसाठी फळपीकनिहाय प्रतिहेक्टरी कमीत कमी 50,814 ते जास्तीत जास्त 1,78,188 रुपयांपर्यंत अनुदान देय आहे.

### एकात्मिक फलोत्पादन विकास अभियान योजनेअंतर्गत-

द्राक्ष, आंबा, पेरू, स्ट्रॉबेरी, केळी, पपई लागवडीसाठी प्रतिहेक्टरी किमान 36,350 ते कमाल 86,660 रुपये अनुदान देय आहे

### मधमाशी पालन -

मध उद्योगासाठी आवश्यक असलेली साहित्य मधपेट्या (वसाहतीसह) मध्यंत्र व अन्य साहित्य रु 42700/- पुरविण्यात येते. यात प्रशिक्षण विनामूल्य तसेच साहित्य खरेदीवर 10,000/- पर्यंतचे अनुदान पश्चिमघाट विकास योजना अथवा जिल्हा वार्षिक योजना यांचे माध्यमातून ते दिले जाते. शिवाय शेतकऱ्यास मधासाठी हमी भाव रु. 120/- प्रति किलो निर्धारित केला असून मंडळाकडून मध खरेदी केला जातो.

### औषधी वनस्पतीची लागवड -

औषधी वनस्पतीची लागवड या घटक योजनेअंतर्गत समूह पद्धतीने औषधी वनस्पतीची लागवडीस प्रोत्साहन देण्यात येत आहे. औषधी वनस्पतींच्या लागवडीकरिता प्रजातीनिहाय प्रकल्प खर्चाच्या २० टक्के, ५० टक्के व ७५ टक्के एवढे वित्तीय साह्य देण्यात येते.

### समारोप:

भारतात कृषी पर्यटन सुरु करणारे महाराष्ट्र हे पहिले राज्य आहे , आज मितीस ५०० पेक्षा जास्त कृषी पर्यटन केंद्र अस्तित्वात असून मागच्या वर्षात या कृषी पर्यटन केंद्रांना ८ लाख पर्यटकांनी भेटी दिल्या असून रुपये १८ कोटी चे अतिरिक्त उत्पन्न कृषी पर्यटन केंद्र चालकांना मिळाले आहे, ५००० लोकांना या माध्यमातून रोजगार मिळाला आहे , गावातील महिला बचत गट , युवक , कारागीर , कलाकार , या सर्वांना कृषी पर्यटनाला येणाऱ्या पर्यटकांमुळे फायदा झाला आहे , त्यामुळे कृषी पर्यटन हे गावाला पूरक व्यवसायांचे जाळे निर्माण करणारा शेतीवर आधारित उपक्रम आहे ,जगभरातील देशांनी पर्यटन क्षेत्र खूप गांभीर्याने घेतले आहे , आशिया खंडातील कित्येक देशांची आर्थिक उलाढाल फक्त पर्यटनाच्या जोरावर सुरु आहे , त्या सर्व देशांचे पर्यटन धोरण खूप अनुकूल आहे, आपल्या देशात

महाराष्ट्र राज्य कृषी पर्यटन चळवळ सुरु करणारे पहिले राज्य आहे. काळाची गरज ओळखून महाराष्ट्रातल्या शेतकऱ्यांनी आता जोमाने कृषी पर्यटन व्यवसाय सुरु केला पाहिजे. अत्यंत उज्ज्वल असे भवितव्य असणारा असा हा कृषी पर्यटनाचा पूरक व्यवसाय करून तो मुख्य व्यवसाय कसा होईल याचा ध्यास घेतला पाहिजे. आज शेतीमालाच्या दराबाबत अनिश्चितता आहे. शेतकरी शेती उत्पादन पिकवतो. त्याला दर निश्चितीचा हक्क नाही. यामुळे शेतकऱ्यांना उत्पादनखर्चसुद्धा मिळत नाही. अशा अवस्थेमध्ये कृषी पर्यटन व्यवसायात पर्यटकांचे दर निश्चिती पॅकेज ठरविणे शेतकऱ्यांच्या हातात आहे. म्हणून हा व्यवसाय आर्थिकदृष्ट्या स्वातंत्र्य व सामर्थ्य देणारा आहे.

