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Sustainable Development for Society, Industrial Development, Material, Energy and Environment: Key Issues, Opportunities and Challenge

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FOREST FIRE: IT'S EFFECTS AND MANAGEMENT IN INDIAN FORESTS

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Abstract:
Forest fire is a burning issue of the present scenario over the globe.Indian forests since decades back faces an alarmingforest fireincidences with more predominant in North and North- east Indian regions.In 2021nearly 35.46 percent of the forest cover and out of that 2.81 percent are extremely vulnerable to fire.Forest fires are human caused in over 95% of cases, either intentionally or unintentionally and remaining only 5% by natural causes which uncover disastrous impact on forest landscapes.El-Nino event is also link with forest fires.Every year, fire damages resulting in massive economic losses due to burned wood, deteriorated real estate, degradation of forest, harm to environmental, recreational and aesthetic valuesas well as loss of life.Forest fires, on the other hand, aren'talways detrimental to forest management, but they can also be beneficialin shaping forest's structure, recycle nutrients locked up in litter; to decrease competition of overstocking; suppress or kill insect-pests and diseases; to promote seed germination or cone opening; to generate fire breaks in a wildfire countermeasure.To reduce, prevent, control and monitor fire risks, some of the key fundamentalsilvicultural practices, counter fire, fire retardant chemicals, constructing green fire belt can be employed.

Keywords: *Forest fire, fire types, causes, effects, fireline*

Introduction:

Forest fire is characterised as an open, widely spreading flame that burns natural fuels where as wildfire occurs when a fire burns out of control. Forest fires have been sparked and burnt spontaneously across the forest throughout history. Forest fires, on the other hand, have different impacts. Depending on the prevailing conditions and kind of floral vegetations, fire may be helpful to one habitat but harmful to another. Every year, fire damages thousands of hectares of the world's forests, resulting in massive economic losses due to burned wood, deteriorated real estate, expensive suppression costs, harm to environmental, recreational, as well as aesthetic values, including loss of life.

Remnant of past fires may be found in fossilized trees that lived a long time ago and have transformed into hard rock over time. The fossilised charcoal known as "Fusain" may be found in the trunks of some petrified trees. Fire scars on a live tree are charcoal traces that show that the tree was formerly in the passage of a fire. All of these evidences point to the fact that fire has played an important role in the development of our temperate world's forest environment.

The consequences of fire on all woods are not the same. Depending on the climatic circumstances and kind of vegetation, the same fire that is favourable for one environment may be disastrous for another. Tropical rain forests are least impacted by fires because they are blanketed in fog and are constantly wet in mists and downpours. Fire is exceedingly rare and less harmful in temperate deciduous woods due to profuse rainfall, wetness plus comparatively higher humidity. Coniferous woods and evergreen forests having wide leaves are more sensitive to fire in overall.

Forest fires are a national tragedy that is being overlooked. Forest fires aren't even classified as a natural catastrophe in the National Disaster Management Authority's

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framework (NDMA). Only floods, cyclones, earthquakes, wind and landslides were initially listed as disasters in the 2009 National Policy on Disaster Management. Heatwaves and glacial lake explosions were later taken into account. However, the much-needed acknowledgement of forest fires as a disaster remains strangely missing.

Causes of Forest fires:

Fires have always been a problem in Indian forests. To start the fire, three elements are required: fuel, heat, and oxygen, all of which must be present in the right proportions. The "fire triangle" is formed when these elements are combined. The third component, heat, is what really starts a fire there in forest. Heat can come from either natural or manmade sources. Forest fires can be characterised as either natural or manufactured, depending on source of heat.

Forest fires are human caused in over 95% of cases, either intentionally or unintentionally. The remaining 5% fires are generated by natural causes such as lightning, rolling stone friction, volcanic explosions, rubbing of dry boles of trees or bamboo clusters and so on, all of which are pretty uncommon. Lightning, for example, can cause trees to catch fire. The ideal circumstances for a fire to start are high ambient temperatures and little humidity. Natural sources in isolated places are the most common cause of forest fires.

The leading causes of forest fires seem to be anthropogenic everywhere over the world. The situation got worse as the human and cattle populations have grown, as has the demand for shifting cultivation, grazing, and forest products by people and families. Communities sets fire as intentionally to clear forest floors for NTFP gathering, prepare areas for shifting cultivation, and encourage grass growth for grazing and forage. To promote profuse tendu leaf growth; to trespass on forest land; to mask illegal logging; tribal customs and traditions. Hunters and Poacher gangs utilise fire to drive wild animals out of sheltered hiding spots, while unintentional fires caused via reckless tossing of flaming matchsticks and cooking fires escaping from temporary roadworker shelters also contribute to a plethora of forest fires.

Unintentional forest fires are also triggered by careless tossing of flaming matchsticks and cooking fires escaping from temporary roadworker shelters. Farm residues, picnicker campfires, automobile exhaust sparks, transformer sparks (an electric spark), unmanaged prescribed burning, resin tapping, heating coal tar for forest road building, and any other form of ignition.

Forest fires can be exacerbated by high temperatures, wind direction and speed, soil and atmospheric moisture levels, and the length of dry spells. Other causes claimed include less snow, rather dry winters, and even less rainfall in the mid-Himalayas between 3,000 feet to approximately 7,000 feet height, among others (IMPRI, 2021a).

Forest fires have been linked to El-Nino incidents (Parameswaran *et al.*, 2004). El Nino causes lesser rain to fall across many tropical regions, increasing the risk of forest fires ignited by mankind. As per a US research, El Nino triggered forest fires on several continents in 1997-98 (Siegert*et al.*, 2001). Forest fires across South America, Africa, & Asia were also attributed on El Nino in 2015-16 (Burton *et al.*, 2020).

Types of forest fires:

Forest fires are classified into four categories based on their nature, spread speed, behaviour, and magnitude i.e., *Surface fire*, *Underground fire*, *Ground fire* and *Crown fire*. Within forest all these types of fire may be the possibility to occur at the same fire event.

Surface fire:

Surface fires burn vegetation and dead stuff along the forest floor, and they are the most common type of forest fire. Surface litter, other loose forest floor detritus, and smaller plants are also burned in this sort of fire. Surface flames burn quickly and do not devour the whole organic layer. Moisture in the organic layers inhibits the humus layer from igniting and shields the soil and soil-dwelling creatures from the heat. It is beneficial to the growth and regeneration of forests in general. However, if this fire gets bigger enough, it will destroy not only ground vegetation but also the forest's undergrowth and middle storey.

Underground fire:

Muck/underground fires seem to be low-intensity fires that destroy the organic matter

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underlying the forest floor as well as the surface trash. On top of the mineral soil, a thick layer of organic matter may be found in most dense bush. The fire spreads across the region by devouring such material. Typically, these fires extend entirely underground and flames for so several metres below ground level. Since this fire flames and spreads slowly, it's difficult to spot and put out in the severe cases. This could burn for days or weeks, ruining the ground cover of the soil.

Ground fire:

Normally, ground fires smoulder or creep gradually through the litter and humus layers, destroying all or most of the organic cover and exposes mineral soil or beneath rock. As a result, it's difficult to tell the difference among underground and ground fires. These flames often only occur during prolonged droughts when the whole soil organic layer has dried enough, yet they can burn for extended periods of time until they are extinguished by precipitation and cold temperatures, or they run out of fuel. This fire destroys root as well as other material on or under the surface, i.e. it destroys herbaceous growth on the forest floor as well as a layer of organic materials in various stages of decomposition. They are more dangerous than surface fires because they may entirely damage plants. These flames are the most difficult to spot, as well as the least showy and slow-moving.

Crown fire:

Crown fire is the most unexpected type of fire since it burns the tops of trees and rapidly spread owing to the wind. In most situations, surface fires start these fires. This is among the most dramatic types of forest fires, which often spread from the top to the bottom of trees or bushes, and are more or less reliant on surface flames.Well before fire moves on, trees normally lose 20-30% of its crowns. The crown fire may pull ahead of the accompanying surface fire in crowded conifer stands with a fast wind. It's uncontrolled until it falls to the ground since it's above the head.

Season of forest fire:

The fire season vary from one region to the next, relying upon the type of forest, plant species the climate, and a variety of other factors. Even though the country's peak forest fire season runs during February to June, certain woods are vulnerable to flames all year.

The forest fire data obtained by FSI over two years (2005-06 and 2006-07) aids in pinpointing the critical time of forest fire in various states throughout the country. According to the data, the country's peak fire season is from February to May.

As a result, it is desirable to enhance disaster risk reduction and mitigation measures and concentrate on adaptability. These fires are mostly man-made phenomena with flawed interventions at many layers, ranging from monoculture plantations to the expulsion of forest people from the mountains' woods.

Status of forest fire:

Forest fires have started in Himachal Pradesh, Uttarakhand, Nagaland-Manipur border, Odisha, Gujarat, Madhya Pradesh since the beginning of the year 2021, including those in wildlife sanctuaries. From February 22 and March 1, 2021, at least 5,291 incidents of forest fires were detected in Odisha, according to FSI (2021), the largest in the country during the same period. Forest fires in Odisha are caused by the collection of tendu leaves, mahua flowers, shifting cultivation, as well as grazing in forest areas. During the same time period, Telangana had the second-highest number of fires in the country, with 1,527, preceded by Madhya Pradesh (1,507) then Andhra Pradesh (1,292). According to the FSI, India had 345,989 forest fires during November 2020 to June 2021. This is the country's highest figure during this time period. During the same period in 2018-19, at least 258,480 forest fires were registered, the second-highest number ever. This is 2.7 times the number of fires reported in the period November 2019 to June 2020. Large, ongoing, and recurring forest fires are examples of this. Currently, forest fires menace 35.46 percent of the forest cover, 2.81 percent are extremely vulnerable, 7.85 percent are very highly vulnerable, and 11.51 percent are highly vulnerable. According to a new analysis by the UNEP (UN Environment Programme) and GRID-Arendal (2022), climate change as well as land-use change are expected to increase the frequency and intensity of wildfires, with a global rise of

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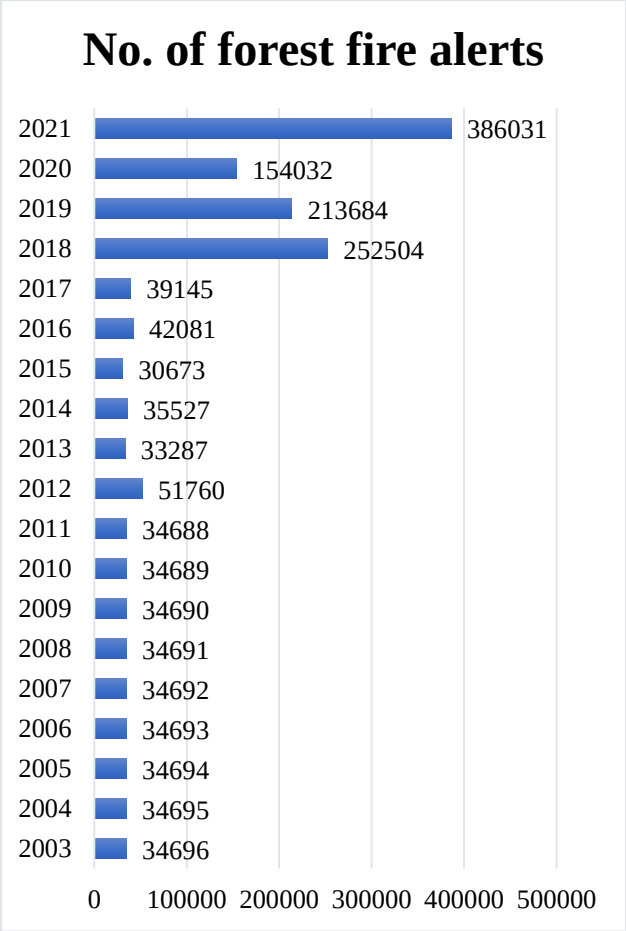
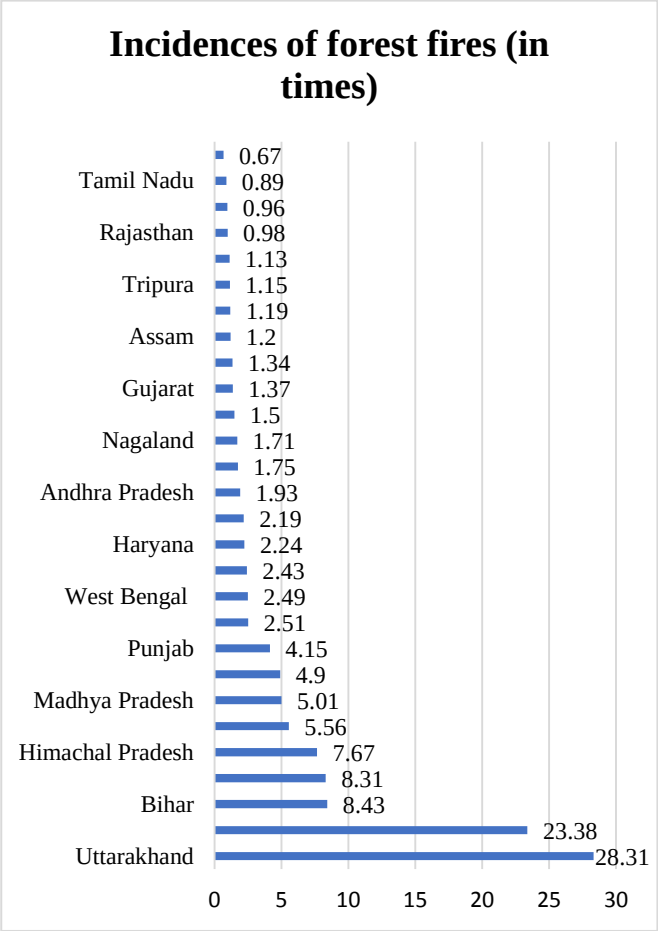
roughly to 14% by 2030, 30% for 2050, and 50% by an end of 21st century.

In just one year (2019-20), India lost over 38,500 hectares of tropical forest, or 14% of its total. As one fifth of India's 70.82 Mha of forest land burns every year, India's forests are no longer carbon sinks rather carbon emission regions. These flames would emit far more carbon into the sky than that of the Californian fire estimate of 91 metric tonnes emitted from a forest fire area with just 1.4 Mha. According to GFW, Mizoram had seen the foremost forest loss (47.2 percent), next by Manipur, Assam, Meghalaya, and Nagaland, which collectively lost more than 52 percent of India's tree cover in 2019-20.





Source: Forest survey of India (2021)

The state with the most fires (51,968) was Odisha, followed by Madhya Pradesh and Chhattisgarh are the next two states with 47,795 and 38,106 fire events respectively. Uttarakhand had the country's 6thhighest fire count, with occurrences up 28.3 times over the previous season. According to the survey, climate change zones in Indian forests will be identified based on forecasts for 2030, 2050, and 2080, and the state would see the highest temperature increase and perhaps a drop in rainfall. Forest fire counts in Chhattisgarh were 23.3 times higher than last year, while in Bihar they were 8.4 times higher.

Effects of forest fire:

Forest fires keep releasing billions of tonnes of CO_2 emissions globally, and million people worldwide are assumed to die as a result of illnesses brought on by smoke from forest fires as well as all other landscape fires.

Forest fires are being stoked by global heating, which in turn is igniting further global warming: a lethal cycle. Observations

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over the last two decades suggest that rising temperatures and decreasing precipitation, together with escalating land use intensity, were substantially responsible for increasing the intensity as well as prevalence of forest fires throughout Asia (IPCC, 2007).

Mountain forest fires are not a new occurrence. Monoculture plantations assisted in the spread of green cover and the planting of exotics in mountain and plains kinds that are extremely effervescent to fires. Both Uttarakhand and Himachal state governments embarked on large scale Chir-Pine plantation drives, planting trees even now in mixed forests and grasslands (IMPRI, 2021b). After a few years, pine plantations had overtaken the native woodlands, wreaking devastation. These fires are caused by highly effervescent pine needles that fall from the trees. Second, no green flora grows beneath the pine tree, with the exception of Lantana Camara, an non-native shrub that has depleted wide swaths of woodland in the mountains and is also a forest fire enhancer. Third, the pine tree roots are deep and suckers' water even from deep rocks, causing the area to become arid. A pine forest contains no water bodies. Global forest loss is driven by forest fire is estimated about 4.8Mha*i.e.*, 28% of the global forest cover (Curtis *et al.*, 2018).

Forest fires releases harm full polluting gases such as nitrogen oxide, carbon monoxide and sulphur oxide, all of which contribute to climatic changes, global warming and imbalances of water table level all of which have an influence on quality of life(Rather *et al.*, 2018). Forest fires are predicted to emit more than 8 billion tonnes of CO_2 per year (Van Der Werf *et al.*, 2017). Total CO_2 emissions from forest fires in India were 98.11 Tg (Teragrams) in 2014. (Reddy *et al.*,2017).

Forest fires seem to be the primary cause of forest loss, and because no quick afforestation is planned, this land is being encroached onto by encroachers, leaving the rest of it even more prone to flames. According to India's Forest Survey, over 36% of the country's forest cover is severely prone to forest fire.

Effect on vegetation and wildlife:

Many ecosystems operate on fire regimes (intensity, frequency, size, pattern, severity and season), which can alter the structure, composition and functions of forest landscapes (Bowman *et al.*, 2009; Bond, Keeley, 2005; McKenzie *et al.*, 2004). Fire supported fire-tolerant tree species while discouraged fire-sensitive ones, according to Ivanauskas*et al.* (2003). By promoting the mineralization of nutrients contained in organic debris and enabling the invasion of fast-growing early successional vegetation, fires can also impact ecosystem production and diversity(Boerner *et al.*, 2009).

Forests dominated by deodar pine, chir and sal,sesame and bamboo are especially flammable (Rather *et al.*, 2018).Fire has very little effect on mature *Tectonagrandis* and *Shorearobusta* tr ees, and they recover only when suitable climatic conditions return, however young recruits' status is negatively impacted (Chandra and Bhardwaj, 2015). Other important tree species, such as *Terminalia bellirica*, *Terminalia chebula*, and *Terminalia tomentosa*, which do have commercial but also medicinal value, produce low yield and quality after fires, and species such as *Cassia occidentalis*, *Cassia tora*, *Lantana camara*, *Lantana indica*, *Partheniumhysterophorus* and *Eupatorium glandulosum* have invaded due to repeated fire within those areas.Following a fire, the dwarf bamboo *Sinarundinariarollaona* invades wooded regions and takes over, suppressing other natural species (Attri*et al.*, 2020). Fire has the most dramatic effects on oak and coniferous forests, which require a lengthy break to recover because these plant species catches high intensity crown fire despite the high heating value. The low-intensity fire burns litter including organic matter, increases available plant nutrient and enabling herb regeneration and post-fire communal growth. The risk of fire may reduce pollinators,

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resulting in a significant reduction in orchid number and diversity (Coats and Dixon, 2007).

Due to their location-based existence, endemic species are pushed to extinction by fires. Many wild cat species, including panthers, leopards, tigers, and cheetahs, are on the verge of extinct as a result of fires and habitat destruction and fragmentation. Ground-nesting birds may be killed before they can fly (Reinking, 2005), whereas arthropods on the forest floor in their egg and early larval stages are often more vulnerable to extinction(Niwaand Peck, 2002).The number of butterfly species in Assam's UltaPani Forest decreased from 200 to 30 after a forest fire in 2012. The flames that raced throughout the continent harmed an estimated 2.5 billion reptiles, 180 million birds,143 million mammals, 51 million frogs, according to The Guardian (2020).The devastating fires in Australia in 2019–20 shot dead or dispersed about 3 billion animals, highlighting the country's natural wildlife devastation.

Effect on soil properties:

The chemical, physical, and microbiological characteristics of soil alter when it is heated by fire. Through leaching, volatilization,
oxidation, erosion, and ash mobility, wildfire affects the soil nutrient composition and pool.

In central India, (Jhariya and Singh, 2017) found that the levels of nitrogen stock, macronutrients, carbon stock and overall microbial biomass carbon were greater in no-fire zones than in fire-prone areas.The no-fire zone had the largest total soil carbon store (0–20 cm soil depth), next by medium (66.55 tonne ha1) and low fire severity (53.69 tonne ha1) fire severity zones. The total soil nitrogen stock varied between 2.60 and 4.08 tonnes per hectare throughout the locations, with the no-fire zone having the highest total soil nitrogen stock, followed by medium and high fire severity. Soil microbial biomass carbon followed a similar pattern, with greater levels in the no-fire zone. Microorganism biomass is reduced by fire, and these organisms are vital in nutrient cycling and energy transfer in the forest ecosystem. Positive (Liu *et al.*, 2007), negative (Choromanska and DeLuca, 2001; Rodriguez *et al.*, 2009), or neutral (Mabuhay *et al.*, 2003) effects of fire on soilmicrobial biomass have been reported (Rutiglianoet *al.*, 2007).

Another study by Chandra and Bhardwaj (2015) found that, higher-intensity fires result in total removal of soil organic matter with volatilization of nitrogen, phosphate, and potassium, while complete combustion of Mn, Mg, Cu, and other micronutrients needs extremely high temperatures. Forest fires reduce the number of actinomycetes, fungal populations, and arbuscular mycorrhizal fungi while increasing the diversity of bacteria.Higher water repellency leads to reduced infiltration and increased runoff, which leads to increased erosion (Bano, 2000).

Economic loss:

Forest fires caused financial losses of Rs 9000 per hectare per year, as perstatementof the UNDP (United Nations Development Program) (Satendra& Kaushik, 2014). Forest fires, on the other hand, caused a total economic loss of INR 4.95billion in 2018. (Paliath, 2018).The data on forest fires is inaccurate since the number of fires measured and the area burnt are understated. This estimate ignores soil moisture, biodiversity loss, wood, enhanced carbon sequestration, and nitrogen loss, among other factors. Furthermore, thorough data on forest losses in terms of area burnt, values, volume and regrowth lost by fire is lacking in India. Due to a lack of accountability, this is the justification (Bahuguna and Singh, 2001).

Fire as a tool:

Since ancient times, fires, either accidental or intentional, have played a fundamental role in shaping forests. Forest fires are not always detrimental to forest management, but they can also be beneficial. It has the following roles in forest ecosystem

management and functioning: to recycle nutrients locked up in litter; to decrease competition, allowing pre-existing trees to grow relatively big; to limit the overstock or growth of unwanted plants and stimulate suitable food plants like legumes for both forage and soil improvement; to enable in the better dispersion of species on even a range or management unit, such as bird habitat; to boost growth during season whenever there is minimal green grazing; to suppress or kill insect-pests and diseases; to increase seed germination or cone opening, whether naturally or artificially; to generate fire breaks in a wildfire countermeasure.

As a result, forest fires are often not catastrophic. Modest, controlled burns, such as prescribed burning, are vitally important and beneficial. Without fire, vegetative changes can occur in fuel loads considerably beyond safety norms, posing a major hazard to the forest if ignited. Reasonably small fires offer social and ecological rewards as well, such as lowering the probability of catastrophic forest fires, boosting silvicultural opportunities, expanding forage and habitat chances for wildlife, and encouraging biodiversity.

Managerial implications:

To reduce fire risk, following are some of the key fundamental principles that can be employed to prevent, control and monitor fire prone areas. Its difficult to implement all the practices at a time but by integrating those its an excellent approach to curtail the future incidences of forest fires.

- *Silvicultural practises:* In attempts to break the vertical continuity of any fuels, useful silvicultural practises are required, such as weeding, cleaning, climber cuttings, removal of dead and dying trees along with litter residue, regulate thinning treatments as per types of vegetation, planned grazing, promoting fire resistant species, and afforestation of burnt areas to recover at resilience.According to Smith et al. (1997), canopy treatments that alter the architecture and structure of the upper most forest canopy not only alter the forest's function as a source of fuel, and yet also redistribute vegetation cover to lower stems and/or allow for forest regeneration.
- *Forest line:* Fire lines are permanently cleared swaths of vegetation in the aim of putting out or delaying a fire. There are two types of it. Internal forest fire line to keep fire from spreading from one area to the next. An external fire line is used to keep fires from entering forest regions from the outside. Forest fire lines can range in width from 5m to 30m, depending on the forest type, terrain, and other factors. However, in order to prevent losses due to timber species cutting, the width of the external and internal fire lines is maintained at 3m and 1.5m, respectively.
- *Counter-fire*: Setting back a fire against fire in order to reduce the intensity and spread of a forest fire. Depending on topography, weather and fuels, the uniformity of the wildfire front, counter-firing may or may not succeed.
- *Constructing green fire belt*: In Nilgris, Tamil Nadu, evergreen plants like as *Eugenia, Wendlandia, Syzygium* and others are frequently cultivated to construct a fire-break zone surrounding Shola woods. Strobilanthes serves as a natural fire barrier in evergreen woods due to its succulent stems. *Sesbaniaaculeata* and *Crotolariajuncea* are also intentionally raised in interspace to check the forest fires in many parts. Species like *Atriplex* and *Tamarix* contains high salt, burns slowly and could act as a firebreak in dry areas.
- *Fire retardant chemicals*: For the management and suppression of wildland fires, aerial application of fire retardant chemicals such as Bentoite, Borate, Ammonium Biphosphate and Ammonium Sulfate (Attri*et al.,* 2020) and Fire-Trol and Phos-Chek is particularly successful.
- *Technological approach:* Ground-based troops spray fire retardant chemicals or pump water to put out the fire using helicopters or

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air tankers. These are costly techniques that make sense for preserving a human group, yet they are rarely used in India.

Legal measures:

In 1988, the NFP (National Forest Policy) was revised to emphasise conservation efforts from expansion, grazing and fire.For forest fire management and prevention, India has a solid legislative and institutional framework in place. Setting fire to woodlands is prohibited by national legislation.

According to section 26 and section 33 of the IFA (Indian Forest Act,1927), it is unlawful to burn and enable a fire to continue burning in reserved and protected forests. The Wild Life (Protection) Act of 1972, Section 30, makes it illegal to set fire to wildlife sanctuaries.

Advance tech:

It is vital to use satellite data to track and understand catastrophic fires so that we can effectively manage it in a warming climate. Long-term multilateral datasets that track fires from initial detection and precisely map the magnitude of the area burned are required to understand both of the immediate or long impacts of fire.

Remote sensing and geographic information systems (GIS) are game-changing technologies for fire detection and management, its diagnisis and prevention so they must become an integral element of fire suppression.

Since 2004, the Forest Survey of India has been informing state forest departments about forest fires spotted by NASA's MODIS (Moderate Resolution Imaging Spectroradiometer) sensor onboard the Aqua and Terra satellites. The "Forest Fire Alert System 2.0" has been given to the updated fire alert system, which was inaugurated on January 23, 2017. Highlights include the inclusion of Forest Fire Alerts from the SNPP-VIIRS (Visible Infrared Imaging Radiometer Suite) Sensor with greater resolution. In 2019, it was renovated once more, with the debut of FAST Ver. 3.0, a faster, faster, and more resilient version of the Fire Alert System.Forest fires could be tracked using modern technology-driven smart sensors (labelled "green bots") (Shah, 2020). Apart from being expensive and time-consuming to install, data collected by green bots may be used to generate a real-time forest inventory, which can assist avert forest fires and other calamities.

Initiatives by India:

The Government of India devised strategies and schemes to address and mitigate the forest fire catastrophe. The Ministry's Forest Protection Division released NAPFF (National Action Plan on Forest Fires) in 2018 with the goal of reducing forest fires by educating, training, and incentivizing forest fringe communities to collaborate with state forest departments as well as released a report titled "Strengthening Forest Fire Management in India." In January 2019, the FSI, Dehradun unveiled a quicker and more resilient version of the Fire Alert System on behalf of the Ministry. For locating fir hotspots and issuing early alerts across the nation, the Forest Fire Geoportal and Forest Fire Danger Rating (FFDR) are launched. FFPM (Forest Fire Prevention and Management Scheme) is the only federally financed programme aimed at assisting states with forest fire prevention and management. FFPM efforts, as well as NAPFF, address wide range of preventive techniques outlined in SDG 15 targets 15.5 and 15.7.

Issues in Forest Fire management:

There are key difficulties and lacunas in implementing, adopting and maintaining forest fire management tools and measures right from gross root level to policy makers which need to be addressed in the upcoming future for effective forest management interventions.

- The forest fires in India often extensive and intense, making seclusion a difficult solution.
- For impactful FFPM (Forest fire prevention and management), there is a lack of a coherent policy framework with such a clear strategic goal.

- National FFPM recommendations issued in 2000 are principally unimplemented.
- The FFPM process is being hampered by the lack of a specific FFPM fund at both the federal and state levels.
- Post-fire management is still not considered a necessary component of FFPM.
- Standard for gathering data on forest fires, notably their causes, are inadequate.
- The Forest Departments is lacking with equipment, technology, and infrastructure, as well as manpower and monetary resources.

Way forward:

- Forest fires are extremely devastating, both in the short and long term. Scientific analysis and standardised procedures must be used to cope with it.
- It's crucial to offer FFPM with precise and consistent financing, with an emphasis on allocation optimization.CAMPA funds must be put into practical use.
- To fill field personnel openings, ensure enough budgetary resources and incentives.
- The National Green Mission is an essential asset aimed at increasing the size and quality of India's forests in order to meet the UNFCCC's INDCs.
- In regions wherein green felling is prohibited, the MoEFCC believes that silviculture methods must be comprehensive and transparent.
- To rationalise fire use and avert undesirable fires, communities must be engaged.
- Satellite-based alert systems as well as ground-based detection systems are being improved.
- The formulation of national standard procedures for forest fire response may go a far toward harmonizing the country's forest fire management in resilience.
- Post-fire management is a vital part of the overall FFMP that must be addressed.

Conclusion:

By reviewing literatures, we can say that with increasing population, the anthropogenic causes are becoming major source of forest fires in the country and controlling them is the need of the hour. Many factors involved in fire, and its ecological, social and economic implications. Forest fires offer both advantages and disadvantages. depends on the intensity, frequency, and severity of the event, which alters the structure and composition of the forest ecosystem's biotic and abiotic elements.Background has been provided on the need of exact and reliable baseline data, as well as its inadequacy in India.For building a complete management strategy for fire in a dynamic environment, certain points are advised sector-by-sector having short- and long-term ambitions.MOEFCC and NDMA also must walk the talk and give assistance to state-level mechanisms.In order to maintain harmony with forest fire, there is a need of proper practical implementations of the existing practices and upcoming modern technologies at ground level with the involvement of forest personals, JFM committees, forest dwellers to make it effective at global scale.

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REGIONAL VARIATION OF LAND USE AND LAND USE EFFICIENCY IN KOLHAPUR DISTRICT - A GEOGRAPHICAL ANALYSIS

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Abstract:
The aim at this paper is general land use pattern and land use efficiency in Kolhapur District
Land use and efficiency plays vital role in agricultural planning Land use efficiency is a ratio between gross cropped area and net sown area in a component areal unit. Efficiency of land drastically effects on land use as well as cropping pattern, crop productivity. The present investigation is based on secondary data. The data thus collected is processed and further represented through the table. The study region is the Kolhapur district of Maharashtra which is one of the well-watered & agriculturally progressive part of the state. The study region has low area under forest is observed with 18.04 percent, it needs increase in forestation, The high land use efficiency is observed in Gaganbawda, Bhudargadh and Ajara tahsils due to development of irrigation facilities through medium irrigation facilities. The low land use efficiency in four tahsils i.e. Panhala Kagal, Gadhinglaj and Chandgad.

Key Word: *Land use pattern, land use Efficiency, Intensity, Agriculture Efficiency.*

Introduction: -

Agricultural geography is a scientific study of the spatial pattern of agricultural activities in the dimension of time and space Land use is the surface utilization of all developed and vacant land on a specific point at a given time and space. The land use of a Kolhapur district at any particular time is determined by the physical, economic and institutional framework taken together. The general land use can be divided into five categories such as the net sown area, the land not available for cultivation, cultivable waste, fallow land and forest cover. The data regarding general land use have obtained for 2014-15 from the Department of Revenue, Agricultural Department of Kolhapur district.

Land use efficiency is a ratio between gross cropped area and net sown area in a component areal unit. The population is continuously increasing and the demand for food is also increasing. There is very little scope for horizontal expansion of agriculture. So it is very necessary to use land intensively. Agriculture efficiency is a function of various factors including the physical, socio-economic and technical organization (Salunke, 2011). The efficiency of land drastically affects on land use as well as cropping patterns, crop productivity. The study of land use and efficiency I quite significant to develop solutions for naural resource management.

Objectives of the Study: -

1) To study the regional variation in general land use pattern of study region.
2) To observe Spatio- temporal change in land use efficiency.
3) To study analyse the tehsil wise distribution of land use efficiency in Kolhapur district.

Study Area:

The district of Kolhapur lies in the south-west of Maharashtra between **15°43**'to **17° 17'North** latitude and **73°40**'to **74° 42'East** longitude and spreads across the Deccan Plateau in the rain shadow region of the Sahyadri mountain ranges on the southernmost tip of the state of Maharashtra. The Sangli district lies to the north, the Belgaum district of Karnataka State is to the east and south, Ratnangiri and Sindhudurg districts of Maharashtra are to the West. To the west, we have the Sahyadri ranges and the river Warana is to the north which forms the natural boundaries to the district. It has an area of 7685.00 sq.kms. Which about 2.5 per cent is of total area of the state and it ranks 24th in the state as far as area is concerned.

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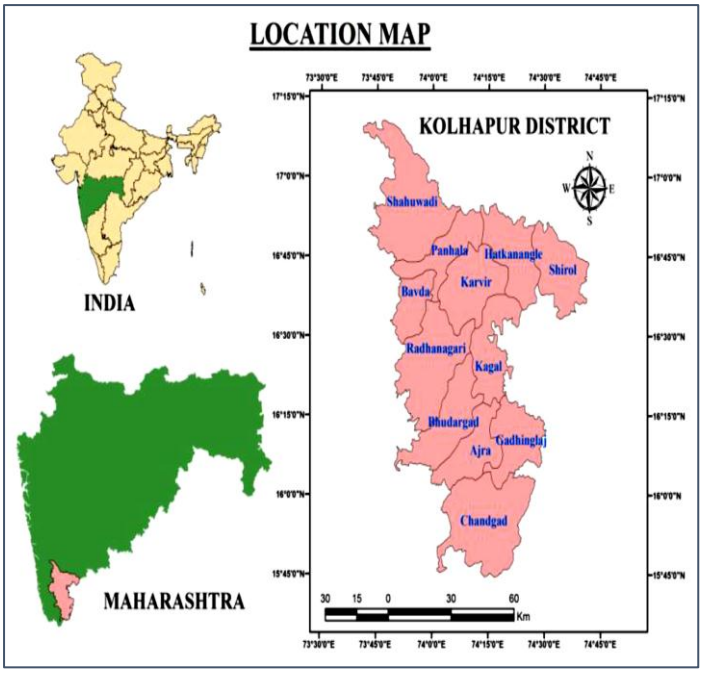

Database and methodology:

The entire study is based on secondary data, land use data (2014-15) is obtained from various secondary sources. Sources are socio-economic abstracts of Kolhapur district, Bulletins of agricultural statistics, Agricultural epitomes, and unpublished material. Acquired secondary data, tabulated, processed and labelled with suitable cartographic techniques. Findings and conclusion of this paper are based on analysis of data.

The index of land use efficiency is obtained by using the following formula-

$$Index\ of\ Landuse\ Efficiency = \frac{\text{Net Sown Area}}{\text{Gross cropped area}} \times 100$$

Spatio-temporal Variations of Land use Pattern: -

The study of land use pattern in the study area covers a proportion of area under different land-use at a point of time. It is based on the classification of the land and grouped into the following five categories. The land use pattern of the study region is shown in Table No. 1. And Figure no.1 the geographical area of the study region is 7685.00 Sq. Km. The proportion of Forest cover is the total geographical area is 18.04 percent (140100 Hector), Out of the total geographical area is 10.06 percent (78160 Hector) area is Land not available for cultivation while 9.78 percent (75981 Hector) of the land is under other uncultivated land, Fallow land is 3.46 percent (26935 Hector) and the highest area is covered by the Net sown Area is 58.62 percent (455085 Hector).

Table No. 1: Kolhapur District Tahsil Wise Land Use Pattern (2014-*Area in Percentage*)

Tahsil	Geographical area	Forest cover	Land not Available for Cultivation	Other Uncultivated land	Fallow land	Net sown area
Shahuwadi	13.44	2.82	1.75	2.38	0.37	6.1
Panhala	7.32	1.49	0.64	0.91	0.48	3.78
Hatkanangale	7.85	0.18	0.76	0.46	0.13	6.31
Shirol	6.54	0.11	0.63	0.35	0.07	5.36
Karvir	8.64	0.10	1.03	1.20	0.22	6.07
Gaganbawada	3.63	1.36	0.16	0.70	0.04	1.34
Radhanagari	11.49	3.44	1.67	1.85	0.41	4.11
Kagal	7.05	0.14	0.58	0.21	0.08	6.03
Bhudargadh	8.3	3.06	0.59	0.41	0.76	3.46
Ajara	7.07	1.58	0.43	0.73	0.36	3.95
Gadhinglaj	6.19	0.23	0.31	0.11	0.07	5.45
Chandgad	12.43	3.49	1.47	0.43	0.41	6.61
Total District	**100**	**18.04**	**10.06**	**9.78**	**3.46**	**58.62**

Source: socio-economic abstract, Kolhapur District (2014)

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Area under Forest: -

Table no. 1 show that there is much variation in forest area from tahsil to tahsil. Out of total geographical area in Kolhapur district under forest area is about 18.4 %(140100 Hector).If you study different tahsils in Kolhapur district, The highest area under forest was found in chandgad (3.49%), Radhanagari (3.44%), and Bhudargad (3.06%) Respectively. Whereas lowest area was found in under forest in Karvir (0.10%), Shirol (0.11%), Kagal (0.14%), and Hatkanangale (0.18%) Respectively, during 2014 in the study region.

Land not available for Cultivation: -

The table no.1 and fig.no 1 show that cropping pattern of the study area, this category includes land under settlements, roads, railways, streams, canals, rivers, dams etc. Barren and uncultivable land includes rocky and hilly areas, desert land, barren land and inaccessible area in nature. In the study area average proportion of such land is 10.06 percent (78160 hectors). The highest proportion is observed in Shahuwadi (1.75%), Radhanagari (1.67%) and Chandgad (1.47%) tahsils, The lowest proportion is Gganbawada (0.16%), Gadhinglaj (0.31) and Ajara (0.43%) tahsils.

Other Uncultivated land: -

Uncultivated land has not been used for growing crops or has not been changed in order to make it suitable for farming. The total other uncultivated land is 9.78 percent (75981 hectors) in the study area. Highest proportion of the other uncultivated land is shahuwadi (2.38%) and Radhanagri (1.85%) tahsils, and the lowest proportion is observed in Gadhinglaj (0.11%) and Kagal (0.21%) tahsils.

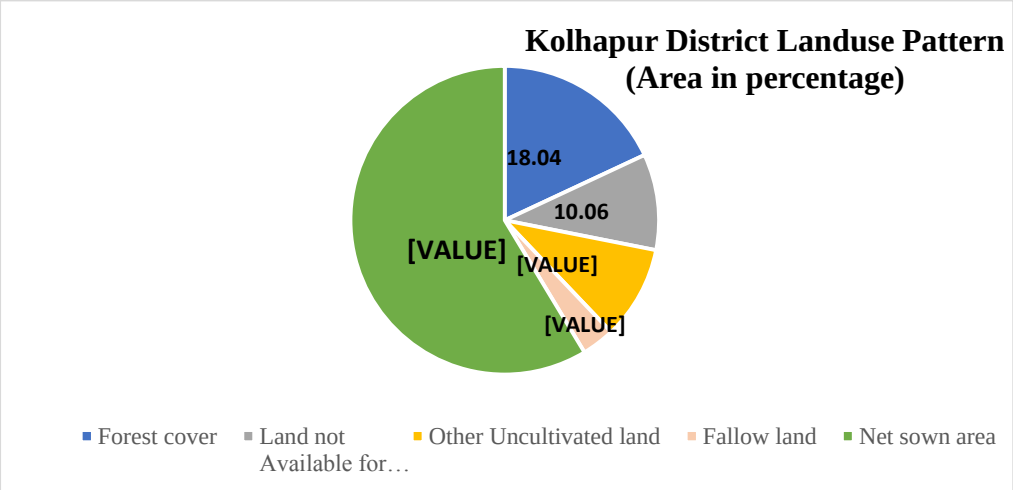
Fallow land: -

A piece of land that is normally used for farming but that is left with no crops on it for a season in order to let it recover its fertility is an example of land that would be described as fall. Table no.1 and figure no.1 the show that the total Fallow land is 3.46 percent (26935 hectors) in the study area. Highest proportion is observed in Bhudargad (0.76%) tehsil, and lowest fallow land is observed in Gaganbawda (0.04%) tehsil.

Net sown Area:-

Net sown area is the total area sown with crops and orchards.it represents an area in which total crops are grown only one in year. The total Net sown area is 58.62 percent (455085 hectors) in the study area. The highest proportion of net sown area is Chandgad (6.61%) and Hatkangale (6.31%) tahsils. The lowest net sown area is Ganganbawda (1.34 %) tehsil

Figure no.1



ANALYSIS OF LAND USE EFFICIENCY:

Land use efficiency of Kolhapur district is 126.47, spatial distribution varies from tahsil to tahsil. The highest land use efficiency is observed in Gaganbawda tahsil and lowest tahsil Gadhinglj (Table no.2). This index value land use efficiency is divided in three divisions. To analyse land use efficiency the tahsils of Kolhapur district are grouped into three categories.

Formula: -

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$$Index\ of\ Landuse\ Efficiency = \frac{\text{Net Sown Area}}{\text{Gross cropped area}} \times 100$$

Table No.2: Land use Efficiency in Kolhapur District (2014-15) (Area in Hector)

Tahsil	Gross Cropped Area	Net Sown Area	Index of Landuse Efficiency
Shahuwadi	56007	47426	118.09
Panhala	33672	29374	114.63
Hatkanangale	60005	48992	122.47
Shirol	48631	41667	116.71
Karvir	63369	47152	134.39
Gaganbawada	31545	10471	301.26
Radhanagari	38824	31921	121.62
Kagal	54555	46819	116.52
Bhudargadh	35322	26912	131.25
Ajara	46353	30708	150.94
Gadhinglaj	47671	42312	109.66
Chandgad	59622	51331	116.15
TOTAL DISTRICT	**575576**	**455085**	**126.47**

Source: socio-economic abstract, Kolhapur District (2014)

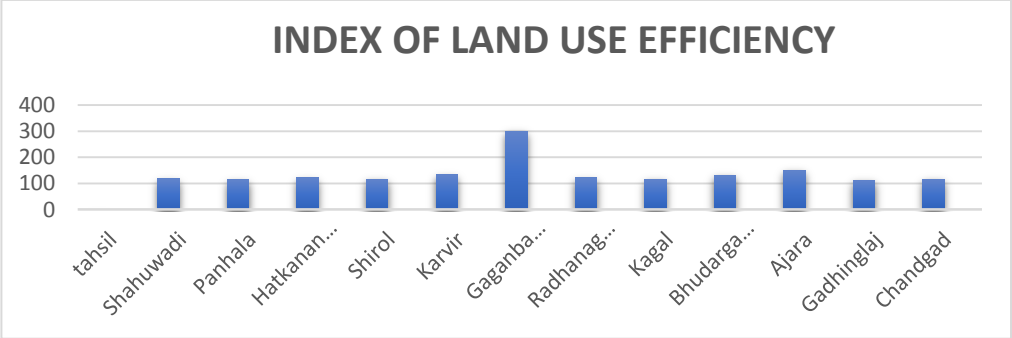

Figure No. 2

Areas of Low intensity (Below 110 %):

Areas of low intensity are distributed in Gadhinglaj Tahsil, soil conditions, use of chemical fertilizers, pesticides, variety seeds, physiography irrigation all these factors are the causes of low intensity.

Areas of medium intensity (110 % to 115%):

Areas of medium intensity are confined to Panhala Tahsil. Percentage of physiography irrigation, soil conditions, manures etc. are responsible for the medium intensity.

Areas of High intensity (above 115 %):

High intensity was found in Shahuwadi, Hatkanangale, Shirol, Karvir, Gaganbawada, Bhudargadh, Ajara, Chandgad Tahsils, Physical and non-physical factors are responsible for the high intensity of landuse.

Conclusions

1) The study region has low area under forest is observed with 18.04 percent, it needs increase in forestation.

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2) Net sown area is quite significant in the study region basically riverside fertile plain region has more area under cultivation.
3) Proportion of the fallow land is high in the western part of study region.
4) The high land use efficiency is observed in Gaganbawda , Bhudargadh and Ajara tahsils due to development of irrigation facilities through medium irrigation facilities.
5) There is need to proper agricultural policy for agricultural developments in the hilly as well as western part of study region.

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SELECTION OF SUITABLE BIOLOGICAL METHOD FOR THE ECO-FRIENDLY GREEN SYNTHESIS OF SILVER & IRON NANOPARTICLES

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Abstract:

In the recent years the green and eco-friendly method of synthesis for metal nanoparticles is an an emerging field in nanotechnology and nanoscience. The importance of nanoparticles in society and industries is due to the remarkable change in the physical and chemical properties of the materials in nanodimensions. This paper aims to present a brief overview of different biosynthesis routes of silver nanoparticles (NPs), their applications and influence of the method used on the size and morphology of these nanoparticles. A detailed and comprehensive study of available biological methods, also referred to as a bottom-up approach, as well as techniques reported, have been provided with an eye for details and comparison between the techniques involving fungi, bacteria, algae and plant extracts. Plant-derived bioreductants such as leaf, stem or root extracts of various plants are seen as suitable solutions to green synthesis of silver NPs, implementing an easy, non-toxic, clean and environmentally friendly approach. Furthermore, reports on the antimicrobial activities with the zone of inhibition for various pathogens have also been included.

Keyword: *Nanotechnology, Silver Nanoparticles, Biologi- cal Methods, Antimicrobial Activity*

Introduction:

Matter can be comprehensively isolated into two classes in view of the size: Macroscopic and Mesoscopic. Naturally visible matter is noticeable to the unaided eye while Mesoscopic particles, for example, microscopic organisms and cells that have aspects on the request for micron(s), can be seen with optical magnifying lens. Falling into the hole between the minute and the mesoscopic is one more class of issue, the nanoscopic particles. The size of nanoparticles is contrasted with that of other "little" particles in Figure 1 underneath, where the bacterium is colossal in correlation [1].

Nanostructures generally range from 1-100 nm in aspect. These particles have high surface to volume proportion and a high part of surface iotas. At nano level they have explicit physicochemical properties like optical property, attractive property, synergistic property and so on [2]. With the rise of new physical and compound strategies for the combination of nanoparticles, the worries for natural defilement have been expanded. The engineered methodology create unsafe results that could influence the climate straightforwardly. In this manner there is an incredible prerequisite for green science that incorporates techniques which are climate amicable. In this strategy for green amalgamation there is no prerequisite for high strain, energy, temperature or poisonous synthetic compounds. Consequently these days numerous analysts are redirecting themselves from utilizing engineered strategies. They are attempting to turn themselves towards organic frameworks for the most part plants for nanoparticle amalgamation as it is financially savvy and can be effectively increased to be utilized for enormous scope production.[3].

Organic frameworks, for example, plants microorganisms produce inorganic materials and the majority of these are available in nanoscale aspects. The cell removes from these natural living beings can be utilized to blend nanoparticles of various size and substance creations. Biosynthesis of metal nanoparticles separated from various parts (for the most part leaf) of the plant is the best cycle of combination at an entirely reasonable expense. During the union bioreduction of metal particles happens. Concurring to the analysts the polyol parts present in the plant remove are answerable for the decrease of iron

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particles while water solvent heterocyclic parts balance out the nanoparticles framed. Fitting forerunners, for example, Ferric Chloride can be utilized for the decrease of plant separates. [4]. Here we report the amalgamation of nanoparticles, lessening Ferric particles present in the fluid arrangement of Ferric chloride by the assistance of various plant extricates. Through intricate screening process including around 45 plants, we chose 10 most appropriate plants as the possible contender for the combination of iron nanoparticles.

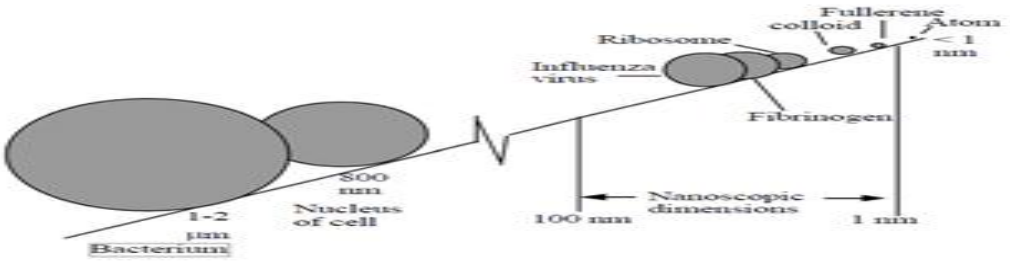

Figure1. Comparison of nano range with other sizes

The circle of nanotechnology has been at the center of attention in ongoing years, as the astounding development of numerous significant enterprises, like synthetic compounds, hardware, horticulture, medication and the space business, has been reformed because of its impact on the above-expressed ventures [5]. The development of metallic nanoparticles is a functioning region for analysts for scholastic purposes as well as in the improvement of nanotechnology. Metallic nanoparticles stand out as they are seen to have strange physical and compound properties, which essentially vary from their properties when taken in mass sums [6]. Any adjustment of their size would cause an immediate change in the reactant, electronic and optical properties of the nanoparticles [7]. For example, metallic silver as silver nanoparticles has upgraded synthetic and actual properties as contrasted and typical silver metal [8]. In addition, they show better antibacterial [9], antifungal [10] and antiviral [11] properties in correlation with metallic silver and different silver mixtures. Uses of silver nanopar- ticles (AgNPs) incorporate, yet are not restricted to, hardware [12], biosensing, photonics, optoelectronics,detecting, drugs [13], materials, water treatment [14], DNA sequencing [15] and surface-upgraded Raman dissipating (SERS) [16]. Ag nanoparticles go about as an antimicrobial specialist [17] and are being utilized for the treatment as well as the counteraction of HIV [18]. AgNPs have arranged application, like colors, photographics, wound treatment and conductive/autostatic composites [19]. Such a wide assortment of uses has driven scientists to plan better and more conservative ways for the creation of AgNPs for a huge scope. The plan of exploratory strategies for the creation of nanoparticles with various substance sythesis, sizes, shapes and dispersity is an significant feature of nanotechnology [20].

Throughout the most recent couple of years, the imperative meaning of manufac- turing clean, non-poisonous and harmless to the ecosystem solvents and synthetic substances has catalyzed the biosyn- postulation of nanoparticles. Organic cycles fixated on microscopic organisms, parasite, bio-determined synthetic substances and plant removes are definitely concentrated due to their eco-accommodating nature and morphological control [21]. Natural sources accessible in nature, including microorganisms, green growth, yeast, parasites, lower plants and higher angiosperm plant items, can be utilized for the amalgamation of nanoparticles. These surrounding natural frameworks give fantastic instances of nano-phasic materials with profoundly enhanced attributes. The assembling of inorganic materials might happen in twoways, either extracellular or intracellular [22]. In current research areas of nanotechnology, creating solid exploratory guidelines for the amalgamation of nanoparticles over a scope of substance structure, size, and synchron- ized, non-poisonous, clean and eco-accommodating

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monodispersity is a huge test. Albeit many papers have been accounted for over the most recent couple of years, a more prominent number of comprehensive distributions are required so the world may find the uses of the biosynthesis of different metal nanoparticles. The utilization of harmless to the ecosystem materials, for example, plant remove, microbes , parasite furthermore compounds [23] for the combination of silver nanoparticles offers many advantages of similarity with drug furthermore other biomedical applications, attributable to the utilization of nontoxic synthetic substances for the blend methodology. Substance combinations of nanoparticles include the presence of some poisonous synthetic compounds assimilated on a superficial level that might have a lamentable impact whenever utilized in the field of drugs. In contrast, green union has an edge over synthetic and actual techniques for union as it is modest, eco-accommodating also can be increased to bigger scope blend easily.

This technique doesn't need the utilization of high strain, energy, temperature and harmful synthetics as contrasted and synthetic union. Blend of nanoparticles utilizing natural means, particularly plants, is biocompatible as they emit practical biomolecules which effectively decrease metal particles. Additionally, natural specialists, for example, plants engaged with the diminishing system likewise go about as covering specialists and are eco-accommodating [24]. Thus, we give diagrams of different reports on the natural method for nanoparticle union with wanted attributes, with an eye for subtleties to permit powerful correlation and significant determination.

1.1 Synthesis of silver nanoparticles:

The union of silver NPs can be completed by a few strategies including compound (e.g., substance decrease, microemulsion strategies, pyrolysis, UV-started photo- decrease, photoinduced decrease, electrochemical engineered technique, illumination strategies, microwaveassisted combination, polymers and polysaccharides, Tollens strategy), physical (e.g., vanishing buildup, laser removal, circular segment release technique, direct metal faltering into the fluid medium) and organic techniques (e.g., utilization of green growth, organisms, microorganisms and plants as bioreductant) [25].

The synthetic and actual cycles for the most part include dangerous synthetic substances, high energy necessities and other severe circumstances. The sizes and morphology of silver nanoparticles blended from these two strategies are very factor contingent upon the circumstances and strategies applied. As opposed to the substance and actual strategies,the organic technique, otherwise called the base up approach, has had the option to biosynthesis silver nanoparticles with better sizes and morphologies. The majority of the NPs created were accounted for to have a dominantly circular shape. Different advantages of the utilization of the green methodology are the utilization of natural reductants, low to zero energy prerequisites and better attributes of the metallic silver nanoparticles, with the upside of disposal of the requirement for harmful synthetic substances to be utilized as surfactant or stabilizers since different proteins present in the plant extricates go about as decreasing as well as covering specialists for silver NPs [26]. The following is a correlation between different bio-based strategies to examine and rehearse the most appropriate organic methodology for the biosynthesis of silver NPs to address the future difficulties of interest and supply of metallic silver NPs.

1.2 Preparation of Plant Extract and the Precursor :

For the synthesis of iron nanoparticles, 0.001 M Ferric Chloride was prepared by using triple distilled water. Plant extracts were prepared by taking approximately 25gms leaves/seeds/buds. These were of thoroughly washed with sterile distilled water, dried and finely crushed with the help of mortar and pestle by adding 5-10 ml of deionized water gradually. The mixture was poured in a flask and heated for 5-10 minutes at 70^0C before finally decanting it. The mixture was then filtered using Whatman No. 1 filter paper. Wherever necessary the plant mixture was centrifuged at 5000 rpm for 5 minutes and the supernatant was collected as the plant extract and used for further process. Clean and aseptic condition was maintained throughout the process.

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1.3 Synthesis of iron nanoparticles:

During the synthesis of Iron Nanoparticles both the precursor and the reducing agentwere mixed in a clean sterilized flask in 1:1 proportion. For the reduction of Fe ions, 5ml of plant extract was mixed to 5 ml of 0.001 M aqueous of $FeCl_3$ solution with constant stirring at 50-600

2. Organic Methods:

2.1 Bacteria:

Highly stable silver NPs with an average size of 40 nm were prepared by reduction of silver ions using culture superannuate of Bacillus licheniformis. Similar bacteria were reported to be able to synthesize well dispersed silver NPs with an average diameter of 50 nm. Microwave irradiation was used to support uniform heating in the case of extracellular biosynthesis of silver NPs by bioreductant culture supernatant of B. subtilis. The silver metal NPs produced by this method were reported to be monodispersed, within the size range of 5-20 nm. Various researchers reported the ability of Pseudomonas stutzeri AG259 to biosynthesize intracellularly silver NPs of varying compositions, with a size range of 35-46 nm, or up to 200 nm in the case of high concentrations of silver ions of varying geometrical structures. Shahverdi AR et al. successfully demonstrated the rapid bioreduction abilities of culture supernatants of Entero- bacter cloacae, Escherichia coli and Klebsiella pneumonia to reduce silver ions into metal silver NPs within five minutes of exposure [27].

The effects of visible-light irradiation on the biosynthesis of silver NPs using culture supernatant of Klebsiella pneumonia were studied by Mokhtari N et al. The size range of such NPs was calculated to be 1-6 nm. The mechanism of bioreduction of Diamminesilver to biosynthesize metallic silver NPs using Aeromonas sp. SH10 and Corynebacterium sp. SH09 was suggested by Mouxing FU et al. Spherical silver particles were observed when strains of Lactobacillus were used to reduce silver ions with an average size of between 25-50 nm. In the case of agglomeration of silver NPs, the average size of the agglomerated metal particles was observed to be 100 nm. Enzymatic process was attributed as the reason for the stability of the biosynthesized silver NPs [28]. Table 1 provides sizes of silver NPs' biosynthesis by reducing silver ions by bioreductant bacteria.

Table 2. Biosynthesis of Silver NPs using Bacteria

Organism	Mode	Characteristics of Silver NPs			Characterization Instrument	Microbial activity against / Applications*
		Size (nm)	Shape	Others		
Pseudomonas stutzeri AG259	–	Up to 200	Equilateral triangles, hexagons	Agglomerations	TEM, quantitative EDX, electron diffraction	–
Plectonema boryanum (strain UTEX 485)	extracellular intracellular	1 – 15	Spherical	25°C	TEM, TEM-SAED, TEM-EDS, XPS	–
		1 – 40	Spherical	60°C		
		5 – 200	Spherical , octahedral crystal platelets	100°C		
Klebsiella pneumoniae, Escherichia coli, Enterobacter cloacae	extracellular	50 – 100	Predominantly spherical	–	SEM, UV-visible spectroscopy	–

2.2 Fungi:

A few analysts, including Ahmad et al., Macdonald et al., Ahmad et al., Kumar et al. what's more Korbekandi et al., have shown incredible interest in the capability of Fusarium oxyspo- rum to incorporate silver NPs to lay out new ways to deliver them in a harmless to the ecosystem and costeffective manner. Ahmad An et al. analyzed the given strain to deliver 5 - 50 nm silver NPs extracellularly and referenced the high strength of these silver NPs due to proteins in the strain. Macdonald IDG et al. Showed distinct fascination with this subject and attempted to comprehend the collaboration of these proteins including cytochrome c (Cc)

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with silver NPs. Crafted by Ahmad An et al. Also Kumar SA et al. give further knowledge into the bioreduc- tion of silver particles by utilizing bioreductant F. oxysporum and portray the enzymatic cycle and the subsequent solidness of silver NPs. The morphology of the biosynthe- estimated NPs and the impacts of pH on the covering proteins were outlined by Kumar SA et al. Korbekandi H et al. detailed the morphology of silver NPs arranged utilizing Fusarium oxysporum to be practically round, with a size scope of 25 - 50 nm and 100 nm on account of person furthermore agglomerates separately, by Scanning Electron Magnifying lens (SEM) micrographs. The creators express the biosynthesis of silver NPs by Fusarium oxysporum to beintracellular instead of extracellular . The bio reduction of silver ions and its stability was further explained to be the result of an enzymatic process [29].

The potentials of Fusarium acuminatum Ell. and Ev. (USM-3793) cell extracts were exploited to obtain metallic silver NPs with an average diameter of 13 nm. The NPs were synthesized quite rapidly, i.e., within 15-20 minutes of reaction, by the cell extracts of the mentioned algae and remained within the size range of 5 – 40 nm. Vigneshwaran N et al. reported the use of Phanerochaete chrysosporium to reduce silver ions acquiring predomi- nantly pyramidal-shaped silver NPs. Aspergillus flavus and Aspergillus fumigatus were exploited for biosynthesis of silver NPs [30]. The Aspergillus flavus was claimed to be highly stable in water [75]. The morphology of the extracellularly biosynthesized silver particles, size 5 – 25 nm, was reported to be predom- inantly spherical with few triangular shapes; such exceptions or few changes thereof are expected to be present in bio-based synthesis of silver NPs [30].

Balaji DS et al. studied the extracellular biosynthesis of silver NPs by filtrate of Cladosporium cladosporioides fungus. The chemical compounds released by the strains of Cladosporium cladosporioides were considered to be responsible for the stability and shape of the silver NPs. Penicillium sp. J3, Penicillium fellutanum and Penicillium genus were successfully treated for the reduction of silver ions into silver NPs. Penicillium fellutanum was able to reduce silver ions into silver NPs successfully using incubation under dark conditions. Monodisperse spherical silver NPs were reported to be produced by reduction of silver nitrate solution by Coriolus versicolor [31]. The characteristics of these silver NPs were recorded through UV-visible absorption spectrophotome- try, Transmission Electron Microscope (TEM), Atomic Force Microscopy (AFM) and Fourier Transform Infrared spectroscopy (FT-IR) [31]. Sanghi R et al. reported the influence of parameters such as pH and temperature on the reaction time and characteristics of the NPs [31]. Proteins were reported to be the main cause for the stability and were suggested to be performing as a capping agent as well [31]. A list of organisms used for the biosynthesis of silver NPs and the characteristics of these silver NPs have been summarized in Table 2

Table 2. Biosynthesis of Silver NPs using Fungi

Organism	Mode	Characteristics of Silver NPs			Characterization Instrument	Microbial activity against / Applications*
		Size (nm)	Shape	Others		
Fusarium solani	extracellular	5 – 35	Spherical	Large distribution range, polydisperse	UV-vis spectrophotometer, FT-IR, TEM	–
Aspergillus clavatus	extracellular	10 – 25	Spherical few polyhedral	Highly variable, polydisperse	XRD, TEM, atomic force microscopy (AFM)	Candida albicans, Pseudomonas fluorescens and Escherichia coli
Cladosporium cladosporioides	extracellular	10 – 100	Mostly spherical	Different crystallite shapes, polydisperse	UV-vis spectrophotometer, XRD, TEM, FT-IR, Scherrer's equation	–
Penicillium fellutanus	–	5 – 25	Mostly spherical	Variable Well dispersed	UV-vis absorption spectra, TEM	–
Fusarium acuminatum Ell. and Ev. (USM-3793)	extracellular	5 – 40	Spherical	Spherical with a broad size	UV-vis spectrophotometer, TEM	Staphylococcus aureus, Salmonella typhi, Staphylococcus epidermidis and Escherichia coli
Penicillium fellutanum	–	5 – 25	Mostly spherical	Well dispersed	UV-vis absorption spectra, TEM	–

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2.3 Algae:

Yellowish brown colour indicating the formation of silver NPs was observed when Spirulina platensis biomass was challenged with 0.001 M aqueous $AgNO_3$ solution. Surface plasmon absorbance, X-ray powder diffraction (XRD), High-resolution transmission electron microscopy (HRTEM) and Fourier transform infrared spectroscopic (FT-IR) measurements were utilized for recording the characteristic dispersions of nanometallic particles, confirmation of formation of silver NPs, crystalline nature, predominantly spherical shape, size range of silver NPs 7-16 nm and the possible action of proteins for reduction and capping of silver NPs respectively [32]. Iravani S et al. mentioned in their review the ability of C. Vulgaris and Oscillatoria willei to synthesize silver NPs [33]. C. Vulgaris biosynthesized silver nanoparticles in a rod-like shape with a mean length of 44 nm and width of 16- 24 nm, while Oscillatoria willei biosynthesized silver NPs with a diameter range of 100- 200 nm [33]. The efforts of a few researchers to biosynthesize silver NPs using algae have been presented in Table 3.

Table 3. Biosynthesis of Silver NPs using Algae

Organism	Mode	Characteristics of Silver NPs			Characterization Instrument	Microbial activity against / Applications*
		Size (nm)	Shape	Others		
Spirulina platensis	extracellular	7 – 16	Predominantly spherical	Relatively uniform	HRTEM, FT-IR, UV-vis spectrophotometry, XRD	Showed anti-coagulative activity
Oscillatoria willei NTDM01	extracellular	100 – 200	–	Agglomerations	HRTEM, FT-IR, UV-vis spectrophotometry, XRD	Antimicrobial
C. vulgaris	extracellular	Mean length of 44 and width of 16 – 24	Rod-like particles	–	TEM, FT-IR, UV-vis spectrophotometry, XRD, field emission scanning electron microscopy (FESEM)	Antimicrobial

2.4 Plants:

Plants that were used in the experiment are described below:

1) Bionomial Name-Mangifera indica
Common Name – Mango
Plant part taken- Leaves
Family Name-Anacardiaceae
Description-Mangiferin (a harmacologically active flavonoid, a natural xanthone C-glycoside) is extracted from Mango at high concentrations from the young leaves. Mangiferin shows an exceptionally strong antioxidant capacity. It has a number of pharmacological actions and possible health benefits. These include antidiabetic, antioxidant, antifungal, antimicrobal, antiinflamatory, antiviral, hypoglycemic, anti-allergic and anticancer activity.

Fig. 2 Mangifera indica

2) Bionomial Name- Syzygium aromaticum

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Common Nam –Clove
Plant part taken- Buds
Family Name-Myrtaceae
Description: Cloves are the aromatic dried flower buds of a tree. It is used as a spice in cuisines all over the world. Cloves are used in Indian Ayurvedic medicine, Chinese medicine, and western herbalism and dentistry where the essential oil is used as an anodyne (painkiller) for dental emergencies. Cloves are used as a carminative, to increase hydrochloric acid in the stomach and to improve peristalsis.

Fig. 3 Syzygium aromaticum

3) Bionomial Name-Rosa indica
Common Name – Rose
Plant part taken-Leaves
Family Name-Rosaceae
Description: Rose is a woody perennial. They form a group of erect shrubs, and climbing or trailing plants. Roses are best known as ornamental plants. Many roses have been used in herbal and folk medicines. Other species have been used for stomach problems, and are being investigated for controlling cancer growth.

Fig. 4. Rosa indica

4).Bionomial Name- Azadirachta indica
Common Name – Neem
Plant part taken- Leaves
Family Name- Meliaceae
Description: It is a tree in the mahogany family. The leaves are used in this manner that first they are washed thoroughly. Then 5-10 leaves along with the branch are boiled till the water turns green The water is then used for varying purposes. Elders find it useful in controlling high blood sugar level and is said to clean up the blood. The tender shoots and flowers of the neem tree are eaten as a vegetable in India. Neem gum is a rich source of protein. Products made from neem trees have been used in India for over two millennia for their medicinal properties:

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neem products are believed to be anthelmintic, antifungal, antidiabetic, antibacterial, antiviral, contraceptive and sedative.

Fig 5. Azadirachta indica

5) Bionomial Name-Camellia sinensis
Common Name – Black Tea
Plant part taken- Leaves
Family Name-Theaceae
Description: Tea is the second most commonly drank liquid on earth after water. It has numerous medicinal benefits mainly due to its antibacterial and antioxidant properties. It has been known to inhibit the growth of cancer cells and support cardiovascular health.

Fig 6. Camellia sinensis

6) Bionomial name-Camellia sinensis
Common Name – Green Tea
Plant part taken-Leaves
Family Name-Theaceae
Description: Green tea originates in China. Green tea has purported health benefits, with some evidence suggesting that regular green tea drinkers may have a lower risk of developing heart disease and certain types of cancer. A green tea extract containing polyphenols and caffeine has been shown to induce thermogenesis and stimulate fat oxidation, boosting the metabolic rate 4% without increasing the heart rate. Flavonoids are a group of phytochemicals in most plant products that are responsible for such health effects as anti-oxidative and anticarcinogenic functions.

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Fig 7. Green Tea

7) Bionomial name- Coffea arabica
Common Name – Coffee
Plant part taken-Seeds
Family Name-Rubiaceae
Description: Coffee is a genus of flowering plants whose seeds, called coffee beans, are used to make coffee. The caffeine in coffee "beans" is a natural plant defense against herbivory, i.e. a toxic substance that protects the seeds of the plant. Several insect pests affect coffee production, including the coffee borer and the coffee leafminer. Coffee is used as a food plant by the larvae of some Lepidoptera (butterfly and moth) species.

Fig 8. Coffea arabica

8) Bionomial name-Trachyspermum ammi
Common Name –Carom seeds
Plant part taken-Seeds
Family Name-Apiaceae
Description: The plant has a similarity to parsley. Because of their seed-like appearance, the fruit pods are sometimes called seeds. The raw fruit pod smells almost exactly like thyme because it also contains thymol. It is traditionally believed to be a digestive aid.

Fig 9. Trachyspermum ammi

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9) Bionomial name-Magnolia champaca
Common Name –Joy Perfume Tree, Champa
Plant part taken-Leaves
Family Name- Magnoliaceae
Description: Magnolia champaca is a large evergreen tree. The flowers are used in Southeast Asia for several purposes. It is rarer and has a strong perfume, and is not that commonly or plentifully used. Magnolia champaca is cultivated and used as an ornamental tree in temperate climate gardens.

Fig 10. Magnolia champaca

10) Bionomial name: Murraya koenigii
Common Name – Curry Leaves
Plant part taken- Leaves
Family Name- Rutaceae
Description: It is a tropical to sub-tropical tree which is native to India. The leaves are highly valued as seasoning in southern and west-coast Indian cooking. The leaves are used as a herb in Ayurvedic medicine. It is valued as an anti-diebetic, antioxidant, antimicrobial, anti-infammatory, anti-hypercholesterolemic, etc.It contains carbazole alkanoid that can induce apoptosis in cancerous cells in liver.

Fig 11. Murraya koenigii

Discussion

The biosynthesis of silver NPs using biological techniques– fungi, algae, bacteria, yeast and plants has proved to be environmentally friendly and an economical approach.Although microbial species have been able to biosynthesize predominantly spherical metallic silver NPs within the range of 1-70 nm and fungi able to produce SNPs with an average size range of 13 nm, yet the lack of knowledge of the mechanism of the reduction process represents a barrier still to be overcome [34].

The suggested mechanism for the biosynthesis of intracellular and extracellular silver NPs by bacteria involves reduction of silver by sulphur-containing proteins [169] or deoxyribonucleic acid (DNA), while in the case of fungi the mechanism is thought to occur with the involvement of carboxylic group or through nitratedependent reductase. In the case of plants, the reduction is suggested to be carried out by a wide variety of compounds such as terpenoids , flavonoids, phenols, pinito and allantoin, present in differ- ent parts of

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the plants including leaves, roots, bark and latex. In the case of intracellular synthesis, the downstream processing is difficult and expensive due to the separation and purifying steps involved, thus making extracellular synthesis preferable, owing to its easier and simpler downstream processing. Compared with bacteria or algae, fungi provide a more rational and economical approach for biosynthesis of silver NPs due to the fact that not only is the downstream processing and biomass handling much simpler and easier in the case of fungi, but the amounts of proteins known to reduce silver are also secreted in much higher amounts, thus increasing the biosynthesis productivity several fold [35]. In the case of microorganisms, not only is the strain preparation and growth intricate, but the isolation of strain is also difficult and requires too many precautions. The difficulty of maintaining the culture medium and respective conditions such as (but not limited to) pH, temperature, salinity of the culture and reaction mixture points towards the complexity of these techniques to be applied on a large scale. Plant broths or extracts, on the other hand, are quite simple and easy to handle and eliminate the complicated procedures of cell culture maintenance. Furthermore, the clear filtrate production from bacterial broths necessitates the use of complicated equipment in process technology, thus increasing investment costs to a considerable extent, which is yet another major drawback in the case of the bacterial biosynthetic approach [36]. Conversely, in the case of fungi and plants, simple equipment such as a filter press can be utilized to obtain clear filtrates, thus promising economic feasibility [35].

The synthesis of silver NPs utilizing microorganisms [37] or their filtered cell parts creates silver NPs at rates a lot more slow than the rates at which plants can biosynthesize silver NPs. The time expected for the total decrease of silver particles is known to go from 24 hours to 120 hours on account of microorganisms, while the response fulfillment time is substantially less for the situation of plants, going from a couple of hours to a limit of 48 hours, as portrayed in the examinations referenced before in the plants area [37]. This addresses one more downside as far as plausibility of microorganisms to be utilized for huge scope biosynthesis of silver NPs in examination with plants, which require less time for finishing of response. The decrease rate by plants is quick enough to cause to notice the chance of fostering a normal biosynthesis system with decrease rates proportionate to those of physical and compound methods [38].Recent investigations were directed with the goal of tracking down an appropriate method to gain wanted sizes and morphological qualities of biosynthesized silver NPs alongside an expanded creation rate. As plainly addressed in the properties of silver NPs talked about in their particular classes, just plants in correlation with other natural methods can exhibit better command over morphological qualities, sizes and rates of creation of silver NPs by taking advantage of basic response conditions like stock fixations, silver nitrate arrangement focus, saltiness, proportion of plant (leaf, stem, bark or plastic) concentrate to silver nitrate arrangement, pH, temper- ature, blending time, season of extraction, sonication and light [39]. The decrease of silver nitrate can be completed at typical temperature, despite the fact that raised temperatures are best due to the expanded pace of response and less time expected for the arrangement of silver NPs. Sonication has ended up being the best, albeit the size accomplished from sonication was accounted for to be somewhat bigger than that achieved from raised temperature, yet the consistency in shape and lessening in response time were obviously higher for sonication than any of the other two circumstances [38].

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Accordingly, as per the requirement for a financially reasonable, green methodology for the combination of silver NPs, the plant-based strategy addresses a hopeful other option not exclusively to natural strategies, yet in addition to different techniques counting actual strategies, and is additionally apparent for huge scope creation. In any case, there is as yet an extraordinary need to take advantage of the plant-based biotechnique to accomplish even better command over dispersity, morphology, molecule size what's more creation rates on the off chance that it is to substitute compound techniques for creation of silver NPs on a modern scale.

Conclusion:

Biosynthesis of silver nanoparticles can be completed by natural strategies in which the organic species range from microbes, parasites and green growth to plants fit for diminishing silver particles to metallic silver nanoparticles. Natural techniques have been ended up being all the more ecologically cordial than compound and actual strategies because of a few reasons including, however not restricted to, arrangement of hazardous/poisonous bioproducts, use of natural species as reductants and lower energy necessities. In spite of the fact that microbial species have shown successful potential for the biosynthesis of metallic silver NPs, by and by the absence of mastery to completely comprehend and control the system of the decrease cycle addresses a hindrance yet to be overcome. Furthermore, the intricacy of keeping up with the balanced out culture medium and individual circumstances such as, however not restricted to, ideal pH, temperature achievability, or on the other hand saltiness of the way of life and response blend focuses towards the multifaceted nature of these procedures to be applied on a modern scale. Besides, on account of plants and a couple of other organic species like green growth, some normal synthetic mixtures present in the concentrate go about as diminishing as well as covering specialists, subsequently wiping out the requirement for harmful synthetic compounds to be utilized as covering specialists. The methodology to integrate metallic silver NPs utilizing plant-inferred extricates (leaf, root, and stem) addresses the start of an eco-accommodating, simple and straightforward methodology with no economic and ecological hindrances. Further headways in the determination of plant-inferred remove bioreductant and a satisfactory information on the decrease interaction mecha- nism will likewise be useful in deciding a modern, costeffective method for orchestrating silver NPs with amazing qualities, morphologies and properties, for example, yet not restricted to, antimicrobial, optical and electrical.

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SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL ISSUES IN INDIA

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Abstract

Development cannot stop for the sake of the environment what is needed is to stress the choosing of method that would ensure minimum environmental damage while maximum developmental benefits. The major concern is to redress the situation rather than attribute problems. With the conviction that there is a limit bearing capacity of over development, the damage must happen. In developing countries the damage to the environment has not been very much, and there is still time to undertake some preventive and even curative measures. The nature of the development and environmental impact vary significantly among developing countries but there is so badly impact on whole world. Hence, sustainable development refers to development activities that do not impair environmental resources quality. This includes maintaining ecological processes, preserving biodiversity, and protecting species and ecosystems.

Keywords *– Environmental damage, Conviction, Sustainable Development*

Introduction

"Sustainable Development is the development that meets the needs of the present generation without compromising with the needs of future generations." This definition was put forward by the Brundtland Commission in its report "Our Common Future" in 1987. It calls for a concerted effort to build an inclusive, sustainable, and resilient ecosystem for the people and the planet. The main features of sustainable development include Increase in per capita income, judicious use of natural resources and preserving the resources for future generations.

There are four dimensions to sustainable development – society, environment, culture and economy – which are intertwined, not separate. Sustainability is a paradigm for thinking about the future in which environmental, societal and economic considerations are balanced in the pursuit of an improved quality of life. For example, a prosperous society relies on a healthy environment to provide food and resources, safe drinking water and clean air for its citizens. The report of the World Commission on Environment and Development has also recognized that unlimited growth was neither feasible nor desirable, that basic needs for all should be the highest priority of development, and that only protected and carefully nurtured environment could sustain human aspirations. It is commendable that the general feeling today is for preserving the environment for sustainable development which has led to common understanding in both developed and developing countries in that the environmental considerations should be linked to development strategies

Objective

1. To understand what is sustainable development
2. To know the sustainable development goal
3. To identify the environmental issues and how to overcome on it

Goals of Sustainable Development

As an affirmative action towards tackling the global environmental crisis that involves global warming, climate change, and ozone layer depletion, the United Nations adopted 17 Sustainable Development Goals (SDG) and 169 targets as part of the United Nations 2030 Agenda.

The 17 Sustainable Development Goals are: 1. End poverty in all its forms everywhere 2. End hunger, achieve food security and improved nutrition, and

promote sustainable agriculture 3. Ensure healthy lives and promote well-being for all at all ages 4. Ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all 5. Achieve gender equality and empower all women and girls 6. Ensure availability and sustainable management of water and sanitation for all 7. Ensure access to affordable, reliable, sustainable, and modern energy for all 8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all 9.Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 10. Reduce inequality within, and among, countries 11. Make cities and human settlements inclusive, safe, resilient, and sustainable 12. Ensure sustainable consumption and production patterns 13. Take urgent action to combat climate change and its impacts 14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Environmental Issues and Challenges in India

In India, factors like rapid growth of population, urbanization, industrialization, and poverty, among others are responsible for harming the environment. Some of the severe environmental issues prevalent in India are

1. Degrading Air Quality Index
2. Rampant Environmental Degradation
3. Loss of Biodiversity
4. Urbanization in the Himalayas
5. Loss of Resilience in Ecosystems
6. Lack of Waste Management
7. Depletion of Resources (land, air, water)
8. Growing Water Scarcity

There are many more such issues that need to be addressed to maintain a sustainable environment so as to ensure consistent economic development.

Major Environmental Issues

Population Growth and Environmental Quality

There is a long history of study and debate about the interactions between population growth and the environment. According to a British thinker Malthus, for example, a growing population exerts pressure on agricultural land, causing environmental degradation, and forcing the cultivation of land of higher as well as poorer quality. This environmental degradation ultimately reduces agricultural yields and food availability, famines and diseases and death, thereby reducing the rate of population growth.

Population growth, because it can place increased pressure on the assimilative capacity of the environment, is also seen as a major cause of air, water, and solid-waste pollution. The result, Malthus theorized, is an equilibrium population that enjoys low levels of both income and Environmental quality. Malthus suggested positive and preventative forced control of human population, along with abolition of poor laws.

Malthus theory, published between 1798 and 1826, has been analysed and criticised ever since. The American thinker Henry George, for example, observed with his characteristic piquancy in dismissing Malthus: "Both the jayhawk and the man eat chickens; but the more jayhawks, the fewer chickens, while the more men, the more chickens." Similarly, the American economist Julian Lincoln Simon criticised Malthus's theory. He noted that the facts of human history have proven the predictions of Malthus and of the Neo-Malthusians to be flawed. Massive geometric population growth in the 20th century did not result in a Malthusian catastrophe. The possible reasons include: increase in human knowledge, rapid increases in productivity, innovation and application of

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knowledge, general improvements in farming methods (industrial agriculture), mechanisation of work (tractors), the introduction of high-yield varieties of rice and wheat among other plants (Green Revolution), the use of pesticides to control crop pests.

More recent scholarly articles concede that whilst there is no question that population growth may contribute to environmental degradation, its effects can be modified by economic growth and modern technology. Research in environmental economics has uncovered a relationship between environmental quality, measured by ambient concentrations of air pollutants and per capita income. This so-called environmental Kuznets curve shows environmental quality worsening up until about $5,000 of per capita income on purchasing parity basis, and improving thereafter. The key requirement, for this to be true, is continued adoption of technology and scientific management of resources, continued increases in productivity in every economic sector, entrepreneurial innovation and economic expansion.

Water Pollution

India has major water pollution issues. Discharge of untreated sewage is an important cause for pollution of surface and ground water in India, since there is a large gap between the generation and treatment of domestic waste water. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained. The majority of government-owned sewage treatment plants remain closed most of the time due to improper design, poor maintenance, or lack of reliable electricity supply, along with severe understaffing. The waste water generated in these areas normally percolates in the soil or evaporates. The uncollected waste accumulates in urban areas, causing unhygienic conditions and releasing pollutants that reach to surface and groundwater.

According to a World Health Organization study, out of India's 3,119 towns and cities, just 209 had partial sewage treatment facilities, and only 8 have full wastewater treatment facilities (1992). Over 100 Indian cities dump untreated sewage directly into the Ganges River. Investment is needed to bridge the gap between 29,000 million litre per day of sewage India generates, and a treatment capacity of mere 6000 million litre per day. Other sources of water pollution include agriculture runoff and small scale factories along the rivers and lakes of India. Fertilizers and pesticides used in agriculture in northwestern India have been found in rivers, lakes and ground water. Flooding during monsoons worsens India's water pollution problem, as it washes and moves all sorts of solid garbage and contaminated soils into its rivers and wetlands.

Air Pollution

Air pollution in India is a serious issue, with the major sources being biomass burning, fuel adulteration, vehicle emission, and traffic congestion. Air pollution is also the main cause of the Asian brown cloud, which has been causing the monsoon season to be delayed. India is the world's largest consumer of fuelwood, agricultural waste, and biomass for energy purposes. Traditional fuel (fuelwood, crop residue and dung cake) dominates domestic energy use in rural India and account for about 90% of the total. In urban areas, traditional fuel constitutes about 24% of the total. Fuel wood, agricultural waste and biomass cake burning release over 165 million tonnes of combustion products every year.[25][26] These biomass-based household stoves in India are also a leading source of greenhouse emissions, which contribute to climate change.

The annual crop burning practice in northwest India, north India and eastern Pakistan, before and after monsoons, from April and May to October to November, are a major seasonal source of air pollution since 2002. Approximately 500 million tons of crop residue are burnt in the open, releasing NOx, SOx, PAHs and particulate matter into the air. This burning has been found to be a leading cause of smog and haze problems through the winter over Punjab, cities such as Delhi, and major population centers along the rivers through West Bengal. In other states of India, rice straw and other crop residue burning in open is a major source of air pollution.

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Vehicle emissions are another source of air pollution. Vehicle emissions are worsened by fuel adulteration and poor fuel combustion efficiencies from traffic congestion and low density of quality, high speed road network per 1000 people. In order to reduce air pollution effects India is introducing hybrid and electric vehicles as per the Faster Adoption and Manufacturing of Electric vehicles in India scheme. While challenges are slowing down the development cleaner combustion fuels are being use in motor vehicles. As of now Delhi Transport Corporation is the world's largest operator of CNG bus fleet. Many Indian cities are testing out with cleaner fossil fuels mostly CNG fuel and renewable biofuels such as biodiesel and E85 blended petroleum. In June 2020, the supreme court promised that in order to improve emissions from vehicles all BS4 vehicles will be upgraded to BS6 standards.

Noise Pollution

Noise pollution or noise disturbance is the most efficiently changing and disturbing or excessive noise that may harm the activity or balance of human or animal life. The source of most outdoor noise worldwide is mainly caused by machines and transportation systems, motor vehicles, aircraft, and trains. In India the outdoor noise is also caused by loud music during festival seasons.Outdoor noise is summarized by the word environmental noise. Poor urban planning may give rise to noise pollution, since side-by-side industrial and residential buildings can result in noise pollution in the residential areas. Indoor noise can be caused by machines, building activities, and music performances, especially in some workplaces. Noise-induced hearing loss can be caused by outside noise. High noise levels can contribute to cardiovascular effects in humans and an increased incidence of coronary artery disease.[44] In animals, noise can increase the risk of death by altering predator or prey detection and avoidance, interfere with reproduction and navigation, and contribute to permanent hearing loss.

Indian Governmental Initiatives to Tackle Environmental Degradation

While the cooperation of every citizen of the country is essential for safeguarding the environment, governments have a huge role to play in helping find solutions to the problems. The government of India has taken various steps to safeguard the environment. Some of them are listed below:

1. Swachh Bharat Mission
2. Green Skill Development Programme
3. Namami Gange Programme
4. Compensatory Afforestation Fund Act (CAMPA)
5. National Mission for Green India
6. National River Conservation Programme
7. Conservation of Natural Resources & Eco-systems

Environmental Sustainability

Environmental sustainability covers a wide range of issues starting from a specific location to global. Global issues comprise concerns about greenhouse gas mitigation, climate change, and renewable energy, while the location-specific issues are soil erosion, water management, soil quality, and air and water pollution. The role of biofuel in the dimension of environmental sustainability is largely to reduce greenhouse gas emissions though there are controversies regarding its effectiveness. The leading sources of greenhouse gas emissions for non-CO_2 greenhouse gases are agricultural practices like the use of fertilizer, soil tillage, pesticides, irrigation practices, and harvesting. In evaluating the environmental factor, the use of land prior to the production of biofuel plays a significant role. If forest or grassland are used for the conversion of biofuel, then the reduction of greenhouse gas emissions is markedly affected. Sustainability of biomass-based biofuel is increasingly measured via lifecycle analyses.

Conclusion

Development is must to enhance the human need and greed, but if it harmful to human existence it's very dangerous. Development and environmental sustainability is not going with hand in hand. If we apply some technique in our society I think it's better to our future for sustainable development.

By planting more trees. Rainwater harvesting. Reduce, Reuse, and Recycle. By reducing the use of chlorofluorocarbons. Reduce fuel consumption. Treating the industrial effluents

before dumping them in water bodies. Reducing the use of fertilizers.
Control population growth.

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TRANSIT OF SUN ACROSS CONSTELLATIONS CAPRICORNS, AQUARIUS AND VARIATION OF SECONDARY GAMMA RADIATION FLUX IN MONTH OF FEBRUARY, 2021 AT UDAIPUR, INDIA.

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Abstract
We conducted an experimental study at Udaipur (27^0 43' 12.00" N, 75^0 28' 48.01" E), Rajasthan, India during transit of Sun across constellations Capricorns and Aquarius in month of February, 2021 using ground based NaI (Tl) Scintillation detector. Data files were stored in computer for half hour duration from time 17.00 IST to 17.30 IST on the dates February 9, 11, 12, 13, 15, 16, 17 and 19. After analyzing data we observed significant variation of secondary gamma radiation flux (SGR). We interpret such variation of SGR flux counts on the basis of transit of Sun across constellations Capricorns, Aquarius. Combine gravitational lensing and gravitational pull effect on background radiation due to constellations, Sun and celestial objects and radiation from constellations.

Key Words: *Cosmic radiation, solar radiation, secondary gamma radiation, combines gravitational lensing and gravitational pull, radiation from constellations.*

Introduction

The electromagnetic radiation has composition of about 89% nuclei are protons, 10% nuclei of helium, and 1% of others heavier elements (Lithium, Beryllium and Boron) is called cosmic radiation [1, 2, 3]. Cosmic radiation lies in the energy range of 10^9- 10^{20} eV or more [4].In different energy range Simpson (1983) [5] gave information about chemical abundances of cosmic radiation. Above 50 km from the surface of the Earth intensity of primary cosmic radiation flux remains almost same but about 20 km from surface of the Earth Primary cosmic radiation produces denser ionization. Denser ionization produced in the Earth atmosphere is called secondary cosmic radiation [6] having X- rays, protons, alpha particles, pions, muons, electrons, neutrinos and neutrons. When such secondary particles moves downward in atmosphere of the Earth, loses energy [7, 8]. Therefore there is formation of secondary cosmic particles shower [9]. In secondary radiation there is an electromagnetic component[10, 11, 12]. Electromagnetic component produced secondary shower contains electrons, gamma particles [13]. Secondary radiation flux can be detected using appropriate detector on ground [14, 15]. Gravitational lensing is that phenomenon when the electromagnetic radiation passing near a massive object then due to gravitational field of the object it bends towards massive object. The object could a galaxy, a star, or a cluster of galaxies [16, 17, 18].

Celestial events and variation of radiation flux

It is very interesting to observe secondary radiation flux during different celestial events such as Solar eclipses, Lunar eclipses, appearance of comet in sky, phases of moon, closest approach of celestial objects, transit of celestial objects etc. Many scientist groups conducted experimental studies to observe secondary flux during celestial events. Bhattacharya et al [19], Kandemir G. et al [20], Nayak. et al. [21],Bhaskar et al [22], Pareek et al [23] conducted experimental studies during solar eclipses.

For the celestial event lunar eclipses experimental studies were conducted by Pareek et al. [24], Raghav et al. [25], J.N. Ananda Rao et al. [26], Pareek et al. [27], Pareek et al. [28] Experimental study during celestial event of transit of Venus June 6, 2012 at Udaipur India was conducted by Pareek et al [29] observed 2 %. decrement in secondary solar radiation gamma ray flux. To understand information about the GCR, SR modulation at the time of new Moon, Full Moon and different phases of the Moon with different background of constellation in the sky in the month September, 2000 Pareek et al. [30] conducted experimental study. Analysed results showed abrupt change in

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energy spectra on 9th and 10th September 2000, when Moon was in background of Capricorns **constellation.** Pareek et al [31] conducted an experimental study for transit of the Sun across Constellations Libra, Virgo and observed variation of Secondary Gamma Radiation Flux in Month November, 2018 and September, 2019 respectively at Udaipur, India. Pareek et al [32] conducted an experimental study for transit of the Sun across constellation Libra in the month of October and November, 2020 at Udaipur and observed the variation of secondary gamma radiation flux

In month of October, 2020 at Udaipur, India to observe variation of secondary gamma radiation flux during closest approach of Mars towards Earth, Mars at opposition and transit of Moon across different constellations, planets Pareek et al [33] conducted experimental using scintillation counter.

During appearance of Comet Hyakutake in the month of March, 1996 using scintillation counter, Pareek et al. [34] conducted experimental study. Analyzed results showed variation of secondary cosmic radiation flux in energy spectrum of specific energies of about1.127 MeV, 2.29 MeV and 3.66 MeV.

With the fact that during different celestial events happening in sky, modulate terrestrial secondary flux of cosmic and solar radiation, we attempted to see effect of transit of Sun across constellations Capricorns, Aquarius in month of February, 2021 on secondary gamma radiation flux at Udaipur India.

Experimental Set-up and Observations

In this experimental study we used Scintillation detector of (SD 152 F) flat type with Size of the NaI (Tl) crystal of 2" x 2"ofNucleonix make (Figure 1). This is optically coupled with photo multiplier tube (MC 1000) having 1024 channels. The integral line was connected to 1k multi-channel analyzer of Nucleonix make with usb interface built in high voltage and shaping amplifier. Using gamma ray software Anuspect data files were collected in computer. This Scintillation counter system kept open to collect the counts as a function of time on the roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' University Udaipur (Rajasthan) India. For this experimental study the data files were stored in computer for half hour duration from time 17.00 IST to 17.30 IST on the dates February 9, 11, 12, 13, 15, 16, 17 and 19.

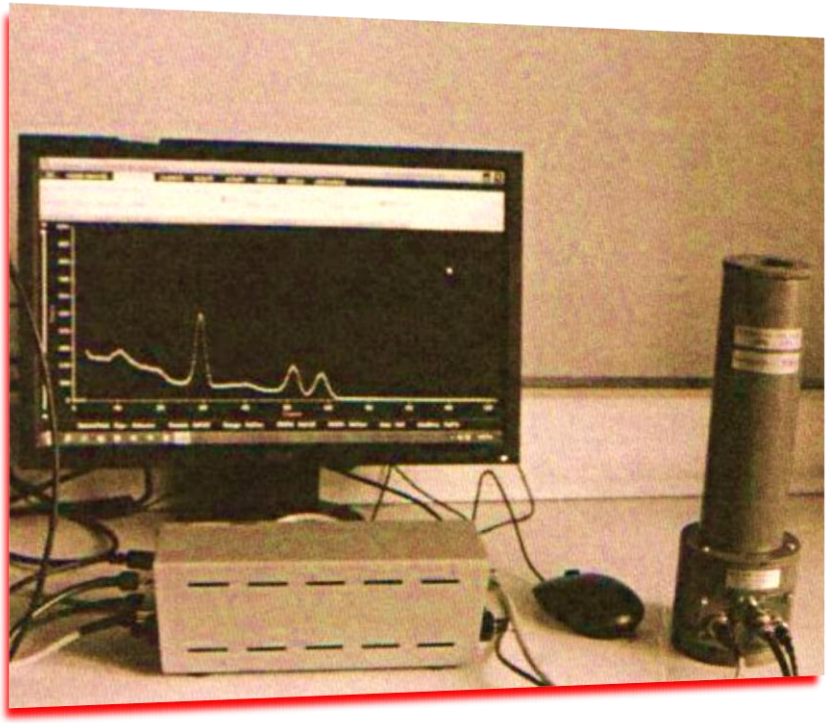

Figure 1 (Scintillation Counter System)

Analysis and Results

As depicted in figure- 2 the panels of SGR flux integrated data files between channel and

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integrated counts for half hour duration between time 17.00 IST to 17.30 IST on the dates February 9, 11, 12, 13, 15, 16, 17 and 19.

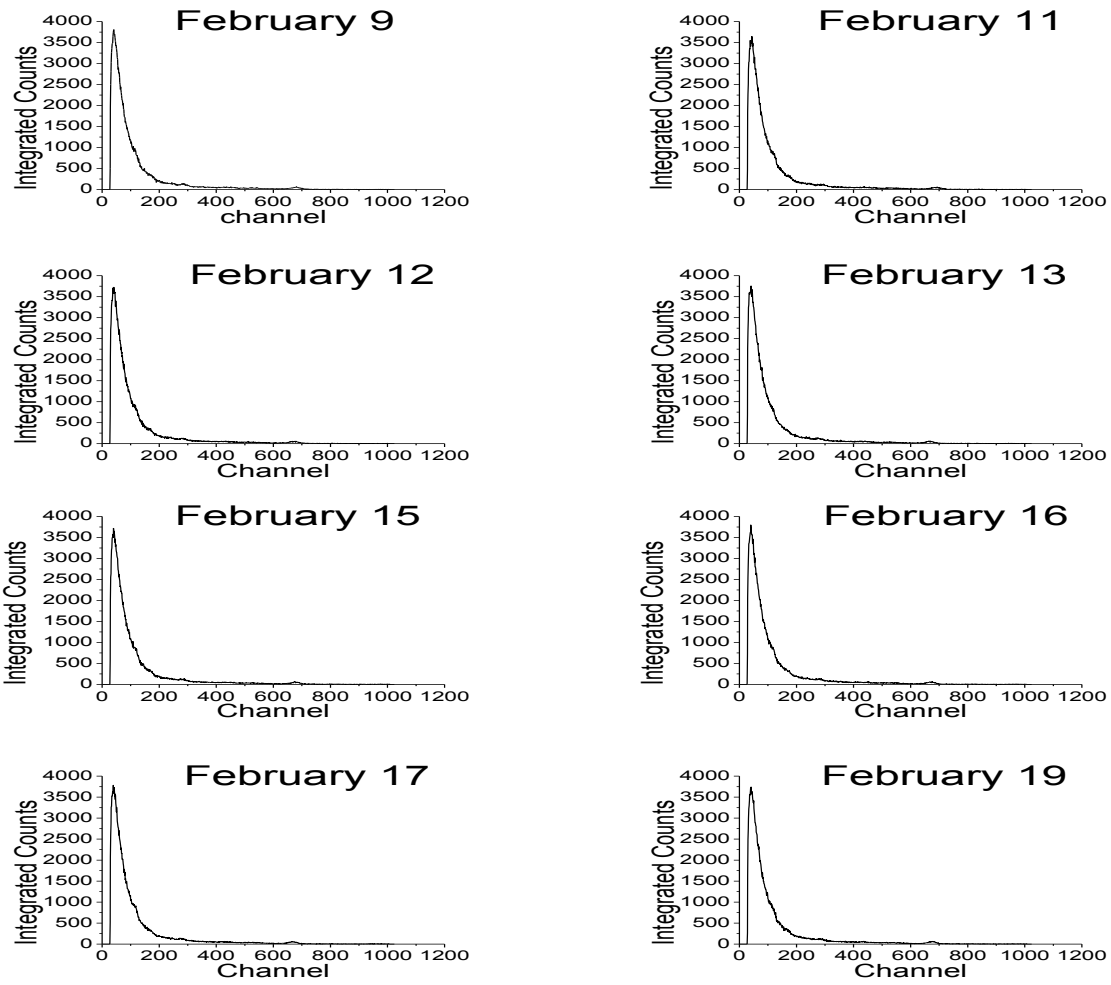

Figure- 2 (Panels of SGR flux integrated data files)

Using Figure 2 we made the table 1 which represents integrated counts of secondary gamma radiation flux with respect to dates February 9, 11, 12, 13, 15, 16, 17 and 19.

Table 1

Sr. No.	Date	Integrated Counts
1	9	259592
2	11	252172
3	12	250853
4	13	249366
5	15	247411
6	16	252979
7	17	252019
8	19	253000

Using figure 2 and table 1 of SGR flux integrated data files, we made figure 3 which represents integrated counts of secondary gamma radiation flux with date for the month of February, 2021.

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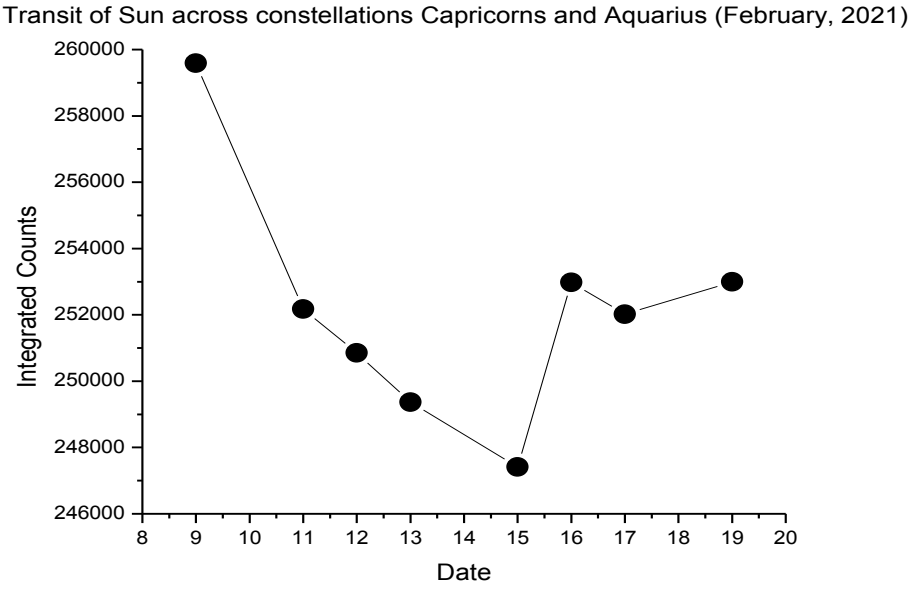

Figure 3 (Iintegrated counts of secondary gamma radiation flux)

Discussions

The probable reasons in this present experimental study for the variation of SGR flux counts in the month February, 2021 are as follows:

(1) Table 1 and figure 3 clearly showed that on February, 9 there were highest counts in this experimental study. On this date the Sun, planet Jupiter, planet Saturn, Planet Venus were in the constellation Capricorns. Planets Mercury was close to constellation Capricorns. Therefore on this date due combined gravitational lensing and gravitational pull by the Sun, constellation Capricorns and planets on background radiation, more radiation bent. Also on this date radiation from constellation Capricorns was more. These more radiation interact with atmosphere of the Earth hence formation of secondary radiation were more.

(2) After February, 9 the Sun started to shift away from this constellation Capricorns and we observed decrease in counts on the comparison with February, 9.

This is due to gravitational lensing, gravitational pulling effect started to decrease and less secondary radiation formed in the atmosphere of Earth.

(3) Table 1 and Figure 3 showed from date February, 16 integrated counts started to increase because the Sun approached towards constellation Aquarius. Therefore again combined gravitational lensing, gravitational pulling effect by Sun and constellation Aquarius and radiation from constellation Aquarius caused increased in secondary gamma radiation flux.

This experimental study is unique and first time we reported variation of secondary gamma radiation flux on surface of the Earth during Transit of Sun across constellation Capricorns, constellation Aquarius and presence of planets in the constellation Capricorns.

Conclusions

Change of secondary radiation flux on the surface of the Earth during Transit of Sun across constellation Capricorns, constellation Aquarius and presence of planets in the constellation Capricorns is another signature. In my experimental studies we observed such variation [31], [32].Also, we observed variation of secondary flux during transit of Sun in constellation Sagittarius. This research paper is accepted for publication in Nepal Journal of science and technology and will publish in NJST Vol 20 (1).

In the experimental studies [31] analyzed data showed variation of secondary flux during transit of Sun across constellations Libra in month November, 2018 and Virgo in month September, 2019 at Udaipur. In month November, 2018 on 13 November the Sun was in the Libra constellation and on another dates the Sun was shifted away therefore we

observed less secondary radiation flux. In the Month September, 2019 from 4 September onwards the sun was approaching towards Virgo constellation and we observed increase in secondary radiation flux.

Also, in another experimental study [32] in the month November 2020 the Sun was approaching towards Libra Constellation and on November 12 the Sun was in the constellation Libra. On this date we observed highest secondary flux.

Another study was conducted in the month of January, 2021 and on January 8 the Sun was in constellation Sagittarius and we observed the highest secondary flux. This research paper is accepted for publication in Nepal Journal of science and technology and will publish in NJST Vol 20 (1).

Results of above experimental research studies encouraged to observe such variation due to transit of Sun across another constellations therefore an experimental study was further conduced to observe such variation during Transit of Sun across constellation Capricorns, constellation Aquarius and presence of planets in the constellation Capricorns in the month February, 2021 at Udaipur, India. In this study we observed variation of secondary radiation flux, because on February, 9 combined gravitational lensing and gravitational pull by the Sun, constellation Capricorns and planets on background radiation more therefore more radiation bent. Also on this date radiation from constellation Capricorns was more. Further from February, 16 integrated counts started to increase because the Sun approached towards constellation Aquarius. This experimental study gave the conclusion that during Transit of Sun across constellation Capricorns, constellation Aquarius and presence of planets in the constellation Capricorns on the surface of the Earth secondary gamma radiation flux varies.

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ETHNO MEDICINAL PLANTS USED FOR TREATMENT OF DERMATITIS AND SKIN DISEASES BY TRIBALS OF RAIGAD DISTRICT WITH REFERENCE TO KARNALA FOREST, MAHARASHTRA, INDIA

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Abstract

Karnala forest lies in the Raigad district of Maharashtra state 18°75'o" N and 70°07'o" E. It is characterized by average rainfall of 3000 mm, black rocky basalt to reddish yellow coloured soil. Karnala is a combination of moist deciduous and semi evergreen forest. The tribals of these region are Katkaries, Thakars and Mahadev Koli. They frequently suffer from different types of skin infections The paper deals with medicinal plants used by these tribals for treatment of skin diseases. The data on ethnomedicinal plants and rich herbal forest wealth is on the verge of extinction and special efforts are required for documentation,conservation and sustainable utilization of these plants. So a survey was carried out to collect valuable information on traditional medicinal plants. The information regarding use of plants, their botanical names and local names is described in this paper.

Keywords*: Karnala, Ethnomedicinal plants, Skin diseases,Conservation*

Introduction

Ethnobotany is a branch of economic botany that deals with use of plants in life of man. The tribal communities that dwell in the dense forests of India use the traditional medicine system for health care based on folk remedies for centuries, which is defined as Ethnomedicine.They use plants to cure the common ailments even today,as they consider and prefer this system to be pure,natural and safe, aswell the health care centres are at a distance from their dwellings.

Area under study

Karnala forest lies in Raigad district of Maharashtra state, India 18 75 N and 70 070 E. It is haracterized by black , rocky, basalt to reddish yellow coloured soil,rainfall about 2000mm per year.The forest is a mixture of semievergreen to moist deciduous with temperature around 25 to 30 celcius.

Materials and Methods

The tribals of this region are Thakkars and Katkaris.A survey carried out revealed that they frequently from different skin diseases.The paper deals with plants used in the treatment of skin diseases by these tribals which are found in this forest.

List of Ethnomedicinal plants

Sr. No.	Local, Botanical Name, Family	Part used and mode of administration
1	Khair Acacia catechu Willd -- Family : Mimosaceae Kapha pit samak, Kustaghan	Powder dried bark sprinkled – affected skin – morning and evening.
2	Onion Allium cepa Linn -- Family : Liliaceae Kustaghana Glycollic acid, Allyl propyl disulfide – antibacterial	Fresh juice applied – on skin infection with rash, scabies
3	Dhotra Argemone medicana Linn -- Family : Papavaraceae Kustaghana Dahashamanee	Latex + coconut oil – locally – once- 3 days.
4	Kidamari Aristolochia bracteata Linn - Family : Aristolociaceae Tridoshar, Twagrogaghana (cures skin diseases) Shwetakushtaghna	Leaf juice applied on white patches 2 times a day, for skin parasites.
5	Neem – Azadirachta indica A. Juss -- Family – Meliaceae	Bark and leaves dried – ashes + coconut oil- paste applied morning and evening on

	Kaphapitta samak, Kustaghan Dahasamak	scabies and leprosy – cured,for Skin parasites.
6	Punarnava Boerhaavia diffusa Linn --- Family – Nyctaginaceae Dahanashak, Alkaloid – Punarnavine	Hot poutice of roots locally – skin disease with parasites.
7	Shalmali Bombax cebia Linn --- Family – Bombacaceae Dahadhaman, Sterol glycosides	Paste of bark – applied locally eruptions and pimples
8	Rui Calotropis gigantea Linn --- Family – Asclepiadaceae Kustaghana, Kaphanashak Bitter resins- Calotropin Akundarin	Latex of the leaves applied – broken pustulas – Scabies 2 times a day for 3 days.
9	Bahava Cassia Fistula Linn ---- Family – Caesalpinaceae Dahashamanee Kustaghana Anthraquinone Glycoside, Fistulic acid antibacterial	Piece of bark/root rubbed on a stone – paste applied after bath – on scabies till cured.
10	Takala Cassia tora Linn --- Family – Caesalpinaceae- Chrysophanic acid	Til oil applied to seeds roasted pan – powder + equal amount of Triphala churana + water- - Rolled pills - 2 pills 3 times a day for 7 days in treatment of skin diseaes / allergy.
11	Brahmi Centella asiatica Linn ---- Family – Umbellifereae Kushtahara Twagrogaghana - Vellarin	Decoction of entire plant 4 cups – conc – 1 cup applied locally – Leprosy, Psorasis and skin diseases.
12	Mahalunga – Citrus medica Linn --- Family – Rutaceae Kustaghana, Vatakaphahar	Fruit is cut rubbed on body at bed time 7 days – scabies
13	Airan – Clerodendron phlomidis --- Family – Verbenaceae Kustaghana	2 handful of leaves – a cup of juice – Once on empty stomach - Scabies
14	Dhaniya Coriandrum sativum Linn --- Family – Umbelliferae Kaphahar	Juice of leaves applied – allergy once a day
15	Ranharbara Cressa cretica Linn --- Family – Convolvulaceae	Whole plant dried in shade – burnt – black ash + coconut oil- paste – applied once a day for scabies
16	Kanvat Feronia limonia Corr ---- Family Rutaceae Tridoshahar Kandooghna	Leaves 2 handful – crushed – juice ½ cup twice a day orally and locally applied – Skin allergies.
17	Ambadi Hibiscus cannabinus Linn --- Family – Malvaceae	5 leaves crushed – fine paste – applied morning and evening. 7 days - Scabies
18	Safed Jamalgota – Jatropa curcas Linn -- Family – Euphorbiaceae Tridoshhar, Kusthaghana - Curcin	Fresh latex applied on scabies and other skin diseases
19	Mehendi Lawsonia inermis ----- Family- Lythraceae Dhahanashamanee	Paste of leaves applied morning and evening on soggy skin between toes – 6 days

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	Lawsone	
20	Karanj Pongamia pinnata Pierre -- -- Family – Paplionaceae Shwetakusthaghna Essential Oil	Oil from seeds scrubbed over body twice - 7 days – scabies, Leprosy,itching leucoderma, skin parasites.
21	Bavachi Psoralea corylifolia Linn ----- Family – Paplionaceae Kushthanashini Antifungal, Antibacterial Psoralen – Staphylococci Streptococci	Powder of dried leaves – Scabies, Leprosy and Sorasis till cured. Paste of entire plant - Bedtime for 15 days – white spots
22	Chinch Tamarindus indicus Linn ---- Family – Caesalpinaceae Vata Kaphahar, Dahahara, Pottasium tartaric acid, Vit. A and C	Polutice of leaves once day used for - All parasitic skin diseases till cured
23	Sag Tectona grandis Linn - Family – Verbenaceae Kandooghna Essential Oil	Leaves dried crushed – dropped on burning coal – fumes spread all over body once – skin allergy.
24	Unhali Tephrosia villosa Pess- - Family – Paplionaceae Kusthaghana Raktavardhak Glycoside – Rutin	Decoction whole plant – one cup morning and one evening – 4 days – Chronic skin diseaes
25	Dudhali Trichodesma indicum- R. Br. Family Boraginaceae Kandoohara (Skin itching)	Ashes of burnt leaves + 2-3 teaspoons coconut oil – paste applied twice a day – 3 days on skin allergy.

Conclusion :

Rapid intrusion of modern civilization into forest areas due to urbanization is causing deforestration. Special efforts needed to – collect store and record valuable data to incorporate sustainable utilization of ethnomedicinal and forest wealth before its extinction.

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EVALUATION OF CREATION OF EMPLOYMENT UNDER THE MGNREGA IN TELANGANA

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Abstract:- *The National/Rural Employment Guarantee Act 2005 (NREGA) renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the utmost accurate method to the problems of poor and idleness people. In fact, the scheme ensures the economic care of the rural below poverty people by providing guaranteed wage employment. MGNREGA undertakes the creation of employment that are largely focused on total no of Habitations, total no of Job cards issued, no of wage seekers, total no of person days generated, no of person days generated for SC, ST, BC, minorities, others, average wage rate per day per person, Average no of days employment provided per Household and total no of Households completed 100 Days of wage Employment. The study is an attempt to evaluate the creation of employment under the MNREGA in Telangana. During the financial year 2016 to 2019.*
(3 years).

Keywords: *- Employment, Economic Safety, MGNREGA, Financial year, Unemployment, person days.*

Introduction:-

The National Rural Employment Guarantee Act (NREGA) of 2005 is a single policy intervention by the state to ensure a "livelihood" for resource-poor people in rural India. Under the law, the government should provide unskilled adults (labour card holders) who are willing to work at the normal legal minimum wage with 100 days of guaranteed physical employment in local public enterprises. Is legally required. If they do not appear at work, they will be paid an unemployment allowance. The law came into force on February 2, 2006 and came into force in stages. Phase I was announced in the 200 most rearward counties in the country. From 2007 to 2008, Phase II was conducted in an additional 130 districts. The law was notified in the remaining 285 rural areas of India as of April 1, 2008 in Phase III. The program proposes a statutory minimum wage for Rs. 202 per incumbent per day from the year 2019-2020

This scheme shall come into presence with effect from 2nd February 2006 in rural areas of following 9 districts of Telangana State that is; (1) Adilabad, (2) Karimnagar, (3) Nizamabad, (4) Medak, (5) Mahabubnagar, (6) Ranga Reddy, (7) Khammam, (8) Nalgonda, (9) Warangal.

Features of the scheme:

- Gives legal guarantee of wage employment to the adult members of rural households who are willing to do unskilled manual labour subject to a maximum of 100 days per household
- Applicable for all villages in the District
- Every rural household has the right to register under MGNREGA
- Job cards issued to every household registered under MGNREGA
- Job cards issued within 15 days from the date of receipt of application for the job card registration
- The registered job card holders can seek employment by giving a group / individual application
- A minimum of 10 job seekers shall apply to sanction a new work under MGNREGA
- Employment provided by sanctioning one of the works under "Shelf of Works" as identified and prioritized by the village community within 15 days from the date of receipt of applications for providing employment under MGNREGA
- The village community has the right to choose works under 8 permissible categories of works

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- "Shelf of works" will be identified by the village community for 5 yrs which can be taken up in their villages as per the job demand and entitled persondays
- The works proposed by the village community cannot be altered by anyone unless they are not in conformity with the guidelines of MGNREGA
- The work shall be provided within 5 kms jurisdiction from the village
- If the work provided is beyond 5 Kms, the job seekers shall be given 10% of the minimum wages as additional amount
- State Govt. to pay 25% of minimum wage for the 1st 30 days as compensatory daily unemployment allowance on failure to provide employment for the families demanding the works under MGNREG Act, and ½ of wage for remaining period of the year
- Wages are paid according to State Minimum Wage rate notified under Minimum Wages Act 1948. The current wage rate is Rs.117/- for all unskilled work and Rs. 120/- for skilled labour.
- Equal payment for men and women
- Wages to be paid within a fortnight
- 1/3 beneficiaries should be women
- Work site facilities such as creche, drinking water and shade have to be provided
- 60:40 wage and material ratio has to be maintained for all works undertaken under NREGA

Reviews of literatures:

A few studies at the state levels have been piloted and reported on the Mahatma Gandhi NREGA. Maximum of the studies stress the impact created by the NREGA programme on the profits, social status and asset holdings of the rural women and disclose the limitations to efficient implementation of the programme. A profitable review of the related studies has been in brief endeavoured below.

Bairagya Ramsundar and Sarkar Shubhabrata (2013)

Employment Guarantee scheme is a new thought in India. MGNREGA works are largely concentrated on land and water resources which contain: water harvesting and preservation, soil maintenance and protection, irrigation provisioning and improvement, renewal of traditional water bodies, land development and drought proofing. The paper judgmentally evaluates the overall success of the MGNREGA in the bright of a case study on Birbhum district of West Bengal.

Das (2013)

evaluates the National Rural Employment Guarantee Scheme (NREGS) allowing to criteria viz. average number of days of employment per household; percentage of households finishing 100days of employment under NREGS; percentage of expenditure against total existing funds etc. Presentation across the first two criteria has been unsatisfactory and has declined over time. Percentage of expenditure against total available funds has risen quickly. Finally, it is hard to escape the conclusion that the NREGS has not performed healthy.

Ahuja, Tyagi, Chauhan and Chaudhary (2011)

conducted a study in Haryana to check implementation of MGNREGA in two districts — one agriculturally-advanced (Karnal) and the other agriculturally-backward (Mewat). In this they found that the farmers owning large size of landholdings and more number of livestock are not much interested in participating in MGNREGA works as they are busy in their own activities. The farmers who have small land and livestock resources work in MGNREGA works. So employment scheme of MGNREGA is providing livelihood security to the resource- poor rural people. Thus, if size of holding is large, the chances to work in MGNREGA work are less. It can be inferred that in agriculturally-developed area MGNREGA did not check the migration as the people were earning more income from migration. It implies that for the backward and resource-poor areas, MGNREGA is a good source of employment. The study has concluded that the farmers having large size of holding, more number of livestock, are migrating to other places for employment and have taken loans are less inclined to participate in MGNREGA.

Mitra and Murayama (2008)

found that Migration rates defined in terms of the gross decadal inflow of population as a percentage of total population at the place of destination does not seem to be high in a large number of districts. The intra-state rates are

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substantially larger than the inter-state rates. Secondly, the male and female migration rates are closely interconnected irrespective of whether they migrate from the rural areas within the state or outside the state. This would suggest that women usually migrate as accompanists of the male. Though many of the relatively poor and backward states actually show large population mobility, which is primarily in search of a livelihood, the mobility of especially male population is also seen to be prominent in the relatively advanced states like Maharashtra and Gujarat. The effect of factors at the place of destination on migration is interesting. Prospects for better job opportunities are a major determinant of migration.

Jacob (2008)

recommends that the lack of exact official data on migration is a matter that should be corrected as it is quite important to quantify migration as accurately as possible as rural-urban migration can become quite a problem for both the source and the destination areas. The aspect of NREGA where it can be used to curb rural-urban migration is conditional on the NREGA being implemented well in that region, otherwise, if work is not supplied, if wages aren't paid on time and if money is just being siphoned off, then workers will have no incentive to stop migrating. However it should be clear that the primary aim of the Act is to provide welfare for the section of the population that does not even earn the minimum wage- the fact that it can also curb distress migration is just a positive secondary impact of the Act. This paper does not mean to suggest that the focus of the Act should shift to preventing rural-urban migration, it only seeks to highlight that it should become a priority to implement NREGA as efficiently as possible because there are enormous secondary benefits from the Act which could really have a positive impact on economic development.

Bhagat (2012)

thinks that temporary and seasonal migration has long been an important income diversification and risk-coping strategy in many agriculture based economies in the developing world. In places where access to non-agricultural employment is limited, or climate (or technology) prevents continuous cultivation, seasonal migration is often the key to a household's income during the agricultural lean season. Regional variations in temporary migration are noteworthy in a country. Bihar, Jharkhand, Gujarat, Madhya Pradesh, West Bengal and Nagaland have a very high intensity of migration. All these states either have a high level of intra-state inequality or a high proportion of STs and SCs. Overall, temporary and seasonal migration declines with better economic and educational status. In rural areas, those with increasing incomes become less prone to migrate temporarily. Social factors play a critical role in migration decisions. Those belonging to STs have a higher chance of migrating seasonally than people in any other social group. The study concludes that temporary mobility is higher among the poorer sections of Indian society irrespective of the level of economic development of the states concerned.

Jaswal (2009) finds out that migration has reduced by more than half since MGNREGA was introduced. This has allowed families better access to educational and medical facilities in their existing domiciles. Most of the NREGS workers surveyed had little or no land. Many of the ones that do have land did not have access to irrigation and hence the productivity of the land is low. In such circumstances, the importance of migratory labour or an alternative such as NREGS goes up. An important aspect is the effect of NREGS on the labour market. It has buoyed up the off-season wages and has been instrumental in allowing the rural workforce to obtain means for basic sustenance in their local areas without having to migrate. In terms of number of people who have migrated before and after NREGS, it was found that there has been a drastic fall in the number of migrants.

Objective of the study:-

The present study was mainly on an attempt to study the creation of employment under the MGNREGA in Telangana. (It includes:- (Total No of Habitations, Total No of Job cards Issued, No of Wage Seekers, Total No of Person days generated, No of Person days generated for SC, ST, BC, Minorities, others, Average Wage rate per day per person, Average No of days employment provided per

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Household and Total No of Households

Research Methodology:-

Secondary Data:- Secondary sources of data is from records and reports of Ministry of Rural Developmentand nrega.telangana.gov.in/nregs/.

completed 100 Days of Wage Employment).

Period of Study:- The period of study is from 2016-17 to 2018-2019 i.e., for 3 years.

Proposed Statistical Techniques: The data collected from Secondary sources will be analyzed with the help of percentiles statistical tool.

Analysis and Interpretation:-

Table no:-1 Physical Employment

Physical Employment	Financial years		
	2016-17	**2017-18**	**2018-19**
Total No of Habitations	22421	22225	22225
Total No of Job cards Issued	5246806	5069885	5274273
No of Wage Seekers	11479504	11146772	11822671
Total No of Person days generated	106766296	114547846	117289622

Source: - https://nrega.telangana.gov.in/Nregs

The total number of dwellings (households) that worked under the program during the study period was 22421 in 2016-17, 22225 in 2017-18, and 22225 in 2018-19. It shows that. The above analysis shows that the number of households working under the program has increased from 22421 to 22225 (2016-17 to 2018-19). i.e., 0.87%.

The total number of labour cards issued under the program during the study period was 5246806 labour cards in 2016-17, total 5068985 labour cards in 2017-18, and total 5274273 labour cards in 2018-19. Is shown. The above analysis shows that the number of labour cards issued under the program has increased from 5246806 to 5274273 (2016-17-2018-19). i.e., 0.52%.

The total number of wage seekers under the program during the survey period was 11479504 in 2016-17, 11146772 in 2017-18, and 11822671 in 2018-19. The above analysis shows that the number of unemployed job seekers under the program has increased from 11479504 to 11822671 (2016-17-2018-19) job cards. i.e., 2.98%.

The table above shows that when the program was implemented in Telangana, the man-hours generated in 2016-17 were 106766296. Similarly, it increased to 114547846 in 2018 - 19. That is, an increase of 7.28% compared to 2016-17, and in 2018-19, 117289622 days were employed. That is, 24% more than in 2017-18. The above analysis clearly shows that Telangana is performing astoundingly in terms of man-hours generated.

Table no:-**2** No of Person days Generated Employment

No of Person days Generated Employment			
Person days	**No of Person days (%)**	**No of Person days (%)**	**No of Person days (%)**
No of Person days generated for SC	24166466 (22.63%)	26020684 (22.7%)	26242876 (22.37%)
No of Person days generated for ST	19374771 (18.15%)	20336755 (17.8%)	20371636 (17.37%)
No of Person days generated for BC	55638985 (52.11%)	60756263 (53%)	62960151 (53.68%)
No of Person days generated for Minorities	1402145 (1.31%)	1431732 (1.25%)	1466298 (1.25%)
No of Person days generated for Others	6183929 (5.79%)	6002412 (5.24%)	6248661 (5.33%)
Average Wage rate per day per person (Rs.)	133.25	140.89	148.42

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Average No of days employment provided per Household	42.19	45.23	46.53
Total No of Households completed 100 Days of Wage Employment	203808	224507	224402

Source: - https://nrega.telangana.gov.in/Nregs

It depicts that in the year 2016-17 person day generated in percent among SC, ST, BC, Minorities and others Beneficiaries were 22.62%,18.1%,52.11%,1.31% and 5.79% respectively, Similarly in the year 2018-2019 SC- 22.37%, ST- 17.37% BC-54%, Minorities-1.25% and others-5.33%. As compared with 2016-17, ST and BC person day Generation has been increased and SC, Minorities and others beneficiaries' person day Generation has been decreased .From the calculated analysis it shows that there is an improvement in generation of ST and BC person day in Telangana state.

That average day of Employment provided per household in percentages. The average day of employment provided per household in the year 2016-17 is 42.19%, 2017-18 is 45.23% and in the year 2018-19 is 46.53%. The above analysis shows that average day of employment provided per household has been Improved during the study period.

That at the time of detect wage rate per person under TS-MGNREG scheme. The objective of the scheme is to pay minimum wages of Rs 211 per day from the year 2016-17. In 2016-17 the average wage rate per day was Rs 133.25, in year 2017-18 wage rate Rs 140.23 similarly in the year 2018-19 wage rate Rs 148.42.The average rate has increased to 11.38% from the year 2016-17 to 2018-19. It shows that the Average wage rate per person has been increased

It depicts that at the time of observation of the scheme in Telangana state. In year 2016-17 203808 number of households got 100 days of employment, similarly in the year 2017-18, 224507 households and in the year 2018-19, 224402 number of households got 100 days employment. From the above analysis it is seen that from 2016-17 to 2017-18, 100 days of wage employment number has been increased and in 2018-19 employment has been decreased. It shows beneficiaries are not working 100 under the scheme and their ratio also very less than participation ratio.

Findings and conclusions:

1. The no of Habitations (House Holds) working under the scheme during the study period has been decreased to 0.87%. It is less percent of increase due to less awareness about scheme.
2. Total no of Job cards Issued under the scheme has been increased from 5246806 to 5274273 Job cards i.e., 0.52%. It is showing that new job cards issues has been decreased due to new cards not issuing.
3. Total no of wage Seekers under the scheme during the study period has been increased from 11479504 to 11822671 (2016-17 to 2018-19) Job cards i.e., 2.98%.the wage seekers increased is very less due to wage rate is not equal with market rate.
4. The person days Generated under the scheme has been increased from 216-17 to 2018-19 i.e., 24%. Person days Generated ratio is very small as compared with beginning of the scheme due to not issuing new cards.
5. The caste wise person day generated scheme in which there is an improvement in generation of ST and BC person day in Telangana state. Participation ratio of community wise SC, minorities and others ratio is very less due to agriculture and other activities.
6. The average day of Employment provided per household under the scheme has been increased from 42.19% to 46.53%. Due to the wage rate is very less.
7. The Average wage rate per day per person under scheme has been increased i.e., Rs 133.25 to 148.42 (11.38%). Increased in wage rate is very less as compared with market wage rates.
8. The number of households got 100 days of employment in the scheme has been decreased.

Suggestions:-Through the analysis of study very few recommendations such as:

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1. Issue the new job cards for those who are new unemployed if demanding in rural area. So that, every years new unemployed beneficiaries will join under the scheme.
2. Increase the wage rate per day to beneficiaries due to that they can improve their economic status as well participation of no of days will be increase, 100 days of employment also increase and migration from rural to urban will decrease.

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DECREMENT OF SECONDARY GAMMA RADIATION FLUX DURING GREAT CONJUNCTION OF JUPITER AND SATURN ON DECEMBER 21, 2020 AT UDAIPUR, INDIA

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Abstract

The experimental study during great conjunction of Jupiter and Saturn on December 21, 2020 at Udaipur (27^0 43' 12.00" N, 75^0 28' 48.01" E), Rajasthan, India was conducted. Data files for half an hour between times 18 IST to 19.00 IST were collected from, December 19, 20, 21, 22, 24and 26, 2020 using ground based NaI (Tl) Scintillation detector. The analyzed data reveal significant decrement of secondary gamma radiation flux (SGR) about 2% during great conjunction of Jupiter and Saturn (December, 21) on comparison to the average integrated counts on another dates. We interpret such decrement of SGR flux counts on the basis of great conjunction of Jupiter and Saturn, obstruction effect produced by planet Jupiter on reflected solar radiation from planet Saturn.

***Key Words**: Primary cosmic radiation, solar radiation, conjunction of Jupiter and Saturn, reflected solar radiation form planet Saturn.*

Introduction

Electromagnetic radiation coming towards the Earth is called cosmic radiation (CR). Cosmic radiation travels nearly the speed of light. Such radiation has about 89% nuclei are protons, 10% nuclei of helium, and 1% of others heavier elements (Lithium, Beryllium and Boron) [1, 2, 3].Primary cosmic radiation lies is from 10^9- 10^{20} eV or more [4]. On comparison interstellar abundances of the elements and solar system with help of cosmic radiation we can understand about their origin and propagation process through interplanetary space and arrive on the Earth. Simpson (1983) [5] showed that chemical abundances of cosmic radiation in different energy range. He made comparison between solar system abundances and estimated abundances for the local interstellar medium. He observed carbon, nitrogen, oxygen and iron group are present both in the cosmic radiation and solar system abundances. The atmosphere of Earth above 50 km from the surface of the Earth, the intensity flux of primary cosmic radiation is almost same as in the interstellar space. About 20 km form surface of the Earth secondary radiation produces a denser ionization. High-energy primary radiations undergo collisions with atoms of the upper atmosphere, and produce a cascade of lighter particles known as secondary radiation [6]. Therefore there is formation of shower of secondary particles. Secondary particles have X- rays, protons, alpha particles, pions, muons, electrons, neutrinos and neutrons. In each interaction the particles loose energy hence particles increase rapidly as these moves downward in the atmosphere and [7, 8]. In this way secondary particles shower down through the atmosphere to the Earth's surface [9]. Secondary radiation contains three components which are electromagnetic component, hadronic component and masonic component [10], [11], [12]. The electromagnetic component has electrons and gamma particles. Hadronic component has low energy protons and neutrons. Masonic component has pions, muons, neutrinos and kaons. Therefore, penetrating cosmic radiation produced shower of secondary particles [13]. Produced secondary radiation flux can be detected using appropriate detector on ground [14], [15].

Gravitational lensing is the phenomena in which due to gravitational field of the object electromagnetic radiation when passing near a massive object then bends towards object. The object could a galaxy, a star, or a cluster of galaxies [16] , [17], [18]. This effect was proved by A. S. Eddington and collaborators in a famous experiment during a total solar eclipse in 1919. The great conjunction of Jupiter and Saturn was occurred on December 21, 2020. On this date both planets look like a single star and the pair was at an angle of 0.1

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degree. The last time both the planets comes closer on July 16, 1623 i.e. 397 years ago. Such extra close Jupiter and Saturn conjunction will observe on March 15, 2080.

2. Celestial events and variation of radiation flux

Secondary radiation flux was observed by many scientist groups during normal days and on days of special celestial events such as Lunar eclipse, Solar eclipse, phases of moon, appearance of comet in sky, closest approach of celestial objects, transit of celestial objects etc. with help of efficient counter system. Many scientist groups conducted experimental studies to observe secondary radiation flux named Bhattacharya et al [19], Kandemir G. et al [20], Nayak. et al. [21], Bhaskar et al [22], Pareek et al [23].

Pareek et al. [23] conducted solar eclipse study to understand the interaction of GCR&SR flux with gravitational fields of the Sun and well-established shadowing effect of the moon. To observe variation in secondary radiation flux many experimental studies were conducted by scientist groups during lunar eclipse named Pareek et al. [24], Raghav et al. [25], J.N. Ananda Rao et al. [26], Pareek et al. [27], Pareek et al. [28] Pareek et al. [24] did experimental study of lunar eclipse to observe variation of secondary cosmic and solar gamma radiation flux at some energy. Such results can be explained on the basis of bending of primary cosmic radiation and solar radiation by combined gravitational lensing effect of Sun and Earth, backscattered Secondary flux form the Moon, combined magnetic field of the Sun and the interplanetary magnetic field. Pareek et al [29] also conducted the experimental study during celestial event of transit of Venus June 6, 2012 at Udaipur India and observed 2 %decrement in secondary solar radiation gamma ray flux. Phases of Moon experimental study was conducted by Pareek et al., using Scintillation counter in the month of September 2000 [30].This experimental study was conducted to understand information about the GCR, SR modulation at the time of new Moon, Full Moon and different phases of the Moon with different background of constellation in the sky. Results showed that due to gravitational lensing effect abrupt change in energy spectra on 9th and 10th September 2000, when Moon was in background of Capricornus

constellation.

An experimental study was conducted by Pareek et al [31] for transit of the Sun across Constellations Libra, Virgo analysed result showed variation of Secondary Gamma Radiation Flux in Month November, 2018 and September, 2019 respectively at Udaipur, India. Another experimental study was conducted by Pareek et al [32] for transit of the Sun across constellation Libra in the month of October and November, 2020 at Udaipur and observed the same result of variation of secondary gamma radiation flux Pareek et al [33] conducted experimental using scintillation counter in month of October, 2020 at Udaipur, India to observe variation of secondary gamma radiation flux during closest approach of Mars towards Earth, Mars at opposition and transit of Moon across different constellations, planets An experimental study was conducted by Pareek et al. [34] during appearance of Comet Hyakutake in the month of March, 1996 using scintillation counter. Analyzed results showed variation of secondary cosmic radiation flux in energy spectrum of specific energies of about1.127 MeV, 2.29 MeV and 3.66 MeV. With help of EUV satellite from this comet Extreme ultraviolet (EUV) emission was detected [35]. From Comet Hyakutake Mumma, M.J. et al. [36], Peterson, K. [37] and Huebner, W.F. [38] reported large quantities of the gases ethane, methane, Co present and also water in icy form.

With the fact that during different celestial events happening in sky, modulate terrestrial secondary flux we, attempted to see effect of great conjunction of Jupiter and Saturn on December 21, 2020 on secondary gamma radiation flux at surface of the Earth.

3. Experimental Set-up and Observations

Scintillation detector of (SD 152 F) flat type (Figure 1) of Nucleonix make used in this experimental study to detect the secondary gamma radiation flux. The NaI (Tl) crystal of size 2" x 2" optically coupled with photo multiplier tube. This integral line was connected to 1k multi-channel analyzer (MC 1000 of Nucleonix make has 1024 channels) with usb interface built in high voltage and shaping amplifier. This Scintillation counter system kept open to collect the counts as a

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function of time on the roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' University Udaipur (Rajasthan) India. The data files were stored in computer for half hour duration between times 18 IST to 19.00 IST from December 19, 20, 21, 22, 24 and 26, 2020

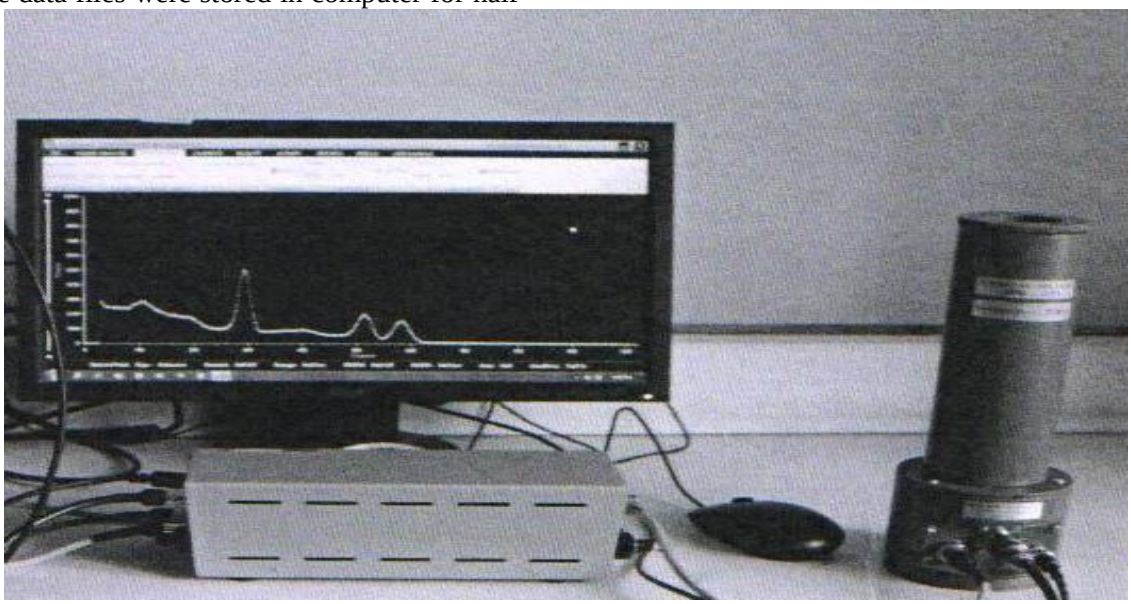

Figure 1 (Scintillation Counter System)

4. **Analysis and Results**

As depicted in figure- 2 the panels of SGR flux integrated data files between channel and integrated counts from, December 19, 20, 21, 22, 24 and 26 , 2020

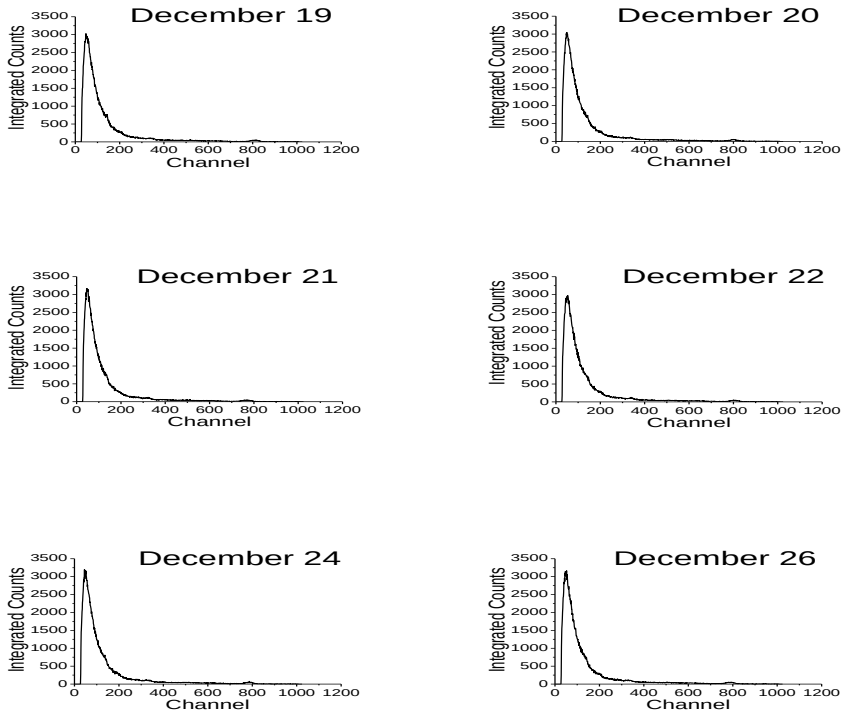

Figure- 2 (Panels of SGR flux integrated data files)

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Using Figure 2 we made the table 1which represents integrated counts of secondary gamma radiation flux with respect to dates (19, 20, 21, 22, 24 and 26 December, 2020).

Sr.No.	Date	Integrated Counts
1	19	256989
2	20	253291
3	21	251811
4	22	254275
5	24	259324
6	26	260943

Table 1

Using figure 2 and table 1 of SGR flux integrated data files, we made figure 3 which represents integrated counts of secondary gamma radiation flux with date for the month of December, 2020.

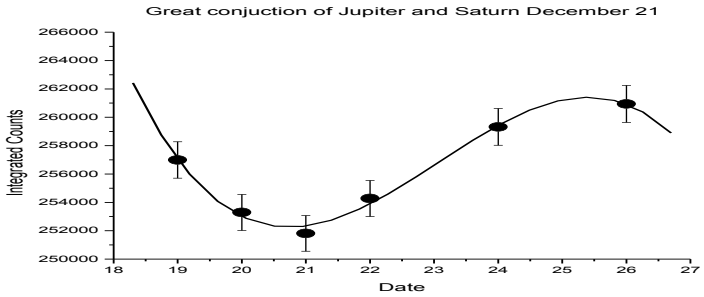

Figure 3 (Integrated counts of secondary gamma radiation flux)

Table 1 and figure 3 showed that on the dates December 19, 20, 21, 22, 24 and 26 the integrated counts were 256989, 253291, 251811, 254275, 259324 and 260943 respectively for half hour duration between times18.00 IST to 19.00 IST. The great conjunction was on the date December, 21. The average of integrated counts of normal dates December 19, 20, 22, 24 and 26 were 256964. To see the variation in secondary gamma radiation we used the following formula:

$$\%\ of\ variation = \frac{Average\ counts\ of\ normal\ days - Counts\ on\ date\ of\ great\ conjunction}{Average\ counts\ of\ normal\ days} \times 100$$

Using this formula, we observed on the great conjunction date (December 21) about 2 % decrement of secondary gamma radiation flux on comparison to average counts of normal dates (December 19, 20, 22, 24 and

Discussions

Table 1 and figure 3 clearly showed that integrated counts on the date December, 21 were lowest on the comparison to other normal days.

The probable reasons in this present experimental study for the decrement of SGR flux counts

are as follows:

On date December, 21 the planets Jupiter and Saturn was in the position of great conjunction and we got lowest integrated counts in the whole experimental study. This surprising result was unique and it could be understood due to obstruction effect produced by planet Jupiter on reflected solar radiation by planet Saturn. Due to this less reflected solar radiation entered towards atmosphere of the Earth. Therefore formation of secondary radiation less. This caused decrement in the secondary gamma radiation flux.

On other normal days the integrated counts were high on comparison to the date December 21.

This experimental study is unique and first time we reported such decrement of secondary gamma radiation flux at the surface of the Earth during great conjunction of planets Jupiter and Saturn.

Conclusion

From points (1) and (2) we can understand decrement of secondary gamma radiation flux about 2 % at surface of the Earth on December, 21during great conjunction.

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MERGER AND ACQUISITION OF BANKS IN INDIA

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Abstract

Banking industry has played a significant role in money creation in economy. In Indian banking industry Merger and acquisition of bank has emerged as commendable Trend and for expending scale of operation and market share of bank. This paper has focus on merger and acquisition of Banks in India. This proposed study has contemplated to know reasons and challenges for merger and acquisition of banks. The Reason of merger and acquisitions of bank has been studied. And also study the positive effects have been seen on merged bank. Secondary data has been used for collection of Data.

Keywords- *Merger and acquisition, effects after merger, reason behind merger decision.*

Introduction

Banking Industry of India is rapidly growing industry with innovative digital trend and Merger and acquisition is applied strategic mode in Indian banking to compete globally. It is evident from reviewing related literatures that combined banks have to face many issues and challenges. Banking sector is one of the fastest growing areas in the developing economies like India. M&A is discussed as one of the most useful tool for growth, which has evoked the interest of researchers and scholars. Indian economy has witnessed fast pace of growth post Liberalization era and banking is one of them. Merger &Acquisition in banking sector has provided evidences that it is the useful tool for survival of weak banks by merging into larger bank. It is found in our study that small and local banks face difficulty in bearing the impact of global economy therefore, they need support and it is one of the reasons for merger. Some private banks used mergers as a strategic tool for expanding their horizons. There is huge potential in rural markets of India, which is not yet explored by the major banks. The merger of public sector banks (PSBs) involves integration of six weaker PSBs with four better performing 'anchor' banks. Andhra Bank and Corporation Bank were merged with Union Bank while Oriental Bank of Commerce and United Bank were merged with Punjab National Bank. Syndicate Bank has been merged with Canara Bank, while Allahabad Bank with Indian Bank

Objectives of the Study

1. To study the concept of Merger and Acquisition.
2. To Study the recent merger of banks in India.
3. To study the reasons for merger and acquisition of Banks in India.
4. To study the challenges for mergers and acquisition of Banks in India.

3. Concept of Merger and Acquisitions

Merger is the amalgamation of two or more corporations into a single corporation where one subsists and the others lose their corporate existence. The survivor obtains all the assets and the liabilities of the merged corporations. All assets, liabilities and the stock of one corporation stand transferred to transferee Corporation in consideration of payment in the form of Equity shares, Debentures and Cash. An Acquisition refers to the procurement of a smaller corporation by a larger corporation. Acquisition is also known as a takeover. It occurs between the bidding and the target corporation. There may be either hostile or friendly acquisitions. In business combinations, an acquisition is the purchase by one corporation of a controlling interest in the share capital of another existing company.

Recent Mergers of Banks in India

In August 2019, the Finance Minister of India announced the merger of 10 Public Sector Banks into four entities. The logic behind this merger is to increase the global competitiveness of the Indian banks. Presently,

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the total Public Sector Banks reduced to 12 from 27 in 2017 in India.

i. Merger Number 1: PNB+OBC+UBI

Oriental Bank of Commerce (OBC) and United Bank of India (UBI) were merged with the Punjab National Bank (PNB). After this merger, PNB will be the second-largest Public Sector Banks of India after the State Bank of India in terms of the branch network. Its total branches would be 11,437 and the total Business of the PNB would be Rs. 17.95 lakh crore.

ii. Merger Number 2: Syndicate Bank+ Canara Bank

Syndicate Bank is merged with the Canara Bank. After this merger, Canara bank would be the fourth largest Public Sector of India. The total business of Canara would be 15.20 lakh crore with branch strength of 10,342. This merger will reduce the cost of operations owing to network overlaps. These two banks have a similar work culture that is why it would lead to facilitate a smooth transition.

iii. Merger Number 3: Andhra Bank+ Corporation Bank+ Union Bank of India

Andhra Bank and Corporation Bank are merged with Union Bank of India. This merger would make Union Bank of India 5th largest Public Sector Bank. This merger would have the potential to increase the post-merger banks business by 2-4.5 times. After this merger, the total business of Union Bank of India would be Rs. 14.59 lakh crore while total branches would be 9,609.

iv. Merger Number 4: Allahabad Bank + Indian Bank

In the fourth merger, Indian bank was merged with the Allahabad Bank. After this merger, Allahabad bank will be the 7th largest Public Sector Bank of India. After the merger, the total business of Allahabad bank would be Rs. 8.08 lakh crore and the number of branches would be 6,104. After the merger of these two banks the size of business would get doubled which would increase their global competitiveness.

Reasons for Mergers and Acquisitions of Banks

Mergers and acquisitions have molded the Indian Banking sector in a perfect manner. Though there seem to be diverse opinions on this particular material, yet there is always hope for an improvement in the current condition after bank mergers. The following are the reasons for the mergers to take plakhe in banks.

1. The exercise of merger of weaker banks with stronger banks was encouraged in order to provide stability to weak banks but Narasimhan committee conflicted with this practice. They said that mergers can diversify risk management.
2. Invention of new financial products and merging of regional financial system are the reasons for merger. Markets industrialized and became more competitive and because of this, market share of all individual firm condensed and hence, mergers and acquisition started.
3. Ability of producing economies of scale when firms are merged.
4. Allocation of skill takes plakhe between two organizations which helps them to progress and become more competitive.
5. Introduction of e- banking and some monetary instruments / Derivatives. Removal of admission barrier opened the gates for new banks with high technology and old banks can't compete with them and hence they decide to merge.
6. When two companies merge their sole motive is to create a positive result which is higher than the shared effect of two individual companies working alone. Two features of it are cost synergy and revenue synergy.
7. Performing banks survived after merger and enhanced branch network geologically.
8. Larger customer base i.e., through rural reach and increased market share.
9. Achievement of infrastructure & restrict competition and prevent congestion of banks & utilize underutilized resources so that the banks can contest with the foreign banks in a global era.

Challenges for Merger of Banks in India

i. Technology Integration

These different banks could be seen as asymmetrical entities using different technological platforms and having various geographic reach. Hence, it is important to select the merger partners based on their IT compatibilities over anything else. This sometimes leads to a lack of geographical synergy as the geographic reach is overlooked. Then, there are cases where merger partners

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are using different versions of the same software solution hence it has to be upgraded for seamless integration. Besides, every bank has got a certain level of customization done depending on their needs. Thus, it takes a considerably long time to integrate technology platforms of partners involved.

ii. Human Resource

Harmonizing the human resource is another key aspect of these bank mergers. The banks are merged only on papers but their people and culture don't. Employees of all partner banks often go through the changes in guidelines, policies, designation, and sometimes they get transferred. Ignoring their issues can decrease morale, productivity and may lead to an exodus of key talent. So, several committees are formed to look after various aspects of the merger including HR, IT, and product offerings. While the best available benefits from all the banks are passed on to employees, there remain many challenges to deal with. Apart from job security, different working styles, levels of stress, career-related issues in terms of growth, internal transfers, and pay structures need to be in synchronization.

iii. Other Challenges

When two banks are being merged, compliance is needed in every decision, which might not be favorable as their risk-taking abilities and thinking perspectives are different. This may lead to friction and rift which, if not managed well can result in the downfall of the organization as a whole.

One of the purposes behind banks' merger is to bail out poor performing banks. The anchor banks are made to set aside crores for loans to harmonize the bad loan accounts of the banks to be merged and as the ensuing provisions after the merger. A complex merger with an under-capitalized PSB can halt the bank's recovery efforts and the merged entity may become weak as well.

Conclusion

The banking industry has been experiencing major Mergers and Acquisitions in the recent years, with a number of global players emerging through successive Mergers and Acquisitions in the banking sector. The current study indicates that the pre- and post- Mergers and Acquisitions of selected banks in India have no greater changes in profitability ratio; a few banks are satisfactory during the study period. But in future, there are robust projections of improvements in profitability. However, results specify that mergers led to higher level of cost efficiencies for the merging banks. Merger between distraught and strong banks did not produce any significant efficiency gains to participating banks. However, the forced merger among these banks prospered in shielding the interest of depositors of frail banks but stakeholders of these banks have not revealed any gains from mergers.

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EFFECT OF INTERMEDIATE HOST 'SNAIL' ON PARASITIC POPULATION

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Abstract

Snails are invertebrate animals, belonging to the Phylum Mollusca. This group of organisms possesses a unique feature, known as "shell" which is a major characteristic of the group. The snail inhabits a wide range of habitats because they are found not only in freshwater environment but also in other ecological niches. Some snails are medically important because they transmit disease-causing trematodes in humans and other animals. Most of the diseases caused by snail-borne trematodes are prevalent in the tropic and sub-tropic regions of the world, and the medical and economic burden of these diseases are often neglected which is why they are called neglected tropical diseases. The distribution of the diseases caused by snail-borne trematodes especially schistosomiasis is focal. Hence, the parasites distribution is strongly dependent on the intermediate snail hosts distribution. Snails have four roles in the life cycles of the parasites they host: as an intermediate host infected by the first-stage larvae, as the only intermediate host infected by miracidia, as the first intermediate host that ingests the parasite eggs are ingested, and as the first intermediate host penetrated by miracidia with or without the second intermediate host being an aquatic animal. Snail-borne parasitic diseases target many organs, such as the lungs, liver, biliary tract, intestines, brain and kidneys, leading to overactive immune responses, cancers, organ failure, infertility and even death. Developing countries in Africa, Asia and Latin America have the highest incidences of these diseases, while some endemic parasites have developed into worldwide epidemics through the global spread of snails. Physical, chemical and biological methods have been introduced to control the host snail populations to prevent disease. Any animal, plant, or protest that spends a portion or all of its life intimately associated with another organism of a different species is considered to be a symbiont or host-parasite relationship. A parasite relationship in which, one member of the association benefits while the other is harmed (Ahmodjian and Paracer, 2000). Parasitism may be regarded as an ecological association between species in which, one parasite lives on or in the body of the other, the host. The parasite may spend the majority of its life in association with one or more host species, or alternatively it may spend only short periods, adopting a free living mode for its developmental cycle.

Larval stages of parasites completed in association with definitive host (final host) and intermediate host. Definitive host (final host) is the organism in which a parasite passes its adults and sexual existence. Intermediate host is the organism in which a parasite passes its larval or non-sexual existence.

Larval helminth in fish hosts are transmitted to their definitive hosts (larger predatory fish, birds or marine mammals) by predation, clearly the best fish species to use as intermediate hosts would be small bodied enough to serve as prey and they should not be top predators (they would have to be near the bottom or middle of the food chain, not at the very top) (George Nascimento, 1987; Marcogliese, 2002).

Freshwater crustacean such as a copepod is the first intermediate host of adult cestode. Insect larvae, copepods and tubificid worms have often been accused as the first intermediate host of parasitic nematodes and molluscs as the first intermediate host of trematode.

Trematode that parasitize livestock are hermaphrodites (except the schistomosomes) but they have the ability to reproduce asexually and multiply in aquatic or amphibious snails, which they require as intermediate hosts in order to complete their life cycles. Most flukes are very discriminating in their choice of snail as intermediate host and geographic distribution of trematode species dependent to the distribution of suitable species of snails.

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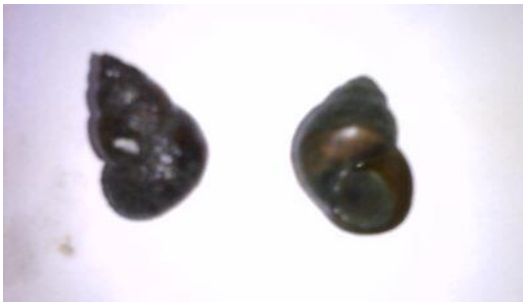
Parasites occupy the same position in a functional food web as predators, and thus can exact similar impacts on their hosts as predators on pray. Digenea trematodes are a widespread group of parasitic flatworms that use snails almost exclusively as first intermediate hosts (Schmidt and Roberts, 1996). Trematodes have a complex life cycle a gill and an operculum, aquatic gastropod molluscs in the family Viviparidae.

Snail habitat includes all types of fresh water bodies ranging from small temporary ponds and streams to large lakes and rivers. They live on water plants, mud that is rich in decaying organic matter. They are most common in waters where water plants are abundant and in water moderately polluted with organic matter such as faeces and urine, as it often the case near human habitations.

Azygia Sp. complete their life cycle in association with intermediate host snail



Bellamya bengalensis

present study area, there are high population of *Azygia* trematode, because of availability of intermediate host snail *Bellamya bengalensis* in which different larval stages (meracidia, sporocyst & redia) of *Azygia* sp. develop and then remaining larval stages (cercaria, metacercaria) develop in the definitive host *Channa gachua.* So in the study area, Sina Kolegoan Dam has favourable conditions for the development of trematode parasites or completion of their life cycle. Both the host are available in the same ecosystem that involving several host species, with a vertebrate usually serving as the definitive host.

In the present study, in Sina kolegoan Dam snail *Bellamya bengalensis* (Lamarck, 1822) observed for larval trematode, *Azygia sp.* Snail *Bellamya bengalensis* (Lamarck,1822), *Bellamya* is a genus of freshwater snails with

Bellamya bengalensis (Lamarck, 1822). (Ubgade, S.R.1980).

The life cycle of *Azygia* Sp., the eggs, which were fully embryonated when laid, hatched after ingestion by snail. The meracidia penetrates the intestine and become sporocysts in the connective tissue wall. Two generation of rediae were produced. Mother Radiae give rise to daughter rediae at first, and then cercariae, whereas the daughter rediae produced only cercariae. Cercariae emerged from snail after infection, the flukes matured when cercariae were fed to fish (Fig. No.1)

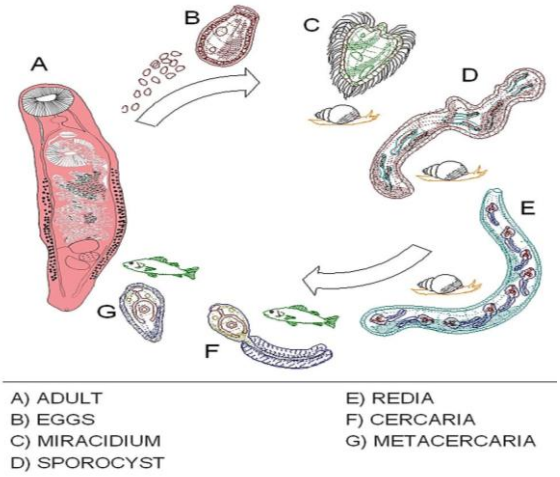


Fig.1 Life cycle of *Azygia* Sp.

becomes easy to grow and continue the life cycles of *Azygia* sp.

To prevent this infection water quality closely monitor and other management tools put in place to prevent their spread to the fish farm around vicinity and beyond, as to reduce low fish productivity and marketable value of fish, also by killing the larval stages of intermediate hosts, prevent the parasitic infection.

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FINANCIAL RESOURCES OF SAVITRIBAI PHULE PUNE UNIVERSITY: A CRITICAL STUDY

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Abstract: Finance is an important and mandatory resource in educational provisions'. Finance, is the most important resources which through a process and mechanism of budgeting is converted in to real instructional resources. The educational systems greatly work and help to render quality education effectively by the amount of finance available to education To improve the quality of education, provision of adequate financing for the overall improvement of educational institutions is very essential task. The present study is concerned with studying the financing sources of funding the Indian higher education. The study is mainly based on the secondary sources. The data is considered of year 2012- 13 to 2015-16. Through the study, the grants received by Savitrbai Phule Pune University have been studied.

Keywords*: Finance, education, quality education, financial sources, grants*

Introduction:

Education is the focal point of each development and is assuming the central part in the steadily changing way of life of person. It is a significant area for monetary, social, and social advancement pointed toward fulfilling the necessities, wants and any desires for a general public overall. Concerning this, United Nation Educational, Scientific and Cultural Organization (UNESCO, 2010) noticed that schooling as a vital opportunity of decision and activity, enabling them to partake in friendly and political existences of their general public, and outfitting them with the expertise they need to foster their occupation. Training assumes an imperative part in building a country and improves the advancement on the loose by creating labor supply to the nations. Without instruction advancement and development is unimaginable and incomprehensible. The fundamental hotspots for the financing of advanced education in India incorporates government reserves, assets of self administering bodies, educational expenses, gifts, grants, instructive cess, etc. Accordingly, advanced education is considered as one of the main interest in the long term plans of the public authority and among the public level speculations for the improvement of the human culture. However, it is vital to use those monetary assets monetarily and sensibly for come by the normal outcomes from the advanced education area and make it the most splendid one among the advanced education frameworks of the world.

Higher education in India:

It remained exceptionally internal arranged in spite of a few post-freedom changes in schooling area. As far as number of instructive establishments, India has the world's biggest advanced education framework with around 1,000 colleges and 40,000 universities though it positions third as far as size and variety, however its quality in the worldwide training framework has been horrifyingly beneath its actual potential that stays neglected. India's advanced education framework is the world's third-biggest as far as understudies, close to China and the United States. India's Higher Education area has seen an enormous expansion in the quantity of Universities/University level Institutions and Colleges since autonomy. In the prestigious Quacquarelli Symonds (QS) World University Rankings 2020, only three Indian Universities- IIT-Bombay, IIT-Delhi and IISC (Bangalore)- have been included in the top 200 institutes.

Educational Finance:

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Instructive money remembers the idea of speculation for man and its effect lies upon the cycles which are worried about the monetary advancement of the country. Whenever training is considered as a course of interest in more youthful age of the general public, this additionally prompts the satisfaction of future requests expected by the general public from its speculation. Subsequently, every general public has an assumption for exceptional yields from its use on human and material assets. This course of use on schooling can be perceived as a course of renouncing of present happiness for having an expansion in the

Significance of the study:

Advanced education is one of the main pieces of the training framework through which it is relied upon to make learned and useful residents for a country. For the smooth working and quality result from the higher instructive establishments, instructive money is the main component. Subsequently, it is vital to comprehend the course of money in advanced education so we can find out with regards to the consumption on training and potential returns that we can get from that speculation which will signify the accomplishment of the entire advanced education framework.

Objectives of the study:

- To study the different sources of finance in higher education
- To study the grants received by Savitrbai Phule Pune University

Hypothesis of the study:

H0: There is no significance difference in grants received by Savitrbai Phule Pune University

Savitribai Phule Pune University:

Savitribai Phule Pune University, formerly University of Pune and University of Poona, is a university in Pune in western India, founded in 10 February 1949. Spread over a 411 acres (1.66 km2) campus, the university is home to 43 academic departments. The university is named after Savitribai Phule, a 19th-century Indian social reformer who is known for her contribution towards empowerment and emancipation of women through education. The university has affiliated colleges, departments, and research institutes, which are primarily in Pune.

progression of profits later on. Thus, we can think about instructive money as a cycle that comprises of pay, use and saving a harmony between the two for the advantage if the general public. It is said that instructive money is expected to fill various needs prefer to set out new instructive open doors, to keep up with the ordinary instructive administrations, to grow the current instructive offices, to extend the instructive administrations, to diminish in differences in the instructive open doors, to increment in the quantitative parts of training, to increment in the nature of schooling.

Sources of Finance in Higher Education:

- **Rashtriya Uchchatar Shiksha Abhiyan:** (RUSA) Rashtriya Uchchatar Shiksha Abhiyan, a centrally sponsored scheme (CSS), launched in 2013 aims at providing strategic funding to eligible state higher educational institutions. RUSA is envisaged as the prime vehicle for strategic funding of state institutions so as to ensure that issues of access, equity and quality are addressed in an equitable manner. All funding under RUSA are norm based and future grants would be performance based and outcome dependent.
- **Governmental bodies:** In India, education is included in the concurrent list i.e. education is considered as the joint responsibility of both center and the state. The government funds are created and distributed through its various agencies like UGC, NCERT, NCTE, NUEPA, AICTE, SCERT etc. The central government of India has been framing several policies and schemes and the state government is required to implement those in every now and then. Apart from that both the central and state government jointly frame enormous schemes to uplift the financial provisions of the students in the form of scholarships, fellowships etc.
- **Local bodies:** In managing education, local bodies also furnish as an important means of financial help whenever necessary. Different local bodies like Zila Parishad, Panchayat Samities Nagar Panchayats, Gram Panchayats, Municipalities and Corporations etc. are working for the fulfilment of educational goals in the higher educational institutions at the grass root level.

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- **Private funds:** Private assets signifies the assets which are designated through the gifts, memberships, gifts, estates, fines, deal continues, premium on bank adjusts, lease from structures and so forth These are additionally called public altruism. Private assets for the higher instructive establishments additionally incorporate those foundations which are controlled by the private bodies and subsequently reserves are created through their own pay amassed from different sources.
- **Grant-in-aid:** Grants are given by the public authority or through its different offices to the higher instructive establishments. The monetary assistance or commitment as cash or material merchandise by a greater government to a more modest unit of it is known as an award. These awards might be given a periodical installment or once premise by zeroing in on a particular region under the heads like ordered award, compensatory award, different awards, the debatable and hoc award and so on.
- **Fees:** The fees are collected from the students in return of the tuition or other services provided to them in the educational institution. Fees generally includes admission fees, tuition fees, library fees, examination fees, fees collected for co-curricular activities, laboratory fees, electricity fees etc.
- **Endowment and land grant:** Strict foundations and different associations or NGO"s keep to the side a few piece of their gathered cash or pay to spend in instruction and these associations give this measure of cash for the government assistance of instructive organizations and consequently the enriched universities or instructive establishments get profited from such gifts. Enrichment reserves, gifts, gifts and other such kind of willful commitments from people or firms, manufacturing plants, sanctuaries, temples and so on are remembered for the pay from blessings for the instructive foundations.
- **Other Sources of income:** The higher educational institutions also generate income from donations, gifts, subscriptions, fines, money from rents, loans, debts. etc. and all these are included in the other sources of income
- **Income from Alumni Fund:** Pay from the graduated class can be of one more conceivable elective kind of revenue for the colleges. Clark (2003, p. 104) determines that pay acquired from graduated class raising money, reserved for long haul general help or to be spent in the present time and place, is a top notch source. Consequently, the college can lay out a decent contact with the graduated class for raising a few assets. Consequently, from all the previously mentioned sources the higher instructive foundations are creating pay for the satisfaction of its various purposes.

Grants received by university:

Following is the data of grants received by Savitribai Phule Pune University from 2012-13 to 2015-16.

Grants/Year	2012-13	2013-14	2014-15	2015-16
State	1409.64	158.42	251.24	237.48
UGC	2333.12	1729.66	1191.6	1460.7
CSIR	155.01	131.25	138.07	135.32
GOI	2675.90	1024.69	1271.48	2229.95
OIB	86.34	132.36	197.87	173.3
Grand Total	6660.01	3176.38	3050.26	4236.75

Above table shows the grants received by Savitribai Phule Pune University from 2012-13 to 2015-16. From the table it is observed that State grant is continuously declining. It was 1409.64 in the year of 2012-13 and in 2015-16 it decreased to 237.78. Also the UGC, CSIR, GOI funding is declining only OIB grant is increasing in constant rate. The overall grant from 2012-13 to 2015-16 also declining.

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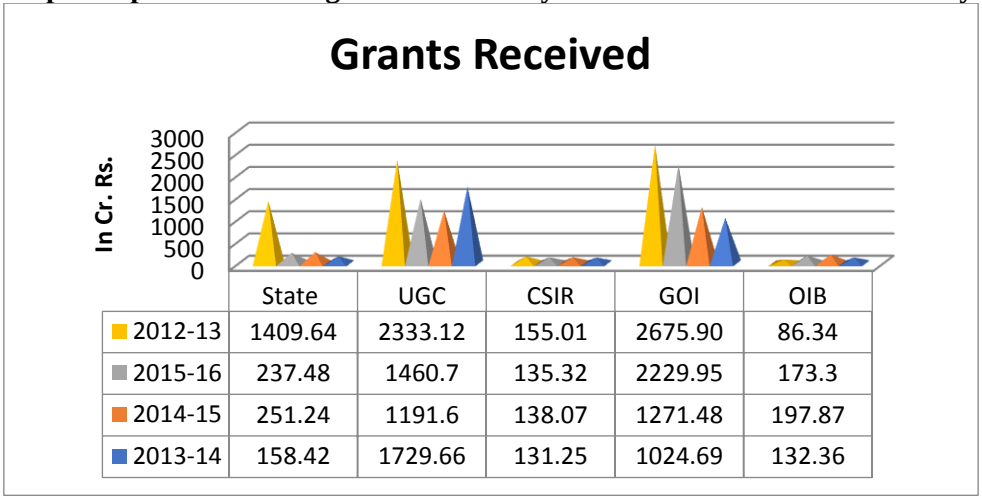
Graphical presentation of grants received by Savitribai Phule Pune University:



	State	UGC	CSIR	GOI	OIB
2012-13	1409.64	2333.12	155.01	2675.90	86.34
2015-16	237.48	1460.7	135.32	2229.95	173.3
2014-15	251.24	1191.6	138.07	1271.48	197.87
2013-14	158.42	1729.66	131.25	1024.69	132.36

(Plotted from above table)

Hypothesis Testing:

The hypotheses refers to the basic statements formulated for their confirmation in analysis done in the various chapters of the study, these are the outcomes set before the study for the conclusion. Students t test have been used for this study.

H0: There is no significance difference in grants received by Savitrbai Phule Pune University

Students t test analysis of grants received by Savitrbai Phule Pune University

Variable	**Value**
Average	4280.85
Standard Deviation	1672.98
t-value	3.41
p Value	0.0135

The above table provides the description of grants received by Savitrbai Phule Pune University from 2013 to 2026. Since the p-value is less than 0.05 we have sufficient evidence to reject null hypothesis at 5% significance level. So we can reject null hypothesis.

Conclusion: There is significant difference in grants received by Savitrbai Phule Pune University.

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BIOLOGICAL ASPECT OF *Boswellia serrata* ROXB. AN IMPORTANT MEDICINAL PLANT

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Abstract

The current review is based on medicinal valuable plant *Boswellia serrata* Roxb.from family burseraceae. The manuscript covers the important of ethnomedicinal and their used in different level followed by the detailed taxonomical studies on *Boswelliaserrata.*Plants has been used by various medicinal practitioners and so significant work has been done on phytochemical and pharmaceutical aspects of *Boswellia serrata.*Plant stem produce oleo-gum which is used to treat chronic ulcers, nervous diseases, urinary tract disorders, skin diseases, cervical tuberculosis lymphadentitis,diseased bones, rheumaticamenorrhea, dysmenorrhea and many more.

Keywords: *Boswellia serrata, ethnomedicinal, plant, phytochemical and pharmaceutical.*

Introduction

Medicinal plant and ancient human being civilization have strong binding due to plant have been used by mankind for its medicinal and therapeutic value. From the thousands of years nature has been a direct source of medicinal agents in impressive number of modern drugs have been isolated from natural sources. Many of these extractions and isolations were based folk information available already in traditional medicine system. The folk plant-based medicinal system many time sated as "Ethnobotany" or "Traditional Botany" played an essential role in health and nutrition care, for about 80% of the world's population, inhabitants relying mainly on traditional medicines for their primary health care (Owolabi *et al.,* 2007). Plants have been the main source of medicine for man before than the current advancement of Science and Technology (Schmelzer and Omino, 2003). In India, lots of information is available about the medicinal plants, the sages mastered in unparallel knowledge of medicinal plants from ancient time and their medicinal practice is popularly known as Ayurvedic Medicine (Arash *et al.,* 2010). The oldest known repository of our Indian culture is *Rig-Veda* (4500-2500 BC) mentions about hundreds of medicinal plants and is followed by *Yajurveda* 81 species, *Atharva Veda* (2500-2000 BC) describes elaborate description of medicinal plants (Prakash & Gupta 2005). Among two important ancient treats *The Charak Samhita* (1000 BC) written by Charaka describes the use of over 1100 medicinal plant. Whereas *Sushruta Samhita* (1000-800BC) by *Sushruta* describes properties and use of 1270 species and their medicinal practice is popularly known as Ayurvedic Medicine (Arash *et al.,* 2010).

Recently, it is clearly known that they have roles in the protection of human health, when their dietary intake is significant. More than 4,000 phytochemicals have been cataloged (American Cancer Society 2000) and are classified by protective function, physical characteristics and chemical characteristics and About 150 phytochemicals have been studied in Detail (American Cancer Society 2000).

Boswellia serrata Roxb. exColebr. In Asiat. Res. 9: 379. t. 5. 1807; A.W. Bennett in Hook. f., Fl. Brit. India 1: 528. 1875. *B. serrata* Roxb. exColebr. var. *glabra* (Roxb.) A.W. Bennett in Hook. f., Fl. Brit. India 1: 528. 1875. *B. glabra* Roxb., Pl. Coromandel 3: t. 207. 1811.

Common Names:Bengali. *Kundro, Luban, Salai*; **Guajarati.** *Mukul-salai*; **Hindi:** *Luban, Salai, Salhe, Salpe*; **Kannad.:** *Chitta, Maddi*; **Mal.:** *Vella-kundirukkam*; **Marathi.**; *Salai*; **Sans**.: *Kunduru,Sallaki*;
Tam.: *Guggulumaram,Kundrikam, Kundutukkan-pishin,Kungiliam, Parangisambrani*; **Tel.:** *Andaka, Anduga-pisunu, Tellaguggilamu*; **English.:** *Indian olibanum.*

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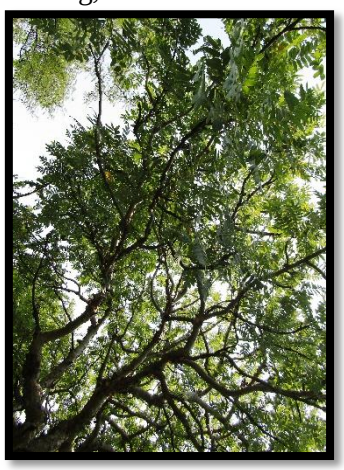
Trees; 6-20 m high; branches with annular swelling at intervals. Leaves 15.5-44 cm long; axis pubescent or puberulous; leaflets 8-23, variable in size, shape and degree of pubescence (sometimes the lowermost pair much smaller than the others, ovate-lanceolate, oblong-ovate or elliptic, 0.8 - 9.4 x 0.4 - 3.5 cm, coriaceous, oblique, cuneate, rounded at base, crenate-serrate, sometimes entire or repand along margins, acute, obtuse or retuse, mucronate at apex. Panicles axillary, up to 21 cm long; bracts subulate, pubescent, caducous. Flowers pink, or white with pinkish tinge, fragrant. Calyx tube broadly campanulate, 1.5-3 x 2.5-3 mm; calyx-lobes triangular-ovate, pubescent, persistent. Petals ovate-oblong, 5-7 x 2.5-4 mm, shortly clawed, obtuse, inflexed at apex; pubescent outside except margins. Stamens 2.5 - 5 mm long, glabrous, pubescent or puberulous; anther lobes oblong; connective produced beyond the anther lobes. Pistil ca 4 mm long; stigma capitate. Capsules 3-gonous, 1.2-2.4 x 1-1.4 cmPawar S and Patil D A (2008)..

Flowering:. Jan -May, Sept.- Dec.; **Fruit:.** April - Aug., Nov. – March.

Distribution: India: On dry hills and slopes, on gravelly soils at altitudes 275 – 900 mt. Punjab, Uttar Pradesh, Madhya Pradesh, Rajasthan, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Endemic.


Boswellia serrata Roxb. (Family-Burseraceae) is well known as Kundru or Shallaki, referrers as *Indian frankincense* and distributed in dry forests (Pawar*et al.*, 2011).The word frankincense is derived from the ancient French name "frankincense"meaning "pure incense." Frankincense is also known in Arabic as "luban," which means "white" or "cream;" in Greek as "libanos;" in Ethiopia as "etan".The properties of *Boswellia* plants have been exploited for millennia in the traditional medicines of Africa, China, and especially inthe Indian Ayurveda. The plant is widely distributed in India, it occurs in dry hilly forests of Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Bihar, Assam, Orrisa, central peninsular regions of Andhra Pradesh etc. Plant is known by various vernacular names like *Kundur*in Unani, Arabic; Indian frankincense tree in English; *kundur, luban, salai*inHindi; *parangisambrani*inTamil; *phirangisambrani,parang, sambrani*, inTelugu; *kundur*in Persian; *kundur*in Urdu; *ashwamuthri, kunduru*in Sanskrit; *Chilakdhupa, Tallaki, Madd*iin Kannada (Maupetit P 1984 and Arshiya Sultana *et al.*, 2013).

An oleo-gum-resin producing medically important plant *Boswellia serrata* taxonomically nomenclature likes *Boswellia serrata*Roxb. *ex*Colebr., *Boswellia serrata* Roxb. var. *glabra* (Roxb.) and *Boswellia serrata* Roxb. reported in manual of non-wood forest produce plants of Kerala from Kerala Forest Research Institute Kerala, India (Leun and Foster 1996). Medicinally, the tree is well known as astringent, stimulant, expectorant, diuretic, diaphoretic and antiseptic, in addition to its anti-bacterial and antifungal properties had also reported several local uses of the gum in Kerala, especially in the treatment of sexually transmitted diseases reported by

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Ramesh Marasini and Susan Joshi, 2012, during their study reported various phyto-constituents which were detected and screened successfully by the antihelmintic activity in leaves extract of *Boswellia serrata*.

Active component of *Boswellia serrata*, in which most usable is the oleo-gum resin. The gum resin has been used extensively in traditional and Ayurvedic medicine to treat chronic ulcers, diseased bones, rheumatic, nervous diseases, cervical tuberculosis lymphadentitis, urinary tract disorders, skin diseases,amenorrhea,dysmenorrhea, ringworm, jaundice, diarrhea, dysentery, dyspepsia, hemorrhoids, and so forth (Pawar *et al.*, 2011 and Arshiya*et al.*, 2013). Resins are also important ingredients in incense and perfumes with their potential applications in different industries and other sectors (Arshiya*et al.*, 2013). Boswellic acids, which are components of the resin, have shown promising results in the treatment for asthma and various inflammatory conditions. Boswellia gum, extracted from the resin, is used in the prevention and treatment against colitis, ulcerative colitis, Crohn's disease, and ileitis. These gum resins are also known as guggals. Boswellia, or boswellic acids, exhibit potent anti-inflammatory properties, demonstrated both in vitro and invivo. Triterpenes in boswellic acid reduce the synthesis of leukotrienes in intact neutrophils byinhibiting 5-lipoxygenase, the key enzyme involved in the biosynthesis of leukotrienes, whichmediate inflammation (Arunabha*et al., 2010*).

Thepharmacological activities of frankincense, as crude extracts, the distilled essential oil and the isolated compounds have been investigated by Mikaeil *et al.*, 2003. According to Ahmed and Salim 2008, the frankincense essential oil exhibits *in vitro* antibacterial, antifungal and immunomodulatory activity. Several other studies investigated the anti-inflammatory, anti-leukotriene, antiacetyl cholinesterase, and anticancer activity of the resin and especially its major components, the boswellic acid derivatives (Pardhy and Bhattacharyya 1978 and Ghorpade et al., 2011).

Selective and quantitative HPTLC method has been developed for determination of β-Boswellic acid is done by Pawar *et al.*, 2011 and Goyal *et al.*, 2011, reported the therapeutic potential and phytochemical profile on the herbal anti–inflammatory agents in *Boswellia serrata.* This search also provided the better information regarding to the formulation and evaluation parameters of the novel herbal gel for anti-inflammatory activity (Pawar *et al.*, 2011).

Description, distribution and ecology of gum and resin bearing species, their production aspects and food and non food applications of *Boswellia* species are reported by Tadesse *et al.*, 2007.Widely used of raw materials in several industries such as pharmacology, food, beverage, flavouring, liqueurs, cosmetics, detergents, creams and perfumery, paints, adhesive and dye manufacturing, etc. by Mulugeta *et al*., 2003.

Ghorpade et al., (2010 and 2011) study the *in vitro* production of boswellic acid from callus cultures of *B. serrata*using various biotic and abiotic elicitors. Accumulation and enhancement of the active metabolites like boswellic acid using tissue culture techniques. They also studied effect of biotic and abiotic elicitors on production of four major components of boswellic acids, 11-keto boswellic acid (KBBA), acetyl-11-keto boswellic acid (AKBBA), boswellic acid (BBA) and acetyl boswellic acid (ABBA) in callus culture.

In vitro antioxidant activity and anti inflammatory activity and Phytochemical screening reveals the presence of saponins, tannins, anthraquinones, terpenoids, and flavonoids are reported by Afsar *et al.*, 2012, in leaf extract.

Sunayan and Prakash, 2012, reported the fungal endophytes about 17 genera, isolated from bark and twing of the *Boswellia serrata.*

This critical review opened up vision to have specific biomolecules in different organs with its drug actions. The detailed studies will certainly bring numerous bioactive components to benefit human in better health practice and disease cure.

Conclusion

Boswellia serrata a valuable tree as current review of literatureespecially with its ole-gum secretes from stem. Phytochemical and pharmacological studies so far has been done for gum that's used in various disease. Plant stem, root and leaves also might have a useful

ingredient and remains good field of research for farther studies.

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BLOCK COPOLYMERISATION OF POLYURETHANE WITH STYRENE THROUGH LIVING RADICAL POLYMERIZATION

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Abstract :
Tetraphenyl ethane and its derivatives having a sterically hindered carbon- carbon single bond are known to act as thermal iniferters in free radical polymerization. Thus, polyurethane macroiniferters (PUMI) based on diphenyl methane- 4,4′-diisocyanate (MDI), polypropylene glycol(PPG), M.W 1000 and varying amount of 1, 4- Butanediol(BD) and/ or 1,1,2,2- Tetraphenyl ethane diol(TPED) as chain extender have been synthesized using methyl ethyl ketone (MEK) as solvent. The reactions were catalysed by dibutyl tin dilaureate(DBTDL). These polyurethane macroiniferters were then used to synthesize polyurethane – block – polystyrene copolymers (PUMI-b-PS) through thermally induced living radical polymerization. The homopolymers, polystyrene (PS) were also removed by soxhlet extraction with methanol and acetone. Polyurethane macroiniferters and the corresponding block copolymers were characterized by FTIR, SEM measurements.

***Key words** : Block copolymer, living radical polymerization, polyurethane, thermal iniferter, SEM.*

Introduction:

Polyurethanes are a broad class of polymers having only one aspect in common, the presence of urethane linkage. But the urethane linkage may constitute only a portion of the total number of linkages in the polymer chain. By changing the nature of the diisocyanate, low molecular weight diol and macrodiol, a variety of hard and soft segments, having different compositions and chemical structures can be attained. This results in the alteration of the physical properties and morphology of the polyurethanes. It is this potential for tailoring the properties of polyurethanes to suit a specific purpose, has made it a highly versatile class of polymer. There is a good deal of current interest in the chemistry and technology of linear, branched, grafted, network polyurethanes and number of review articles have appeared (Adibi, George & Barrie, 1979; Otsu & Kuriyama, 1985)[1-2]. Linear segmented polyurethanes, which are essentially block copolymers made up of hard and soft chain segments in an alternating fashion, exhibit many of the properties of crosslinked elastomers and are of particular importance. In recent years, a number of polymeric system based on reversible termination of growing radicals were reported in order to improve the radical polymerization, such as iniferters (Otsu & Matsumoto, 1982)[3] where the some species served the purpose of initiator, transfer agent and/or terminator. Iniferters may be activated both by thermal and photochemical means. When an iniferter is used as an initiator, living radical polymerization can be carried out using the same mild reaction condition as in general radical polymerization reaction. The thermally and photochemically labile iniferters (Zhu & Li, 2005; Guan et.al., 2000) [4-5] were used for the preparation of block and graft copolymers. Recently, polymethacrylic acid and polymethyl methacrylate prepared with the polyurethane iniferter have been reported (Bhuyan & Kakati, 2009)[6]. Most of the thermal iniferters containing carbon-carbon bonds are symmetrically disubstituted tetraphenylethane derivatives which were reported in the earlier work (Chen et.al., 2000)[7]. The living radical nature of a kind of polyurethane iniferter prepared from diisocyanate and 1,1,2,2-tetraphenyl-1,2-ethanediol (TPED) was reported by some workers (Tharanikkarasu & Radhakrishnan, 1994)[8].

In this paper, we describe the synthesis of variety of polyurethane macroiniferter (PUMI) by varying the percentage of 1,1,2,2-tetraphenyl-1,2-ethanediol (TPED) and 1,4-butanediol(BD) with 4,4′-diphenylmethanediisocyanate(MDI).
Tetraphenyl ethane and its derivatives having a

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sterically hindered carbon- carbon single bond are known to act as thermal iniferters in free radical polymerization. The polyurethane macroiniferters having varying percentage of tetraphenyl ethane moieties were then used to synthesise a series of polyurethane-block-polyvinyl copolymers. The vinyl monomers used is styrene(St). The living radical nature of PUMI is confirmed by the successful synthesis of block copolymers with styrene(St) and characterization of polymeric materials are also described.

Experimental :

Materials and methods:

1,1,2,2- tetraphenyl-1,2-ethanediol (TPED) was prepared from benzophenone and propan-2-ol and recrystallised from ethanol. 4,4′-diphenylmethanediisocyanate(MDI; Aldrich), Styrene (St; E.Merck), 1,4-butanediol(BD; E.Merck), polypropylene glycol,M.W.1000 (PPG; Aldrich), were distilled under reduced pressure before their use. Dibutyltindilaurate (DBTDL; E.Merck) was used as received. Other solvents such as Ethylmethylketone(MEK; E.Merck), dimethylsulphoxide(DMSO; E.Merck), N,N-dimethylformamide (DMF; E.Merck) were purified by standard procedure (Perrin & Armarego, 1966)[9].

2.2 Synthesis of polyurethane macroiniferters:

MDI(2.0001 g), PPG(2.6603 g) and varying amount of BD (0.0502 g to 0.1906 g) and/or TPED(0.1902 g to 1.9504 g) were taken in the molar ratio 3: 1: 2 respectively. MDI and PPG were reacted first at 70^0C for 1.5 h under dry nitrogen atmosphere. The reaction mixture was lowered to 50^0C and TPED dissolved in 25 ml MEK was added drop wise through the pressure equalizing funnel into the flask with constant stirring at 50^0C. This was followed by the addition of catalyst DBTDL. After 4 h, the resultant polymer was precipitated from water and it was then dried in a vacuum oven at 40^0C for several days.

Table 1 shows the amounts of MDI,PPG,BD and TPED taken to synthesise polyurethane macroiniferters(PUMI- X%).

PUMI- X%	Amounts of MDI (g)	Amounts of PPG (g)	Amounts of TPED (g)	Amounts of BD (g)
PUMI- 100%	2.0001	2.6603	1.9504	Nil
PUMI- 80%	2.0001	2.6603	0.7803	0.0502
PUMI - 60%	2.0001	2.6603	0.5906	0.0904
PUMI - 20%	2.0001	2.6603	0.1902	0.1906

2.3 Synthesis of polyurethane-block-polystyrene copolymer:

The polyurethane macroiniferters (1.0126 g) having varying percentage of TPED were taken in a 100 ml round bottomed flask and dissolved in DMF (15 ml) under nitrogen atmosphere. Then styrene (1.0545 g) was added to the flask and heated at 70^0C for 8 h, in constant agitation. At the end of reaction, the polymers were precipitated by pouring the mixture into large volume of methanol-water system. The block copolymers were then freed from polystyrene homopolymers by soxhlet extraction with acetone. The resultant polymer were dried under vacuum for several days.

Table 2 : Synthesis of polyurethane-block-poly 2-hydroxyethyl methacrylate copolymers.

Sl. No.	PUMI-b-PS	PUMI-X%	Amount of PUMI (g)	Amount of Styrene (g)	A (g)
1	$PUMI_{100}$-b-PS	PUMI – 100%	1.0106	2.2455	1.3227
2	$PUMI_{80}$-b-PS	PUMI – 80%	1.0106	2.2455	1.2614
3	$PUMI_{60}$-b-PS	PUMI – 60%	1.0106	2.2455	1.1937
4	$PUMI_{20}$-b-PS	PUMI – 20%	1.0106	2.2455	1.0967

PUMI-b-PS = Polyurethane-block-polystyrene copolymer

PUMI – X%= Polyurethane macroiniferters

A= Weight of dry product (PU-b-PS copolymers) after removal of homopolymer (PS).

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3. Results and discussion :

All the synthesis were carried out by the prepolymer method where MDI and PPG were reacted first followed by chain extension with short-chain diols BD and TPED. The polyurethane macroiniferters (PUMI-X%) having varying percentage of the tetraphenyl ethane moieties were synthesized and these thermal macroiniferters were then used to synthesize a series of polyurethane-b-polystyrene copolymers. The conversion (%) Styrene during the block copolymerization with polyurethane macroiniferters (PUMI-X%) was calculated (Tharanikkarasu & Radhakrishnan, 1997)[10] as follows.

Conversion (%) = M / (X+Y) x 100

Where, X and Y are the weights of polyurethane macroiniferters (PUMI-X%) and monomers respectively and M is the weight of block copolymers after the removal of homopolymers, polystyrene(PS). The results are tabulated in table 3.

Table 3 : Block copolymerisation of Styrene with PUMI-X% at 70^0 C in DMF.

Name of PU-b-PS	Weight of PUMI-X% (g)	Weight of Styrene(g)	Weight of PUMI-b-PS after removal of homopolymer(g)	Conversion (%)
$PUMI_{100}$ -b-PS	1.0106	2.2455	1.3227	40.62
$PUMI_{80}$ -b-PS	1.0106	2.2455	1.2614	38.74
$PUMI_{60}$ -b-PS	1.0106	2.2455	1.1937	36.66
$PUMI_{20}$ -b-PS	1.0106	2.2455	1.0967	33.68

It was observed that the conversion (%) of styrene was directly proportional to the number of initiating sites present in the polyurethane macroiniferter. Figure1 and figure 2 indicate the FTIR spectrum of polystyrene and $PUMI_{100}$-b- PS copolymer respectively. The band at 3429 cm^{-1} indicated the presence of N – H stretching due to urethane groups. The nature of the peaks due to C = O groups were different from that in the polyurethane macroiniferter(Patel & Mequanint, 2007; Momtaz et.al.,2014)[11-12]. The peak due to carbonyl group (1701 cm^{-1}) was also observed in the $PUMI_{100}$ -b-PS copolymer. The intense peak at 1610 cm^{-1} was due to C = C stretching of all the benzene rings contributed from MDI and polystyrene. The peaks appeared at 1071.3 cm^{-1} and 1020 cm^{-1} were due to C – O – C stretching in the polyether segment and C – H out of plane bending in the benzene ring.

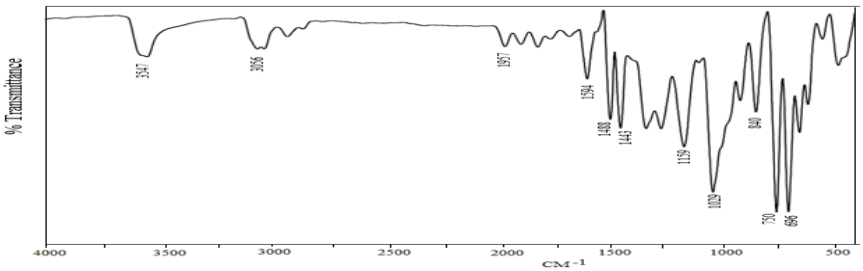

Figure1. FTIR Spectrum of polystyrene.

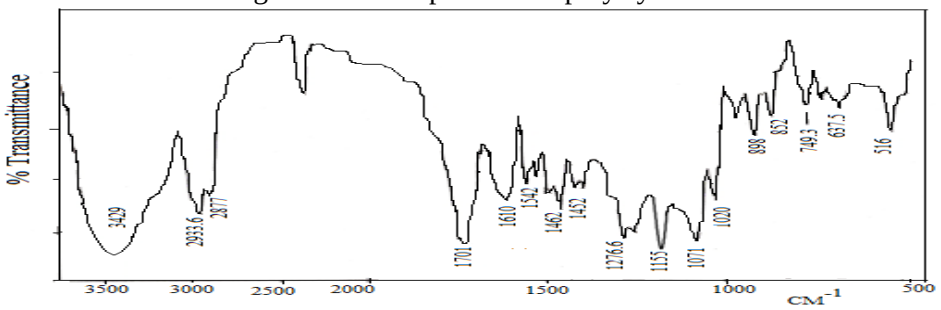

Figure2. FTIR Spectrum of $PUMI_{100}$-b-PS copolymer.

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Figure 3and figure 4 represent the scanning electron micrograph of PUMI-100% macroiniferter and $PUMI_{100}$-b-PS copolymer respectively. The use of TPED as chain extender diol should increase the size of the hard domain structure in comparison to polyurethane hard domains from MDI and BD. Spherulitic hard domain structures with the width (1.74 to 3.48 μm) was observed in PU-100% macroiniferter. The morphology of the $PUMI_{100}$-b-PS was observed to be different from the macroiniferter (Okano et.al. 1978)[13] as there undergoes interaction of polystyrene with the soft and hard segments of the polyurethane macroiniferter.

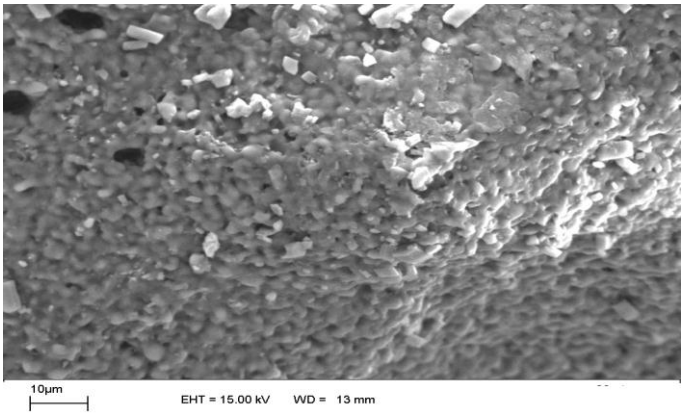

Fig.3: Scanning electron micrograph of PUMI-100%

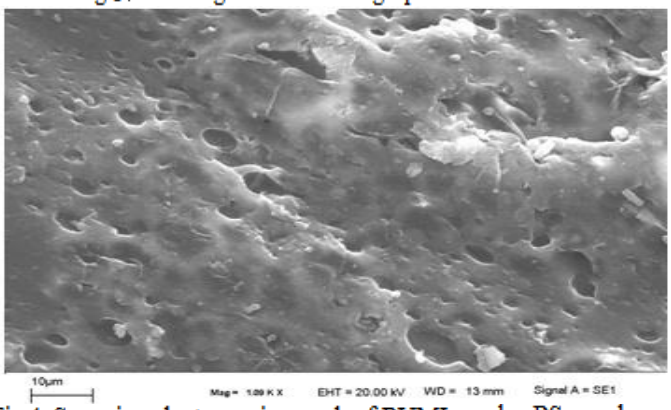

Fig.4: Scanning electron micograph of $PUMI_{100}$–b –PS copolymer

Conclusion

The polyurethane macroiniferters having varying percentage of tetraphenyl ethane moieties were synthesized and these were also used to synthesise $PUMI_{100}$-b-PS copolymers. The conversion (%) styrene during the block copolymerization with polyurethane macroiniferters (PUMI-X%) was calculated. The resultant polymers were successfully characterized by FTIR and SEM. The scanning electron micrograph of $PUMI_{100}$-b-PS copolymer showed different surface morphology from the macroiniferter.

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SOCIAL ASPECT WITH REFERENCE TO THE AUTOBIOGRAPHY IN ENTITLED *UPARA* BY LAXMAN MANE

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Abstract

Sociologist defines society as a group of people who share common values and lifestyles. Social aspects are important part of the foundation of the society. Laxman Mane has with scientific frame of mind. He interrogates faith a way of life and sometimes a whole tradition. He criticise blind adherence to religious dogmatic belief and ruthlessness of tradition. He presented the misery of his fellow men and women and a considerable part of his Autobiography. His dedicated to the real freedom of human being. Laxman Mane liked to portrait in his writing the way we live and what we think about life. The people he wrote about in his work were those he had seen in real life and he portrait the way those people lived with great simplicity. In his works there is an attempt to give strength and respect to people who were looked down upon by the society. All the characters in his Autobiography whether they are rural or urban, male or female were all other Dalits, tribal or the oppressed classes. Those people who were frowned by the Indian cast system. Laxman Mane work also ensures that women are never treated with disrespect.

Keywords: *Knowledge of freedom, human relationship, existence, Dalit literature, exploitation, conflict*

Introduction:

Laxman Mane, who belonged to a nomadic tribe, writes in his autobiography *'Upara'* (1997) his journey as a Kaikadi child and how he has to face many social evils being a dalit child. His struggle starts from his family only. Later in schools also he has been discriminated by other children. Mane's father was fond of education. He had a strong desire to educate his son. When Laxman's mother objected to his education, his father got angry:

Yah! Let him be a street mongrel and run across the street! Why should I send him to school? You bitch of a wife! You want him to be a beggar? I will certainly send him to a school and make him a teacher or an officer. Who are you to poke your filthy nose into my affair, woman? (22)

These words indicate that Laxman's father really wanted to overcome the sufferings of his life by educating his son. But the people from upper strata wanted exploit Dalits for their own benefits and hence, they did not want to give education to Dalits. It becomes clear from the words of a teacher, who makes fun of Laxman's father who had gone to the school to enrol his son in school:

You funny guy! Do nomadic beggars go to school?.... if they study, who will weave our baskets? Nothing doing! You want to study, Huh! (36)

It shows the caste politics in the field of education due to which dalit children were deprived of education. However, Laxman's father managed to take admission in school for his son. But still Mane has to face many problems. Initially, in school he didn't understand the language, as he knew only the Kaikadi dialect. So it was very difficult for him to stay in school. While describing insulting and humiliating treatment given to him, Mane writes:

I was a stranger to the whole village. Everything in the school was new to me and so it was to the pupils and to the teacher. I don't exactly recall the name of the village now. Possibly it was Vadi. We came here to earn our livelihood. How many days were we to stay on? No idea at all. When were we to leave this village? No idea again. All the pupils started teasing me in the way the hens do when

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a strange chick intrudes upon their privacy. Moreover, I had the look of mongrels straight from a dunghill…. No student would allow me near him. The poor schoolmaster! He was a good man. He asked me to sit near the door. The pupils were afraid of any physical contact with me. I had no slate. What's a book?... What's a pencil? What a school?....What is one to do there? I was absolutely ignorant of everything.(20)

It makes very clear how difficult it was to take education for a dalit child as he has to face such a discrimination, insult and humiliation. *Upara* narrates repulsive experiences of exclusion of an individual and his community. In Indian social structure there are many castes and communities which were not the part of four Varna systems. These people used to live outside the villages, on pavements, on hills and in forests. Speaking about a huge number of communities that lead unknown lives, Laxman writes:

During his study hours, he discovered at least eight to ten nomadic tribes hitherto unknown and unrecorded. Before undertaking this study, I hardly knew anything beyond my own tribe. Even of my own tribe I hardly had complete details. Today, there are around 143 sub-castes of the Kaikadi tribe alone. One may still find more of them in the future. Other tribes too, are in a similar situation. Each tribe has a distinct dialect, a distinct culture, distinct conventions and traditions. The tribes have their life fenced and imprisoned from the outside.(10)

In Indian society some tribes have been branded as 'Criminal tribes'. A member of this tribe is considered to be a criminal by birth. These tribes are Pardhi, Kanjarbhat, Kaikadi, Vadar, Atakari, Bhamta, Vaidu, Gosavi, etc. The police were authorized to arrest the members of these 'criminal' tribes without any warrant, which has led to the intense police atrocities against these tribes. Laxman Mane's life story narrates many incidents in which the members of these communities were forced to suffer at the hands of police only because they belong to that particular community. In one of the incidents, Laxman Mane tells the readers that:

In Latur a woman of the Masanjogi tribe (a nomadic tribe that stays in the cemeteries) wore a new sari and some woman in the village happened to lodge a complaint at the police station that her new sari had been lost. What do you think the policeman did in this case? He snatched away the sari worn by the tribal woman right in the middle of the road. Poor woman! To save her modesty, she run into a hut near-by. Someone threw a sheet on her body in order to save her honor.(10)

There are also many such pathetic incidents that had occurred throughout the society. No one bothered about the sufferers who were facing the problems without raising their voice. One of the incidents which shook the writer was when he was informed that in a village some fifteen to twenty Vaidus were being whipped. Someone informed to the police station. When the writer went there he was shocked to know the reason to arrest the Vaidus. The police officer said:

How was it possible for the Vaidus to own radio transistor? When the receipt was shown of the purchased transistor the policemen asked how can one know for sure that he is the same person whose name appears on the receipt?(11)

These words of a police officer clearly show the partial and tainted attitude of the government agencies towards the Vaidu tribe. Earlier discrimination on the basis of caste and gender was prevalent. These people were not allowed any sort of freedom. Though the socio-economic life of the Dalits is improvising, the cases of humiliation and discrimination are still happening. In literature, Upara is the pathetic account of poverty of Laxman Mane and his community. Once when his parents had gone to the village to sell the baskets and other articles, Laxman and his sister starved in the hut as there was nothing to eat. His mother usually received stale food from the villages which was their routine meal. Laxman writes:

"Father had just returned with a heavy bundle of canes. He threw it on the floor raising a cloud of dust. He sprinkled some water to settle the dust and went into the village calling to my mother. Just then I saw Mother returning from the village with 'bhakri' and curry and some other such things in her hands. Father took the bundle from over her head. Both entered the hut locked in angry exchange

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of words. Frightened, Kali and Pushpi, my sisters, and Kisnya, my brother clung to Mother's sari…… I was the eldest. Being small they had accompanied mother to the village. All of us were terribly hungry. Mother had brought lots of bhakri. Three of these were given by the village chief's wife. She had also given the leftovers of the night before. In addition, the women whose baskets mother had mended had given her something or the other which she had packed in the loose end of her sari.(19)

From the above words, we come to know how Dalits were leading humiliating life. As they belonged to untouchable communities, they were given heartless treatment. However, now the things have started to change for better for Dalits as they have become aware of their rights. It is recently reported that with the support of The Association of Removal of Suspected Crime, Dalits made a bonfire of their handcuffs and begging bowls, the symbols of crime and poverty respectively.

In 1871 the British administrators created 'camps' in which the criminals were forced to live and work hard. These camps are known as settlements, which were the legal seals of crime and slavery. Though the British administrators were very strict about the presence of the criminals in the 'camps', they had made arrangement for their resettlement. In fifty-two settlements in the old Bombay Presidency, there were schools for professional training. A special grant was given to those who had been set free. But after the independence, the barbed wires and the six hourly presence disappeared and everyone was set tree. Each got a begging bowl and the stigma of 'criminality' has accompanied them since then. Even today police stations hold blacklists of the criminal tribes. The crime may be committed anywhere; the police hold these tribes responsible for it and torture them. Disinherited and disowned there was no one to protect them. To draw the readers' attention towards the sufferings of criminal tribes, the narrator has written drawn our attention to the following scenario:

The other day a Zabzabya Paradhi's wife was saying: "Tell your government to pull all our people behind bars then it will be all right. Otherwise shoot us dead. So that we will have gone once and for all. Then there won't be any thefts Brother dear, what great things are we asking for? A small hut, some work, something to wear, and something to eat. (14)

These words throw a flood light on the restlessness of dalit people who were unable to express their views and ideas freely.

Conclusion:

Laxman Mane writes in his autobiography is related to the community court which plays a vital role in *Kaikadi* community in Maharashtra. There are four types of community courts: Jat Panchayat, Thal Panchayat, Village Panchayat and Madhi Panchayat. Jat Panchayats are meant to solve the quarrels among the members of the community. Laxman Mane narrates his father's revolutionary decision of admitting him to school. However, as per the jat panchayat, it was an act of violation of the community tradition. Through Upara, Laxman Mane has tried to show the humiliation at each and every stage of the lives the members of his community. Kaikadi community had a tradition of informing the village chief of their arrival and providing all the information of their belongings after which they were allowed to live out of towns, in huts and under the trees. Laxman Mane's *Upara* has an outstanding contribution to Marathi literature for its lively depiction of the life of the downtrodden people and his strong plea for social justice. He describes the life of *Kaikadis,* who have been wandering in the darkness of illiteracy. They have their own laws, customs and traditions.

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WEB PORTALS OF STATE GOVERNMENT IN INDIA: AN EVALUATIVE STUDY

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Abstract:

E- Government website helps citizens to access government information and services with ease and gather greater opportunities to participate in democratic processes. Through this paper, researcher made an attempt to evaluate the productiveness of the government portal in Indian states. Now a days portals are key elements for rendering web based services. They create an initial window which can provide guidance to users to employ service offered by any institution which can be e-governance or e- business. Government of India initiated National E governance plan to implement e governance project in the whole nation. This paper proposes to access the website belonging to various Indian states against guidelines provided by Government of India. So in this paper researcher have made an attempt to discuss the various issues pertaining to government portal in India's context. This paper evaluates 15 state government websites and compared those state websites with 47 different parameters grouped under 7 broad categories based on usability, accessibility, identifier, participation, information, services and security. This paper highlights the state web portals are ranked based on compliance with the overall usability parameters.

Keyword: *e-Government, State Government, Web Portals, Website evaluation, Usability analysis, district e-portal.*

Introduction:

The tenth – five year plan 2002-2007 giving very high importance to e-governance, suggested for an Indian Portal – portal for all government websites for providing non-stop delivery of public services and distribution of services. The whole of India has 28 states and 7 Union territories with the population of approximately 1.2 billion. All the state government of India have established the web portal which are becoming very popular communication interface between citizens and the elected representatives of the state governments. Such portal has become a major information centers for knowing various states government functions and for availing various online citizen services. Government both at central and state level are actively engaged in building e-governance platforms for the citizens. The digital India initiative highlights not only on providing information and services through an e-governance platform but also to make it available to the Indian citizens across the country. Government information such as acts, policies and schemes are of greater importance to citizens. The real objectives of these policies and schemes are achieved only when the associated benefits reach down to the masses. The goal of Government e-services is to reach to all sectors of community with favors of distance and dialect.

In this context, researcher wants to find out following research question: Are the state government research portal useful and serve the purpose of citizen cause?

E-Government:

The term E-Government came into picture with the introduction of government websites in late 1990s. "E-Governance or Electronic Governance" refers to the use of Information and Communication Technologies (ICTs) to provide citizens and organizations with better access to the government services and information. The benefit of internet not only delivers the services faster but also brings more transparency between the government and the citizens. Acknowledging the increasing importance of electronics, the Government of India established the Department of Electronics in 1970. The establishment of the National Informatics Centre (NIC) in 1977 was the first big step towards e-Governance in India as it brought 'information' and its communication in prime focus. Very few organizations has been used computers in the early 1980's. The arrival of personal computers brought the storage, retrieval and processing capacities of

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computers to Government offices. After 1980s, a huge number of government leaders can be used computers but they were mostly used for 'word processing'. Gradually, with the advent of better software's, computers were put to other uses like managing databases and processing information. Firstly in information and communications technology also exalted the versatility and attain of computers, and numerous Government sectors started using Information and Communication Technology for a figure of applications like tracking and strolling of files, monitoring of development programs, processing of employees' pay rolls, generation of reports etc. However, the main push for e-Governance was provided by the launching of NICNET in 1987 – the national satellite-based computer network. It was succeeded by the beginning of the District Information System of the National Informatics Centre (DISNIC) program to computerize all shire officials in the country for which free software and hardware was given to the State Governments. In 1990, NICNET was elaborate via the State capitals to all towns headquarters. In the coming years, with continuing computerization, teleconnectivity and internet connectivity came a large number of e-Governance initiatives, both at the Union and State levels. On Information Technology A National Task Force and Software evolution was participating in May 1998. The Union Ministry of Information Technology was created in the year 1999. In the year 2000, a minimum agenda with 12-point for e-Governance was recognized by Government of India for impersonation in all the Union Government Departments/ Ministries.

E-Government is a multidisciplinary term for web based services from agencies of local, state and federal governments. (Palvia & Sharma, 2007). Electronic Government is the use of Information and Communication technologies, principally the World Wide Web and internet, to improve the skills, value and quality of government information and services distributed to its stakeholders such as citizens, businesses, employees and other government agencies (Adawi-AI, Yousafza, & Pallister, September,2005) .

World Bank (www.worldbank.org) definition: "E-Government states the use by government agencies of information technologies such as Wide Area Network, the Internet and Mobile Computing that have the ability to transform relations with citizens, businesses and other arms of government. These techniques can gives a inequality of different ends: excellent and speedy delivery of government jobs to burgher, best interactivity with business and endeavor, denizen empowerment through access to information or more efficient government management. The resulting benefits can reduce corruption, increased transparency, greater convenience, revenue growth and /or cost reduction."

National Portal Of India:

National Portal of India has been developed as a Mission Mode Project under the NeGP. The motive abaft the portal is to give a single platform for browsing to the information and services shall provided by the Indian government for the denizens and other stakeholders. An endeavor has been create through this portal to give a extensive, proper, dependable, and one-stop source of knowledge about India and its different facets. For 28 states and seven union territories, the National Informatics Centre (NIC) has developed the portals. The states and union territories (UT) again include 626 districts. Out of this 626 district 566 have there own websites. Links have been provided at various places to other Indian government portals and websites (National Portal of India, 2010).

Objectives:

(i) To study information dissemination through different state government websites of India

(ii) To assess the usability of websites run by different state government.

(iii) To understand the relationship between various parameters of the websites.

(iv) To evaluate different state government websites with respect to various parameters

(v) To create an information facilitation index.

Research Method:

In place of assessing only one or two aspects of state government web portals in India, researcher have chosen to assess them based on a balanced mix of parameters which also reflect the skill of governance in the certain state. Keeping in view the above conceptual

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framework, researcher have considered seven broad key categories for the study i.e. identifier, information, usability, security, participation, services, and accessibility. Identifier is the concept which confirms the authenticity of websites and certifies the credibility which is very important from the user point of view to determine the accuracy and dependability. Information or content is the second major parameter which actually defines the key information that is being transferred. Information made available for the consumption to the perspective users is part of this parameter. Usability is considered to be the user friendliness of the websites which determines the ease of use and other accessibility characteristics. Security and privacy confirms the sense of being saved from risks and vulnerability. Participation is the commitment of government and the public across various platforms being linked through the websites. Service delivery through the websites makes the citizen's access the platforms developed for a quick and easy service delivery. Lastly, Accessibility of website addresses the concern of physical disability and age related deficiency people. These parameters are further divided into 47 parameters. These 47 parameters aggregated from within the 15 state web portals in India for relative comparison. By means of MS Excel the data was examined and presented using statistical analysis.. The present focuses on the current status and online services provided in India by different state government portals to respond to the facts needs of denizens. The state government portals, including National Portal of India, various government portals, and district portals, were observed during the study. This research is concluded by ranking the state web portals based on their compliance with the overall usability parameters. Researcher has ensured that the selected parameters are not abstract but concrete in terms of noticeable presence of a particular factor / indicator in the website. The amends is only in clops of the presence or absence of the special things or applicability of the given parameter. Researcher have not taken into consideration the qualitative merit of the parameters e. g. presence of a long home page length is recorded as (1) whereas its short length is recorded as (0). It is also important to mention that researcher have clicked on all the links present on the home page of every state web portal but not evaluated the links which open into separate websites belong to different government departments. In the analysis, a total of fifteen State Government websites were considered. Table 1 shows the list of chosen State names and their websites. Table 2; describe the groups and parameters used for this examination.

Name of States	Web address
Andhra Pradesh	http://www.ap.gov.in
Bihar	http://gov.bih.nic.in
Gujarat	http://www.gujaratindia.com
Haryana	http://www.haryana.gov.in
Himachal Pradesh	http://himachal.nic.in
Jammu & Kashmir	https://jk.gov.in/jammukashmir/
Kerala	https://kerala.gov.in
Madhya Pradesh	http://www.mp.gov.in
Maharashtra	https://www.maharashtra.gov.in
Manipur	http://manipur.gov.in
Nagaland	https://www.nagaland.gov.in
Punjab	http://punjab.gov.in
Rajasthan	https://rajasthan.gov.in
Telangana	http://www.telangana.gov.in
West Bengal	https://www.wb.gov.in

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Table 1
Assessment of different categories and outcome:

Parameters	Number of indicators	Key criteria
Identifier	5	Emblem 2) Domain name 3) Title 4) Copy Wright 5) Developer and Designer
Information	23	About State 2) About Portal 3) Acts/ Rules 4) Schemes 5) Forms 6) Tenders 7) News 8) Recruitment 9) Press Release 10) FAQs 11) Map 12) Government Holiday 13) Calender 14) Market Rate 15) RTI 16) Budget 17) Mission/Vision 18) Whether 19) Times and Date 20) Last Update 21) Visitor 22) Help 23) Publication
Usability	9	Site Map 2) Home Page In English 3) Language Change Option 4) Key Word Search 5) Presence of Page Title 6) Home page length 7) Loading Time 8) Visible Grouping 9) Blinking
Security	5	1) Log in, 2) Contact web master, 3) Contact General, 4) Privacy and security statement 5) Disclaimer
Participation	6	1) Feedback 2) Discussion/ Chat 3) Mobile App 4) Social Network Participation 5) Public Poll 6) On line Tracking
Services	4	1) Transactional services, 2) Link with other National portals, 3) Emergency numbers, 4) Link with district portals,
Accessibility	6	1) Screen Reader 2) Font Size 3) Color Adjustment 4) Specified display resolution 5) Return to Home page 6) Skip to main content

Table 2, Identifier

Sr no.	Parameters
1	Emblem
2	Domain
3	Title
4	Copy right
5	Developer & Designer

Table 3

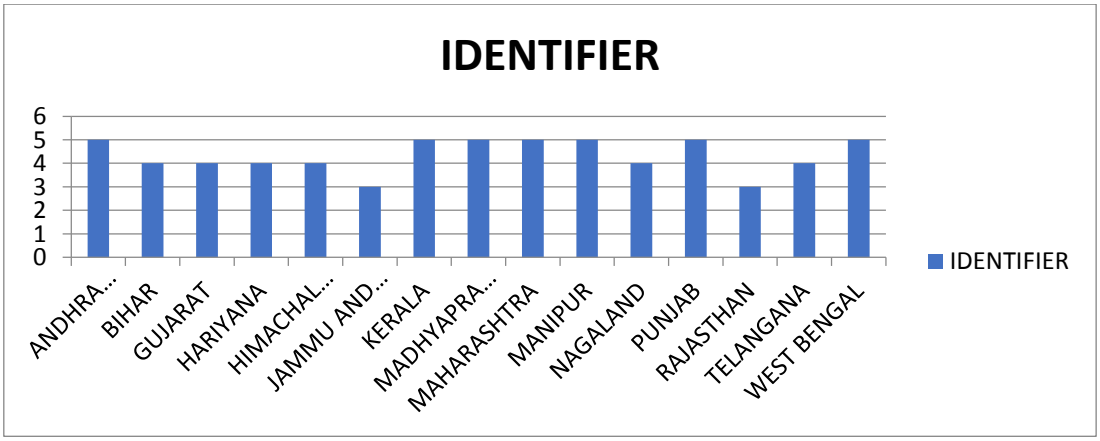

Figure 1

Identifier of a website is one of the criteria in website from where we can find out authenticity of the website. Here the researcher chosen 5 criteria's and compared those parameters with 15 states websites. Out of 15 states, 7 states fulfilled 5 parameters, 6 states fulfilled 4 parameters and 2 states fulfilled only 3 parameters. At the same time researcher

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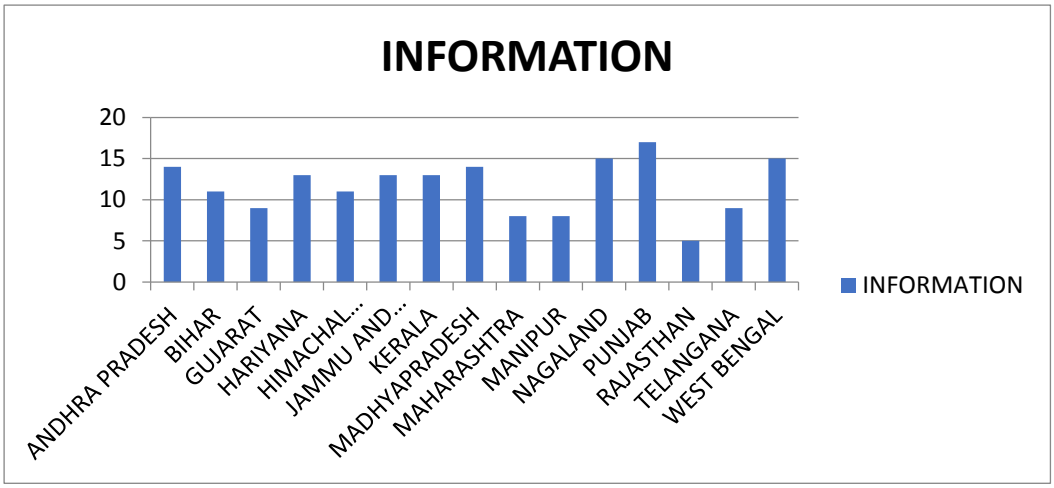
could able to establish that out of 15 states , 12 states using gov.in as domain, 2 state using nic.in and Gujarat state using guj.india.com.

Category: Information

Sr no.	Parameters
1	About state
2	About portal
3	Acts/ Rules
4	Schemes
5	Forms
6	Tenders
7	News
8	Recruitment
9	Press release
10	FAQs
11	Map
12	Holiday
13	Calendar
14	Market rate
15	RTI
16	Budget
17	Vision/ Mission
18	Weather
19	Time & Date
20	Last update
21	Visitor
22	Help
23	Publication

Table 4



Information is about the facts provided in the website which helps to learn and also gain knowledge by accessing that information. Here the researcher chosen 23 criteria's and compared those criteria's with 15 states websites. Out of 15 states, 1 states fulfilled 17 criteria's , 2 states fulfilled 15 criteria's , 2 states fulfilled 14 criteria's , 3 states fulfilled 13 criteria's, 2 states with 11 criteria's, 2 states with 9 criteria's , 2 states with 8 criteria's and 1 states with 5 criteria's.

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Category: Usability

Sr no.	Parameters
1	Site map
2	Home page language in English
3	Language change
4	Keyword search
5	Page title
6	Home page length
7	Loading time
8	Visible grouping
9	Blinking

Table 5

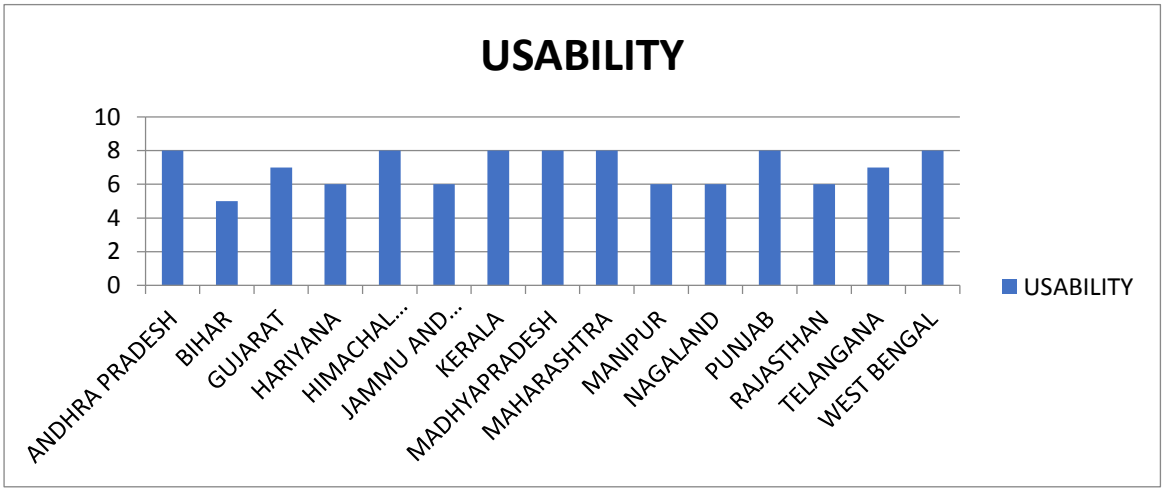


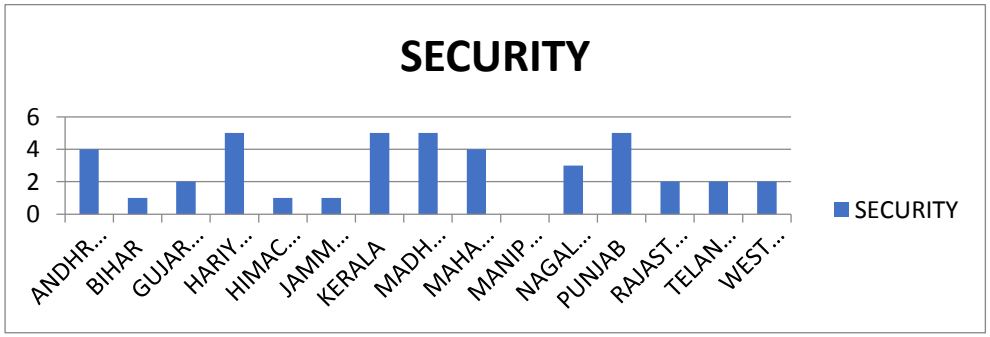
Figure 3

Usability is about how much effective, efficient the website is. User friendliness of the website is need of an hour now a day. Here the researcher took 9 parameters. Here we could find 8, 7, 6, and 5 parameters are covered by 7, 2, 5 and by 1 states respectively.

Category: Security

Sr no.	Parameters
1	Log in
2	Contact web master
3	Contact general
4	Privacy and security
5	Disclaimer

Table 6



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Security of a website is defined as the process of securing relevant document and information from unidentified and unauthorized sources. Here the researcher chosen 5 criteria's and compared those criteria's with 15 states websites. Out of 15 states, 4 states fulfilled 5 criteria's , 2 states fulfilled 4 criteria's ,1 states fulfilled 3 criteria's , 4 states with 2 criteria's, 3 states with only 1 criteria's and to a surprise one state with no criteria fulfillment.

Category: Participation

Sr no.	Parameters
1	Feed back
2	Discussion/ Chat
3	Mobile App
4	Social networking participation
5	Public poll
6	Online tracking

Table 7

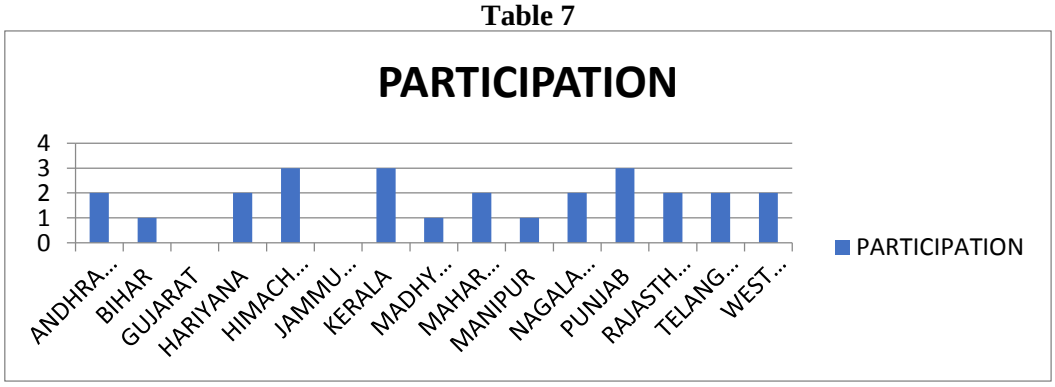

Figure 5

Participation is about involving users directly in the website so that they can take part in the process and give valuable opinions on various points. Here the researcher chosen 6 criteria's and compared those criteria's with 15 states websites. Out of 15 states, 3 states fulfilled 3 criteria's, 7 states fulfilled 2 criteria's, 3 states fulfilled 1 criteria's and to a surprise 2 state with no criteria fulfillment.

Category: Service

Sr no.	Parameters
1	Transaction
2	Link with other portals
3	Emergency numbers
4	Link with district portals

Table 8

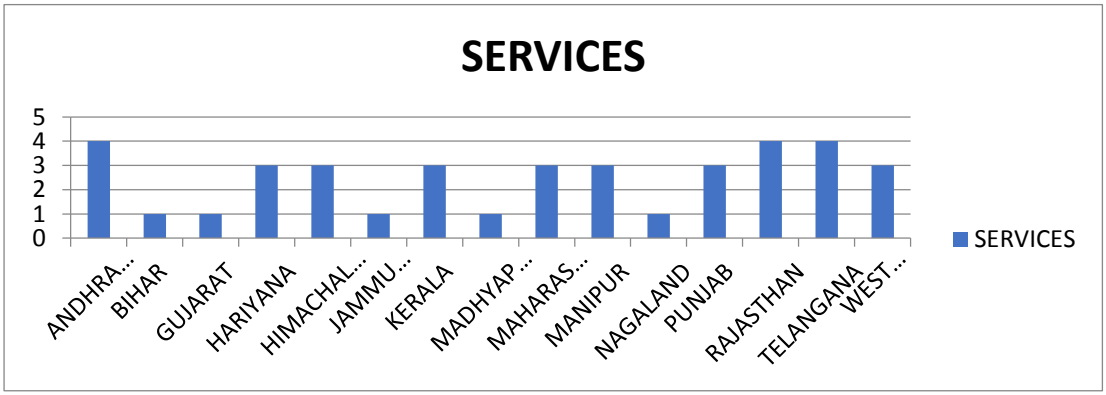

Figure 6

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Service is the action of helping or assisting the users through various applications in the website portal. Here the researcher chosen 4 criteria's and compared those criteria's with 15 states websites. Out of 15 states, 3 states fulfilled all 4 criteria's, 7 states fulfilled 3 criteria's, and 5 states fulfilled 1 criterion's.

Category: Accessibility

Sr no.	Parameters
1	Screen reader
2	Font size
3	Color adjustment
4	Specified display resolution
5	Return home page
6	Skip to main content

Table 9

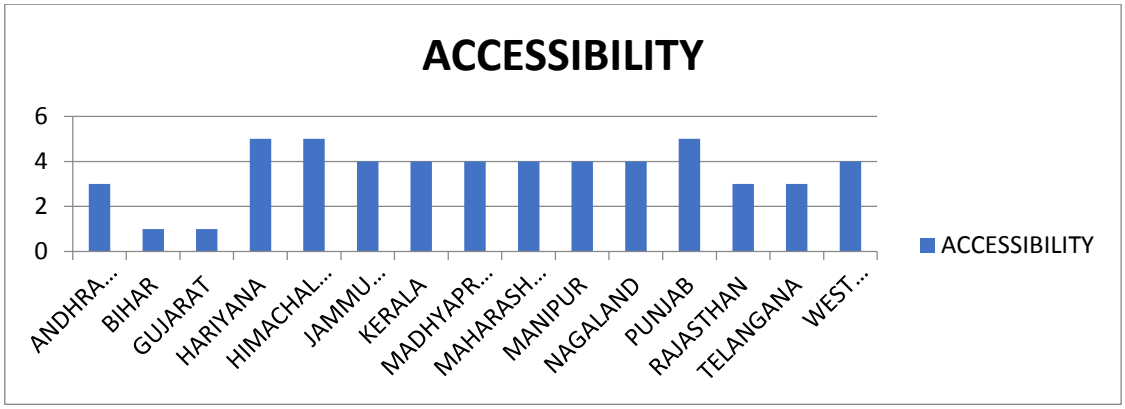

Figure 7

Accessibility helps to address peoples with disabilities and also people with age related impairment.

In other way, accessibility make disable person understate, perceive, navigate and interact with websites and tools without any difficulties

Here the researcher taken 6 parameters and compared those parameters with 15 Indian States for better understanding. In the above figure we can see that 7 states have fulfilled 4 parameters , 3 states have got 5 parameters right and next 3 states could fulfilled 3 parameters and only 2 states got 1 parameter fulfilled only.

Limitations:

The researcher has done the study taking into account 15 state government websites out of 28 states websites and dividing the research work into 7 broad categories and 47 subcategories or parameters. The result would have been more concrete and wider had the researcher considered all the states more broader parameters. The date of the government website search has been measured from 10.12.17 to 21.01.17. Observations and assessments might change if the State web portals are altered or enhanced in future. This might lead to new findings too. It is also important to mention that researcher have clicked on the home page of every state web portal only but have not assessed the link which open into separate websites belong to different government departments. Researcher has also not reviewed the functionality of online services as it requires login name and password for registered citizens belonging to particular state.

Suggestion & Conclusion:

Based on the findings or research output within stipulated period some suggestions cane be made. These are as follows.

The State government should provide exhaustive list of other state government websites including their accurate links.

1. Every State government website must place their basic information in a uniform location on the website. For example some website have provided a separate link for "recruitment" and some of them provided recruitment information in the "Notice" or "News"
2. The implementation of standard, uniform guidelines for building a government website should be compulsory across the States and the Nation.

Here the researcher proposes some solutions to address some the complications observed during the research work. The standardized user interface and user interaction patterns need to be designed and developed to compensate the lack of design skills. Technical and design teams working on state web portals should be trained to understand the usability apprehensions. A dedicated content management system for state web portals with user friendly features needs to be developed on priority to ensure compliance with all usability parameters.

To conclude, Electronic (E) Government has become very important tool to disseminate knowledge and information to our citizens sitting at any corner of our Nation. It is the fastest way of communication; the government can have with his own citizen's. With reference to library and information science, all public libraries need to have digital library facilities with up to date infrastructure. It is much easier and convenient for any citizen's (especially disabled and age related impairment people) to come to any public library and get all the information's available of the desired state by a just a click on that particular state website. State Government should also work in tandem to keep all the information up to date so that proper information reaches out and valuable feedback comes back to Government.

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PRODUCT PROMOTIONAL PLANNING IN EVENT MANAGEMENT: CURRENT SCENARIO

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Abstract

Event management is a need in approximately any kind of business - entertainment, finance, government, retail, fashion, sport, music and so their day-to-day job can be filled with an enormous range of stimulating challenges and unique situations. So, the role of Event Management increases day by day. To find profit and to survive in the rivalry Event Management should change according to the requirements of the Market. Therefore, to convene the requirements of the market lots of trends are innovated in the market. The study on awful planning is destroying good planning is in management. This paper aims to study the challenges in event management and also to suggest some concept planning to deal with the crucial problem of managing and suggesting strategies for sustaining in disorderly times of Business.

Key Words: - *Products, Event Management, Concept planning, Strategies, Promotional.*

Introduction

Event management is the purpose of project management to the pattern and development of festivals, events and conferences, etc. Event management involves studying the particulars of the brand, identifying the object audience, devising the event conception, developing the logistics and coordinating the procedural aspects prior to essentially initiation the occasion. Post-event study and ensuring a revisit on speculation have become important drivers for the event industry. The recent expansion of festivals and events as an industry concerning the globe way that the management can no longer be ad hoc. Events and festivals, such as the immense Games, have a huge collision on their communities and in some gear, the entire country. The diligence now includes events of each and every one size from the Olympics down to a banquet meeting for ten or more business people. Many industries, altruistic and interest groups will embrace events of some size to promote them, assemble business affairs, increase money or rejoice.

There are 5 Stages important in Event management.

1) Concept Planning
2) Research
3) Strategic Planning
4) Implementation 5) Evaluation

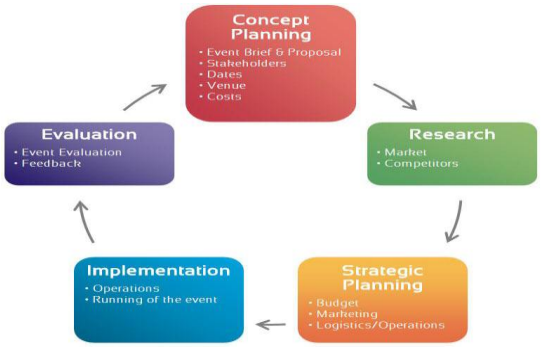

Fig. 01

1. Concepts of Event planning:

A) Event Brief & proposal
B) Event Stakeholder
C) Event Dates
D) Event Venue
E) Event Budget/Cost

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A) Event Brief & Proposal:
Event data warehouse, data warehousing, data acquisition, metadata management, data mining, data cleansing, data capture, Data Warehousing definition, Ralph Kimball, database technology management experience, data warehouse design expertise.

B) Stakeholder:
Any person, faction or association with the purpose of has significance or anxiety in an organization. Stakeholders can influence or be pretentious by the organization's performance, objectives and policies. An example of a

E) Event Budget/Cost:
An inference of the income and expenses above a precise outlook era. A resource can be prepared for an important person, relatives, faction of people, business, government, country, multinational organization, or immediately regarding something else that makes and spends wealth. A resource is a micro-economic impression that shows the trade-off made when one excellent is exchanged for any more.

2) Research:

A) Market:
An intermediate to allow buyers and sellers of an explicit good or service to cooperate to make possible an exchange. The price that individuals forfeit during the matter may be determined by many factors, but the price is time and again gritty by the forces of supply and demand.

B) Competitor:
Any person or thing which is an opponent against a different. In business, a company in negative impact on stakeholders is when a company needs to cut costs and plan around layoffs. Someone owning shares in a business such as Microsoft's positively affected, for example, when the company releases a new mechanism and sees their earnings and consequently stock price increase.

C) Event Dates:
The revamp day of the week of the put right month or year as precise by a numeral.

D) Event Venue:
The statement naming the place and person before whom an affidavit is sworn.
the same industry or a related industry offers a parallel product or service. The occurrence of one or more competitors can diminish the prices of possessions and services as the companies' effort to increase a kindly balanced market share. The challenge also requires companies to become more proficient to decrease costs.

3) Strategic Planning:
Strategic planning is an organization's progression of defining its strategy or bearing and making decisions on allocating its possessions to follow this strategy.
To decide the future way of the organization, it is essential to appreciate its current position and the potential avenues through which it can follow particular courses of action. Normally, strategic planning deals with at least one of three key questions:
1. "What do we do?"
2. "For whom do we do it?"
3. "How do we excel?

Fig. 02

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A) Marketing:

The performances of a company are related to buying and selling a product or service. It includes advertising, selling, and delivering products to the public. Persons who work in marketing departments of companies strive to obtain the concentration of intention audiences by using slogans, packaging design, celebrity endorsements, and general media revelation. The four 'Ps' of marketing are -

Fig. 03

1) Product:

A product is a thing obtainable for sale. It can be corporeal or in essential or imitation form. Every product is through at an outlay and everyone is sold at an outlay. The price that can be exciting depends on the marketplace, the eminence, the promotion or marketing, and the embattled section. Every product has a constructive existence after which it desires an alternative and a life- cycle later than which it has to be re-invented. In FMCG idiom, a brand can be revamped, re-launched, or comprehensive to make it more related to the section and times, frequently observance the product approximately the same.

2) Product Price:

A Product value that will purchase a finite quantity, weight, or other measures of a good or service. As the consideration given in exchange for the transfer of ownership, price forms the essential basis of commercial transactions. In commerce, Product price is determined by what (1) Product a buyer is willing to pay, (2) a seller is willing to accept, and (3) the competition is allowed to be charged. With product, promotion, and place of the marketing mix, it is one of the business variables over which organizations can exercise some degree of control.

It is a criminal offense to manipulate prices (see price-fixing) in collusion with other suppliers and to give a misleading indication of prices such as charging for items so as to be convincingly likely to be included in the advertised, inventory or quoted outlay.

3) Product Place:

A particular position, point, or area in space; a location.

4) Product Promotion:

Product Promotions refer to the entire set of activities, which communicate the product, brand, or service to the user. The thought is to compose people awake, attract and persuade to obtain the product, in predilection more than others.

B) Operation Management:

Operations Management deals with the design and organization of products, processes, services, and supply chains. It considers the attainment, development, and operation of possessions that firms require to distribute the

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goods and services their customers desire. The source of OM ranges from tactical to considered and operational levels. Representative strategic issues include formative the extent and location of developed flora, deciding the configuration of service or tale-communications networks, and designing technology supply manacles. Considered issues contain plant design and constitution, project management methods, and apparatus assortment and stand-in. Operational issues consist of invention development and control, inventory management, quality control, and scrutiny, interchange and materials management and tools preservation policies.

- **Implementation :**

Implementation is the haulage away, implementation or preparation of a plan, a process, or some design for doing rather. In an information technology circumstance, performance encompasses all the processes involved in the attainment of new software or hardware operational suitably in its environment, including installation, formation, running, testing, and making essential changes. The express operation is on occasion used to signify the same thing.

A) Running of the event:

The running of the event relates to the Execution of the program until the last stage.

B) Evaluation of the event:

Event evaluation is the analysis of the efficiency and efficacy of such events using a range of empirical methods.

1. Applications Event evaluation can be performed for all of an organization's events, e.g. Trade fair participation, open days, gala evenings, exhibitions, seminars, and conferences. The examination can resolve how many public took a piece in the event or heard of it (output), whether the event achieved the discrete goals amid the selected object groups (outcome), and the effectiveness or cost-effectiveness of the happening in comparison with other communication processes. The financial sensation (outflow) can be firm for occurrence if the event was related to direct purchasing actions (trade fairs, sales events, etc.).
2. Conduct Requirements for event evaluation are:

- Define target groups to be reached
- Define goals (e.g. Contact figures)
- Define desired benefit (impact on target groups)
- Count the cost

Evaluation is conducted there are three phases - before, during, and after the event. Before the event, the baseline values for the respective endpoints are determined, for example by surveys (e.g. Image). During the event, guest examination is performed, i.e. Output determination. This involves determining the number of contacts by counting the participants. Observation and surveys on event performance additionally disclose reasons for the success of the event and hence provides pointers for improvements. Finally, the efficiency of the event versus other measures will be assessed based on the outcome measures given below. The time and cost of evaluation depend on the duration of the event and the size of the target population. Approximately one month should be earmarked in each case for pre-and post-event surveys.

3. Indicators:

- Contact cost ratio = event cost / number of target persons reached. The contact cost ratio expresses the costs essential to accomplish one person in the intention set. The inferior the ratio, the more proficient the event.
- Equivalent communication value

This calculates the costs that would have arisen by attempting to reach the target groups through the use of other measures and compares that figure with the event costs.

B) Feed of the company:

Information comes directly from customers about the satisfaction or dissatisfaction they feel with a product or service. Customer comments and complaints were given to a company are an important resource for improving and addressing the needs and wants of the customer.

Conclusion

It seems apparent that the development of Product Promotion in Event Management is of immense consequence. It is largely instrumental in creating awareness in customers regarding any product as well as the concerned company. In a particular event, huge public gathers on a single platform and hence any kind of promotion has a larger

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impact. This directly or indirectly results in a business boom. However, planning of promotion in an event requires extreme carefulness since a single error can have an unenthusiastic collision so destroying the very intention of promotion.

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ORGANIC FARMING: PRESENT SCENARIO IN INDIA

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Abstract:-

In India, Organic Farming is not anything new as it has been in practice from ancient times. With the shifting towards minerals-based farming and the chemical and technological advancements made in agriculture in the 1960s. Organic agriculture is found to be superior to conventional farming because of increased human labour employment, lower cost of cultivation, higher profits, better input use efficiency and reduced risk leading to increased income, enhanced self-reliance and livelihood security of the farmers and maintaining soil health and environment. Indian agriculture for long remained sustainable only because of the low external input factors. The main issue emerging in organic farming include yield reduction in organic farm is certification, marketing and policy support. Furthermore, organic farming restricts the use of off-farm inputs because it leads to residue on foodstuff and adverse effects on the environment, while it supports in-farm inputs to developed success of organic agriculture. The present research paper highlights on present scenario of Organic farming in India.

Keywords: *- Organic Farming, ancient times, environment, livelihood, technology etc*

Introduction:-

Organic Farming broadly refers to the farming methods free from toxic pesticides, chemicals and synthetic fertilizers. It stringently follows cultivation methods that keep the soil healthy and avoid adverse impact on environment by using organic waste such as crop, animal and farm wastes including biological materials. According to the Indian Council of Agricultural Research (ICAR), "Organic Agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including bio-diversity, biological cycle and soil biological activity. This is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs". Organic Farming System lays great emphasis on crop rotation, use of crop residues, animal manure and off-farm organic wastes, mineral grade rock additives and biological system of nutrient mobilization and plant protection techniques for sustaining the fertility of the land under cultivation.

Need Of Organic Farming:-

Organic agriculture may be a good choice among the farmers to concern about the ecological balance would be more significant in the present as well as prospects while, agrochemicals are produced from fuel and it is not renewable, diminishing in availability. It will become more costly in the future. Organic produced products are widely accepted throughout the world. The farmers market also helps in the commercialization of organic products regional and national levels (Reddy and Gaur 2010, 2016). Besides this, the retail sales of organic products are expected to continue rising within the coming years at a rate of quite 20% yearly. Therefore, the rise in population in upcoming generation would be not only to stabilize agricultural production but also to extend it further in a sustainable manner. Therefore, scientists have realized that after the throughout the "Green Revolution" with high input use has crossed the maximum level, and is now sustained with diminishing return of falling dividends. Thus, a natural balance must be maintained in the least costs for the existence of life and property.

Organic Farming: Present Scenario In India:-

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Table 1. Growth under Organic areas, area share of total farmland percentage and producers in India

Year	Organic Area (Farmland) (M.ha)	Organic Area Share of total farmland (%)	Organic producers in Million
2010	7.80	0.43	4.01
2011	10.84	0.6	5.48
2012	5.00	0.28	6.00
2013	5.10	0.28	6.50
2014	7.20	0.4	6.52
2015	11.80	0.66	6.85
2016	14.90	0.83	8.35
2017	17.80	0.99	10.93
2018	19.38	1.08	11.49
2019	20.26	1.14	12.10
2020	22.68	1.18	12.48

Source:-FiBL Survey 2020-21

Table 1 indicates the growth of area percentage share of total agricultural land and producers in year 2010 to 2020. In under area if organic farming in 2010 was 7.80 mha and 2020 has increased 22.68 mha of organic area (farmland). The share percentage of total agricultural farmland has slightly increased 0.43 to 1.18. The number of producers under the organic farming has increased around three times from 2010 to 2020.

State-Wise Area Under Organic Farming (Cultivated +Wild Harvest) In India:-

Table 2. State-wise area under Organic farming (cultivated + wild harvest) in India in 2020-21

State	Area in mha
Andaman & Nicobar Island	0.07
Andra Pradesh	0.37
Arunachal Pradesh	0.11
Assam	0.55
Bihar	0.23
Chhattisgarh	0.22
Goa	0.12
Gujarat	0.95
Haryana	0.06
Himachal Pradesh	0.12
Jammu & Kashmir	0.30
Jharkhand	0.26
Karnataka	0.81
Kerala	0.42
Ladakh	0.00
Lakshadweep	0.01
Madhya Pradesh	8.93
Maharashtra	2.82
Meghalaya	0.13
Manipur	0.13
Mizoram	0.10
Nagaland	0.14
New Delhi	0.00
Odisha	0.88

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Pondicherry	0.88
Punjab	0.09
Rajasthan	2.88
Sikkim	0.76

Source:-FiBL Survey 2020-21

Tab.2 indicates that, largest area under organic farming is covered by Madhya Pradesh State (8.93%) and area under organic farming is found in state of Ladakh and New Delhi.

Major Schemes For Organic Farming

Government has been promoting organic farming across the country through various schemes. Some of the main schemes are as follows:

1.**Paramparagat Krishi Vikas Yojana (PKVY)** :- The Parampragat Krishi Vikas Yojana (PKVY), launched in 2015, is the first comprehensive scheme launched by the Central Government as a centrally sponsored programme (CSP), where the Central and State Governments share the funding in varying ratio. It is 100 per cent in the Union Territories, 90:10 in the North-Eastern and Hilly States and 60:40 in the case of the other

Main Features of the PKVY:-

- The cluster chosen for Organic Farming shall be 20 ha or 50 acres in extent and in as contiguous a form as possible.
- Total financial assistance available for a 20 ha or 50 acre cluster shall be a maximum of Rs. 10 lakhs for farmer members and Rs. 4.95 lakh for mobilization and PGS Certification with a subsidy ceiling of one hectare per farmer
- Of the total number of farmers in a cluster, a minimum of 65 percent farmers should be allocated to the small and marginal category.
- 3. At least 30 per cent of the budget allocations need to be earmarked for women beneficiaries/ farmers

2. Mission Organic Value Chain Development for North-Eastern Regions (MOVCDNER):-

Realizing the potential of organic farming in the North Eastern Region of the country, Ministry of Agriculture and Farmers Welfare has launched a Central Sector Scheme entitled "Mission Organic Value Chain Development for North Eastern Region" for implementation in Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, during 2015-16 to 2017-18. The scheme aims at the development of certified States. The scheme is implemented by the State Governments. It is implemented on a cluster basis of 20 hectare each. The farmer within the cluster is given financial assistance upto a maximum of 1 ha and the limit of assistance is Rs. 50,000 per ha during the conversion period of 3 years. The target is to promote 10,000 clusters covering 2 lakh ha over the period of 3 years (2015-16 to 2017-18). In order to implement the PKVY in the 2015-16, 2016-17 and 2017-18 an amount of Rs. 300 crore, Rs. 297 crore and Rs 350 crore respectively has been allocated to the States. Assistance is provided for cluster formation & capacity building, organic inputs, certification, labeling, packaging, transportation and marketing of organic produce. Till now 2,16, 560 hectares have been covered under the scheme benefitting 5,41,400 farmers.

organic production in a value chain mode to link growers with consumers and to support the development of entire value chain starting from inputs, seeds, certification and creation of facilities for collection, aggregation, processing, marketing and brand building initiatives. The scheme was approved with an outlay of Rs. 400 crore for three years for an area of 50,000 ha to be covered under the Organic Farming in North-Eastern Region. Till June 2017, 2406 Farmer Interest Groups (FIGs) covering an area of 45863 ha and 44604 farmers have been formed.

Major Challenges For The Organic Farming Sector

Since the organised organic food segment is still at a nascent stage in India, many challenges, affecting their livelihood and income are faced by the organic producers. Some of the major challenges are as follows:

1. The transition from conventional to organic farming is accompanied by high input cost and low yield in the initial years. The commercially available bio-manure products may not be completely organic and, therefore, the products sometimes get disqualified at the certification stage.

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2. Though the Government is subsidizing farmers in Participatory Guarantee System (PGS-India), which is a self-certification process, these farmers are not allowed to export their products.
3. Lack of an organic policy for the domestic markets and products, poses as a big hurdle for the organic sector. In the absence of regulation on labeling standards for organic production and logo, it is impossible to distinguish an organic product from a conventional product. This leads to fraudulent practices causing financial loss to the genuine players who are not getting their fair dues.
4. High certification cost, lengthy procedures in the certification process and the inadequate supporting infrastructure for it are major problems the farmers have to contend with.
5. There are no subsidies from the Government on agriculture inputs for organic farming, especially for the bio-fertilizers and bio-pesticides making the cost of cultivation for organic farming quite high.
6. Due to the relatively low volume of organic production, the marketing and distribution chain of organic food products is relatively inefficient and very costly.

Prospects For Organic Farming In India:-

Indian soil is god gifted with various types of naturally viable organic form of nutrients across different regions of the country, which are helpful in organic cultivation of crops. There is a wide diversity in climate and eco-system helps in sustainable environment. Traditional farming system in an India is well developed with innovative farmers, vast dry lands and least use of chemicals. The rain-fed tribal, northeast and hilly regions of the country where negligible chemicals are used in agriculture have been practicing subsistence agriculture for a long period; such areas are organic by default (Bisoyi et al., 2003). The rain-fed, tribal, north-east and hilly regions of India where the traditional farming is more or less practiced could be considered, Agriculture production in these areas is still almost on the traditional eco-friendly lines and making the farmers aware of the methods of organic farming may not be very difficult (Veeresh, 2003). Indian agriculture should be able not only to maintain but also must strive to increase the production of food grains. It appears that given the availability of organic infrastructure, minimum efforts for conversion due to the low use of chemical farming methods and the limit of the public investment, organic farming can be progressively introduced. The potential areas and crops, which fulfill the above constraints, could be explored and brought under organic agriculture. Organic farming practices are ecologically sustainable in terms of soil fertility stability, increase diversity of microbes, plant and animals, increase carbon sequestration and reduce energy dependence. "Organic agriculture could help fulfill the population need and provide more jobs in rural people: A conventional farm of similar size could support one family, with some seasonal employment opportunities; his organic farm supports five families"

Conclusion:-

Organic agriculture which emphasizes on the sustainable use of locally available natural resources is a holistic food production system. For its sustained growth, ensuring quality, it is imperative for us to adopt a comprehensive approach by taking the support from all stakeholders adopting environment-friendly technologies, providing for marketing infrastructure and effective financial support. An environmentally sustainable system of agriculture like organic agriculture will be able to help maintaining a resource balance, avoiding the over exploitation of resources and conserving the soil nutritional quality and biodiversity in the country.

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FINANCIAL INCLUSION SCHEMES: AN IMPLICIT STUDY OF AWARENESS LEVEL OF PEOPLE FROM THREE INDIAN STATES

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Abstract

The World Bank has defined financial inclusion as a means for individuals and businesses to have access to useful financial products and services. Although India dreams of 100% financial inclusion but as per the CRISIL report only 58% of the population is financially included. Against this background present research aims to understand the awareness level of financial inclusion schemes among the people of three Indian states namely Kerala, Jharkhand, and Manipur. Because of their varying levels of financial inclusion, these three states were chosen for the study. The study adopted a quantitative research design. The research is based on the survey data collected from the respondents. The sample size was determined at 384 by using the Cochran sample size determination formula. The reliability test showed good internal consistency with the Cronbach Alpha value of more than 0.70 on the items used in the instrument. The findings reveal the overall awareness level of financial inclusion schemes is about 72%. Further, findings show that there is no significant difference in awareness among the people of the three Indian states. The study findings carry some positive bearing on the key stakeholders of the country including that of policy framing agencies.

***Keywords**: Awareness Index, Financial Inclusion, Jharkhand, Kerala, Manipur*

Introduction:

Financial Inclusion (FI) means extending the reach of the financial sector to weaker sections of society. The main aim of financial inclusion is to provide the benefit of the vast formal financial market to the citizens of the country. There is growing recognition that access to financial services has a critical role in reducing extreme poverty, boosting shared prosperity, and supporting inclusive and sustainable development. Lack of accessible, affordable, and appropriate financial services has always been a problem for India. In a country like India where the vast majority of the population is poor, financial inclusion is a great challenge. The main negative effect of low financial inclusion is people would struggle to acquire their daily basic needs and money will be vested in a few hands. Access to finance is the prime goal of the Indian Government. In India, only 58% of the population is financially included (Crisil Inclusix Report, 2018). Despite numerous measures of financial inclusion, poverty and exclusion dominated the Indian economy. Overcoming the barriers to financial inclusion would help in socio-economic development. Against this background, it is imperative to understand the awareness level of the financial inclusion scheme among the Indian people.

Literature Review:

According to Joshi and Rajpurohit (2016), the Indian government has been working hard to bring rural customers into the organized financial system. The current situation demonstrates that the present government has been successful in opening roughly 12.54 crore new bank accounts and deposits totaling more than Rs. 5000 crores through the Pradhan Mantri Jan Dhan Yojana (PMJDY), a new type of financial inclusion. However, it is recognized that a large chunk of the rural market remains untapped and unexplored. The majority of rural residents are unaware of the various financial inclusion schemes.

Agarwal (2017) conducted a study to explore the awareness of the financial inclusion scheme. The researcher used primary data for the investigation purpose. Data was collected from 349 respondents of rural and urban areas of Rohtak and Rewari districts of Haryana.

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Findings reveal that respondents are well aware of the PMJDY scheme however, the awareness level of other financial inclusion schemes was low.

Waikar and Karmarkar, (2018) acknowledged that the financial inclusion mission at the Indore district of Madhya Pradesh was not successful. The reason for failure is the lack of awareness among the people. The findings reveal that a major chunk of the population is neglected from the basic banking services. Particularly, the women respondents are not having access to banking services.

The awareness level of the financial inclusion initiative was investigated by Sailaja and Rao (2018). Findings reveal that people are aware of the financial inclusion schemes. Both rural and urban populations are benefitted from the government financial inclusion schemes.

Kumar and Pathak (2022) analyzed data obtained from 200 people in the Telangana districts of Nalgonda and Medek. The findings show that women and persons from low-income groups have a lower level of awareness about financial inclusion programs.

Research Gap:

The above review of the literature shows that different authors found different outcomes regarding the awareness level of the financial inclusion scheme. Some researchers found that people are well aware of the financial inclusion schemes on the other hand some research findings show that people are unaware regarding the financial inclusion schemes. Thus, there are no conclusive findings on this topic. Further, most of the studies are restricted to particular districts or states. There is no comprehensive study involving more than one state with different levels of financial inclusion rate. This study is an attempt to bridge the gap in the literature.

Research Objective:

To analyze the awareness level of the financial inclusion scheme among people of the selected states under study.

To determine financial inclusion schemes awareness with reference to different demographic parameters.

Significance of the Study:

The lack of access to finance is a critical factor for persistent income inequality and slower economic growth in the country. It is widely believed that financial inclusion provides easy access to the payments system, insurance, and many other financial services. The Government of India has been introducing various Financial Inclusion schemes to accelerate financial inclusion in India. With more than decades, after the introduction of financial inclusion, the progress in the financial inclusion rate is low in India. The present paper intends to examine the awareness level of the financial inclusion scheme among the Indian people. Understanding the awareness level is important because it would help to accelerate financial inclusion and enhance socio-economic development in India.

Research Methodology:

The study is exploratory and descriptive. The central research question is to explore the awareness level of financial inclusion schemes among the Indian people. The quantitative research design was adopted for the study. According to the Crisil Inclusix report (CIR 2018), India's financial inclusion rate is 58.0 percent. Furthermore, CIR-Report (2018) indicates that Kerala has the highest financial inclusion rate with a score of 90.9, while Manipur has the lowest financial inclusion rate with a score of 32.0. Jharkhand's financial inclusion rate is fairly close to India's overall financial inclusion rate. Because of the varying levels of financial inclusion among Indian states, the respondents from these three states are selected for the study.

Sample size and sampling method:

The sample size determined by using the Cochran sample size formula is 384. The simple random sampling method was employed for selecting the sample. The sample selection process of the respondents is presented below:

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Table 1 Sample Distribution

State	Financial Inclusion	Population[1]	No of respondents to be selected
Kerala	High	35800000	176
Jharkhand	Medium	39000000	192
Manipur	Low	3372689	17
Total		**78172689**	**384**

Source: Author's analysis

Questionnaire Distribution: The study used a survey method to collect data from the rural and urban populations of the three states. The survey questionnaire was distributed by visiting different places in the study area.

Data Analysis: The data analysis was conducted using SPSS and Excel software. Percentage, one-way ANOVA, and one-sample t-test were used for analyzing the data.

3.1 Calculation of the Financial Inclusion Schemes Awareness Level

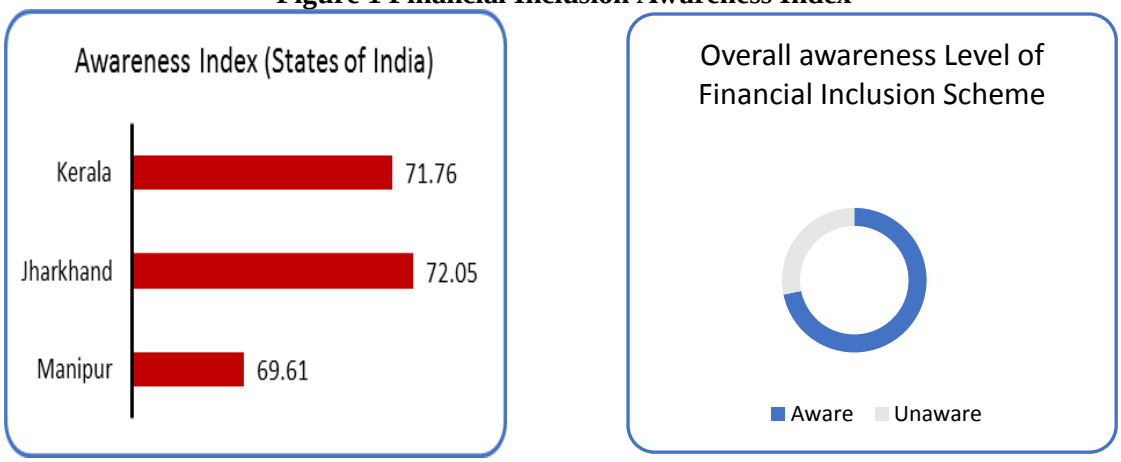
Table 2 Awareness Index Score

	Kerala	Jharkhand	Manipur	Total
Actual Score	3789	4150	355	8294
Maximum Score	5280	5760	510	11550
Awareness Index	0.718	0.720	0.696	0.718
Percentage (%)	71.761	72.049	69.608	72

Source: Author's Analysis

Discussion: The overall awareness index value is 72%. This signifies that Indian respondents are well aware of the financial inclusion schemes prevailing in the country. The high value in the awareness index indicates that the people are aware of financial inclusion schemes. Not much variation is noticed in the state-wise value of the awareness index. Kerala's awareness index is 71.76%, Jharkhand's awareness index stands at 72.04% and Manipur's index value is 69.60%. Table 2 graph is presented below:

Figure 1 Financial Inclusion Awareness Index



Source: Author's Analysis

[1] Aadhar Database

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3.2 T-Test

The following hypotheses were examined to judge the awareness level of the financial inclusion scheme among the Indian people. One sample t-test was used to test the hypotheses. The results of the test are presented below:

H0: People are not well aware of the various schemes of the Financial Inclusion Scheme

H1: People are well aware of the various schemes of the Financial Inclusion Scheme

Table 3 One-Sample t-test

	Test Value = 3					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Financial Inclusion Scheme (Mean)	22.69	384	.000	0.590	0.539	0.642

Source: Author's Analysis

Discussion: The table above shows the result of the one-sample t-test. By examining the table, it is inferred that the p-value is significant. Therefore, the null hypothesis is rejected and it is concluded that people are well aware of the various scheme of financial inclusion.

3.3 ANOVA Single Factor

A single factor ANOVA test was used to investigate whether there was any significant difference in financial inclusion scheme awareness among the three states. The hypotheses of the ANOVA test are presented below:

H0: There is no significant difference in financial inclusion schemes awareness level among the three states understudy

H1: There is a significant difference in financial inclusion schemes awareness level among the three states understudy

Table 4 ANOVA Single Factor

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Kerala	175	628.1667	3.589524	0.277061		
Jharkhand	175	632.1667	3.612381	0.228358		
Manipur	18	63	3.5	0.486928		
ANOVA						
Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.220186	2	0.110093	0.417624	0.658924	3.020455
Within Groups	96.22063	365	0.263618			
Total	96.44082	367				

Source: Author's Analysis

Inference:

A one-way single factor ANOVA was run to examine the statistical difference in financial inclusion awareness scheme between the respondents of three states under study. The findings revealed that F (2,367) = 0.418 and P= 0.658. Therefore, we failed to reject the null hypothesis. From the results, it is concluded that there is no significant difference in financial inclusion scheme awareness among the respondents of Kerala, Manipur, and Jharkhand.

3.4 One Way- ANOVA

In this section, the ANOVA test was used to examine whether there exist significant differences in financial inclusion schemes awareness with reference to different demographic parameters. The table below highlights the ANOVA test result along with F value, Degree of freedom (DF), P-value, and remarks.

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Table 5 Hypotheses Results

	Demographic Parameters	Null Hypotheses	F Value	DF	P-Value	Significant/ Non-Significant	Remarks
H1	Age	There is no significant difference in Financial Inclusion Scheme awareness among respondents of different age groups.	0.874	4	0.479	Non-Significant	Null Accepted
H2	Genders	There is no significant difference in Financial Inclusion Scheme awareness between genders.	0.744	1	0.389	Non-Significant	Null Accepted
H3	Education Levels	There is no significant difference in Financial Inclusion Scheme awareness among respondents of different education levels.	2.501	3	0.059	Non-Significant	Null Accepted
H4	Occupations	There is no significant difference in Financial Inclusion Scheme awareness among respondents of different occupations.	0.657	2	0.519	Non-Significant	Null Accepted
H5	Income Levels	There is no significant difference in Financial Inclusion Scheme awareness among different income- levels respondents.	0.517	5	0.764	Non-Significant	Null Accepted

Source: Author's analysis

Discussion:

In total five hypotheses were examined to understand financial inclusion scheme awareness with respect to different demographic parameters. Five demographic parameters were analyzed. Findings indicated that none of the hypotheses were significant.

4. Findings: There is not much variation among states regarding the awareness level of financial inclusion schemes.

- People are well aware of the various schemes of the Financial Inclusion Schemes
- There is no significant difference in financial inclusion scheme awareness among the three states under study.
- There is no significant difference in awareness of the Financial Inclusion Schemes among respondents of various ages.
- There is no significant difference in awareness of the Financial Inclusion Schemes between respondents of a different gender.
- There is no significant difference in awareness of the Financial Inclusion Schemes among respondents of different education levels.
- There is no significant difference in awareness of the Financial Inclusion Schemes among respondents of different occupations.
- There is no significant difference in awareness of the Financial Inclusion Schemes between respondents of different occupations.

5. Suggestions

- Access to financial services is the right of every citizen. Government must take steps to accelerate the access and usage of financial services. Easy access can help in spreading awareness.
- Although India dreams of 100% financial inclusion, however, the finding indicates that the overall awareness level is just 72%. Therefore, there is a need to enhance the awareness level.
- Financial and technological literacy is important to widespread financial inclusion schemes awareness.

6. Conclusion:

The research's main conclusion is that public awareness of the financial inclusion scheme is impressive across all the states under study. In addition, respondents from various demographics have similar knowledge of the financial inclusion schemes. There was no discernible variation in the responses of respondents from different categories. As a result, it may be said that India's financial inclusion initiative is relatively successful. The study finding carries some positive bearing on the key stakeholders of the country including that of policy framing agencies.

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SUSTAINABLE DEVELOPMENT: DEMYSTIFYING MALABAR CEMENTS AND CEMENT BASED INDUSTRIES IN CONTEMPORARY SCENARIO.

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Abstract

Sustainable development is an imperative part of human development. Today sustainable development has become common due to the unsustainable activities of human beings. Human beings are only responsible for the present wretched condition of world. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Cement is one of the core industries which play an essential role in the growth and expansion of nation. Cement is considered to preferred building material and issued worldwide for all construction works such as housing and industrial construction, as well as for creation of infrastructures like ports, roads, power plants, etc. Cement is an important product that satisfies the human basic need for housing. The demand for cement depends primarily on the pace of activities in the business, financial, real estate and infrastructure sectors of the economy.

Introduction

Sustainable industrial development requires the preservation of the environment. Industries create a demand not only for waste-receptive services from the environmental media – air, forests, land and water – but also for material inputs supplied by environmental resources (e.g., wood in the paper and pulp industry). Environmental resources can ensure a sustainable supply of these services if they are preserved at their natural regenerative level or if the demand for waste receptive services is equal to the waste-assimilative capacity of environmental resources. Given that the demand for environmental services from various economic activities can exceed the natural sustainable levels of supply at a given time, and if measures are not taken to reduce this excess demand to zero, environmental resources can be degraded. Sustainable development has become a heated discourse since 1970s. The first step in this direction was Stockholm Conference in 1972. The main topic of this conference was the destructive effect of human activity on nature. Another World Commission on Environment and Development in 1983 to study the environmental impact under the leadership of Mrs. Gro Harlem Bruntland. This commission published a report in 1987 entitled 'Our Common Future', which discussed the importance of environmental based development. The credit of popularizing the term 'Sustainable Development' goes to Bruntland Commission .Another major event in the history of Sustainable development was United Nations Conference on Environment and Development in Rio de Janeiro in 1992. This is an attempt to address environmental consequences of social and economic development. Another major event in the sustainable development history was the Conference of Parties held in Kyoto Japan in 1997. All participants in the conference agreed to reduce greenhouse gas emissions to prevent global warming. Another thrust areas of the conference were jobs, food, cities, energy, water, oceans and disasters. Latest initiative in the field of sustainable development is 'Transforming Our world'-The notion of sustainable development has received worldwide recognition in the modern era. It is the new focal point of world development discourse.

The industrial sector is more powerful in innovation, which injects dynamism and brings about lasting increase in productivity of labour."Industrialisation not only influences the growth of national output and income, but also influences the natural life and the social, political and cultural pattern. It was hoped that industrialisation would bring social transformation, social equality, higher levels of employment, more equitable distribution of

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income and well balanced regional development. Industrial development has further been acknowledged as a means to distribute employment, income and consumption between the various regions by giving special emphasis on industrialisation of backward regions.

Liberalisation, Privatisation and Globalisation – Industry has to face competition in columns and rows. This is possible only when we create an enabling situation for industry to modernise and ratiionalise its operations including the labour. To survive competitively in the industrial field, it is highly essential to locate a suitable industry where there is wide scope for expansion. Industry will continue to be a major provider of employment. There are pockets in industry, which will become more labour intensive.

Industry is the most powerful catalyst, which can accelerate the economic growth of a nation. Kerala seems to devote much attention for her industrial development for the last five and half decades since independence. Apart from the usual constraints of industrialization, environmental considerations will increasingly influence the future growth of industries. Economic development of Industrialization has been defined by Sutcliffe "as a process which has invariably been the outcome or accompaniment of economic development". It is a set of policies, which more than any other set of policies is seen as a means towards economic development. lndustrialisation, in a state like Kerala, has become inseparable part of development process. Planners and policy makers have viewed it as the most acceptable one and argued that in an under developed country with a poor agriculture and vast population there is little choice but to give priority to the development of industries. Industrial development facilitates the tapping of resources which otherwise would remain unused.These resources include entrepreneurship, capital, labour and raw materials. They can mobilize rural savings which may otherwise remain idle or may be spent on luxuries or channelled into non-productive ventures. The state industrial scenario was having a special feature during the pre independence period. Travancore, one of the erstwhile princely states and later part of Kerala, had ranked top among princely states in industrial development during that time. Traditional industries like coir, cashew, timber, handlooms, handi-crafts,beedi, tile and match industry etc were the major industries during the pre independence period. Towards 1947, industries like Fertilizers and Chemicals Travancore Ltd (FACT), The Indian Rare Earths (IRE), Travancore TitaniumProducts (TTP), The Punalur Paper Mills, Kerala Ceramics, Kundara, Indian Aluminium Company etc came into being. During the Five Year Plan period major units like Kerala Minerals and Metals Ltd, Chavara, Malabar Cements, Palakkad,Travancore-Cochin Chemicals Ltd (TCL), Indian Telephone Industries, Palakkad,Instrumentation Ltd, Palakkad, Kannur Spinning and Weaving Mills,Steel Complex Ltd, Kozhikode, KELTRON etc came into existence.Supplementary to this, private sector industrial giants like Gwalior Rayons also came into existence.

Kerala Government Policy on Small Scale Industries Within the overall framework of the Industrial Policy Resolutions of 1948and 1956 the State Government had been following a policy of encouraging and supporting SSI units in the state. Under the constitution, the development of village and small scale industries is primarily the responsibility of the state govemment. The centre's roles are only to co-ordinate and broadly define the lines of development and to provide technical and financial assistance to schemes implemented by state governments.

The first Industrial Policy Statement for the Kerala State was announced in

June 1960. This policy aimed at:

1. Maximizing the exploitation of local natural resources
2. Spreading industrialization to all parts of the state
3. Priority to small scale and traditional industries and
4. Ensuring the healthy industrial relations in the state.

It also announced a number of incentives and assistance programmes relating to the provision of factory accommodation, machinery, raw materials, marketing, finance and training.

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The second Industrial Policy Statement, which came in 1967, announced a few more special concessions for SS1 units in addition to the ones announced earlier. These related to share participation by government in deserving cases, provision of industrial land and factory sheds, tool rooms and common facilities centers and training assistance, and more liberal credit facilities. In response to the new industrial policy statement announced by Government of India in July 1980, the state govemment announced a new statement of Industrial Policy in January 1983. With regard to the SSI units, the policy aimed at establishing an integrated system of large, medium and small-scale units with modern sector to make optimum use of the state's natural and manpower resources. Some more incentives such as concessional power tariff for SSI units and increased assistance for revival of sick units were also announced.

In recent years this sector is making a substantial contribution towards industrial growth of our country. In spite of the global and domestic recession, small-scale industries registered a higher growth rate than the overall industrial sector in terms of number of units, production, employment and exports. Small-scale industries occupy a significant position in moulding the economic programs of all countries. Being a development economy, in India the small-scale industries occupy a prominent position since they are capital surplus and labour intensive sectors. Small scale industries are considered as harbingers of economic progress and have stemmed and grown out of India's own skill, resources, enterprise and culture and thus, occupy a proud place in the industrial economy of India. Employment in the industrial sector of the region consists of opportunities in government as well as private sectors and co operative sectors. The share of the state's working factories for the region is meager.

The high potential of industry in augmenting economic development of a nation cannot be undermined. Industry with its multiple levels has been playing a vital role in materialising development even at grass root levels, though the parameters of development varies from nation to nation. This realisation has made the managers of our economy to stick to industrialisation at a greater pace. Due to their unique economic and organizational characteristics, these small-scale industries offer balanced resource mobilisation, local employment creation and income generation and act as the catalyst for promoting change in a gradual, dynamic and peaceful manner.Kerala, as one of the premier states in matters of social progress could not effect sustainable economic development through large-scale industrialisation. Even the southern part of the state, with its low industrial base could not make inroads into large-scale industrial units to effect development a reality. Kerala seems to devote much attention for her industrial development for the last five and half decades since independence. It realisation has manifested itself in the mushrooming of large number of small-scale and tiny industries across the region.This radical shift in the approach to development needs exhaustive analysis and proper critique.

Kerala has registered enormous growth in housing sector both in terms of numbers and quality during the last decades. A sustained increase in the demand for housing pushed up prices of factors of production and construction materials in a situation in which their domestic supply was in elastic. Demand for multi-storied buildings, malls, apartments, boundary wall construction and pavement sector are also to be entertained. Traditional building materials in a country like ours may be considered to fall into three broad groups; unstabilised soil, stone and fired brick .Unstabilised soil construction is not popular now even in rural areas. It is generally seen as undesirable being the bottom rung of the materials ladder. It has not been classified as a permanent material under current building regularities, which prevents its legal use in urban districts, leaving the home occupier vulnerable to dispossession and the dwelling vulnerable to demolition.

Cement is an important product that satisfies the human basic need for housing. Cement is a necessary constituent of infrastructure development and a key raw material for the construction industry. The Central and State governments pay more attention to housing problems and also tries to make various policies to provide housing facilities for all.

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The governments, for effective distribution of cement, frame the cement policies. Governmental policies have influenced the growth of cement plants in Kerala in various stages.

As late as the 1970's, the State of Kerala was virtually starving for cement. The state lacked a Portland cement factory in either private or government Sector. In 1961-62, the Geological Survey of India Located a limestone deposit in the Pandarethu valley of the Walayar region on the northern side of the Palakkad gap. Located in dense forest area, the hilly terrain was required heavy investment to mine. Later, the Mineral Exploration Corporation Limited confirmed its efficacy. Industrial Development Corporation (KSIDC) had engaged M/s. Holtec Engineers Pvt. Ltd., in 1975 to study the feasibility of putting up a cement plant at Walayar. And based on this study, KSIDC subsequently obtained an Industrial License for the manufacture of cement in November 1976. The Malabar Cements Limited thus came into existence at Walayar, the then remote and underdeveloped tiny village in the eastern boundary of the Palakkad District.

Malabar Cements limited

Malabar Cements limited is a Governments of Kerala undertaking company incorporated in April 1978 and commenced production in April 1984 at its cement plant located at Walayar. Cement is the basic construction material of the contemporary era. During the 1970s cement was a controlled commodity and Kerala had to depend entirely on other states or foreign countries for its requirements/ supplies of this construction material. In fact, this was the stimulus behind comprehending this state owned cement manufacturing unit. They launch of two Superior quality products under the brand name 'Malabar Super' and 'Malabar Classic'. Malabar Cements contributes to the developmental activities of the State by supplying the basic construction material. Only Malabar Cements can supply its cement, 'factory fresh', without any deterioration in the original strength either due to moisture or humidity, the unit at Walayar is the largest Cement industry is the second most important primary and basic industry for the economic development of India.

Limestone is the main raw material for cement production; the demand is always there with that of cement. The mine produces good grade limestone leading to conservation of mineral resources. The cement market has growth due to the central government liberalization policies and new schemes for housing, roads projects. The cement demand growth is anticipated to increase on infrastructure development and the higher demand from the housing sector and industrial projects. There is no import of limestone at present in India. India especially the southern India has good resource of limestone and has a great demand in the international super market.

Malabar Cements limited has more than 30 years of experience in cement industry and limestone mining. The existing mine over a lease area located at Pudussery East Village, of Malampuzha, Palakkad district. Malabar cements limited is mining limestone of 600000 tons per Annum from August 1983 on words from its existing mine lease area by open cast mechanized mining technique. This feasibility report is prepared to words obtaining the Environmental clearance for the existing mine lease.

The mining lease was granted in G.O (MS) No. 44/2000 Industries Department dated 25.09.1979. Accordingly the lease has to evaluate the possible environmental aspects and their associated impacts that will be raised due to the production of limestone and to delineated the management plan to prevent, controlled mitigate or minimize the adverse environmental impacts envisaged.

Pandarathu limestone mine lease area is a vested Forest land, situated at S.F. No s. 1580/2 and 1580/3 of pudussery East village 866/1, 867/12, 867/13,867/14, 868/2, 869/1, 874/33 of Malampuzha village, Palakkad district, and adopts the open cast mechanized method of mining. The limestone is extracted with the help of machineries for digging, excavation. All operations of mining including drilling, blasting excavation loading and transportation on three shift basis shall form the complete mining operation. The limestone produced from these mines is captive consummations of Malabar cement's limited. The mine is in operation from the year 1980 onwards in an interior backward rural area

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with very little social and infrastructural facilities. It is a Government of Kerala undertaking company and it is the only cement in Kerala. The mining operations by cements in this area have brought improvement in social, infrastructural and employment sectors in the area. Besides above benefits financial accruals will be derived by Central state governments and local panchayat on account of royalty, less, duties etc.

Malabar Cements contributes to the developmental activities of the State by supplying the basic construction material. Only Malabar Cements can supply its cement 'factory fresh' without any deterioration in the original strength either due to moisture or humidity with in 12 hrs anywhere in Kerala. With a production capacity of 4.2 lakh tons of cement per annum the unit at Walayar.MCL is the first public sector company to receive ISO Certification & to win the National Award for best achievement in Energy Conservation. Till date MCL has experienced no loss of production due to labour unrest. In just over 15 years of commissioning Malabar Cements has been able to meet about 10% of total cement consumption in Kerala.

Malabar cements limited is one of the first cement factory in Kerala. Malabar cements limited manufacturing quality cement and distributing supply by state and inter States. Today there are many small scale industries operating in Kerala depending on Malabar cement. The best plus point of Malabar cement is the quality cement. Anything made with this cement would be a very strong. So there are many people who depend on Malabar cement. There are many small scale industries depending on Malabar cement. Malabar cement is high demand in the market. They provide quality products & services to the public through effective intervention in the market.

Cement Based Industries

Kerala, as one of the premier states in matters of social progress could not effect sustainable economic development through large-scale industrialisation. Even the southern part of the state, with its low industrial base could not make inroads into large-scale industrial units to effect development a reality. Kerala seems to devote much attention for her industrial development for the last five and half decades since independence. It realisation has manifested itself in the mushrooming of large number of small-scale and tiny industries across the region.This radical shift in the approach to development needs exhaustive analysis and proper critique.

Cement-based industry is one of such small-scale industries, which not only cater to the needs of the region, but other places too, that had become the major catalyst for development.The multi-utilitarian products of this industry have of course altered the very conception of construction as well as brought rapid and radical changes in the construction sector. These developments have also made a paradigm shift in matters of development.

Moosa A Baker (1979) conducted a study on *The Role of small-scale Industries in the Economic Development of Kerala*, his findings shows that all industries in Kerala acquired more capital and used more capital perworker; there can be higher improvement in capital yields and labour productivity. According to him, per unit of capital of small scale industries produce more output and due to the low capital intensity per worker of small scale industries, they absorb more labourers than large industries.

R.A.Sharma (1980) found that strong desire to do something independently in life, technical knowledge and/or manufacturing experience, financial assistance from institutional sources, business experience in the same or related lines, accommodation in the industrial estates and heavy demand were the factors that induced the new and small entrepreneurial class.

Stephen Mathews (1986) in his study as "The Marketing orientation inc cement industry, with special reference to the Travancore Cements Ltd, Kottayam" says that cement industry is one of the areas where we have to give more concentration. Just for the reason that this sector has not contributed to the extent of the requirements of our country. Forward and backward linkage is also possible in the industry as auxiliary industries and varieties of cements. According to Economic Times Presentation 1995, it is stated that today, design elements, construction techniques and materials have changes

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drastically from traditional norms. It is the era of new ideas, new technology and means of communication, new geo-political relationships, new value systems, new concepts and new life styles. Our planners and architects are already becoming aware of this change. Modern architecture reflects emerging international styles in function décor and efficient use of new methods and materials. The present study tries to locate the significance of this cement-based industry in its own space and mode of operation in the unique industrial climate and in the growing demand for building materials. In the light of the exhaustiveness of laterites and clay in the Palakad, cement bricks have replaced the traditional building materials. Cement-based industry has significant role in the socio-economic upliftment of the cement-based industrialists. Cement-based products are eco-friendly. The boom in the demand for buildings and housing sector in tune with the industrial policy of the government and population growth expedite the quest for new building materials. At present, the scarcity of raw materials, its escalating price, unaffordable labour cost and time delay in completing the work are the major constraints with which this sector suffering from materials like timber, clay bricks, laterite, and black stone are the important construction materials in addition to steel and cement. The exhaustive nature of timber, clay, laterite and back stone led to think about an alternative material in place of this. The concept, pattern, style, mode and even system of building have undergone radical changes in the recent past. This has naturally led to booming of various types of buildings like apartments, multistoried buildings, and the so-called column frame style of building, which altogether altered the pattern of the process of construction. The non-availability of abundant quantity of traditional building materials and the advantage of cement-based products over traditional building materials resulted in its usage in the construction sector.

Many small scale industries depend on Malabar cement's. These Small scale industries produce a host of products like hollow bricks,solid bricks, inter-locking bricks, Pavement bricks, well rings, fencing slabs, pillars, electric posts, lintels, grills, door and window frames, water tanks, flower pots, septic tanks, waste bin etc. a host of other cement based products are there like survey stones, mile stone, Bench Mark stones, tap stand for public water supply system, drainage slabs, rain harvesting tanks etc. Cement-based industry is keeping forward linkage with the house construction and building construction sector. Kerala has registered enormous growth in housing sector both in terms of numbers and quality during the last decades. A sustained increase in the demand for housing pushed up prices off actors of production and construction materials in a situation in which their domestic supply was inelastic. Increase in population creates additional demand for houses. The nuclear explosion of a family into multiple families with independent houses had an impact on the house and building construction and its allied works. Materials used in house and building construction has been undergoing rapid changes. Substitution is taking place in the usage of traditional building materials like laterite, clay bricks, wooden frames etc. with cement based materials because of ecological problems and scarcity of materials. The shifting of demand for cement-based products results in greater employment opportunities in the small-scale sector.

Table-1.Purpose of usage

Purpose	Percentage
House construction	60.17
Boundary wall construction	10.96
Filling side walls of the Building	6.14
Shed & Toilet construction	12.5
Others-Parapets, well rings etc	10.23
Total	100

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The study indicates that 60,17per cent of the consumers used the cement products for house construction and toilets followed by12.5 per cent for boundary wall construction is 10.96 per cent .consumers used it for various purposes like construction of parapets, well walls etc.were10.23percent.

Table-2. Product usage-wise profile of consumers

Products	Percentage
Hollow Bricks	60.00
Solid Blocks	6.39
Inter Locking Bricks	14.00
Solid Blocks & Grills	2.65
Door & Window frames	4.40
Well rings	8.54
Fencing Pillars	1.02
Total 100.00	100
Source: Survey data	

Fabricating the product usage statistics, consumption purpose percentage and supplier selection norms helps to conclude that durability is the main concern for the consumers in using the cement-based products for house construction. Cement based industry is the off spring of Cement Industry. Strengths of cement-based industries depend upon the entrepreneurial and managerial capabilities of those involved in the business. Being small in size with unique operating characteristics, cement-based industry requires a management approach, which is also unique. Cement-based industries are generally managed in a prescribed fashion. In most of the cases, the owner himself is the manager. Regarding the scope and scale of operations are concerned, Cement-based industries usually cater a local or regional market rather than a state or national market. They also tend to have a very limited share of a given market. Therefore these special characteristics must be taken into consideration while planning for Cement-based industries 'development on a state level .Alternatively clay brick or fired brick is the other cheapest building materials where supplies of suitable clay soil and firewood are present. The quality of the clay bricks was found to be highly variable. Consequent to the increase in the price of firewood and scarcity, brick production falls into two categories; high cost bricks, which is produced using adequate quantities of firewood and poor quality of bricks using inadequate quantities of firewood with consequent under burning. Deforestation and depletion in the availability of adequate quantity of clay soil are the constraints from which this are confronted.

The growth scenario of cement-based industries shows a marvelous picture of boom periods in its history. Until 1990, only 6 per cent of the units were set up. Thereafter, a galloping growth of 150 per cent was taken place during 1990-95 periods. Another milestone in the growth of cement-based industries history was taken place during 1995-2000 periods with a sky shooting growth rate of 400 per cent followed by 136.11 per cent growth in 2000-2005 period.

Malabar cement's manufactures cement through the most modern dry process method based on world renowned German technology. The major raw materials for cement manufacture are limestone and laterite, which are natural minerals obtained within the state. These raw materials provide all necessary ingredients of cement like lime oxide.Cement-based industries require large quantity of water in its production stage mainly for curing. Demands for the products are mainly in summer season. Shortage of water in late summer affects the curing process. Hence most of the producers are resorted to stack curing.

Cement-based industry has high potential in employment generation, which helps to reduce the unemployment problem to a great extend. It is also found from the study that most of the units are small in size and their production processes are seasonal. Hence the units size and seasonal production have the concerns in supplying the products.The cement-based industry can contribute a lot to the economy

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with a wide variety of products if properly managed. The success of the industry also depends on many factors such as location, status of entrepreneurs, credit facilities available etc. The future of the industry also based on tastes and habits of the consumers.

The study reveals that limestone quarry is located within the Walayar Reserve Forests and mining has led to deforestation in the area. Dumping of waste material into the valley head of one of the tributaries of Pandarathu which debouches into Malampuzha reservoir, poses threat to the surface water system. Although a dam to check flow of material into the reservoir has been constructed, fines definitely find their way to the reservoir. These problems assume added dimensions in view of the fact that any substantial contamination of the surface water system and large scale transport of waste material through the surface water system shall adversely affect the Malampuzha dam, whose water is used for irrigation in Palghat district and for the water supply scheme of the Palghat town.Air pollution due to dust is more at the cement factory site than at the mine. Dust from the cement factory is flown more than 8-10 km from the factory site at Walayar. Noise pollution at the mining site resulting from blasting drives away the animals, especially elephants, whose pastures are limited in the area.

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A STUDY ON TONY BLAIR'S THIRD TERM AS A UNITED KINGDOM'S PRIME MINISTER WITH REFERENCE TO THE NEW LABOUR PARTY'S 2005 ELECTION MANIFESTO

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Abstract:

This paper mainly explains about Tony Blair's Labour Government's Policies Towards European Union during his third term of premiership. After UK's membership to EU in 1973, it had not actively engaged in the European Union's policies and implementation process. From 1973 to 1996, the successive UK Prime Ministers followed a negative and skeptical attitude towards various EU policy initiatives and none of the UK Prime Ministers showed any special interest to improving its relations with EU. In this context, the study of Tony Blair's third term of premiership plays an important role to understand UK-EU relations during 2005 to 2007. In reality, Tony Blair's Labour government made a huge difference in the EU-UK relationship. His Labour government from the very beginning made clear to the UK citizens that their government would take more pro-active and constructive role in the EU policy making and various developmental programmes. In this context the study of Tony Blair's Labour government's policies and perspectives towards European Union, gives better understanding of United Kingdom and European Union's relations, policies and perspectives during that period.

Key Words:*European Union, United Kingdom, Globalization, Iraq war, Constitutional treaty, Referendum*

Introduction:

The Labour party under the Tony Blair came to power in UK after the 1997 UK General election. The Labour Party in its 1997 General election manifesto introduced the pro-European policy strategy goals and this was whole heartedly supported by the UK people in the election. As a result, the Labour Party won the election by a huge majority of votes in its party history. The 1997 election gave new direction to the UK's EU policy. Tony Blair's pro-European policy initiatives made a huge change in the EU-UK relations. The crux of the policy was to establish some kind of British 'Leadership' within the EU. The policy of Labour government of Tony Blair towards EU modernization and change. It was making a break from the policies of UK in recent past, notably its 1983 manifesto of withdrawal from the European Communities, state intervention in the economy and nuclear disarmament. The Tony Blair government succeeded in placing a British imprint upon the EU; but continued as non-member of the Euro that in a way restricted its aspirations to play leadership role in the EU.

Rationale of the Study:

The proposed research will focus on United Kingdom and European Union's relations during Tony Blair's third term of premiership. Stress here is on UK's policy towards EU during Tony Blair's period. Secondly the study aims to understand Tony Blair's foreign policy in the context of EU and does not deal exclusively with its foreign policy.

Objectives of the Study:

In the light of above, the proposed research aims to understand the following:

- To understand the reason behind Tony Blair's involvement in EU during third term of premiership.
- To analyze as to what extent UK differs from other EU member states in EU Politics.
- Internal debate in EU regarding Tony Blair's role in various policies.
- Impact of Tony Blair's policies on EU and its wider ramification.

Hypothesis:

1) Tony Blair sought to change the role of UK in EU. Distinct to his predecessor he brought about a pro-EU image of UK.
2) Tony Blair also sought to maintain continuity in UK's policy towards EU. On core areas distinct UK identity was maintained.
3) Tony Blair's policy represented an ambivalent attitude towards EU supporting EU where it suited national interest and deviating from the general EU member's position when it did not suit the perceived national interest.
4) Tony Blair's policy perspective has had an imprint on the UK's policy towards EU and has made it difficult for successors to deviate from it.

Methodology:

This work on 'A Study on United Kingdom and European Union's relations during Tony Blair's third term of premiership with reference to the New Labour party's 2005 election manifesto.' is basically an analytical work. The proposed study will to a large extent rely on primary sources including official, Government documents and publications. The study will also critically examine the secondary sources available on the subject matter such as books, journals, periodicals magazines and tertiary sources such as newspapers.

Literature Review:

The Review of literature is an important stage of research as it provides the researcher an overview of what has been done and what is being done. In this background, there exist several works pertaining to the subject matter of the research that could be usefully employed in the research. In this study mentioned a few.

Christian Schwinger, (2007), in his book on **Britain, Germany and the Future of the European Union (PALGRAVE MACMILLAN Publications, New York,)** has analyzed the role played by Britain in the European Union. And the author also analyzed the Britain and European integration, the Britain under Tony Blair's premiership and also discussed Blair's European policies in different fields.

Alistair Jones, (2007), in his book **Britain and the European Union (Politics Study Guides), (Edinburgh University Press, Edinburgh,)** analyzed the history of the EU, its institutions and policies. The author also analyzed the British applications, the referendum on membership and Tony Blair's premiership.

Analysis and Findings:

Tony Blair's Third Term As A United Kingdom's Prime Minister (2005-2007):

In the May 5, 2005 UK general election, the Tony Blair's New Labour Party fought the election with modest European policy objectives in its manifesto promises. The New Labour Party was re-elected in the election for the third Consecutive term with a very lowest parliamentary majority of 65 seats. In this election, Tony Blair was not able to get people's full support to his government's constructive European policy. This election revealed the decreased popularity of the New Labour party as well as Tony Blair following the 2003 Iraq war.

European Policy Commitments In 2005 New Labour Party Manifesto:

1. Globalization means that events elsewhere have a direct impact at home.
2. The new Labour case – Domestic interests and international action are entwined more than ever before.
3. Making Europe work better for Britain.
4. The EU now has 25 members and will continue to expand.
5. We will also work to reform Europe.
6. We will continue to lead European defence cooperation.
7. On the euro, we maintain our common-sense policy.

With reference to the above, in the 2005 UK general election manifesto, the New Labour Party stressed for four important issues. They are, firstly, to give approval to the EU constitutional treaty through referendum. Secondly, to promote economic reforms in the European Union countries. This objective was highlighted in the party manifesto was basically for the 2005 UK presidency of the EU. The economic reforms include, control, regulation, development in the Doha round, supporting EU membership for Turkey, the Balkans and other Eastern European countries

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and also to give attention to the EU aid to less developed countries of the world. Thirdly, it also assured to enhance leadership in European defence co-operation programme. Finally, it also declared to continue a sound policy on Euro currency. This includes to fulfill the chancellor's five economic tests, parliament's approval and finally of holding a referendum to get people's approval.

In this regard, the French and the Dutch governments held a referendum for the approval of EU constitutional treaty in their countries. But in the referendum that followed, people rejected the constitutional treaty's implementation in their countries. This greatly affected the implementation of the first manifesto objective into practice and also these developments strongly gave the message to UK government to not hold referendum for implementation of the EU constitutional treaty. This gave rise to a new challenge to UK in 2005 EU presidency. Later, the EU summit meetings were held in June 2005 by the heads of governments of the EU member countries for the implementation of the Constitutional treaty. This meeting gave two years break for the implementation of the Constitutional treaty. It also blocked the EU's 2007-13 medium term budget before UK's 2005 EU presidency. Tony Blair gave an historic speech to European parliament at Strasbourg on 23 June, 2005. In his speech, he called for reform to social and economic policies of EU for the future global challenges and also criticized the role played by agriculture in EU budget. This speech was considered as an important milestone before UK's EU presidency in 2005.

The study of UK's 2005 EU presidency plays an important role to understand the EU-UK relations during Tony Blair's New Labour governments second term of EU presidency after 2003 Iraq war.

The United Kingdom's Presidency Of The European Union In 2005:

The New Labour party government took over the EU Presidency from July to December 2005. During this period, the New Labour government put forwarded certain manifesto objectives in its EU Policies. These manifesto objectives had been considered very important for the New Labour government in implementing its Constructive European policy. This includes firstly, having an economic and social reform which includes the service directive and working time directive. Secondly, having an agreement with regard to EU financial perspectives from 2007-13. Thirdly, with regard to Sugar market reforms, the New Labour government had the goal to take various policy measures to reform the Sugar industries. Fourthly, the Continuation of enlargement process, and fifthly, to take the initiative to improve and develop EU's role in world affairs. This included the eradication of poverty in African and in some underdeveloped countries. Finally, it had the goal to resolve the Luxembourg Budgetary deal.

In comparison to 1998 UK's EU Presidency, the 2005 EU presidency was less successful in implementing the policy objectives. But, with regard to Turkey and Croatia's accession to EU and reform to sugar market, the New Labour government achieved some success. With regard to financial assistance to UK Presidency, we can say that both the Tony Blair and Gordon Brown showed a commitment, by presiding both EU and G-8 summit simultaneously.

With regard to EU financial perspectives for 2007-13, an important agreement was made with the help from German Chancellor, Angela Merkel. According to this agreement, the UK government had agreed to reduce its budgetary rebate. This ultimately in the long run greatly affected UK economy.

During UK's EU presidency an informal Hampton court summit was organized on the issue of EU's economic competitiveness. But this summit was less successful and failed to implement any policy decisions. At this juncture, the terrorist bomb attacks took place in London on July 7, 2005. This diverted the UK's EU presidency's policy objectives. In response to this attack, in December 2005, the EU adopted a new counter terrorism strategy to tackle the global terrorism.

After UK's EU presidency, there were not many changes in the UK's EU policy objectives and this situation continued till June 2007. In June 2007, the Prime Minister Tony Blair attended the European Council meeting and discussed the implementation of 2005 election manifesto promises into practice. This

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includes, to put approval of the Constitutional treaty to a referendum, promote economic reforms in Europe, leadership in European defence cooperation and continuation of common-sense policy on Euro. But he could not implement these EU policy objectives into reality.

After UK's Presidency, Germany took over the EU presidency. During this period, the long-awaited EU Constitutional treaty was passed. This was considered as a major success after UK's EU presidency. Over all, the 2005 United Kingdom's EU presidency especially after the 2003 Iraq war had deep impact on EU-UK relations for a very long period.

Conclusion:

During his third term as UK Prime Minister, Tony Blair had faced a lot of difficulties and hurdles in implementing his ambitious 2005 election manifesto promises into practice. In this context, the study of New Labour Party's 2005 UK general election manifesto commitments on European policy agenda plays an important role to understand the EU-UK relations during Tony Blair's third term of Premiership from 2005 to 2007.

The 2003 Iraq War had not only reduced Tony Blair's popularity at domestic and international levels but also sharply divided the EU member countries over various European policy decisions. In this scenario, in September 2006, the UK Prime Minister Tony Blair declared that he will resign to his post within a year.

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SUSTAINABLE DEVELOPMENT GOALS (SDGS) 2030: CHALLENGES, ACHIEVEMENTS AND WAY FORWARD FOR INDIA

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Abstract

Earlier the governments of different countries pursued to achieve their planned goals for the sustainable development of their own countries. After the United Nations introduced Global Agenda 2030 in 2015, all the nations have unified in achieving the goals of sustainable development. India has set-up an organization, NITI Aayog to monitor the implementation of Sustainable Development Goals (SDGs) 2030 in all the sectors. As India is a developing country, there are many challenges ahead for India in implantation of SDGs. Moreover, the recent pandemic has affected the flow too. This study is to analyse the performance of India in achieving the SDGs, to know the challenges in the path of achieving the goals and also to know the achievements amidst the challenges.

***Keywords**: SDGs, Challenges, Achievements, Advancements.*

Introduction

In the last few decades, looking at the natural crisis, countries have understood that they cannot achieve socio-economic development of their countries by ignoring the environment. The struggle for growth and excellence has created imbalance in the nature. The countries are facing issues which are concerning the globe and it made it necessary for them to come together to develop a code for sustainable development. In this regard, the United Nations has taken initiative and introduced the 2030 Global Agenda in 2015. This 2030 Global Agenda is the Sustainable Development Goals (SDGs) which are universal policy agenda to reduce or eradicate poverty, hunger, violence and disease. The SDGs are aiming at building safe and sustainable world. The SDGs are a set of 17 goals adopted by governments to have the complete development in the future.

Image 1: Source: www.un.org/sustainabledevelopment.

Objectives

1. To check the origin of SDGs.
2. To analyse how India has adopted SDGs through the Indian Constitution and related policies.
3. To know the challenges in implementing the SDGs 2030.
4. To identify the achievements of India to have SDGs 2030 in place.
5. To understand the impact of Covid 19 on the implementation of SDGs 2030 and to analyse the way forward for sustainable development with SDGs 2030.

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Research Methodology

As SDGs 2030 and its implementation is the responsibility of all the states and of all the sectors, it is difficult to collect the primary data. Hence data available in UN and Indian government websites and the different research articles appeared in different authorized journals are referred to prepare this paper. As such, this paper is based on secondary data. The paper is descriptive-conceptual in nature.

Origin and Implementation of Sustainable Development Goals

Sustainable Development is a development which meets the needs of the present without compromising the needs of the future generation (en.wikipedia.org/wiki/Sustainable_development). Originally there were eight Millennium Development Goals (MDGs) set in 2000 to be achieved by 2015. In the span of fifteen years, world attained significant economic and political changes for the sustainable development. Later, SDGs were developed from that based on the UN Conference on Sustainable Development held in Rio de Jenairo in 2012. In furtherance of that, UN General Assembly constituted a 30-member Open Working Group in 2013 to prepare the general proposal for SDGs, where India is also a one of the Open Working Group. After 13 sessions, a report is submitted to UN General Assembly. Finally, in 2015, the 2030 Global Agenda for Sustainable Development is adopted by UN. It includes 17 SDGs and 169 associated targets (Bhowmick. (2021)).

Indian Constitution and Other Policies on Sustainable Development

The Constitution of India

There are few Fundamental Rights guaranteed to the citizens of India which supports the sustainable development goals of India. The Right to Life' guaranteed under Article 21 (Article 21 of the Constitution) includes right to clean environment, right to livelihood, right to live with dignity and other related rights. In M. C. Mehta V. Union of India (AIR 1987 SC 1086), Rajiv Ranjan Singh V. State of Bihar (AIR 1992Pat 86) and many other cases after that Supreme Court has given judgement on right to have clean and healthy environment.

The Fundamental Duties under Article 51 A (g) and 51 A (j) speaks about duty of every citizen to protect the natural environment and to strive towards excellence in all spheres to rise the level of the nation (Article 51 A (g); Article 51 A (j)).

The Directive Principles of State Policy guides the state to implement policies to develop the nation. Article 47 and Article 48A speaks about state to raise the level of nutrition to improve the public health and to protect the environment, forest and wildlife (Article 47; Article 48A).

The National Environment Policy (NEP), 2006

NEP, 2006 (www.india.gov.in/national-environment-policy-2006) is given by Ministry of Environment and forest in consultation with experts from different categories like state and central government, industries, academicians, research institutions, NGOs and general public.

The NEP, 2006 speaks about India's commitment to clean environment and to support the international associations in this regard. The NEP connects to earlier policies and addresses the goals of sustainable development (Choudhuri. (2019)).

Seventh Five Year Plan (1985-1990)

Chapter 11of the plan speaks about environment, ecology, forestry and wildlife. In the 7th Plan the integration of environmental management and development which was initiated during 4th Five Year Plan was strengthened (SDG 2. Pdf). The organisational and legislative changes were sought to implement the environmental measures and to launch major action programmes (niti.gov.in/planningcommission.gov.in).

Challenges: To Attain SDGs

As India is a developing country, India has to face many challenges in attaining SDG 2030. Indian government is facing many challenges like huge population, poverty, food security, potable water to all, energy consumption, health issues, deforestation, oil crisis etc. Further, there are few other major concerns are (www.business-standard.com).

Devising Suitable Indicators: In all other categories of International Treaties obligation India has been not so successful in setting the

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specific indicators to measure the outcome of policies. As MDG of "safe drinking water" is not achieved by India as records show that there is an increase in the waterborne diseases and deaths (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1151007/).

Financing SDGs: The UN MDG Report 2014 shows one-third of world's extreme poor live in India (www.un.org/millenniumgoals). In the private and public level, when it comes to SDGs, India shows shortage of $ 2.5 trillion from2015-2030 (unctad.org/system/files/official-document).

Indian government is trying to private sector investment in food security and environment matters. Still, it is not enough to reach the goal comfortably. Due to covid pandemic the projected $1.7 trillion adds to the already existing shortfall gap of $ 2.5 trillion (www.oecd.org/newsroom).

Monitoring and Ownership: The responsibility of monitoring and ownership of implementing SDGs in India is assigned to the National Institution of Transforming India (NITI Aayog) which is chaired by the Prime Minister of India (sustainabledevelopment.un.org). Though the role is assigned, the members are not trained to take up the huge task and responsibility. The implementation is depending on different sectors in India and alone NITI Aayog is not able to coordinate all the sectors.

Difficulty in Measuring the Progress: The government has taken measures to implement the SDGs in the nation. But as it is spread to all the sectors, the assigned organisation alone cannot measure the progress achieved by all the sectors (Vinathi. (2016). The measuring devices need to be developed and also authorised people should be trained to use it. Then again, as the progress is not always objective, the measuring devices may not be appropriate for all the categories. There is a measuring Index (Sif Heide-Ottosen. (2016)), the 'Ibrahim Index of African Governance (IIAG), in place, which can be used as a base to measure the progress. But it is for African countries and needs modification for other countries. It comes with its own shortfalls when it is needed to be adapted by Indian government.

Indian Achievements in the Implementation of SDGs

Institutional Set-up

- **NITI Aayog**: NITI Aayog (www.niti.gov.in) was formed in 2015. It is formed to provide directions and develop policies. NITI Aayog provides required technical assistance to Centre, States and Union Territories. It is chaired by Prime Minister and all the heads of states and union territories. Among many other functions, NITI Aayog is formed to invigilate, evaluate and implement different policies, in identifying the required resources to implement the policies and programmes, to upgrade the technology for the overall development, supporting to enhance knowledge, to have innovations in different sectors, to develop the support system for start-ups and established entrepreneurs to adopt innovations etc. NITI Aayog has taken initiative and developed SDG India Index – Baseline Report 2018 to measure the progress of states and union territories in the implementation of SDG 2030 (www.niti.gov.in).
- **MoSPI**: The Ministry of Statistics and Programme Implementation has developed 306 national indicators in par with global indicators to implement the SDGs (www.mospi.gov.in).

Progress in India

India is in 120th place with a score of 60.07 (dashboards.sdgindex.org/rankings) in comparison to other countries in implementing the SDGs 2030. But with all the challenges in India, India has achieved a remarkable success in implementing the SDGs.

The Image 2 shows the goal-wise implementation of SDGs and Image 3 shows the top score ranking state-wise. Kerala, Himachal Pradesh and Tamil Nadu are in top three position in implementation of SDGs for the year 2020 – 2021.

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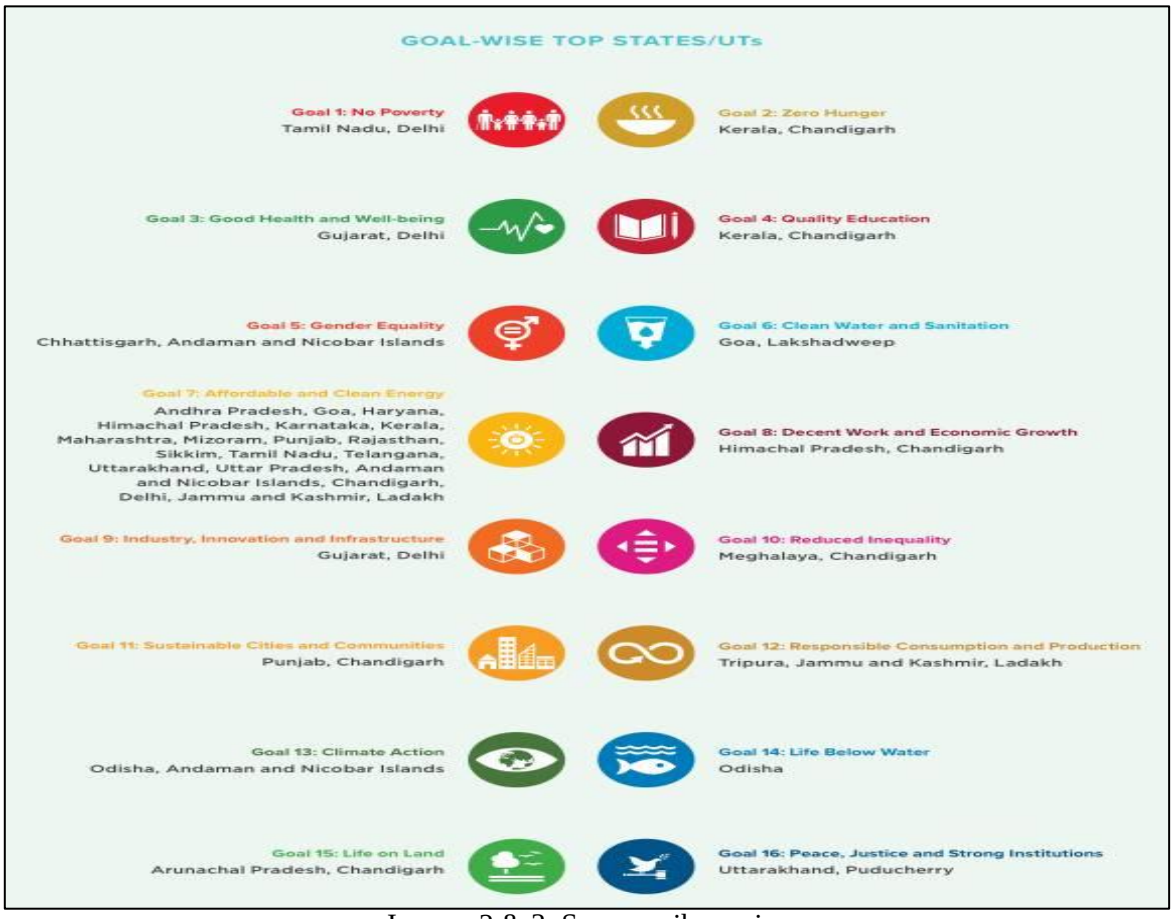
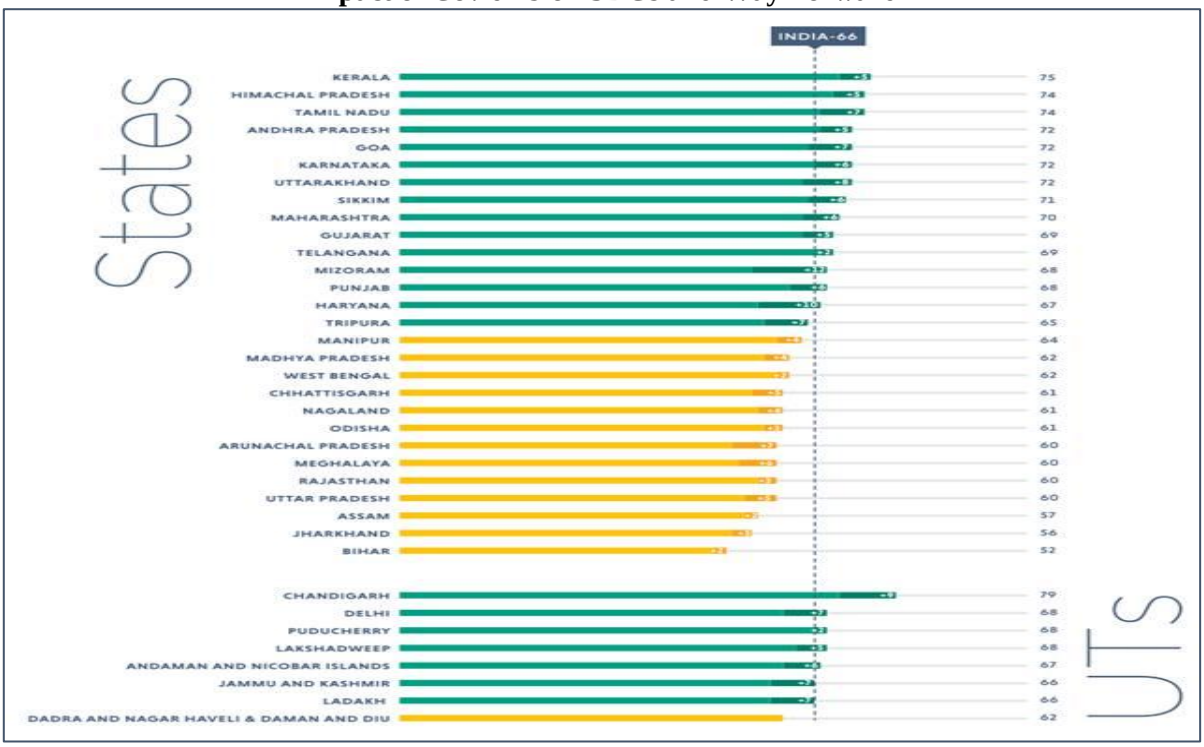


Images 2 & 3: Source: pib.gov.in.

Impact of Covid 19 on SDGs and Way Forward



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Impact of Covid 19 on the Implementation of SDGs

There is interconnection between biosphere, society and economy. All the SDGs are connected to these three aspects. SDG 3, good health and wellbeing is very important than all the other SDGs as it connects the whole world together. SDG 3 has direct impact on SDG, no poverty, SDG 2, zero hunger, SDG 6, clean water and sanitization, SDG 8, decent work and economic growth, SDG 9, industry innovation and infrastructure and on SDG 10, reduced inequalities (Erna Solberg & Nana Addo Dankwa Akufo-Addo. (2020)).

The pandemic has affected the world in all the sectors. The SDGs growth has been stalled due to pandemic. Due to the nature of interconnectivity, pandemic has not only affected SDG 3 but also to all the other connected SDGs. Hence, a single approach programme to overcome the pandemic effect to implement SDG 3 is not enough. It calls for developing policies with an integrated approach to a implement all the SDGs (www.un.org).

The July 2021 Progress report (sdg.iisd.org) on SDG 1 says the pandemic is expected to add another 88 million to 115 million people into severe poverty and the total may reach up to 150 million by the end of the year. During pandemic schools were closed all over in the whole world. About SDG 4 it is the fact that low-income students got affected more than their other peers. Over the world 1.38 billion students got affected by shutting down of schools. The disparity in the education system is affecting the society also. SDG 8 got affected by pandemic too. Pandemic has added to global unemployment and more than 200 million people have been lost their jobs. Most vulnerable categories are women and youth (earth5r.org).

Strategies Required to Implement SDGs Effectively

It is required for the government of any country to focus on a few important aspects to implement SDGs in a complete way. To achieve SDGs nation needs to emphasis on five main categories like environment, resources, education, health, economy and governance (sdg.iisd.org). India is a developing country. It is very much necessary to make reasonable and optimal use of available resources for the implementation of SDGs. Further, in few sectors like technology, India is not able to have advanced technology due to heavy costs. But still, India needs to be in par with other nations in implementing the SDGs. Few of the strategies are:

1. The 3-R Approach: The reduce, reuse and recycle approach in using the available resources will help in attaining SDGs. It will help in reducing the pollution, saving the resources, and manufacturing new by reducing the waste.
2. Technology: The wise way of using the technology will lead to reduced use of technology and will have proper waste management system. The technology should be eco-friendly, easy to use, enhance the culture of the country and need to optimize the use of resources. Technology should be nature friendly and help to create employment. Instead of adopting the technology developed by other countries, its beneficial to develop the required technology in the domestic nation.
3. Enhancing social, economic and cultural lifestyle: As there is huge population in India, it is not easy to enhance the life style of people in all the way. The resources and technology should be shared by both rich and poor equally. The barriers to social life like evils of the society need to eradicated. Also, traditional knowledge and culture of indigenous people should be recognized by the government and adapted by the people of the nation.
4. Education and Awareness: It is common for people of the country to resist changes. Any changes done by the government for the implementation of the SDGs 2030 are usually resisted by people and hence not effective. It is advisable to give proper education and thereby awareness about the SDGs and its necessity of implementation. As sustainable development is the need of the day for all the countries of the globe, there is acute need to educate and bring awareness about SDGs in people.
5. Governance: There need to have a proper authority with responsibility and accountability to monitor the implementation of SDGs. Mere enhancing the levels in all the sectors on its own will not help in implementing the SDGs. The authorities need to create the nexus between the development

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in all the sectors to the implementation of SDGs. Without sustainable growth, any kind of development will not be good for the people and the country and moreover it may harm the country.

Action Plan

To attend the environmental issues and to have sustainable development in the country, the Indian government has initiated the National Action Plan on Climate Change (NAPCC) (www.ncbi.nlm.nih.gov). This plan includes eight measures to attend the issues.

1. National Solar Mission: It is to support the use the solar energy as a form of renewable energy to save fossil-energies. This mission helps in the establishing the solar research centres to increase the nations manufacturing strength, to increase the international collaborations and to reduce the dependency on other countries for energy sources.
2. National Mission for Enhanced Energy Efficiency: To enhance the energy efficiency, the NAPCC supports in developing the plans to decreasing the large energy consumption industries, standard certifications for reduced use of fossil-energies and to develop eco-friendly and renewable energies. It also provides for incentives and for public-private partnerships for investments in renewable energy manufacturing systems. It recommends for tax reductions in the manufacturing and use of energy efficient equipments in industries.
3. National Mission on Sustainable Habitat: This is done by having a proper town plan to have energy conservation buildings and other structures, to have more public transport system not using non-renewable sources, having economy pricing to purchase electric vehicles instead of fuel vehicles. This mission executes the waste management and recycling system too.
4. National Water Mission: NAPCC aims at 20% more improvement in the efficiency of water usage. By pricing strategy and other support this mission is planning to deal with water scarcity and to have potable water for all.
5. National Mission for Sustaining the Himalayan Ecosystem: The purpose of this mission is to address the greenhouse effect, global warming by having measures to prevent glaciers of Himalayas. It also have a system in place to protect Himalayan region biodiversity.
6. Green India Mission: As the name says it all, this mission aims to have afforestation of 6 million hectares in forest land which is degraded. By this it is planning to expand the forest area by 10% more in Indian territory.
7. National Mission for Sustainable Agriculture: The objectives are to have climate adaptation agriculture, to have climate resilient crops, insurance for crisis, best agricultural practices to increase the crops and to decrease the use of harmful pesticides. This mission supports the research on agriculture relating aspects to develop new means to support weather related agriculture and for the use of technology in activities of agriculture.
8. National Mission on Strategic Knowledge for Climate Change: This mission has a plan for Climate Research Fund and Improved Climate Modelling. It provides support for more international collaborations and investments by private sectors to develop new technologies.

Along with these eight measures, the NAPCC has taken initiative in few other areas (dst.gov.in/sites):

- Power Generation: This provides for doing research to generate power based on renewable energy and to get rid of coal-based power plants.
- Renewable Energy: The authorities central and state government are to purchase a grid-based power form renewable energy on proportionate basis under the Electricity Act, 2003.
- Energy Efficiency: Energy audits and energy labelling is introduced to large energy consuming industries under the Energy Conservation Act, 2001.

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- Health Sector: To reduce the water-borne and soil-borne diseases and to have proper public health care system at reasonable price for all.
- Implementation: The different committees, associations and other authorities are ordered to develop plans, measures taken, objectives and purposes, timelines, implementation, monitoring and evaluation strategies and to submit to the Prime Minister's Council on Climate Change. It is made mandatory to review the progress periodically and to suggest criteria and methods to enhance the implementation and progress.

Conclusion

India has adopted 'Sabka Saath Sabka Vikas' meaning 'Collective effort, inclusive development'. This is the base for the SDG 2030 implementation. The NITI Aayog has drafted three-year action plan from 2017-18 to 2019-20 to speedy the process of implementation. There are many schemes and policies have been initiated by Indian government like Pradhan Mantri Jan Dhan Yojna (PMJDY), the financial inclusive programme, ASHA soft, an online monitoring and payment system, Mission IndraDhanush for children's vaccination etc. in support of SDG 2030. India has already started implementing SDG 2030. There is a long way to go. But, even with the setback of pandemic, India is determined that with the coordination of all the states of India and also with the international collaborations India will be successful in implementing and achieving all the goals of SDG 2030 for the sustainable development not only in India but in the whole globe.

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3. Article 51 A (g) of the Constitution
4. : to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures; Article 51 A (j) of the Constitution: it is the duty of one to always strive towards excellence in all spheres of life of an individual and it also talks about the collective activity so that the nation keeps rising higher in an endeavor and this cannot be achieved until the employees maintain the discipline.
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THE ROLE OF SUSTAINABLE AGRICULTURAL WATER MANAGEMENT IN INDIA

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Abstract: *The present paper is to analyze the Role Sustainable Agricultural Water Management in India. A Systems approach that identifies and assesses the roles of multiple actors is required to achieve sustainable development outcomes. A systems approach to Agricultural Water Management begins with the identification of the significant contextual relationships.*

Keywords: *Sustainable Agricultural, Water management, Multiple actors, Economic security, Pollution and Changing Climate etc.,*

Introduction:

India remains highly vulnerable to this water crisis in the coming years. Affordable and efficient methods in water management will be keys to production of food and economic security for sustained livelihoods in both irrigated and rain-fed scenarios. Agriculture uses approximately 70% of the world's freshwater supply, and water managers are under mounting pressure to produce more food and fibre for a growing population while also reducing water waste and pollution and responding to a changing climate. In light of these challenges, more farmers are adopting innovative water management strategies, such as innovative irrigation systems and scheduling and methods to improve soil health. The pacific Institute conducts research and works with innovative agricultural partners to identify and scale strategies to improve water management and ensure a vibrant agricultural system and global food security.

Water Resource Management Planning in India:

Water Management is important since it helps determine future Irrigation expectations. Water management is the management of water resources under set policies and regulations. Water, once an abundant natural resource, is becoming a more valuable commodity due to droughts and overuse. Water resource management is the activity of planning, developing distributing and managing the optimum use of water resources. It is a sub-set of water cycle management.

Ideally, water resource management planning has regard to all the competing demands for water and seeks to allocate water on an equitable basis to satisfy all uses and demands. As with other resource management, this is rarely possible in practice. Water is and essential resource for all life on the planet. Of the water resources on Earth only three percent of it is fresh and two-thirds of the freshwater is locked up in ice caps and glaciers. Of the remaining one percent, a fifth is in remote, inaccessible areas and much seasonal rainfall in monsoonal deluges and floods cannot easily be used. At present only about 0.08 percent of all the world fresh water is exploited by mankind in ever increasing demand for sanitation, drinking, manufacturing, leisure and agriculture.

Objectives of the Study:

The main objective of the present paper is to analyze the Role Sustainable Agricultural Water Management in India.

1. To analyses the role sustainable agricultural water management in India.
2. To analyses the Importance of Efficient Water Management and Efficiency in Agriculture.
3. To explains the systems approach to agricultural water management in India.

Methodology:

The study is based on secondary data collected from internal sources. It will be collected on the basis official records, and their official website. It has been accumulated from Economic Survey of India, ministry of statistics, annual reports and various websites, other trusted publications will be studied like

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Newspapers, research articles, research journals, E-journals, books and magazines, better understanding.

The Role Sustainable Agricultural Water Management in India:

Water is the most critical resource for development. The effects of this resource can be felt not only in agriculture, but in areas such as industrial and economic development and most critically on the environment. India's burgeoning population is facing a water crises, fuelled by unregulated and unplanned exploitation and a "use and discard" policy.

Water as a resource in agriculture is also reaching a tipping point with the constant challenge to feed and hydrate the ever-increasing population. Climate change consequences related to water resources include increase in temperature, shifts in precipitation patterns and snow cover, and a likely increase in the frequency of flooding and droughts, thus affecting agriculture. One estimate is that agricultural production needs to be scaled up to double by 2050. With as much as 80% of freshwater being consumed

Importance of Efficient Water Management and Efficiency in Agriculture:

While the area under cultivation in the world has grown by around 12-15% over the last fifty years, India has shown stagnation, or even a decline, due to changes in land use, weather patterns, and dwindling farm incomes. Changing weather patterns and erratic rainfall have also accounted for the area under irrigation to go up substantially, with most coming from groundwater extraction.

The next contributor is fresh water from aquifers, streams and lakes. It is estimated that about 2-3 litters of water per capita is sufficient for human consumption, and a whopping 3,000 litters is required to produce to the daily food requirements of one person in India, more than 60% of water consumed for irrigation is taken up by sugarcane and paddy, and this inequity places a lot of pressure on the water cycle. For all these is an urgent need to look at sustainable water management in irrigation.

Importance of Water Management to Crop Production:

Water is one of the most important inputs essential crops. It profoundly influences for agriculture, we must ensure that water recourses are efficiently used to achieve social, environmental and economic benefits.

Local Village Participation and Sustainability:

The local Participation and sustainability programme creates awareness among the communities about the value of participation in making level institutions vibrant and improving the last-mile delivery of government programs.

The program incorporates local knowledge and choices in rural development plants to support inclusive and sustainable rural development and builds the capacities of village-level institutions to identify and address community problems, monitors the maintenance of public infrastructure, and conserves natural resources for holistic village development few institutions further creates awareness about important health and sanitation issues and promote usage of digital technologies to widens the reach and benefits of government programes to the communities.

photosynthesis, respiration, absorption, translocation and utilization of universal nutrients and cell division besides some other processes. Both its shortage and excess affects the growth and development of the plants, yields and quality of produce. Rainfall is the cheapest of source of natural water supply. Its distribution is very uneven and uncertain. Artificial water supply through irrigation on one occasion and removal of excess water through drainage on the other becomes imperative.

Water management in India thus comprises of irrigation and drainage or both. With proper combination of water and soil nutrients the crop yields can be boosted manifold under irrigated agriculture. Water is a costly input when canals supply it misuse of water leads to water logging, salt imbalance etc., and rendering agricultural lands unproductive.

Proper appreciation of the relationships among soils, crops, climate and water is essential for and efficient and economic use of water resources for maximum crop production.

Water is one of the most important inputs essential for the productions of crops. Plants need it continuously during their life and in

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huge quantities. It profoundly influences photosynthesis, respiration, absorption, translocation and utilization of mineral nutrients, and cell division besides some other processes. Both its shortage an excess affect the growth and development of a plant directly and consequently, its yield and quality and rainfall plants. In India, however, rainfall is notoriously capricious, causing floods and droughts alternately.

Its frequency distribution and amount are not in accordance with the needs of the crops. Artificial water supply through irrigation on one occasion, therefore, becomes imperative, if the crops are to be raised successfully. Water management in India, thus, comprises irrigation or drainage or both, depending considerably on the environmental conditions, soil, crops and climate. It is a situation oriented entity.

Systems Approach to Agriculture Water Management:

A System approach to Agricultural Water Management begins with the identification of the significant contextual relationships. Analyzing the relationships among the components of a system provides an understanding of the connections and feedback loops among the relevant actors; practices in local crop and livestock farming systems, including tillage, soil fertility management, crop rotations, grazing patterns; availability and access to inputs (including, but not limited to water); geography; environmental water flows; transport; markets; and land and resource tenure. Understanding and building on these interactions is a hallmark of adaptive integrated water resources.

A watershed is a natural boundary for identifying contextual relationships in how water flows through, and is used by, different actors within the same geographic catchment area. Strategies that utilize a watershed approach include.

1. Developing institutions where stakeholders participate in allocating water equitably and efficiently, e.g. water users associations.
2. Managing wetlands, forests, grasslands, and other natural habitats in a way that provides a clean and dependable water supply, including water for agriculture, ecosystems, and livelihoods.
3. Incorporating water monitoring practices that gauge water balance, availability, and quality.
4. Promoting landscape planning to reduce risks of flooding, drought, and land degradation.
5. Supporting agronomic practices that can improve water infiltration in to soils, leading to aquifer recharge and better regulation of stream flow.

Water affects the performance of crops not only directly but also indirectly by influencing the availability of other nutrients, the timing of cultural operations, etc., Water and other production inputs interact with one another. In proper combinations, the crop yields can be boosted manifold under irrigated agriculture.

Water is a costly input when canals supply it. The constructing of dams and reservoirs, the conveying of water from storage points to the fields, the operating and the maintaining of canal systems involve huge expense. The misuse of water leads to the problems of water logging, salt imbalance, etc, thus rendering agricultural lands unproductive. Hence, a proper was appreciation of the relationship and economic utilization of water resources for maximum crop productions. Water Resources, Surface Water Resources, Ground Water Sources.

Conclusion:

With irrigation needs increasing in the times to come, freshwater as a resource will be under pressure and many be diverted to industrial and domestic use. With almost 30-40% of water used in irrigation going unused, a concerted effort is required in policy, water allocation, and management. With the agricultural community facing the challenge to increase food production substantially, a sustained availability of crucial resources such as water is important. We do not want any policy or ground-level inaction to be the genesis of water wars in the future. The government must gear up on this critical and crucial matter, and a synergistic effort is required on all fronts

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CALCULATING & REDUCING CARBON FOOTPRINT FROM TRANSPIRATION, HOUSEHOLD & INDUSTRIAL WASTE

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Abstract:

Carbon footprints is the amount of greenhouse gases emitted during the production, processing and by the manufacture of a product or any given activity that contributes to global warming. Increased greenhouse gas emissions have a direct impact on global warming. Many of us want to know how our country is reducing gas emissions in this paper we analyse the carbon footprint produce by various activities such as Transportation, household, food and so on This paper describes the methodology used to measure the carbon footprint associated with daily activities which are seen daily and how to reduce the emission of harmful gases. The methodologies for calculating carbon footprint are still expanded. Calculating the carbon footprint is to understand how activities impact global sustainability.

Keywords: *Carbon Footprint, Greenhouse gases, Transportation, Household, Industrial Wastes*

Introduction:

A carbon footprint analysis, also known as a greenhouse gas (GHG) emission, the greenhouse gas emissions caused by the manufacture of a product or any given activity that contributes to global warming. The carbon footprint is also an important component of the Ecological Footprint. Carbon Footprint can be tracked in four categories: Energy, Agricultural, Industry and Wastes. The transportation sector is responsible for 16.27 percent of all U.S. greenhouse gas emissions. The industrial waste is responsible for 24.2% of greenhouse gas emission and so on. Calculating a carbon footprint is a first step for any activities looking to understand its environmental impact, though it focuses on GHG emissions. The calculation is not the end goal, but the main goal is to achieving a reduction in Carbon footprint.

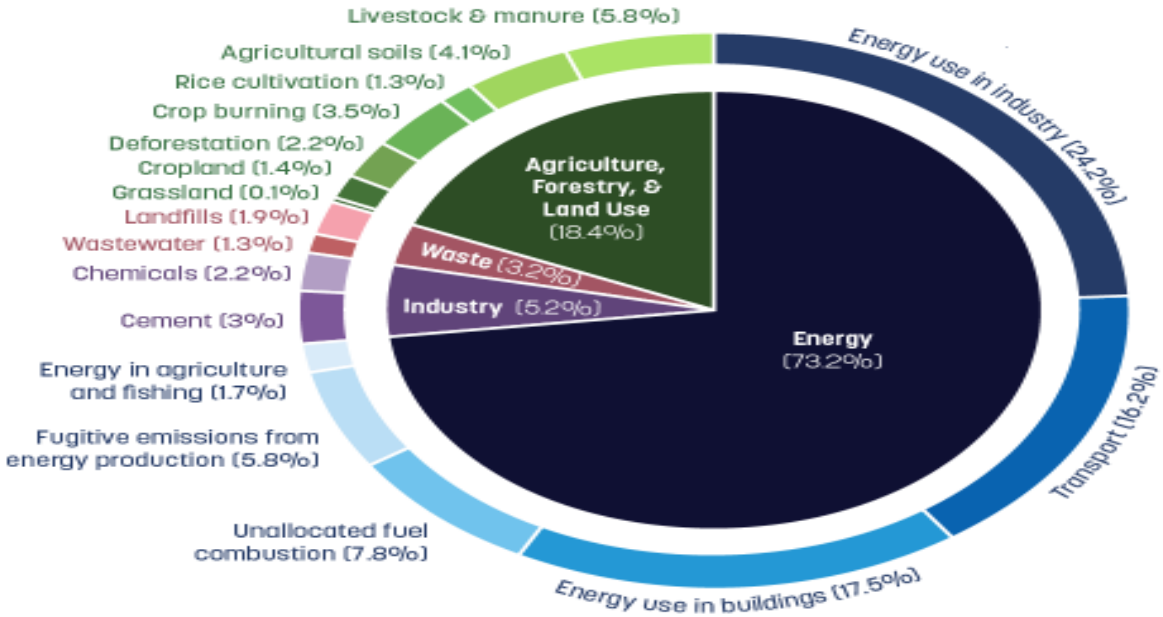

Chart 1

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Methodology:

The increasing concentration of GHGs in the atmosphere can accelerate climate change and global warming. Energy, Agriculture, forestry lands, waste and industry are responsible for carbon footprint. The first step to over come GHG emission is to measure them therefore we are calculating carbon footprint for various activities such as transportation, household, industrial wastes and so on.

There are some guidelines to calculate carbon footprint those are as follows:

- GHG protocol,
- ISO 14064,
- Comprehensive one Life Cycle Assessment (LCA),
- Market-based mechanisms like Clean Development Mechanism (CDM),
- Voluntary Carbon Standards (VCS), etc.

Calculating Carbon Footprint from Transportation:

You can determine current GHG emissions by looking at how much freight you transport, the distance that freight travels, and the specific mode of transport used. Each mode will have its own emissions factor.

Formula for calculating Carbon Footprint (GHG) for vehicle (E.g., Truck):

Carbon Footprint {(Greenhouse gases (GHG)} Emission = D x W x EF

Where; D = The distance your shipment has travelled (in miles or kilometers)

W = The weight or amount of your shipment (in pounds, kilograms or tons when data is available, or volume metrics such as number of twenty-foot equivalent unit)

EF = The mode's specific emissions factor.

Calculating Carbon Footprint from Household:

There are number of resources to calculate carbon footprint from household.

Steps to calculate Carbon Footprint from household:

Step 1: Multiple your monthly electric bill by 105

Step 2: Multiple your monthly gas bill by 105

Step 3: Multiple your monthly oil bill by 113

Step 4: Multiple your total yearly mileage on your car by .79

Step 5: Multiple the number of flights you've taken in the past year (4 hrs or less) by 1100

Step 6: Add 184 if you do NOT recycle newspaper

Step 7: Add 166 if you do NOT recycle aluminum and tin

Step 8: Add all the steps from 1 to 7 for your total carbon footprint

Note: If your carbon footprint is any where from 6,000 to 15,999 pounds per year then it is considered to be low, other wise it is high if it is higher than 15,999 pounds per year.

Calculating Carbon Footprint from Industrial Wastes:

The carbon footprint of an industry measures all the **greenhouse gas emissions emitted directly or indirectly** through the activity.

Formula to calculate Carbon Footprint from Industry:

Carbon Footprint = Activity Data x Emission Factor

Where; Activity Data = Parameter that defines the level of activity that generates greenhouse Gas emission

Emission Factor = Amount of greenhouse gases emitted for each activity.

Activity Data contains 3 major scopes:

Scope 1: Defined as direct greenhouse gas emission controlled by a company.

Scope 2: Indirect emission associated with the energy consumption acquired.

Scope 3: The greenhouse gases emission that an organization can influence but does not control. The steps to follow to calculate the carbon footprint are the following:

Step 1: Choose a year of calculation.

Step 2:Establish organisational and operational limits.

Step 3: Collect consumption data.

Step 4:Carry out the calculations by multiplying the activity data by the emission factors.

Step 5: Prepare a reduction plan including the measures to be carried out.

How to reduce carbon footprint:

Understanding carbon footprint can limit the impact of global warming consumption on the environment. Usually, the bulk of carbon footprint comes from transportation, housing and Industrial wastes. The most effective ways to reduce your carbon footprint are:

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1. **Reduce Your Carbon Footprint from Transport:**
   The transportation is responsible for significant amounts of Carbon Footprint.
   Here are some ways by which we can reduce carbon footprint from transportation sector:

- **Go easy on the gas and brakes:** Efficient driving can help to reduce emissions.
- **Air conditioning and intensive city driving** can make emissions creep up.
- **Use cruise control** on long drives.
- **Carpool** it can save large amounts of gasoline, especially for long trips.
- **Drive an Electric Vehicle**, electric vehicles are a cleaner and greener option than gasoline-powered cars. they prevent air pollution and cut fossil fuel use.

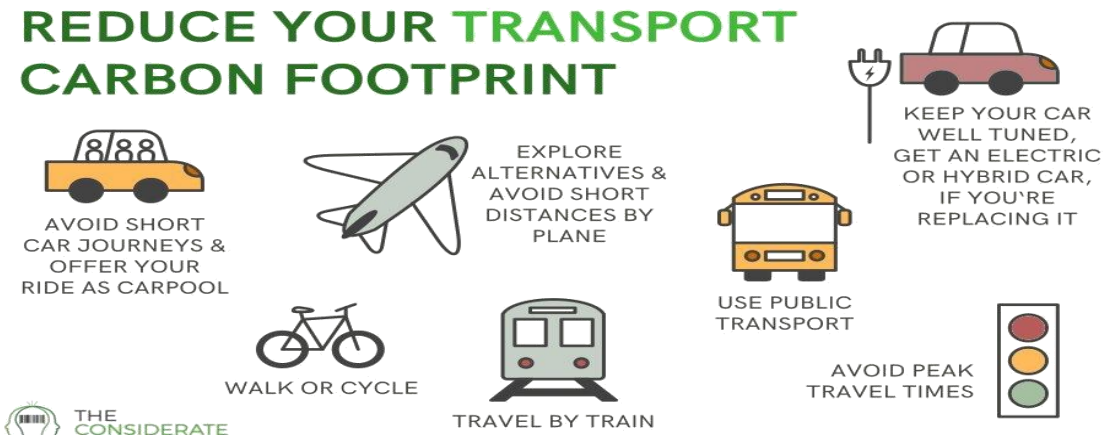

Figure 2

2. **Reduce Carbon Footprint from Households:**
   We found around 20% of all emissions are directly attributed to household consumption. Here are some steps to reduce your carbon emissions from households.

- **Reduce or eliminate bottled water:** Don't buy bottled water use tap water.
- **Insulate your house:** Insulate your home so that will be heated during winter and cold during summer.
- **Reduce, reuse, recycle:** reduce the amount of waste you generate, reuse IT equipment, and recycle the waste.
- **Maintenance of appliances:** Proper repairing of application according to manufacture's instruction will help your device to run more efficiently and reduce the consumptions of energy

Figure 3

Reduce Carbon Footprint from Industrial Wastes:

The industry is being urged to decarbonize manufacturing processes. Here are some ways to reduce carbon footprint:

- **Eco-design engineering:** Carbon footprint can be reduced by considering and actively minimizing the environmental impact of a product across its entire lifecycle i.e from material extraction and supply to end of life.
- **Material substitution:** Finding alternative material which can reduce carbon footprint. This can make product biodegradable.
- **Remanufacturing:** This involves reclamation of used material such as steel, and product that can be reused.

Conclusion:

Recently Carbon Footprint, Global Warming etc have taken centre stage. The carbon Footprint is currently 60 percent of humanity's overall Ecological Footprint and its most rapidly growing component. The goal is to help people to understand carbon footprint and how to calculate carbon footprint show that it reduces the climate change. Many people act to reduce their carbon footprint without ever calculating it. Such action can produce serious reductions ones. Calculating your footprint provides a way of telling the difference between the two. Once you calculate carbon footprint, you should do something with the information. The real win would be achieving reductions in your absolute total footprint, which means getting total emissions down.

"Reducing carbon emission is important but it is shortsighted if not coupled with reducing the toxic emission from our hear; and that is something spiritual leaders are supposed to teach and something all thinking people, regardless of their beliefs, should practice."- Radhanath Swami

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Figures/Charts:

Chart 1: Shows the Carbon Footprint by Sectors

Figure 2: Shows ways to reduce carbon footprint from transport

Figure 3: Shows ways to reduce carbon footprint from transport

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MITIGATING AIR POLLUTION-A ROAD TO SUSTAINABLE DEVELOPMENT – A CASE STUDY OF KOLKATA

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Abstract

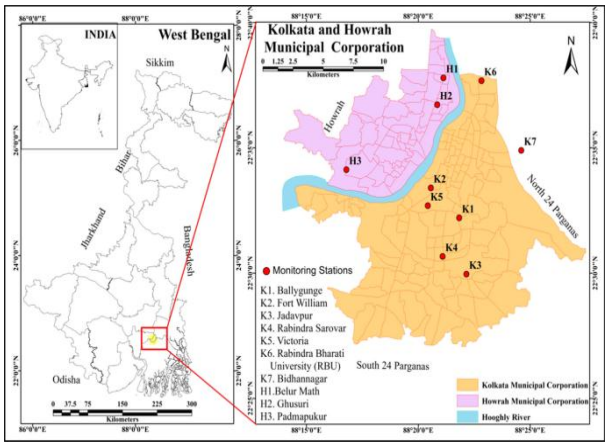
Air is the lifeline of the ecosystem as a whole. But air quality is deteriorating day by day. The study area taken for this research is Kolkata, a major and prominent city of India. This consisted of collection of real time secondary data on air quality of the five stations of Kolkata- Jadavpur, Ballygunge, Fort William, Victoria and Rabindra Sarovar for the year 2021. The data gathered, has been analysed with the help of representative maps and various cartographic techniques. Two major tends have been identified from the data and the graphs- seasonal variation of air quality and spatial variation of the effects of the pollutants. In most of the cases, PM 2.5, PM 10 and Ozone has been found to be the major pollutant. The highest AQI scores are noted during the winter months of November, December, January and February. There has been an aggregate of various factors which resulted in the deteriorating air quality of the city. Kolkata has pioneered innovative techniques to combat and reduce the annual emission of air pollutants in the city of which energy efficiency, electrical vehicles and airshed management with constant monitoring are the key areas. Sustainability lies in the intersection triangle of the ideas of society, environment and economy. The long term and ad hoc policies regarding air pollution must take into account these three areas, the amalgamation of which will bring about spin-off results in the air quality of Kolkata.

Keywords: *air quality, particulate matter, ozone, deterioration, sustainability, energy efficiency techniques.*

Introduction

The urbanised world of cities poses sustainability challenges at the present day. India has been on the road to massive urbanization from the end of the former century. The menaces are thus being faced by the citizens which not only poses a question on their health but also questions the sustainability issues of the society. Air is the lifeline of the ecosystem as a whole. But air quality is deteriorating day by day. According to the Swiss Organisation, IQAIR, air pollution results in nearly seven million deaths per year. Though a comparative study of AQI reports show that air quality in Indian cities have improved from 2018 to 2020, yet India holds twenty-two of the most polluted cities of the world. For the world to sustain the focus of the scientists, researchers should be on this major issue which threatens the very existence of mankind as a whole.

Study Area: The study area taken for this research is Kolkata, a major and prominent city of India. With an area of 206.1 sq. km, the city is the nest of nearly 1.49 crores of people (2020). It is the third most populous city and is the cultural capital of the country as well. There are several AQI stations in Kolkata for monitoring the air quality in a regular basis. However, the study encompasses five of the stations- Ballygunge, Jadavpur, Fort William, Rabindra Sarovar, Victoria.



Objective of the Study

The objectives of the study are:

1. To analyse the quality of air in the selected stations
2. The comparative seasonal and spatial analysis

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3. Suggesting possible solutions to the menace

Materials and Methods

This consisted of collection of real time secondary data on air quality of the five stations of Kolkata- Jadavpur, Ballygunge, Fort William, Victoria and Rabindra Sarovar for the year 2021. Secondary data was collected from the Central Pollution Control Board, books, websites and journals relating to the area under study. The data gathered, has been analysed with the help of representative

4. Policies and programmes undertaken

maps and various cartographic techniques. The collected data, both primary and secondary, were processed and analysed with the help of multiple methods such as tabulation and preparation of various types of charts as well.

Observations on Air Quality and Pollution

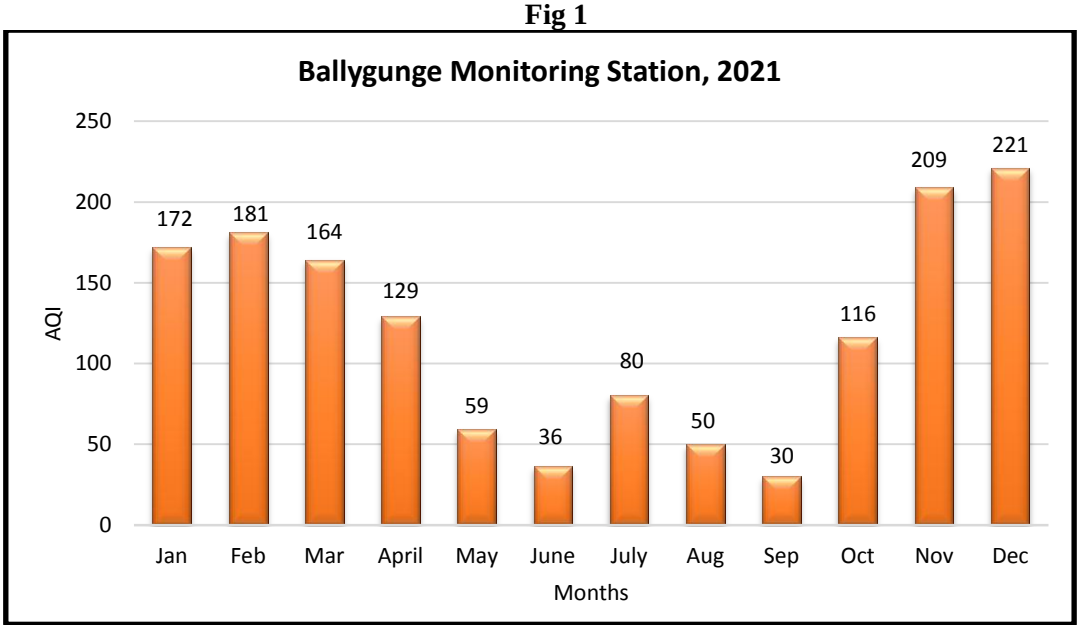
Data has been gathered on the five stations of Kolkata for the year 2021. The monthly average AQI and the number of pollutants has been calculated.

Table 1: Ballygunge Monitoring Station,2021

Month	AQI	PM 2.5	PM 10	Ozone	NO_2
January	172	172	115	87	47
February	181	181	140	170	55
March	164	164	140	150	61
April	129	129	119	81	58
May	59	49	59	57	36
June	36	36	59	32	28
July	80	80	70	49	33
August	50	48	50	43	26
September	30	20	30	27	23
October	116	116	114	62	55
November	209	209	159	103	67
December	281	281	189	71	71

Source: Central Pollution Control Board

Fig 1



Source: Central Pollution Control Board

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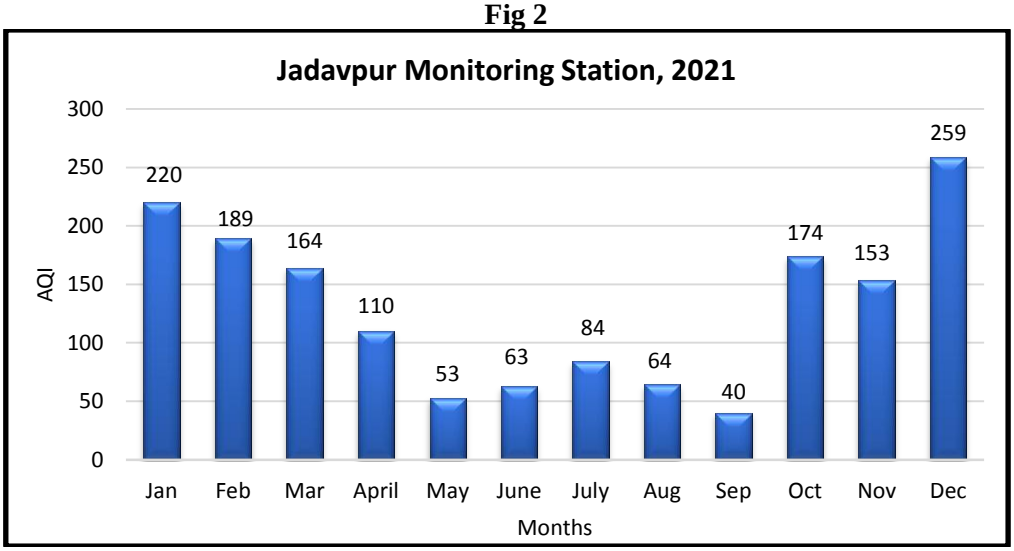
Table 2: Jadavpur Monitoring Station,2021

Month	AQI	PM 2.5	PM 10	Ozone	NO_2
January	220	220	135	105	46
February	189	189	153	165	52
March	164	137	141	164	68
April	110	92	110	88	33
May	53	53	52	34	26
June	63	47	52	63	45
July	84	84	72	36	32
August	64	60	64	53	32
September	40	37	37	25	40
October	174	174	117	43	84
November	153	153	144	25	24
December	259	259	199	178	125

Source: Central Pollution Control Board

Fig 2



Source: Central Pollution Control Board

Table 3: Victoria Monitoring Station,2021

Month	AQI	PM 2.5	PM 10	Ozone	NO_2
January	184	184	137	115	55
February	201	201	159	52	89
March	193	135	128	193	86
April	80	80	64	51	69
May	151	41	52	151	55
June	59	33	44	59	45
July	80	64	80	51	36
August	65	31	65	57	32
September	184	184	137	86	55
October	103	94	103	71	65
November	161	141	141	161	72
December	201	188	201	44	54

Source: Central Pollution Control Board

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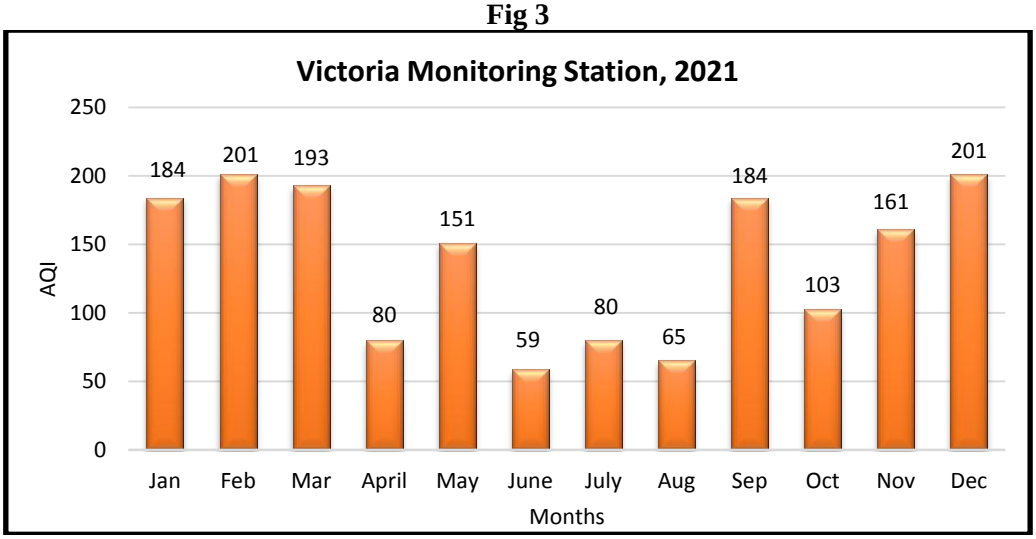
Fig 3



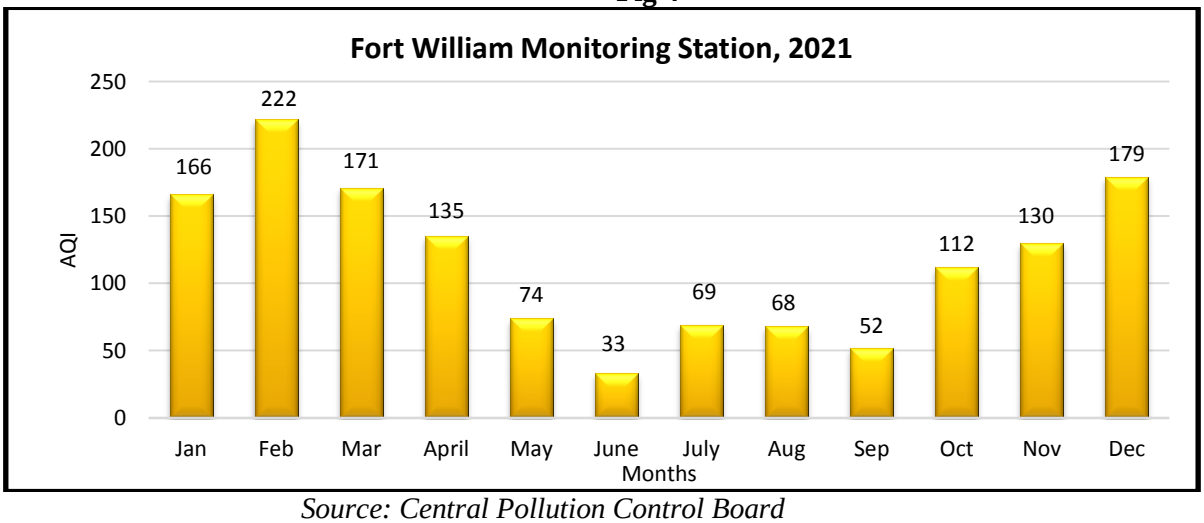
Source: Central Pollution Control Board

Table 4: Fort William Monitoring Station,2021

Month	AQI	PM 2.5	PM 10	Ozone	NO_2
January	166	166	128	53	68
February	222	222	148	85	75
March	171	171	141	102	88
April	135	135	115	92	86
May	74	49	51	74	52
June	33	33	29	28	10
July	69	62	69	57	44
August	68	38	56	68	35
September	52	22	35	52	17
October	112	112	90	50	52
November	130	130	111	77	82
December	179	140	179	36	78

Source: Central Pollution Control Board

Fig 4



Source: Central Pollution Control Board

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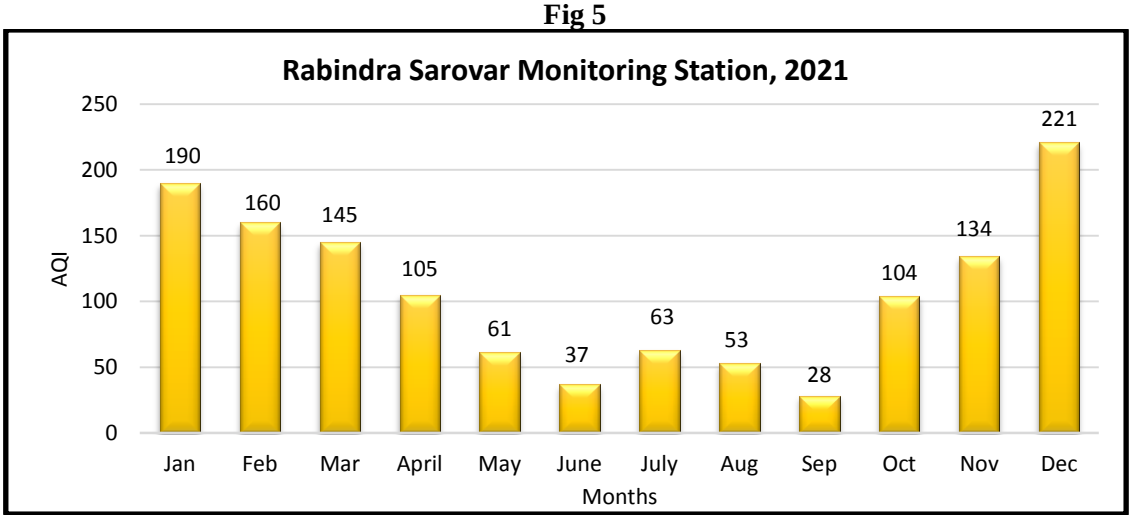
Table 5: Rabindra Sarovar Monitoring Station,2021

Month	AQI	PM 2.5	PM 10	Ozone	NO_2
January	190	190	126	83	79
February	160	160	137	75	82
March	145	120	145	71	67
April	105	79	105	76	62
May	61	34	52	61	48
June	37	25	32	37	22
July	63	54	63	27	35
August	53	39	53	32	36
September	28	19	28	23	28
October	104	104	104	27	37
November	134	110	134	70	63
December	221	221	187	45	140

Source: Central Pollution Control Board

Fig 5



Source: Central Pollution Control Board

Discussion

The air quality index and the major air pollutants of the five monitoring stations of Kolkata have been listed in the study which shows a threatening picture of reality. Two major tends have been identified from the data and the graphs- seasonal variation of air quality and spatial variation of the effects of the pollutants. In most of the cases, PM 2.5, PM 10 and Ozone has been found to be the major pollutant.

PM stands for particulate matters which are otherwise known as particle pollution. They are an admixture of solid and liquid particles quite detrimental to human health. PM 2.5 and PM 10 are inhalable fine particles with diameters less than 2.5 and 10 micrometers respectively. They include dirt, soot, ashes etc. these particles are emitted from industries and automobiles and consisted of hundreds of various chemicals and are the result of complex reactions of Sulphur di oxide and Nitrogen di oxides. All the five stations show that the concentration of particulate matter is very high in the air. Throughout the year, particulate matters are the major pollutants with certain exceptions where ozone and nitrous oxide have been detected to be the major pollutant. Half of Kolkata's particulate matter concentration is contributed by combustion of solid fuels by the households and emitted from the roadside eateries and also from burning of waste.

Another close look at the monitoring station's data reveals the seasonal variation of air pollution which are quite marked all over the city. The highest AQI scores are noted during the winter months of November, December,

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January and February. A decreasing trend of pollution is noted toward the monsoon months of June, July, August and September. According to the Indian Standard Scheme of air pollution, moderate to poor and very poor air qualities are noted in almost all the stations from November to March. However, May to August air quality is noted to be good and satisfactory. Rainfall settles down the pollutants like pollens and particulate matter, thereby drastically changing the air quality positively. This phenomenon known as wet deposition is responsible for bringing down the pollutants to the ground and refreshes the air. Exactly opposite occurs in winter when cold air being denser traps the pollutants and thus air pollution sustains for long. The detrimental effects are thus faced during the winter months in the city of Kolkata. The causes of poor air quality in Kolkata have always been due to anthropogenic factors. A cosmopolitan city like Kolkata is the hub of many industries and automobiles which accelerated the pace of air pollution. Not only it has a huge population to survive on it but also invites short term and daily migration of workers from the surroundings. Thus, automobile emissions from the transport sector, the various industrial houses and individual hoses as well contribute generously towards the pollution. The pressure of population demands the expansion of roads which in turn initiates deforestation along the roads. The aggregate of all these factors has resulted in the deteriorating air quality of the city.

The Adverse Effects

Both the short term and long-term effects of air pollution are noticeable in Kolkata as the poor air quality sustains long here. Air pollution affects negatively the ecosystem as a whole. The effects can be manifold-

1. Irritation of eyes, skin, bronchitis and lung diseases are the short-term effects. Even regular headaches and nausea can also be listed within the category of short-term effects.
2. Outdoor and indoor air pollution can take lives. The long-term effects show a tendency towards lung cancer, heart disease and emphysema. Even the various human organs like kidneys, nerves, brain and liver can be adversely affected by the long exposure to air pollution. A toll of human lives is caused by air pollution in the world every year.
3. Acid rain is a direct negative effect of air pollution which results from the sulphur di oxides, carbon monoxides and nitrogen di oxides that are emitted from the transport sector. This kills crops and affects the yield. Moreover, acid rain falls back to earth and pollutes water and soil.
4. Smog is another form of air pollution found in winter months which envelops the city and obscures the view of shapes and colours. It even muffles sound. Thus, a large number of vehicle accidents are noted particularly in winter.
5. Carbon monoxide, ozone, nitrous oxide, particulate matter can all heavily contribute towards global warming and in increasing greenhouse effect. The temperature of the world and the city is rising, turning into a heat island. Ecosystem is changing abruptly and this pollution is making it difficult for many species to survive.
6. The combined effects of indoor and outdoor pollution is the cause of huge premature deaths and birth defects in new borns every year.
7. Ozone as a major pollutant damages the stomata of the leaves and thus affects plant health.
8. Extreme weather conditions are threatening the very balance of the ecosystem.
9. Ground level ozone is quite detrimental to crops and agricultural yield and increases plant susceptibility to diseases.

Steps Undertaken

Kolkata has pioneered innovative techniques to combat and reduce the annual emission of air pollutants in the city. Yet studies reveal that the current policies are not sufficient to improve the quality of air by 2030. Substantial decrease of particulate matter emission is urgently required for the betterment of life in Kolkata. Researchers have suggested an airshed approach to reduce this emission. A geographical region sharing the same air flow is designated to be an airshed region. This approach is similar to watershed management where the characteristics of airshed will determine the strategies of management.

1. Under this, roadside food vendors should be provided with portable LPG cylinders, water sprinkling vehicles should be deployed at

regular intervals to put down the dust, penalising those who burn waste in the open and illegal and old vehicles which are more than fifteen years old should be banned on the roads. Pollution checks on vehicles on road are mandatory.

2. These are the baseline actions that needs to be employed immediately for having a breathable air for the citizens. The application of advanced control measures, especially from the non-technical emission sources will be of great help in reducing particulate matter concentration.
3. Energy efficient clean fuels in the economic sectors is another low-carbon technology key.
4. Coal consumption of the roadside food vendors to be minimised with proper stress on the use of LPG.
5. As the vehicular fleet on the roads is increasing day by day, control and check measures are adequately required.
6. The group of people vulnerable to air pollution must also be identified and should be made aware. Awareness drives may be fruitful in such cases.
7. Transport sector is already undergoing a transformation with the introduction of electric buses in Kolkata.
8. Monitoring is a big issue for maintaining a standard quality of air. Air quality is monitored by Central Pollution Control Board, State Pollution Control Board and Pollution Control Committees and National Environmental Engineering Research Institute which covers 215 cities and towns in India. There are six ambient air quality monitoring stations in Kolkata itself.

Conclusion

Urbanisation has been the talked about topic now when it comes to environmental deterioration. Kolkata has been infested with thousands of commuters every day along with its growing pressure of population. This heat island therefore makes it miserable for the dwellers to breathe. The ambient air quality appears to be poor for most of the months in Kolkata. This is reflected in the increasing human health problems and an adverse effect on biotic communities as well. This leads to the road to sustainability. This remains the only option which can sustain the breathable air not only for the present but also for the future generations as well. Sustainability lies in the intersection triangle of the ideas of society, environment and economy. The long term and ad hoc policies regarding air pollution must take into account these three areas, the amalgamation of which will bring about spin-off results in the air quality of Kolkata. Breathable air is the birth right and the basic necessity of life on earth. The steps taken to restore air quality ushers hope. Several positive steps have been taken by the State and the Central government to combat the problem.

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VARIATION OF SECONDARY GAMMA RADIATION FLUX DUE TO CHANGE OF RELATIVE POSITIONS OF SUN, PLANET VENUS AND PRESENCE OF CONSTELLATION PIECES IN MONTH OF MARCH, 2021 AT UDAIPUR, INDIA

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Abstract

An experimental study of change of angular position of Sun and planet Venus in space and presence of constellation pieces in sky in month of March, 2021wasconducted at Udaipur (27^0 43' 12.00" N, 75^0 28' 48.01" E), Rajasthan, India using ground based NaI (Tl) Scintillation detector. After analyzing data we observed significant variation of secondary gamma radiation flux (SGR). For this experimental study data files were stored in computer for half hour duration from time 16.30 IST to 17 IST on the dates March 19, 20, 22, 23, 25, 26, 27 and 28. After analyzing data we observed significant variation of secondary gamma radiation flux (SGR). We interpret such variation of SGR flux counts on the basis of change of relative positions of Sun and Venus, presence of constellation pieces, combines gravitational lensing and gravitational pull effect on background radiation due to constellation pieces, Sun and planet Venus.

***Key Words**: Cosmic radiation, solar radiation, secondary gamma radiation, relative positions of Sun and Venus, constellation pieces, combines gravitational lensing and gravitational pull.*

Introduction

About 89% nuclei are protons, 10% nuclei of helium, and 1% of others heavier elements (Lithium, Beryllium and Boron)[1, 2, 3] lies in the energy range of 10^9- 10^{20} eV or more [4] is called cosmic radiation. Simpson (1983) [5] gave information about chemical abundances of cosmic radiation. Above 50 km from the surface of the Earth intensity of primary cosmic radiation flux remains almost same but about 20 km from surface of the Earth there is formation of secondary radiation [6]. The secondary particles have X- rays, protons, alpha particles, pions, muons, electrons, neutrinos and neutrons. After interaction with atmospheric particles secondary particles loses energy [7, 8] and there is formation of secondary particles shower [9]. One of part of such radiation has electromagnetic component [10, 11, 12] contains electrons, gamma particles [13]. Secondary radiation flux can be detected using appropriate detector on surface of the Earth [14, 15].

Bending phenomena of electromagnetic radiation towards massive object is called Gravitational lensing. The object could a galaxy, a star, or a cluster of galaxies [16, 17, 18].

Celestial events and variation of radiation flux

It was showed by many studies that secondary radiation flux effected during different celestial events such as Solar eclipses, Lunar eclipses, appearance of comet in sky, phases of moon, closest approach of celestial objects, transit of celestial objects etc

Bhattacharya et al [19], Kandemir G. et al [20], Nayak. et al. [21], Bhaskar et al [22], Pareek et al [23] conducted experimental studies during solar eclipses.

Lunar eclipses studies were conducted by Pareek et al. [24], Raghav et al. [25], J.N. AnandaRao et al. [26],Pareek et al. [27],Pareek et al. [28].

2 % decrement in secondary solar radiation gamma ray flux observed by Pareek et al [29] during celestial event of transit of Venus June 6, 2012 at Udaipur India.

Pareek et al. [30] conducted experimental study of phases of moon in month of September, 2000. Analysed results showed abrupt change in energy spectra on 9^{th} and 10^{th} September 2000, when Moon was in background of Capricorns **constellation.**

Pareek et al [31],Pareek et al [32]conducted experimental studies for transit of the Sun across Constellations and observed variation of Secondary Gamma Radiation Flux on the surface of the Earth.

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Pareek et al [33] in month of October, 2020 at Udaipur, India to observe variation of secondary gamma radiation flux an experimental study was conducted during closest approach of Mars towards Earth, Mars at opposition and transit of Moon across different constellations, planets conducted experimental using scintillation counter.

Pareek et al. [34] conducted experimental study during appearance of Comet Hyakutake in the month of March, 1996 using scintillation counter and observed variation of secondary cosmic radiation flux in energy spectrum of specific energies of about1.127 MeV, 2.29 MeV and 3.66 MeV.

With the fact that during different celestial events happening in sky, modulate terrestrial secondary flux of cosmic and solar radiation, we attempted to see effect of secondary radiation due to change of relative positions of Sun and Venus and presence of constellation pieces.

Experimental Set-up and Observations

Scintillation detector of (SD 152 F) flat type with Size of the NaI (Tl) crystal of 2" x 2"of Nucleonix make (Figure 1) used in this experimental study. This is optically coupled with photo multiplier tube (MC 1000) having 1024 channels. The integral line was connected to 1k multi-channel analyzer of Nucleonix make with usb interface built in high voltage and shaping amplifier. Using gamma ray software Anuspect data files were collected in computer. This Scintillation counter system kept open to collect the counts as a function of time on the roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' University Udaipur (Rajasthan) India. For this experimental study data files were stored in computer for half hour duration from time 16.30 IST to 17 IST on the dates March 19, 20, 22, 23, 25, 26, 27 and 28.

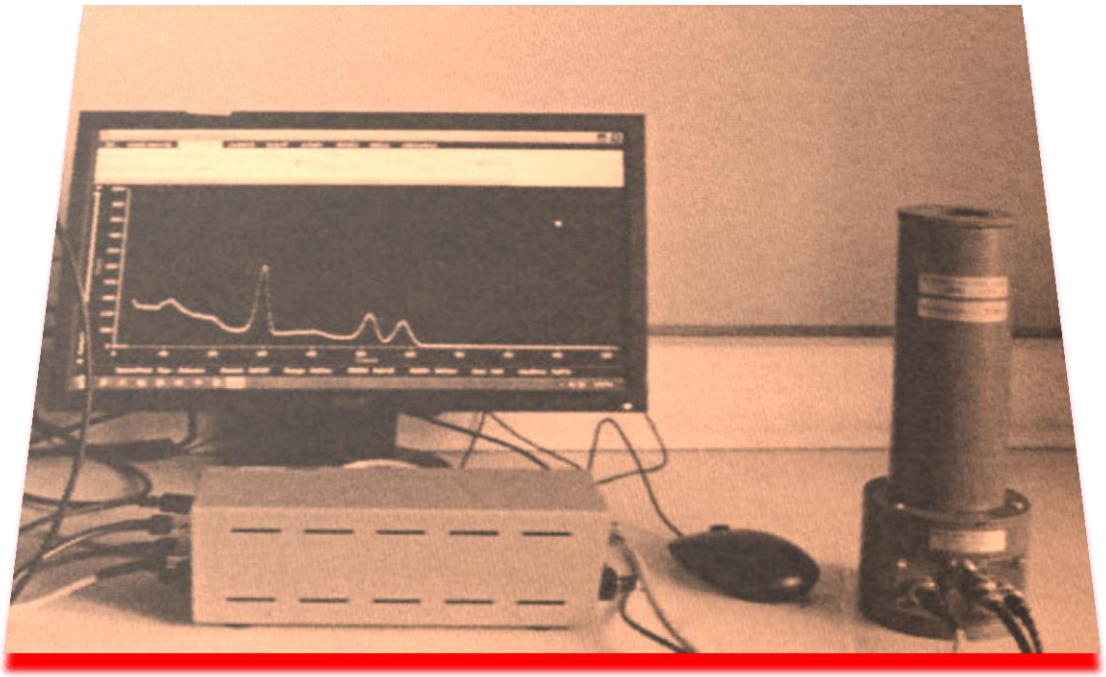

Figure 1 (Scintillation Counter System)

Analysis and Results

As depicted in figure- 2 the panels of SGR flux integrated data files between channel and integrated counts for half hour duration from time 16.30 IST to 17 IST on the dates March 19, 20, 22, 23, 25, 26, 27 and 28.

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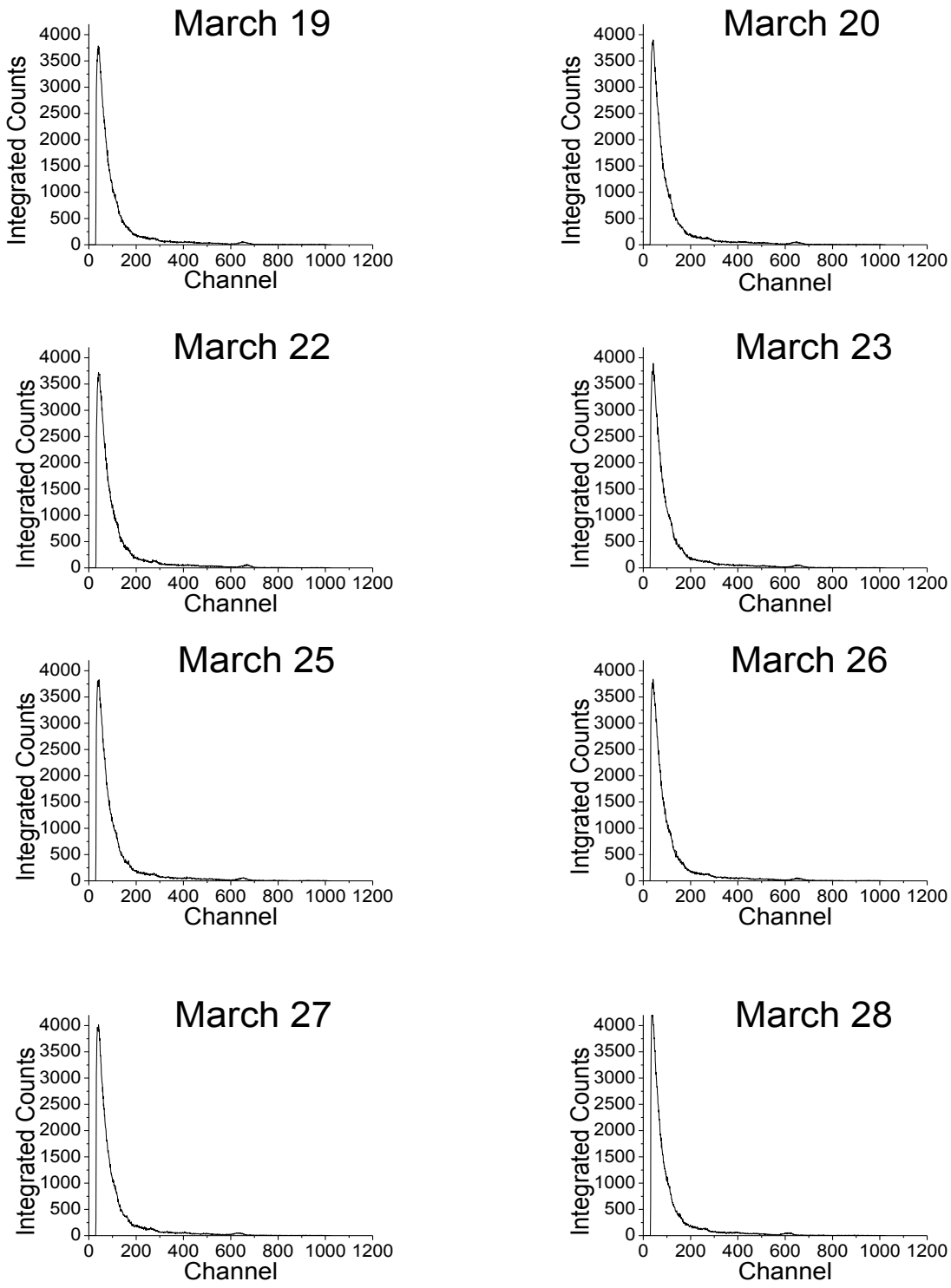

Figure- 2 (Panels of SGR flux integrated data files)

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Using Figure 2 we made the table 1 which represents integrated counts of secondary gamma radiation flux with respect to the dates March 19, 20, 22, 23, 25, 26, 27 and 28.

Sr. No.	Date	Integrated Counts
1	19	244822
2	20	248855
3	22	250821
4	23	251186
5	25	250048
6	26	249948
7	27	247709
8	28	246144

Table 1

Using figure 2 and table 1 of SGR flux integrated data files, we made figure 3 which represents integrated counts of secondary gamma radiation flux with date for the month of March, 2021.

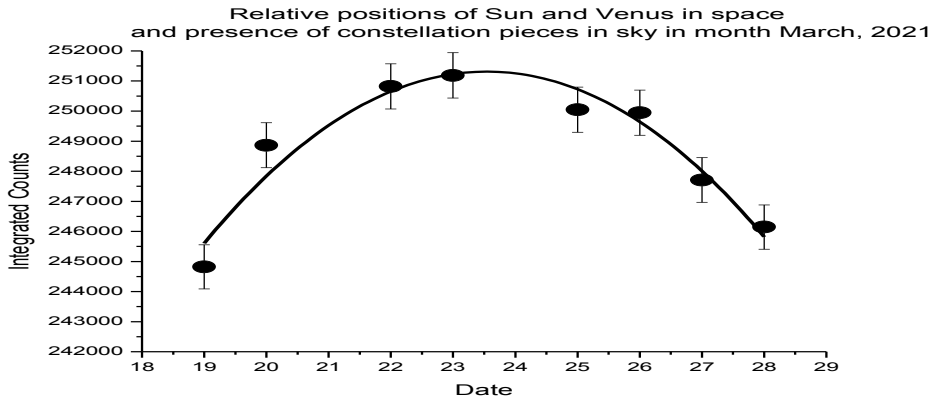

Figure 3 (Integrated counts of secondary gamma radiation flux)

Discussions

(4) Table 1 and figure 3 clearly showed that on March, 23 there were highest counts in this experimental study. On this date the Sun, Planet Venus are very close and almost in straight line with the background of constellation Pieces and planet Earth. Therefore on this date due combined gravitational lensing and gravitational pull by the Sun, planet Venus, Earth and constellation Pieces on background radiation, more radiation bent. These more radiation interact with atmosphere of the Earth hence formation of secondary radiation were more.

(5) Before March, 23 the planet Venus was approaching towards Sun. Therefore the integrated counts started to increase up to March 23. This is due to gravitational lensing, gravitational pulling effect started to increase and more secondary radiation formed in the atmosphere of Earth.

(6) After March, 23 the planet Venus was moving away from the Sun. Therefore the integrated counts started to decrease. This is due to gravitational lensing, gravitational pulling effect started to decrease and less secondary radiation formed in the atmosphere of Earth.

This experimental study is unique and first time we reported variation of secondary gamma radiation flux on surface of the Earth during change of relative positions of planet Venus and Sun and presence of constellation Pieces.

Conclusion

This experimental study gave the conclusion that during change of relative positions of

planet Venus and Sun and presence of constellation Pieces on the surface of the Earth

Acknowledgments

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ENHANCEMENT OF SECONDARY GAMMARADIATION FLUX DURING PERIHELION APPROACH OF COMET C/2020 S3 (ERASMUS) TOWARDS SUN ON DECEMBER 12, 2020 AT UDAIPUR, INDIA.

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Abstract

The experimentalstudy during perihelion approach of comet C/2020 S3 (Erasmus)towards Sun on December 12, 2020 at Udaipur (27^0 43' 12.00" N, 75^0 28' 48.01" E), Rajasthan, India was conductedon from, December 11, 12, 13, 14 and 15, 2020 using ground based NaI (Tl) Scintillation detector. The data files were stored in computer for half hourduration between times5.40 IST to 6.40 IST. The analyzed data reveal significant enhancement of secondary gamma radiation flux (SGR) about 2.7% during perihelion approach of comet (December, 12) towards Sun on comparison to the average integrated counts on another dates. We interpret such enhancement of SGR flux counts on the basis of perihelion approach of comet towards Sun, formation of secondary radiation from comet and formation of secondary radiation in the atmosphere of the Earth.

***Key Words**: Primary cosmic radiation, solar radiation, perihelion approach of comet towards Sun, formation of secondaryradiation from comet, formation of secondary radiation in the atmosphere of Earth.*

Introduction

Electromagnetic radiation coming towards the Earth is called cosmic radiation (CR). Cosmic radiation travels nearly the speed of light.Such radiation has about 89% nuclei are protons, 10% nuclei of helium, and 1% of others heavier elements (Lithium, Beryllium and Boron) [1, 2, 3].Primary cosmic radiation lies is from 10^9- 10^{20} eV or more [4]. On comparison interstellar abundances of the elements and solar system with help of cosmic radiation we can understand about their origin and propagation process through interplanetary space and arrive on the Earth. Simpson (1983) [5] showed that chemical abundances of cosmic radiation in different energy range. He made comparison between solar system abundances and estimated abundances for the local interstellar medium. He observed carbon, nitrogen, oxygen and iron group are present both in the cosmic radiation and solar system abundances. The atmosphereof Earth above 50 km from the surface of the Earth, the intensity flux of primary cosmic radiation is almost same as in the interstellar space. About 20 km form surface of the Earth secondary radiation produces a denser ionization. High-energy primary radiations undergo collisions with atoms of the upper atmosphere, and produce a cascade of lighter particles known as secondary radiation [6]. Therefore there is formation of shower of secondary particles. Secondary particles have X- rays, protons, alpha particles, pions, muons, electrons, neutrinos and neutrons. In each interaction the particles loose energy hence particles increase rapidly as these moves downward in the atmosphere and [7, 8]. In this way secondary particlesshower down through the atmosphere to the Earth's surface [9].

Secondary radiation contains three components which are electromagnetic component, hadronic component and masonic component [10], [11],[12]. The electromagnetic component has electrons and gamma particles. Hadronic component has low energy protons and neutrons.Masonic component has pions, muons, neutrinos and kaons. Therefore, penetrating cosmic radiation produced shower of secondary particles [13]. Produced secondary radiation flux can be detected using appropriate detector on ground [14], [15].

Gravitational lensing is the phenomena in which due to gravitational field of the object electromagnetic radiation when passing near a massive object then bends towards object.The object could a galaxy, a star, or a cluster of galaxies [16] , [17], [18]. This effect was proved by A. S. Eddington and collaborators

in a famous experiment during a total solar eclipse in 1919.

The comet C / 2020 S3 (Erasmus) was discovered by astronomer Nicolas Erasmus in the night of month September, 2020. After the discovery of this comet it has been travelling closer to the Sun and reached its nearest point called perihelion approach towards Sun on December 12, 2020. On this date the comet was inside the orbit of Mercury. Orbital period of this comet around the Sun is around 1900 years. Orbit ofComet around the sun is elliptical.

Comet Erasmus originated from Oort cloud.

A comet contains of ice and dust. Itcan be divided intothree part Nucleus, Coma and Tail. Nucleus of comet is a surfaceof black crustand it absorbs heat due to this ices present in the comet turn into gas. Enveloping part of comet is known as Coma.

Size of nucleus depends on distance from the sun. Comet has two tails known as gas tail and dust tail.Thedust tail is immersed by photons coming from the Sun and due to solar wind charged gases remains awayfrom the sun ingas tail of comet. It pushes away from the sun.

2. Celestial events and variation of radiation flux

Secondary radiation flux was observed bymanyscientist groups during normal days and on days of special celestial events such as Lunar eclipse, Solar eclipse, phasesof moon, appearance of comet in sky, closest approach of celestial objects, transit of celestial objects etc. with help of efficient counter system.

Many scientist groups conducted experimental studies to observe secondary radiation flux named Bhattacharya et al [19],Kandemir G. et al [20], Nayak. et al. [21],Bhaskar et al [22], Pareek et al [23].

Pareek et al. [23] conducted solar eclipse study to understand the interaction of GCR&SR flux with gravitational fields of the Sun and well-established shadowing effect of the moon.

To observe variation in secondary radiation flux many experimental studies were conducted by scientist groups during lunar eclipse named Pareek et al. [24], Raghav et al. [25], J.N. AnandaRao et al. [26]

Pareek et al. [24] did experimental study of lunar eclipse to observe variation of secondary cosmic and solar gamma radiation flux at some energy. Such results can be explained on the basis of bending of primary cosmic radiationand solar radiationbycombined gravitational lensing effect of Sun and Earth, backscattered Secondary flux form the Moon, combined magnetic field of the Sun and the interplanetary magnetic field.

Pareek et al [27] also conducted the experimental study during celestial event of transit of Venus June 6, 2012 at Udaipur India and observed 2 %. decrement in secondary solar radiation gamma ray flux.

Phases of Moon experimental study was conducted by Pareek et al., using Scintillation counter in the month of September 2000 [28].This experimental study was conducted to understand information about the GCR, SR modulation at the time of new Moon, Full Moon and different phases of the Moon with different background of constellation in the sky. Results showed that due to gravitational lensing effect abrupt change in energy spectra on 9^{th} and 10^{th} September 2000, when Moon was in background of Capricornus **constellation**.

During appearance of Comet Hyakutake in the month of March, 1996 anexperimental study was conducted by Pareek et al. [29] usingscintillation counter in the energy range of 10 keV to 5 MeV. Results showed unusual variation ofsecondary cosmic radiation flux in energy spectrum of specific energies of about1.127 MeV, 2.29 MeV and 3.66 MeV. With help of EUVEsatellite from this comet Extreme ultraviolet (EUV) emission was detected [30]. From Comet HyakutakeMumma, M.J. et al. [31], Peterson, K. [32] and Huebner, W.F. [33] reported large quantities of the gases ethane, methane, Co present and also water in icy form.

With the fact that during different celestial events happening in sky, modulate terrestrial secondary flux we, attempted to see effect of perihelion approach of comet C / 2020 S3 (Erasmus) towards Sun on December 12, 2020 on secondary gamma radiation flux at surface of the Earth.

3. Experimental Set-up and Observations

Scintillation detector of (SD 152 F) flat type (Figure 1) of Nucleonix make used in this experimental study to detect the secondary gamma radiation flux.The NaI (Tl) crystal of

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size 2" x 2" optically coupled with photo multiplier tube. This integral line was connected to 1k multi-channel analyzer (MC 1000 of Nucleonix make has 1024 channels) withusb interface built in high voltageand shaping amplifier.

This Scintillation counter system kept open to collect the counts as a function of timeon the roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' UniversityUdaipur (Rajasthan) India. The data files were stored in computer for half hour duration between time 5.40 IST to 6.40 ISTfrom December 11, 12, 13, 14 and 15, 2020

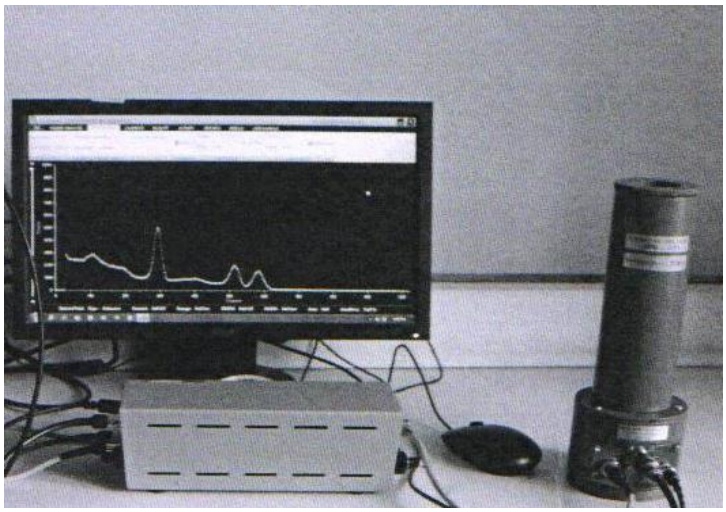

Figure 1 (Scintillation Counter System)

4. **Analysis and Results**

As depicted in figure- 2 the panels of SGR flux integrated data files between channel and integrated counts for half hour duration between time 5.40 IST to 6.40 ISTfrom December 11, 12, 13, 14 and 15, 2020.

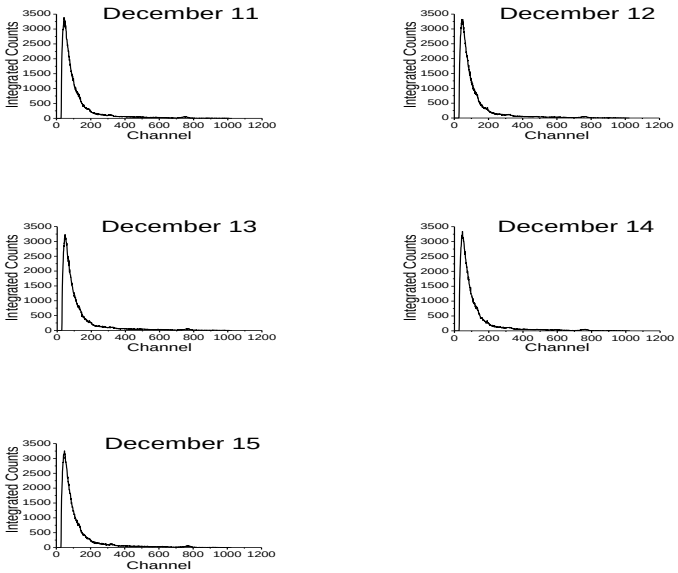

Figure- 2 (Panels of SGR flux integrated data files)

Using Figure 2 we made the table 1 which represents integrated counts of secondary gamma radiation flux with respect to dates (11, 12, 13, 14 and 15, December, 2020).

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Sr.No.	Date	Integrated Counts
1	11	257875
2	12	260636
3	13	248972
4	14	253469
5	15	255311

Table 1

Using figure 2 and table 1 of SGR flux integrated data files, we made figure3 whichrepresents integrated counts of secondary gamma radiation flux with date for the monthof December, 2020.

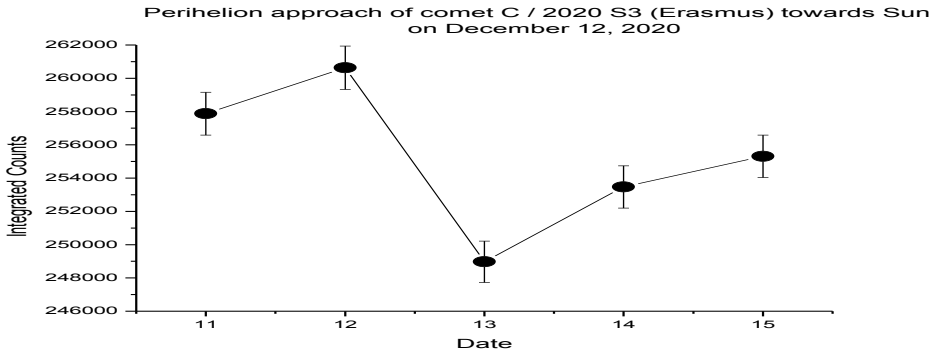

Figure 3 (Integrated counts of secondary gamma radiation flux)

Table 1 and figure 3 showed that on the dates December 11,12,13,14 and 15 the integrated counts were 257875, 260636, 248972, 253469 and 255311 respectively for half hour duration between times 5.40 IST to 6.40 IST.The perihelion approach of comet Erasmus towards Sun was on the date December, 12. The average of integrated counts of dates December 11, 13, 14 and 15(Normal Days) are 253906.

To see the variation in secondary gamma radiation we used the following formula:

$$\% \text{ of variation} = \frac{\text{Counts on date of perihelion approach of comet towards Sun - Average counts of normal days}}{\text{Average counts of normal days}} \times 100$$

Using this formula we observed about 2.7 % enhancement of secondary gamma radiation flux on the perihelion approach of comet towards Sun (December 12) on comparison to average counts of normal days (December 11, 13,14 and 15).

Discussions

Table 1 and figure 3 clearly showed that integrated counts on the date December, 12 were highest on the comparison to other normal days.

The probable reasons in this presentexperimental study for the enhancement of SGR flux counts
are as follows:

1. On date December, 12 the comet Erasmus was in the position of perihelion towards Sun and we got highest integrated counts. This surprising result was unique and it could be understand dueto strong impact of high energy cosmicradiation andsolar radiation on the nucleus of comet which contains water, Methane, Ethane and other gases. Due to such strong impacts on comet materials there may formation of secondary radiation flux. This secondary flux directed towards the Earth atmosphere for further production of secondaryflux. This enhances secondary flux.
2. On December, 12 comet tail expanded towards Earth, therefore more charged particles entered in the atmosphere of the Earth, which may

produces more secondary radiation flux in the atmosphere of the earth

3. Other than date December, 12 we got less integrated count because the comet was not at the perihelion approach toward Sun and after this date (December, 12) comet receded awayfrom the Sun.

This experimental study is unique and first time we reported such enhancement of

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secondary gamma radiation flux at the surface of the Earth during perihelion approach of comet towards Sun.

Conclusion

From points (1) and (2) we can understand enhancement of secondary gamma radiation flux about 2.7 % at surface of the Earth on December, 12 when the comet was in the position of perihelion approach towards Sun.

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ECONOMIC GROWTH: IMPROVEMENT IN CONSUMPTION PATTERN OF RURAL AREA

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Abstract

Economic growth is the main factor which brings change in our consumption pattern. Economic growth is an important factor that affects consumption pattern. India has achieved remarkable quality of life by high rate of gross domestic product (GDP) growth in the last two decades. The most direct and significant result of economic growth in rural India is the improvement in quality of life as high nutrient food, comfortable living, health care and other quality services. The rural territory is experiencing a steady but considerable change. There is a shift in income sources and consumption patterns by consumers in rural area. Rural Indian consumers' earning, saving and consumption patterns are rapidly changing. Social and digital media platforms have exposed rural people to the world which has changed living style of rural people. Their expenditure heads have been shifted from traditional food items (as millet, rice, wheat etc) to non-food items 72.9% to 63.2% and later to 48.6%. Proportion of Expenditure on non-food items increased from 27.1% to 36.8% and further to 51.4%.

This paper will reveal as how rural Indian are spending their income on household items which include various items as food, clothes, lighting and fuel, health and education and so on.

Keywords: *Consumption Pattern, Quality of life, Rural Territory, Social & digital media platform, Traditional food items.*

Introduction Today every country is trying to make comfortable and easy life of their citizen and providing favorable place for easy life condition. Indian government has taken various measures in development process since independence. Indian economy shows significant indication of the developmental change after 70 years of the period.

Consumption is a major indicator of the economy that reflects the conditions of the economy. Consumption level and consumption pattern is very strong indicator of the health of the economy. It's very clear that the consumption depends on the income and its level. Individual's consumption patterns reflect their living standard. Keynesian economic thought is also about income consumption relation. Therefore Consumption and consumption pattern are vital concepts from economics. Consumption is normally the largest Gross Domestic Products component. Consumption comprised of approx 52% of the Gross Domestic Products (GDP) before economic reforms, however after reforms, it has grown above 62%. Income is distributed in the consumption of three categories of products, namely durable, nondurables and services. Since 1991 economic reforms were continued by various governments, the economy grew above 6%, which resulted in improvements of income dynamics.

Consumption patterned has been changed especially when incomes had increased. When income increases, the buying of goods also increases. Wide selections of products are available today. It could be possible through importing and trading technological aspect has paved the way for easier shipping and packing. Indian consumer has undergone an outstanding transformation in their consumption pattern. Today, all people either urban or rural are well equipped with a higher income, credit cards. People of rural areas are also adopting the shopping culture of the west and their desire is to improve standard of living. The Indian consumer is spending like never before. Organized retail with its variety of products and a great number of malls and supermarkets is fuelling consumer's addiction.

Growth in real per-capita income during the 1990s and onwards of labour force in rural area has given households access to higher quality of life, with vehicles, refrigerator, Television etc. There has been changed in

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household expenditure shares on food purchased from modern versus traditional retail outlets as incomes grow. The economy's stock of capital almost doubled, causing gross domestic product (GDP) per capita to increase by about 30%, while the savings rate fell from 23% of disposable income to about 8.8%.

Objective of the study

To study the change in the consumption pattern of rural household due to the change of income and modernity of the society.

Research Methodology

The research paper is based on the secondary data sources from consumption data of NSSO rounds, journals, magazines, articles and media reports. The research design employed in this study is of descriptive type keeping in view of the set objective.

Income and Consumption Pattern

The most important determinant of consumption is income. The rural households obtain their income from several sources like agriculture, apiculture, horticulture livestock and poultry, wages and other self employed activities. Rural consumption pattern has been improved because rural residents getting more cash money through minimum support price (MSP) for food grains and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA) is also became big source of income. There has been a regular rise in the minimum support price for wheat and paddy. This has provided higher income to farmers. Wages under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA) are linked to inflation which has put a floor to wages and boosted income for daily-wage earners. The trend has been aided by a hike in share of non-farm activity in rural economy. Rural economy is no more about farming. Nearly half the rural income is accounted by non-farm activities like construction, retail, repairs, transport, communications, pottery, small scale manufacturing, tailoring and financial services. Their significance continues to rise as core agriculture sector has done well and the government has been supportive.

Propensity to consumption of rural households have higher, higher income has translated into greater spending.

To improve the infrastructure in rural areas the Government of India has planned various initiatives that will have a multiplier effect in increasing movements of products, services and thereby improve earnings potential of rural areas subsequently improving consumption pattern.

- The Government of India approved the plan to construct 10 million houses for the rural people, government has planning to Rs 81,975 crore for the period from 2016-17 to 2018-19.
- The Government of India aims to supply tap water regularly to every household by 2030 in accordance with United Nations Sustainable Development Goals, which require a funding of Rs 23,000 crore annually until the target is reached.
- The Government has introduced various reforms in the Union Budget 2017-18 to boost the rural markets. A number of the key highlights of the Budget are as follows:
  - Rs 187,223 crore has been allocated towards rural, agriculture and allied sectors.
  - The Allocation for Pradhan Mantri Aawas Yojana (Gramin) has been increased from Rs 15,000 crore to Rs 23,000 crore within the year 2017-18. Government target is to finish 10 million houses for the houseless by the year 2019.
  - Roads construction speed under Pradhan Mantri Gram Sadak Yojana (PMGSY) has been accelerated to 133 kms per day which was an average speed of 73 kms per day during the years 2011-14.

  The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has been allocated Rs 48,000 crore in the year 2017-18, which is the highest ever allocated amount.

Consumption Trends in Rural Area

The NSSO conducts a survey for household monthly expenditure on food, tobacco & intoxicants, fuel, conveyance, clothing, bedding, education, medical services, sanitary services, rents, durables goods, personal care and house construction in every five years or earlier.NSSO various rounds data reveal rural India's consumption expenditure grew at a faster pace than urban India's since 1991. From 2007-08 to 2011-12, the monthly per-capita consumption expenditure in rural areas has increased at a compound annual rate of

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16.7%, compared with 15.6% in urban. Within the previous three years, rural consumption had risen at a compound annual rate of growth (CAGR) of 11.4 per cent, against 11.8 per cent for urban areas. For instance rural consumption has increased at a CAGR of 17.2 per cent, against 8.2 per cent in urban areas in Bihar.

Robust demand growth in villages has helped makers of commodity beat the economic slowdown and declining sales due to weakening consumer confidence in urban India. Since 2005-06, the combined income for India's top 25 consumer goods companies has raised at a CAGR of 16.3% more than double the pace seen within the previous five years.

It is noticeable that a better income level family spends less on the food and more a part of the expenditure goes to the non-food. If the extent of income goes up than a consumer will save more and therefore the consumption shifts from food to non-food. So this pattern of consumption of Indian rural economy is additionally shows a good sign of development and it also reflects the expansion of an economy. It's the changing point, where the economy will go faster pace of development.

The monthly per capita consumption expenditure on food has been declining in rural areas, it had been approximately 73% in 1972-73 and it has been 53% in 2011-12. The expenditure on cereals has fallen from 41% of consumer expenditure to 18%. The expenditure on non food items has increased during same period from 27% to 47.24%. During this period overall consumption expenditure at the household level has gone up. The share of light and fuel in total consumer expenditure has risen from 6% to 10% between 1972-73 and 2011-12.The share of clothing in total consumer expenditure has fallen from 7.8% to 4.5%.

Item Group	Expenditure on specific group as % of total consumer expenditure				
	1972-73	1983-84	1993-94	2004-05	2011-12
Cereals	40.6	32.3	24.2	18.0	18.0
Other food items	32.3	33.3	39.0	37.0	34.8
Non- food items	27.1	34.4	36.8	45.0	47.2
Total expenditure	100	100	100	100	100

Source: National Sample Survey Organisation, Various Rounds

If we mention COVID-19 pandemic the rural consumers bounced back much faster than urban counterparts when it came to shopping for food, personal care products or consumer durables goods. The rural growth is continued with rural markets showing the robust 14.2% growth in October- December 2020 quarter where as a 10.6 % growth was in July-August quarter. This sharper recovery of rural area is on the back of favourable agriculture sector performance, government initiatives towards rural development and lesser impact of the pandemic on rural India.

Recommendation

The most important determinant of consumption is income and when income increases consumption pattern also changes. Following are some recommendation to raise income.

1. **Skill development and employment for the future workforce-**

According to the World Economic Forum's report "The Future of Jobs 2018", more than half of Indian workers would require reskilling by 2022 to meet the talent demands of the future. They will each require an extra 100 days of learning, on an average.

2. Socioeconomic inclusion of rural India-

A high priority is infrastructure development physical and digital both to enable rural habitants to access the products and services matching their incomes. The government already has flagship programmes like Digital India, which envisions transforming the country into a digitally empowered society and knowledge economy. Improved physical infrastructure such as road connectivity to nearby urban centres and reliable power supply to all rural households, will be key drivers to ensure inclusive growth in India, truly bridging urban-rural divides across multiple levels.

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3. **A healthy and sustainable future**

India is marching forward but facing new challenges in health and sustainable living, whilst it has achieved key health targets such as polio eradication. Two key challenges must be solved to enhance the quality of health and concrete livability for India's citizens at the macro level.

First, while improving overall access to and affordability of healthcare services, it will be crucial to deal with the advent of non-communicable diseases (NCDs). NCDs are on the increase, due to unhealthy food and lifestyle choices, across both urban and rural areas, and across income segments. Second, the approaching crises in air and water pollution, waste management and urban congestion must be urgently solved.

Conclusion

The above study shows that various NSSO rounds total percent expenditure on non-food items exceeds over expenditure on food items and it shows a clear significant shift from food to non-food items. It is good sign for the developing country like India and especially Indian rural economy. This paper also reflects that Indian rural economy is in very positive and healthy condition. This transition is taking place at different stages and form. In general whenever and wherever economic growth occurs per capita shift in consumption shows the same change of direction.

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INDUSTRIAL DEVELOPMENT IN INDIA

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Abstract-

Industrialization is the process of economic development in which most of the resources of the country are brought into the industry to develop up-to-date technology and industry diversity to overcome the economic and social backwardness. Industrialization reduces the dominance of the primary sector in terms of employment and income generation and increases the share of the manufacturing sector. Changes in the commercial structure of the population increase the rate of urbanization by re-linking the rural and urban population. In addition, the dominance of traditional goods in foreign trade decreases and the proportion of industrial goods increase. Along with the transformation of the second sector, the service sector also develops and expands. In post independence period many industries have been established in India. Bhilai, Bokaro, Rourkela, Ranchi, Jameshedpur and Renukoot are the emerged as major centers during the first one and half decades of independence. After that lot of medium and small scale industries are established in all states. At present the main sector of industrialization are electronics, transport and telecommunication. As compared to developed countries there is very little industrialization in India and near about 10 per cent of the total workers are employed in it.

Keywords- *Industrialization, Population, Infrastructure, growth rate*

Phases of Industrialization: - There are following four phases of industrialization,

1. **First Phase:** The period of first phase was first three five plan that is 1950 to 1965. In this phase the industrial sector was extremely underdeveloped with very weak infrastructure. The first five year plan did not envisage any large scale programs for industrialization but in second five year plan given more priority to industrialization and to create strong base for the industrial development. The plan includes substantial investment in the Iron and steel, Coal, Heavy Engineering, machine building, heavy chemicals and cement industries of basic importance. The third five year plan followed by second five year plan as a result, great emphasis on building up the capital goods industries in public sector. It means in first phase industrial development in India laid the strong foundation and acceleration in the growth rate of the industrial production. The growth of industry has consistently fallen for short of the targets laid down in the successive plan. In the first three five year plan the target growth rates for industry were set approximately at 7, 10 and 10 per cent per annum respectively.
2. **Second phase:** The period of second phase was 1965 to 1980. The first phase mostly focused on the development of capital goods sector. Due to this, the consumer goods sector was neglected. In the fourth and fifth five year plan the target growth rate for industry was set 12 and 8 per cent per annum respectively.
3. **Third Phase:** The Period of third phase was 1980 to 1991. This period was considered as the period of the industrial recovery. The period saw a revival in the industrial growth rates and also marked by significant recovery in the manufacturing and capital goods sector.
4. **Fourth Phase:** Phase four is also known as post reform period. In this period India accept new economic policy in 1991. In this period India took major economic liberalization decision to improve the performance of the industrial sector. Policy of liberalization was adopted for the investment of foreign multinationals. It was also given importance to the removal of regional imbalances and encouraging the growth of employment in small and tiny sector.
5. **Ninth Five Year Plan:** Ninth five year plan was more focus on crude oil, cement, coal, infrastructure, consumer goods, and electricity,

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refinery and steel products. In the ninth five year the target growth rate for industry was set 8.5 per cent per annum.

6. **Tenth Five Year Plan:** Tenth five year plan was more focus on modernization, technology, up gradation, reducing transaction cost and increasing exports. Plan also be recognized that there should be a need to need to rapid industrial development because it helps to generates more employment and brings faster reduction in poverty.
7. **Eleventh Five Year Plan:** The basic theme of eleventh five year plan was inclusive growth. In the eleventh five year the target growth rate for industry was set 10 per cent per annum.
8. **Twelfth Five Year Plan:** In tenth five year plan the planning commission is expected to create more employment through developing India's manufacturing sector. The planning commission indicated that it aims to have industry and manufacturing related activities grow by 11 per cent during this period.

Target and Achieved Growth Rate in Planning Period:

Sr. No.	Name of Plan	Period of Plan	Target Growth Rate (%)	Achieved Growth Rate (%)
1	First Five Year Plan	1951-1956	2.1	3.6
2	Second Five Year Plan	1956-1961	4.5	4.2
3	Third Five Year Plan	1961-1966	5.6	2.4
4	Plan Holiday	1966-1969	-	-
5	Fourth Five Year Plan	1969-1974	5.6	3.3
6	Fifth Five Year Plan	1974-1978	4.4	4.8
7	Rolling Plan	1978-1980	-	-
8	Sixth Five Year Plan	1980-1985	5.2	5.7
9	Seventh Five Year Plan	1985-1990	5.0	6.0
10	Annual Plan	1990-1992	-	-
11	Eighth Five Year Plan	1992-1997	5.6	6.8
12	Ninth Five Year Plan	1997-2002	6.5	5.4
13	Tenth Five Year Plan	2002-2007	8.1	7.7
14	Eleventh Five Year Plan	2007-2012	8.0	-
15	Twelfth Five Year Plan	2012-2017	8,0	-

From the above table it is evident that, since the first five year plan growth rate set was 2.1 per cent and in the subsequent growth rate was gradually increased and in the twelfth five year plan the target was 8 per cent. Similarly the achieved growth rate in the first five year plan was 3.6 per cent it also gradually increased and sometimes decreased. The duration of the period from 1966-1969 was called plan holiday while the period from1978-1980 was labeled as rolling plan and the period from 1990-1992was known as annual plan.

Role of Industry in Development:

India is a predominantly agricultural country so development of industrial sector is must. In India there is a vast manpower, large and varied resources and continental dimensions. The main arguments put forward in this regards are as follows,

1. **Rapid Growth in Income:** Industrial development definitely provides a rapid growth in income. Industrial production mostly depends upon man's efforts, as against agriculture where man's hard work is restricted by the limiting factor of nature. In the sphere of industries, man can by putting in more efforts and application of ever improving technology, push on with the objective of producing more economic goods. The empirical evidence suggests a close correspondence between the high level and income and industrial development.
2. **Increase in Demand for Industrial Product:** Day by day the demand of industrial product is going to increase. Many people are spending their income mostly upon non-food items that is dairy products and junk food. It means the income elasticity of demand of the manufactured goods is high and that of agriculture products low.

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3. **Export- Import Elasticity:** Developing industries are concentrating on the products of primary goods and export them and they are import industrial goods from industrially developed countries. But the income-elasticity of export goods of agricultural countries is low while income elasticity of import goods is high. The demand for agricultural products in developed countries is very low, so developed countries have surpluses in agricultural products for exports. As against this the demand for the import of manufactured goods by underdeveloped countries is very intense.
4. **Absorbing Surplus Labour:** Indian economy is characterized by surplus labour in agriculture sector. Industrial sector absorb all this surplus labour and to provide jobs because industries can generate employment opportunities on an accelerate rate.
5. **Strengthening the Economy:** Industrialization of the Indian economy can provide the necessary elements of strength to it, for this it refers to four things. Firstly, the development of industries producing capital goods like machines, equipments etc. secondly, it makes possible the production of goods like railways, dams etc., which are in any case non importable. These are by and large of the nature of economic infrastructure for the future growth of the economy. Thirdly, it is through the establishment of industries that one can impart elasticity to the system and overcome the historically given position of a primary producing country. With this we can change the comparative advantage of the country to suit its resources and potentialities of manpower. Fourth one is, the requirements for the development of agriculture can be met, for example, improved farms-implements, chemical fertilizers, storage and transport facilities.
6. **Providing Security:** When some international crisis develops then industrialization is provide security to country. Because dependence on foreign sources for defense material is a risky affair in such situations. It is only through industrial development in a big way that the material objective of self reliance in defense material can be achieved.

Major Successful Industries before Independence:

Sr. No.	Name of the Industry	Year of Establishment	State/ Place
1	Aluminum Industry	1837	Jaykaynagar, West Bengal
2	Cotton Textile Industry	1854	Karasji Davar, Mumbai
3	Jute Industry	1855	Rishra, Kolkata
4	Iron and steel Industry	1874	Kulti
5	Woolen Textile Industry	1876	Kanpur
6	Paper Industry	1881	Titagarh, West Bengal
7	Cement Industry	1904	Chennai
8	Chemical Fertilizer Industry (Super Phosphate Plant)	1906	Ranipet, Tamil Nadu
9	Shipping Industry (The Hindustan Shipyard)	1941	Vishakhapatnam

In brief, the history of economic development of developed nations shows that the process of industrialization has played a pivotal role in the economic development of these nations, and as a result in the twentieth century underdeveloped and developing nations of the Third World have given priority to industrialization. At present, economic development of a country means accelerating the process of industrialization in that country. Even in a developing country like India, the emphasis is on industrialization to achieve post-independence economic development. In the words of Pandit Jawaharlal Nehru, the point of view towards industrialization is clear from the statement that the real progress ultimately depends on industrialization.

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MAHARASHTRA'S EUGENE GARFIELD: THE DR.PAWAR R.S.

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Abstract

Maharashtra state is one of the most developing states of India in every field of education. Many research guides of the state supervise the research scholars for getting mastery in the concerned subject. The Dr.Pawar R.S. of guru Budhi swami college Purna is one of the research guide and citation experts of the state as the previous well known citation expert Garfield. Eugene Garfield's theory and practice of information science and envisioned information systems made the discovery of scientific information more efficient. The citation as a qualitative measure of academic impact was introduced by Eugene Garfield. Eugene Garfield also created science citation index which helps us awareness regarding citation. In the citation there are three disciplines like Scientometrics, informetrics and Webometrics. By using Garfield's ideas researchers gather scientific information, findings, and advance their research careers. This article contains Dr. Pawar R.S. ideas on citation analysis for library and information science research scholars to gather information scientifically.

Keywords: *Science Citation Index, information science; scientific information, Scientometrics, informetrics Webometrics.*

Introduction

Library and information science education covers all the points which are very necessary. The different research title improves the library and information science education in all over the world. Near about number of topics are covered under library science research. Citation analysis is one of the famous and necessary topics of research which gives the knowledge about the each field of education, like art's commerce, and science including medical science, engineering and technology. With the help of citation analysis of a particular subject it should be noted that the collection of information, using criteria, and the repetition of the articles. Uses of books, articles, references, are counted to show the importance of particular book, articles, and journals. This helps to the researcher and students for improving their knowledge by studying different most cited books, journals, and article. Citation analysis is actually the analysis of the bibliographical reference which is appended with any of the research communication. It studied that the citations in scholarly works to establish links to other researchers by counting the citations appended at the end of each research article or scientific article. The citations only provide the bibliographic data of the used documents. Citation analysis use to understand subject relationships, authorship pattern, impact, publication trends, and bring out useful information, relative use of documents like books, periodicals, e-resources, reports, Ph.D Dissertations, conferences, standards and patents. These documents will be better to utilize for Bibliometrics studies. The Citations analysis method is most popular in current period for identification purpose of the core references in a any subject. With the help of citation analysis we can evaluate and interpret citations received from articles, authors, institutions, and different indications of scientific activity. Therefore it helps us to identify the quality of any information sources.

Eugene Garfield

Eugene Garfield was born in New York City of America. He was a linguist and a good businessman. The term citation analysis was first used by Garfield. Garfield was the research assistant in the university department. He found this citation analysis method for simple understanding purpose of the scholars. In 1960 the institute for scientific information founded in Philadelphia developed innovative information product which revolutionized science. This institute provides scientific

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information to all researchers over the world by publishing table of contents of key scientific journals in journal current contents. He propelled the concept of citation indexing and citation linking which is the most important way for today's search. He founded web of sciences, and considered English as the international language of science. The Science Citation Index was created by Garfield which is one of the most important for modern science. The idea's given by Garfield's using citations in articles to index scientific literature made a new method of analyzing, disseminating, discovering and collection of scientific information. The Science Citation Index helped for building new information in the form of Web of Science which contains Essential Science Indicators, and Journal Citation Reports. It also developed new disciplines like Scientometrics, informetrics, and Webometrics. The impact factor of any journal is the most accepted tool for measure the quality of journals.

Dr. Pawar R.S.

Most of the countries of world are advanced in the field of education. India is one of these countries for advancement in education. In India some states are more developed in the field of education, in that Maharashtra states also improving very well. The most important field of education for research scholar is library and information science. Most of the students made their career

Methodology

Dr. Pawar R.S. has excellent command over the citation analysis topics. He guides the research scholar to complete their sketch of research on citation. For every research scholar it is very important to choose a valuable and informative and result oriented topic for research. It is the most difficult time to choose such topic in field of research. In the field of library and information science most of the topics are covered under the title of citation analysis, but truly none of the guide given such a title for citation analysis like the Dr. Pawar R.S. which is comparatively very similar to the Eugene Garfield who found the citation methods. The research scholars from the campus of swami ramanand teerth Marathwada University choose citation analysis topics on the doctoral dissertation in in the field of library and information science. The best educational institutes for library and information science under the swami ramanand teerth marathwada university is the Pawar college of library and information science Purna Dist.Parbhani of Maharashtra states runs under the guidance of Dr. Pawar R.S. he is from Wazur gaon of Parbhani District. He has doctoral degree in library &information science and more than thirty years of experience in the same field in marathwada region. Dr.Pawar R.S. spread important information and subject knowledge for librarian, library science student and research scholars from the last three decades. He is a well known librarian and professor for library science. He is also the president of library association of Maharashtra states. He did not have leisure time during his working period but he adjusts time for research scholar and other students those who want some guidance related to their problems. Dr. Pawar R.S. has command over the Citation analysis. Number of students, research scholars, working professionals got very informative and valuable information regarding citation, Bibliometrics, informetrics, Webometrics, and Scientometrics. Now these days he has four research scholars doing doctoral degree under his guidance and supervision on different research topics in which citation analysis is the most favorite and important research topic for Dr.Pawar R.S.

pharmaceutical science. As this scholar concerned under the guidance of Dr. Pawar R.S. they advised him to modify the research topic as "Scientific Citation", before the selected research topic. It means that any research topic in the subject of science has the scientific information, if its gather in scientific manner will be more beneficial and usable for the others scholars and students, doing their research in the same field under different research topics. Dr. Pawar R.S. has excellent knowledge about the prepration of research articles, dissertation, book chapters, seminars papers, and conference presenting papers for library and information science, as he attended most of the seminars and conferences in country and out of the country with informative papers which are also published in international journals. Methodology for doing

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citation analysis was explained by Dr.Pawar R.S. is as follows.

1. Research scholar should prepare mentally for doing citation analysis of the choose topic.
2. The topic should be concerned with the basic degree of the scholar in which area he want to search for citation analysis. This helps him to ease the work fast and fairly.
3. Many library science scholars are science graduate they have to choose only science research topic for citation analysis.
4. Those who are arts and commerce graduated they should take only arts and commerce citation analysis research topics.
5. Citation analysis topics will be choose on post graduate ,doctoral dissertation, journals depending upon the capacity of searching of scholars.
6. The methodology for any citation analysis very easier than other research topics methodologies of the library science.
7. Research scholar has to collect the data related to the topic and then analyze the data by caring the methods of citation analysis.

Objectives:

Following are the objectives for any research related to citation analysis choose by any research scholar, Ph.D student and library science professional guided by Dr.Pawar R.S.

1. To analyze the citation of Ph.D thesis
2. To observe the nature of authorship pattern
3. To examine the kinds of books and journals
4. To observe the chronological distribution of citations
5. To rank the journal (cited).
6. To rank the books (cited).
7. To rank the conference (cited).
8. To rank the web-resources (cited).
9. To find out the distribution of Indian and Foreign authors.
10. To rank the authors (cited).
11. To rank the publisher.
12. To assess the availability of the highly cited journals.

Hypothesis, reason for selection of topic and other basic points of any synopsis will be made depending upon the research data availability. The bibliographical references used by the researchers at the end of each chapter or end of the dissertation will be taken as the source of data for citation. For this study

8. There are different methodologies for every research which include.
   1. Applied and Fundamental research.
   2. Descriptive and Analytical research.
   3. Scientific research
   4. Historical research
   5. Survey research
   6. Sampling research
   7. Qualitative and Quantitative research.
   8. Conceptual and Empirical research.
   9. Field and Table research.
   10. One time and longitudinal research

Dr.Pawar R.S. gives suggestion to research scholar, they have to choose sampling method for doing citation analysis. It is most widely used method and well known in all human societies, and by referring these valuable methodology tips for research every scholar will solved his problem for choosing research methodology. Keeping in view the objective of the study Dr.Pawar R.S. guide one of the research scholar have the research title as "Scientific Citation analysis of doctoral Dissertation in Pharmacy from Universities in Maharashtra State in the year 2011_2018."

of citation analysis each book, journals, patent, web resources, technical reports PhD dissertation, seminar, conference proceedings are taken. The collected data classified, tabulated, presented, analyzed and interpreted. Dr.Pawar R.S. focuses on the development of citation analysis as a research method, uses and abuses of this method, and prospects for the future. Every time he inform to the scholar and student regarding the citation, which represents a relationship between the cited and citing documents. There are many a reason by which author cites the documents. Most of the time nature of relationship is difficult to characterize. Chapter making is also one of the main criteria for any thesis. Depending on the nature of synopsis there is chapter are distributed, generally introductive part of the selected topic will be explained which includes research methodology also, then reviews of related literature, which contain similarly work done by taking different titles, then interpretation of data collection, data analysis and finally finding and conclusion. Last parts of any thesis contain bibliography and appendix. Simply reading different types of books related to how to do research any

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research scholar can command over the

Difficulties During citation analysis:

Dr Pawar R.S. highlighted some basic difficulties comes during citation analysis as follows:

1. Multiple authorship
2. Self Citation
3. Homograph
4. Synonyms
5. Types of sources
6. Implicit citation
7. Fluctuation with time
8. Field variation
9. errors

These points are to be understood very well by the scholar before doing citation analysis. These are very important key points for any citation. With the help of these points one can do citation very well and scientifically.

Citation Analysis Development

Dr.Pawar R.S. explains about the development of citation analysis. The development of citation analysis has new techniques and measures, the exploitation of new tools, study of different units of analysis. The rapid growth increases the number and types of studies using citation analysis. To determining the how many citations received by a given document and set of documents over a period of time from a particular set of citing documents, the easiest technique used is a citation count. This count will be applied to articles appears in a particular journal. This can be refined by calculating the impact factor, the average number of citations received by articles published in a journal during a specified time period. This measure allows one to compare the "impact" of journals which publish different numbers of articles. There are two techniques devised to identify documents closely related are bibliographic coupling and cocitation ana1ysis. In cocitation earlier documents linked because they are later cited together, and in bibliographic coupling later documents linked because they cite the same

writing dissertation and any research articles.

Application:

1. Literature of studies
2. Types of literature studies
3. User studies
4. Historical studies
5. Communication patterns
6. Evaluative Bibliometrics
7. Information retrieval
8. Collection development

Dr.Pawar R.S. gives their opinion as the number of journals, books, research articles are publishing in uncountable number and very advancement in theory and practice gives rise to the development of citation analysis. They also suggest to the researchers for continue contributing in these areas. In practice, simply the citation counts bibliographic coupling, cocitation analysis, evaluative Bibliometrics, cocitation and context analysis.

earlier documents. The difference in between both is that bibliographic coupling is an association intrinsic to the documents and cocitation is a linkage extrinsic to the documents, in which one is valid only so long as they continue to be cocited.

Conclusion

The most essential part for any research papers, particularly in the field of sciences is nothing but the list of references pointing to prior publications. The scientific paper did not stand alone; it is embedded in the literature of particular subject. The references are the acknowledgment in which one document gives to another or one document receives from another it means that, citation implies a relationship between a part and the whole of the cited document and a part or the whole of the citing document. Eugene Garfield was the earlier founder of citation who gives valuable contribution related to citation. The same efforts don by Dr. Pawar R.S. for the proper guidance in the research area of citation analysis makes him the Eugene Garfield of the state for library and information science research scholars.

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CHANGE OF POSITION OF MOON IN SKY AND EFFECT ON SECONDARY GAMMA RADIATION FLUX IN MONTH OF NOVEMBER, 2020 AT UDAIPUR, INDIA

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Abstract

We observed the variation of secondary gamma radiation flux in the month November, 2020 at Udaipur (India). We collected data with help of ground based NaI(Tl) scintillation detector as a function of time. Analyzed data showed variation of secondary gamma radiation flux (SGR) in month of November. Probable reason of such variation of SGR flux on the basis of changes of position of Moon in sky.

***Key Words**: Position of Moon in sky; cosmic radiation; reflected solar radiation; secondary gamma radiation.*

Introduction

Cosmic radiation travel at nearly the speed of light and composition of cosmic radiation is about 89% protons, 10% of helium, and about 1% of others heavier elements [1, 2, 3]. This type of radiation propagates through space, arrives on the Earth and energy range of primary cosmic radiation is from 10^9- 10^{20} eV or more [4]. Radiation coming from the Sun is known as solar radiation (SR). Simpson, J. (1983) [5] pointed out chemical abundances of cosmic radiation in different energy range. Cosmic radiation (CR) and solar radiation (SR) strikes on atoms of the atmosphere of the Earth produce secondary particles known as secondary radiation [6]. Therefore, penetrating radiation produced secondary shower. These particles increase rapidly as these moves downward in the atmosphere and in each interaction the particles loose energy [7, 8] .Secondary particles have pions, muons, neutrinos gamma radiation, electrons and positrons. In this way secondary particles shower down through the atmosphere to the Earth's surface [9]. Such radiation has three components as electromagnetic components, hadronic component and masonic component [10], [11], [12].

Presence of gamma radiation flux in secondary particles known as secondary gamma radiation (SGR) flux [13]. At surface of the Earth secondary radiation can be detected using appropriate detector [14], [15]

A. S. Eddington and collaborators in a famous experiment during a total solar eclipse in 1919 observed the gravitational lensing effect due to Sun. Electromagnetic radiation bends by the massive objects when passing near the object. It is due to gravitational field of the object [16], [17], [18]. The object could a Star, galaxy or a cluster of galaxies.

During solar eclipses scientist groups [19], Kandemir G. et al [20], Nayak. et al. [21], Bhaskar et al [22], Pareek et al [23] observed the variation of secondary radiation flux.

Pareek et al. [24], Raghav et al. [25], J.N. Ananda Rao et al. [26] observed variation in secondary gamma radiation flux during lunar eclipse. It can be explained on the basis of bending of primary cosmic radiation and solar radiation due to combine gravitational lensing effect of Sun and Earth and backscattered Secondary flux form the Moon.

Pareek et al [27] also conducted the experimental study during celestial event of transit of Venus June 6, 2012 at Udaipur India and observed 2 %. decrement in secondary solar radiation gamma ray flux.

Using Scintillation counter system Pareek at al. [28] did experimental of phases of moon in the month of September 2000 to observe secondary radiation flux. This experimental study had been planned to observe gravitational lensing effect. On September 9 and 10, 2000 Moon passes background of Capricornus constellation and on these dates we observed change in energy spectra of secondary gamma radiation due to gravitational lensing effect.

With the fact that during different celestial events happening in sky, modulate flux of cosmic and solar radiation we conducted

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ground based experimental study of changes of position of Moon in sky and effect on secondary gamma radiation flux at surface of the Earth.

2. **Experimental setup and observations**

The Scintillation detector of (SD 152 F) flat type (Figure 1) we used in this experimental study of Nucleonix make to detect the secondary gamma radiation flux. Size of NaI (Tl) crystal is 2" x 2" and optically coupled with photo multiplier tube. This set up was connected to 1k multi channel analyzer (MC 1000) of Nucleonix make with usb interface built in high voltage and shaping amplifier.

For this experimental study the Scintillation counter system kept open to collect the counts as a function of time on the roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' University Udaipur (Rajasthan) India. Data were collected on dates November 1, 2, 3, 4, 5 and 7 around time 5.30 IST to 6.00 IST for half an hour. The detector was pointed towards Moon in this whole experimental study.

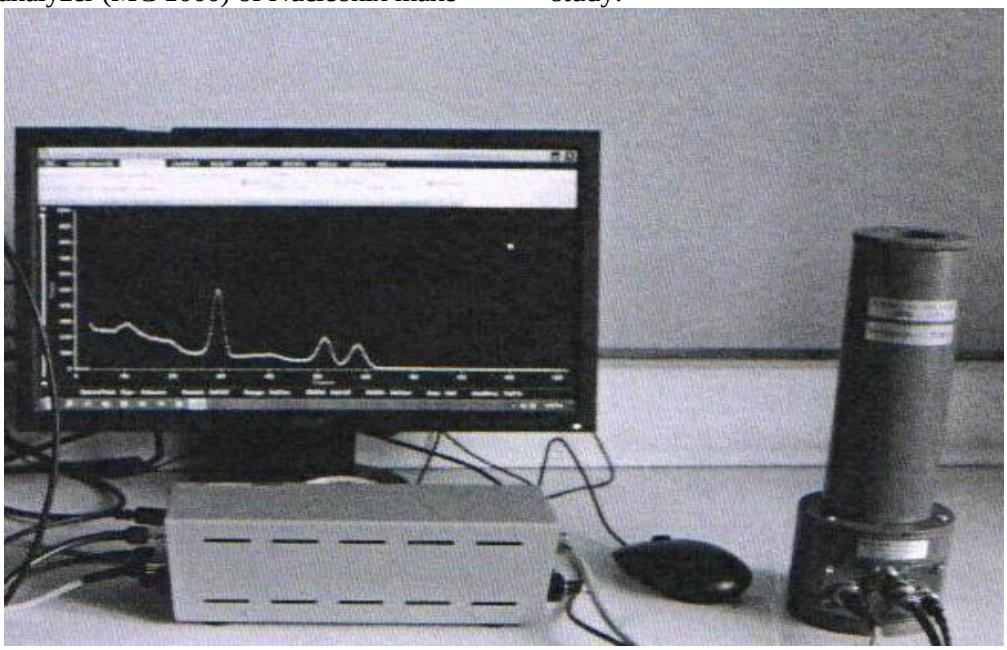

Figure 1 (Scintillation Counter System)

3. Analysis, Results and Discussion

We started observation from November 1. The dates of observation were November 1, 2, 3, 4, 7. From November 1 to 7 integrated counts of secondary gamma radiation flux were 254946, 256525, 259634, 263016 and 264495. From November 1 onwards the Moon came towards scintillation detector and also changes its position in sky. The Moon was closest on the date November 7 towards detector and we observed highest counts in this observation (264495). Following table 1 represents integrated counts of secondary gamma radiation flux with respect to dates in month of November 2020.

Month November 2020

Sr. No.	**Date**	Integrated Counts
1	1	254946
2	2	256525
3	3	259634
4	4	263016
5	7	264495

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Table 1

Using table 1 we made the figure 2 between dates of months November 2020 and integrated counts of secondary gamma radiation flux:

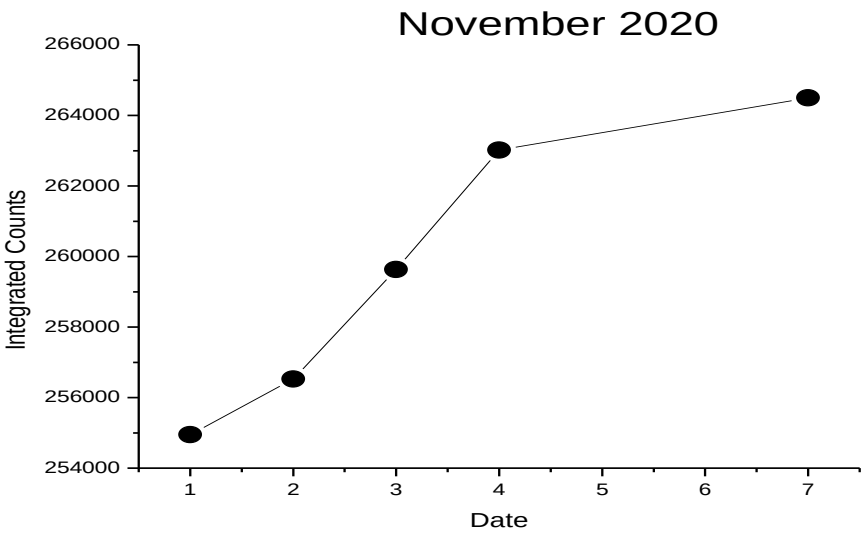

Figure 2

From above table1 and figure 2 we conclude that from November 1 to 7 the integrated counts of secondary gamma radiation were regularly increasing. On date November 7 we observed highest counts. The probable reason is, as changes of position of Moon in sky and approaching towards the detector more reflected solar radiation reached. Therefore formation of secondary shower was more.

Conclusion

This experimental study gave the conclusion that due to change of position of Moon in sky secondary gamma radiation flux on the surface of the Earth varies

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SUSTAINABLE DEVELOPMENT IN MATHEMATICS

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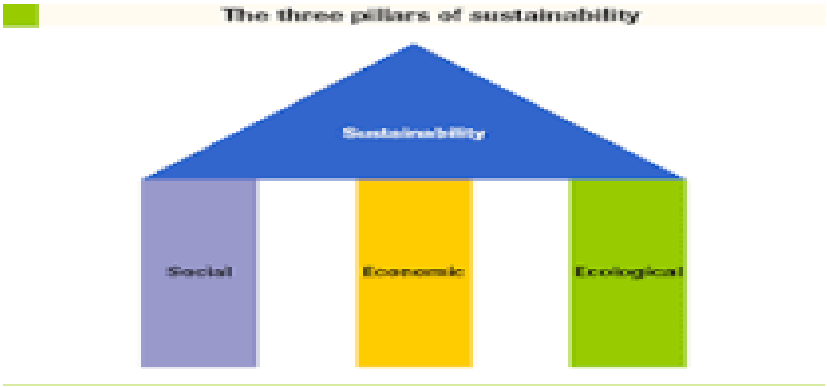
Abstract
What is Sustainability?Sustainability is the ability of a system to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. *"… when someone suggests that mathematicians have a lot, they can contribute to our fight to save the planet, but for many people, it can be hard to imagine just why or how (other than gathering lots of data and making graphs that are totally scary)."*

Keyword: Sustainable Development, Mathematical Model,'bang for buck

Components of Sustainable Development:

The components of sustainable development divide into three elements social, economic and environmental. Social components-workers healthy and safety, equal opportunity, quality of life, benefits to disadvantage groups. Economic components-creation for new market and opportunities for sale growth, cost reduction through efficiency and improvements and reduces energy and raw material inputs. Environmental components-unpolluted environment, effluents generation, emission into environment, resource management, habitat restoration and preservation, use of renewable raw material, elimination of toxic substances. The 3 concepts in sustainable development are:



Throughout the evolution of the concept of "sustainable development" there was consensus on the fact that it does not focus solely on environmental issues. The three interdependent and mutually reinforcing pillars are: economic development, social development, and environmental protection. Sustainability has three main pillars: economic, environmental, and social. These three pillars are informally referred to as people, planet and profits.

The 4 types of sustainability are

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However, it actually refers to four distinct areas: human, social, economic and environmental – known as the four pillars of sustainability. A good example of Sustainability is:

Renewable clean energy is probably the most obvious example of sustainability. Here are three examples. Solar energy: Once the sun's electromagnetic radiation is captured, it produces electricity and heat. Wind Energy: Wind turbines convert the kinetic energy in the wind into mechanical power.

Need for Sustainable Development:-

Education for sustainable development (ESD) promotes the development of the knowledge, skills, understanding, values and actions required to create a sustainable world, which ensures environmental protection and conservation, promotes social equity and encourages economic sustainability.

The idea of sustainable development is essential to address the following issues:

1) Prevent the environmental degradation
2) to ensure a human life
3) to check the exploitative technology and find alternative sources
4) to check the cover exploitation and wastage of natural resources
5) to regenerate renewable energy resources etc.

Role of Mathematics found in Nature:

Mathematics plays a predominant role in our everyday life. A few examples include the number of spirals in a pine cone, pineapple or seeds in a sunflower, or the number of petals on a flower. The numbers in this sequence also form a a unique shape known as a Fibonacci spiral, which again, we see in nature in the form of shells and the shape of hurricanes.

Mathematics is both a method and a language for understanding various natural phenomena. For example, Newton's equations of motion give us a way to calculate what will happen when a point is traveling in space at a given speed. The fourth hypothesis, building on formal results by Kolmogorov, Solomonov and Chaitin, claims that mathematics is so useful in describing the natural world because it is the science of the abbreviation of sequences, and mathematically formulated laws of nature enable us to compress the information.

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Role of Mathematics in Sustainable Development:-

The role that mathematics plays is essential: every phenomena on Earth is subject to mathematics, which is the only language we can use to describe them. Mathematics brings solid science to the debate. It provides confidence in climate change models and it helps to improve existing renewable technologies. Maths is also key in assessing renewables based on observations from the environment. For example, weather data helps to predict efficiency of solar cells.

The perfection of math is visible within living structures in the world, but we can also **use its accuracy and inherent wisdom to improve our own lives**. For example, algebra can explain how fast water may become contaminated, and thus, how many people might become ill from drinking it annually.2Mathematics makes our life orderly and prevents chaos. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills.

Moreover, mankind must factor mathematics into any approach it takes in addressing said challenges. Climate change, protecting biodiversity, tackling pollution, controlling epidemics, ocean sustainability, averting natural disasters (volcanoes, earthquakes, tsunamis), and manmade disasters (fires) are all subject to equations. In short, the sustainability of planet Earth depends on mathematical science.

For energy sustainability alone, mathematics has much to contribute in finding better and less polluting ways to explore for new energy, in increasing combustion efficiency, in the development of alternative energy, in the management of energy grids and networks, and in minimizing the climate consequences of energy use .

Math helps meteorologists understand how the atmosphere works. ... Using math to predict the future of the atmosphere is called Numerical Weather Prediction. The weather models often make mistakes, so it's important for a meteorologist to understand how the computers work so they can create an accurate forecast.

The Earth is subject to constant change: its interior mantle, terrestrial crust, atmosphere and the life that it sustains are all subject to dynamic processes. Describing these processes requires mathematical models, most of which are enormously complex. Developing models that come ever closer to recreating real processes allows us to understand the processes better, meaning we can anticipate them, control them, and alleviate their potential effects.

Mathematics not only helps us to understand natural phenomena, it also allows us to sustain the majority of human activity on the planet. Transport networks, the Internet and business transactions are all practical applications of research, graph theory and number theory. And, finally, we could refer to its key role in education; mathematics are, together with language, the two pillars of any educational system. As we can see, many knowledge areas concerning the Earth require mathematics for their development.

In his 2013 opinion piece, "The Mathematics of Sustainability", Simon Levin, identifies three mathematical challenges towards achieving sustainability: developing the statistical mechanics of ecological communities, socio-economic systems, and the biosphere, modeling the *emergence* of an ecological pattern, and determining indicators of impending *critical transitions* between states. He also points out the great challenge of achieving cooperation with problems at a global scale, especially in the case of common resources, and the mathematical theory needed to tackle it.

"The greatest challenge facing us is to achieve cooperation in dealing with problems of the Global Commons, especially as regards public goods and common pool resources. This brings to the fore a different set of mathematical tools—control theory, game theory, voting theory, and mechanism opinion design — for identifying under what conditions cooperation is possible and how best to achieve it." – Simon Levin

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Mathematicians had already anticipated this proclamation in 2013, the year of Mathematics of Planet Earth. This international initiative is being run by mathematics research organizations and institutes in the United States and Canada, with the support of UNESCO, the International Council for Science (ICSU) and the International Mathematical Union (IMU).

Mathematical Modeling in Sustainable Development:

Mathematical modeling plays useful roles towards sustainable development in arriving the understanding, prediction and control of development process. Mathematical modeling can be a powerful tool for understanding and observed phenomena which cannot be understood by verbal reasoning alone.

In Mathematics, Mathematical model is the application of mathematics to solve real life problems. Mathematical modeling is used widely in the natural science, engineering discipline and social science. Mathematical modeling is the process of formulating and improving a mathematical model to represent and solve real world problem. Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.

Mathematical modeling plays useful roles towards sustainable development in arriving the understanding, prediction and control of development process. For sustainable development, it is necessary to build comprehensive math models.

Mathematical modeling is related to Sustainable Development Biodiversity, climate change, water resources, hazardous waste, nuclear waste, population dynamics etc is the some global sustainable development problem .these problem are describe by mathematical model. The sustainability of planet Earth depends on mathematical science.

Every phenomenon on earth is subject to mathematics, which is the only language we can use to describe them. Moreover, mankind must factor mathematics into any approaches it takes to addressing said challenges. Climate change, protecting biodiversity, tackling pollution, controlling epidemics, and ocean sustainability, natural disaster (volcanoes, earthquakes and tsunamis) are all subject to linear and nonlinear differential equation. Earth interior mantle, terrestrial crust, atmosphere and the life that it sustains are all subject to dynamics process.

Mathematical model sustain the majority of human activity on the planet. Mathematical model are used to solve many real life situations like:

1) Mathematical modeling of launching a satellite.
2) Mathematical modeling of urban city planning.
3) Mathematical modeling of controlling pollution due to vehicles.
4) Mathematical modeling of the traffic flow on highways or the stock market options.
5) Mathematical models to understand the working of heart, brain, lungs, kidneys, and the endocrine system.
6) Mathematical models to estimate the population of India in the year 2050 AD(without waiting till then)

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7) Mathematical models to demonstrate the action of medicine in the human system.
8) Mathematical models for global warming.
9) Mathematical models to understand the fluid flow in drains ,lakes, rivers, spillways, and so on.

Mathematical model are recognized as effective tool that could help examine economic, environmental and ecological impacts of alternative pollution control and resources- conservation actions, and thus aid planners or decision –makers in formulating cost –effective management policies

Role of Students in Sustainable Development:

The SDGs provide for the development of an action plan over the next decade to end poverty and put the world on the path to sustainability. ... Students and youth in general have a role in utilising their creative ideas, technologies and inter-connectedness to bring innovative ideas to the fore to achieve the SDGs.

The 17 SDGs of the 2030 Agenda have a lot to do with the work topics of the Mathematics of Planet Earth program:

1. A planet to discover, focusing on oceans; meteorology and climate; mantle processes, natural resources and solar systems.
2. A planet supporting life, covering issues such as ecology, biodiversity and evolution.
3. A planet organized by humans, looking at political, economic, social and financial systems; organization of transport and communications networks; management of resources; and energy.
4. A planet at risk, covering climate change, sustainable development, epidemics; invasive species and natural disasters.
5. It´s in these critical years that society is gambling with the planet's sustainability, and mathematics is at the heart of the issue. The initiative has determined three key challenges that mathematicians should tackle with enthusiasm:
6. Promoting mathematical research in order to identify the major problems facing the planet and their solutions.
7. Encouraging teachers at all levels of education to raise awareness of the key issues.
8. Informing the general public of the essential role that mathematics has to play an important role.

Seven Ways Mathematics can save the world are:

1. Designing better weather forecasts and climate models. ...
2. Getting 'bang for buck' out of supercomputers. ...
3. Making the most of renewable energy sources. ...
4. Preparing for change. ...
5. Making sense of 'big data' ...
6. Developing new technologies. ...
7. Making maths accessible to everyone. ...

To reorient a curriculum to address sustainability, educational communities need to identify the knowledge, issues, perspectives, skills, and values central to sustainable development in each of the three components of sustainability – environment, society, and economy – and integrate them into the curriculum.

Calamities. Predicting the size, location, and timing of natural hazards is virtually impossible, but because of the help of Mathematics we are able to forecast calamities such as hurricanes, floods, earthquakes, volcanic eruptions, wildfires, and landslides etc.

Conclusions:

Mathematics plays big role in sustainable development in all of its aspects: social, environmental and economic. Many developmental challenges could be solved if it is possible to get mathematical models that could describe them. The sustainability of planet Earth depends on mathematical science. Mathematical modeling has a vital role to play for a sustainable development.

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GRAPH THEORY IN OTHER SUBJECTS

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Abstract

The subject of graph theory had its beginnings in **recreational math problems**, but it has grown into a significant area of mathematical research, with applications in chemistry, physics, biology, operations research, social sciences, and computer science. Graph theory is also used to study molecules in chemistry and physics. In condensed matter physics, the three-dimensional structure of complicated simulated atomic structures can be studied quantitatively by gathering statistics on graph-theoretic properties related to the topology of the atoms. Also, "the Feynman graphs and rules of calculation summarize quantum field theory in a form in close contact with the experimental numbers one wants to understand". In chemistry a graph makes a natural model for a molecule, where vertices represent atoms and edges bonds. This approach is especially used in computer processing of molecular structures, ranging from chemical editors to database searching. In statistical physics, graphs can represent local connections between interacting parts of a system, as well as the dynamics of a physical process on such systems. Graph theory plays an important role in electrical modelling of electrical networks, here; weights are associated with resistance of the wire segments to obtain electrical properties of network structures. Graphs are also used to represent the micro-scale channels of porous media, in which the vertices represent the pores and the edges represent the smaller channels connecting the pores. Chemical graph theory uses the molecular graph as a means to model molecules.

In this book Chapter, we dealt how graph theory is interconnected with Chemistry, Physics and Biology. Graph theory can be employed to understand some tough concepts in physics, Chemistry and Biology in easy manner. Also it helps to estimate their structural values.

Graph theory in chemistry

Introduction

Graph Theory applied in Chemistry is called Chemical Graph Theory. This interdisciplinary science takes problems (like isomer enumeration, structure elucidation, etc.) from Chemistry and solve them by Mathematics (using tools from Graph Theory, Set Theory or Combinatorics), thus influencing both Chemistry and Mathematics. From the very beginnings of chemistry, mathematics was used to create quantitative and qualitative models for helping comprehend the world of chemistry by understanding the elements that make up molecules. An atom is made up of particles which are known as protons, neutrons, and electrons. Chemists study the composition of matter and its properties such as density, acidity, size and shape. They carefully describe the properties they study in terms of quantities, with detail on the level of molecules and their component atoms. Chemists use this knowledge to learn the composition and properties of unfamiliar substances, as well as to reproduce and synthesize large quantities of useful naturally occurring substances and create new artificial substances and useful processes. Graph theory is used to mathematically model molecules in order to gain insight into the physical properties of these chemical compounds. Some physical properties, such as the boiling

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point, are related to the geometric structure of the compound.

The value of graph theory to chemistry started to become apparent in the 19th century. Work by two British mathematicians, Arthur Cayley (1821-1895) and James Joseph Sylvester (1814 - 1897) laid the ground for a long tradition of successful use of graph-theoretical ideas in chemistry.

One of the early discoveries of chemists was that molecules with the same number of carbon and hydrogen atoms (by way of an example) could have different physical or chemical properties. Chemical properties involve such things as such as which other substances a substance will react with. Physical properties include things like boiling point. Molecules which are the same chemically but different in physical terms are called *isomers* of each other. When molecules are represented by graph diagrams these isomers correspond to the fact that the graphs associated with them are not isomorphic (they have different structures). Graph theory is a part of combinatorial geometry (how things fit together) in the sense that its basic ideas are not rooted in metrical (area, angles, distance, etc.) but rather in structural properties. However, with some ingenuity one can obtain surprisingly large amounts of information from graphs by looking at properties that they have. We will now explore a bit of these ideas. Consider the graph in Figure 1.

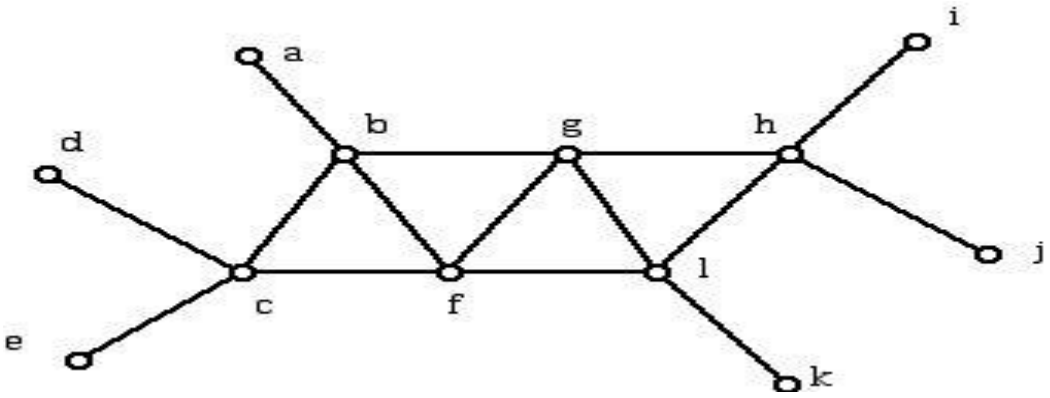

Figure 1 (A connected graph used to model a hydrocarbon)

Graph theorists have developed terms for how to move around in graphs to get from one vertex to another by moving along edges. For example there are several paths from vertex *e* to vertex *i* in graph H in Figure 1. *Ecbfglhi, ecflghi,* and *ecbglhi* are all examples of different paths. These paths have lengths 7, 6, and 6 respectively because they use this number of edges in getting from *e* to *i*. However, there are "shorter" paths from *e* to *i* in the sense that they use fewer edges. Both *ecbghi* and *ecflhi* have length 5. We can define the *distance* between two vertices in a connected graph, (a graph having single component) as the length of the shortest path between them. The distance between vertices *e* and *k* is 4. There is a unique path which has this distance, while the distance between *e* and *g* is 3 but there are two that give this shortest distance, *ecfg* and *ecbg*. Note that we can interpret this diagram as that of a hydrocarbon, since all its vertices are either 4-valent or 1-valent.

Definition: A connected acycle graph is called trees.

Result: A tree having *n vertices and n-1edges.*

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One of the accomplishments of Cayley was showing that trees play a particularly important role in getting insight into problems in mathematical chemistry. Sometimes one knows for chemical reasons the numbers of hydrogen and carbon atoms that are part of a series of chemical molecules. For example, the alkanes are a family of hydrocarbons where, if there are n carbon atoms, there are $2n + 2$ hydrogen atoms, so the alkanes obey: C_nH_{2n+2}. Using some simple graph theory we can see that these molecules must have a tree structure!

Since chemical molecules are connected, this means that an alkane has a total of n (carbons) + $2n + 2$ (hydrogen) atoms. So in a graph of such a molecule we have $3n + 2$ vertices. However, carbon is 4-valent in such a diagram while hydrogen is 1-valent. Thus we have that $4n$ (4 times the number of carbon molecules) + $1(2n+2)$ (1 times the number of hydrogen atoms) = $4n + 2n + 2 = 2(3n+1)$, which is twice the number of bonds in the molecule. So the number of edges (bonds) in the graph of the molecule is $3n + 1$. Since the number of vertices $3n + 2$ is one more than the number of edges, $3n + 1$, we can conclude that the diagrams for alkanes are always trees!

Applications in Chemistry

Graph theory is used in chemistry for mathematical modelling of chemical phenomena. We can make natural model of a molecule where vertices represent atoms and edges represent bond. There is a branch of mathematical chemistry called Chemical graph theory (CGT) which deals with the non trivial applications of graph theory to solve molecular problems. The pioneers of the chemical graph theory are Alexander Balaban, Ante Graovac, Ivan Gutman, Haruo Hosoya, Milan Randic and Nenad Trinajstic and others. Graph theory is also used in computational biochemistry.

Graph theory in Biology

Definitions:

- A **directed graph** is defined as an ordered triple $G = (V, E, f)$, where f is a function that maps each element in E to an ordered pair of vertices in V. The ordered pairs of vertices are called *directed edges, arcs or arrows*. An edge $E = (i, j)$ is considered to have direction from i to j. Directed graphs are mostly suitable for the representation of schemas describing biological pathways or procedures which show the sequential interaction of elements at one or multiple time points and the flow of information throughout the network. These are mainly metabolic, signal transduction or regulatory networks.
- A **weighted graph** is defined as a graph $G = (V, E)$ where V is a set of vertices and E is a set of edges between the vertices $E = \{(u, v) \mid u, v \in V\}$ associated with it a weight function $w: E \rightarrow R$, where R denotes the set of all real numbers. Most of the times, the weight w_{ij} of the edge between nodes i and j represents the relevance of the connection. Usually, a larger weight corresponds to higher reliability of a

Chemical graph theory is the topology branch of mathematical chemistry which applies graph theory to mathematical modelling of chemical phenomena. The pioneers of chemical graph theory are Alexandru Balaban, Ante Graovac, Iván Gutman, Haruo Hosoya, Milan Randić and Nenad Trinajstić . In 1988, it was reported that several hundred researchers worked in this area, producing about 500 articles annually. A number of monographs have been written in the area, including the two-volume comprehensive text by Trinajstić, *Chemical Graph Theory*, that summarized the field up to mid-1980s.

The adherents of the theory maintain that the properties of a chemical graph (i.e., a graph-theoretical representation of a molecule) give valuable insights into the chemical phenomena. Others contend that graphs play only a fringe role in chemical research.[4] One variant of the theory is the representation of materials as infinite Euclidean graphs, particularly crystals by periodic graphs.

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connection. Weighted graphs are currently the most widely used networks throughout the field of bioinformatics. As an example, relations whose importance varies are frequently assigned to biological data to capture the relevance of co-occurrences identified by text mining, sequence or structural similarities between proteins or co-expression of genes

- ***Bipartite graph*** is an undirected graph $G = (V, E)$ in which V can be partitioned into 2 sets V_1 and V_2 such that$(u,v) \in E$ implies either $u \in V_1$ and $v \in V_2$ or $v \in V_1$ and $u \in V_2$. Applications of this type of graph to visualization or modelling of biological networks range from representation of enzyme-reaction links in metabolic pathways to ontology's or ecological connections.
- If $G = (V, E)$ is a graph, then $G_1 = (V_1, E_1)$ is called a ***sub graph*** or if $V_1 \subseteq V$ and $E_1 \subseteq E$, where each edge in E_1 is incident with vertices in V_1.

Examples and shapes describing the aforementioned graph types can be found in Figure 1. The most common data structures that are used to make these networks computer readable are adjacency matrices or adjacency lists. The following section provides a short mathematical description of these data structures.

Graph theory is useful in biology and conservation efforts where a vertex can represent regions where certain species exist (or inhabit) and the edges represent migration paths or movement between the regions. This information is important when looking at breeding patterns or tracking the spread of disease, parasites or how changes to the movement can affect other species.

Graphs are also commonly used in molecular biology and genomics to model and analyse datasets with complex relationships. For example, graph-based methods are often used to 'cluster' cells together into cell-types in single-cell transcriptome analysis. Another use is to model genes or proteins in a pathway and study the relationships between them, such as metabolic pathways and gene regulatory networks. Evolutionary trees, ecological networks, and hierarchical clustering of gene expression patterns are also represented as graph structures.

Graph theory is also used in nervous systems can be seen as a graph, where the nodes are neurons and the edges are the connections between them.

As an effective modeling, graph theory is widely used in biological mathematics to deal with various biology problems. In the field of microbiology, graph can express the molecular structure, where cell, gene or protein can be denoted as a vertex, and the connect element can be regarded as an edge. In this way, the biological activity characteristic can be measured via topological index computing in the corresponding graphs. In our article, we mainly study the biology features of biological networks in terms of eccentric topological indices computation. By means of graph structure analysis and distance calculating, the exact expression of several important eccentric related indices of hyper tree network and X-tree are determined. The conclusions we get in this paper illustrate that the bioengineering has the promising application prospects. Protein-protein interaction (PPI) networks mainly hold information of how different proteins operate in coordination with others to enable the biological processes within the cell. Despite the fact that for the majority of proteins the complete sequence is already known, their molecular function is not yet fully determined. Predicting protein function is still a bottleneck in computational biology research and many experimental and computational techniques have been developed in order to infer protein function from interactions with other bio molecules. The structure which is shown here of PPI is based on graph theory.

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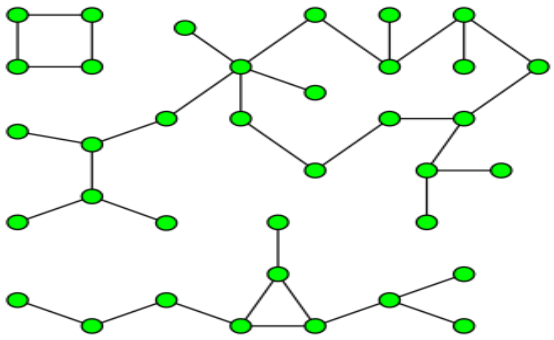

Applications in Biology

Graph theory is used in many areas of biology. Graph can be used in drug target identification, determining a protein's or gene's function. The concepts of graph theory can be also used in studying the structures of DNA and RNA. If we want to study the food chain of different animals in a ecological system, then we draw some arrow diagrams which represent the dependence of one animal upon another for their food. This diagram can be considered as graph where the animals are vertices of graph and they must be connected if any one of them depends on other for food.

Graph theory in physics

Graph theory is also used to study molecules in chemistry and physics. In condensed matter physics, the three-dimensional structure of complicated simulated atomic structures can be studied quantitatively by gathering statistics on graph-theoretic properties related to the topology of the atoms. Also, "the Feynman graphs and rules of calculation summarize quantum field theory in a form in close contact with the experimental numbers one wants to understand." In chemistry a graph makes a natural model for a molecule, where vertices represent atoms and edges bonds. This approach is especially used in computer processing of molecular structures, ranging from chemical editors to database searching. In statistical physics, graphs can represent local connections between interacting parts of a system, as well as the dynamics of a physical process on such systems. Similarly, in computational neuroscience graphs can be used to represent functional connections between brain areas that interact to give rise to various cognitive processes, where the vertices represent different areas of the brain and the edges represent the connections between those areas. Graph theory plays an important role in electrical modeling of electrical networks, here; weights are associated with resistance of the wire segments to obtain electrical properties of network structures. Graphs are also used to represent the micro-scale channels of porous media, in which the vertices represent the pores and the edges represent the smaller channels connecting the pores. Chemical graph theory uses the molecular graph as a means to model molecules. Graphs and networks are excellent models to study and understand phase transitions and critical phenomena. Removal of nodes or edges leads to a critical transition where the network breaks into small clusters which are studied as a phase transition. This breakdown is studied via percolation theory.

Graphs and electrical networks

The relation between electrical networks and graphs is very natural and is documented in many introductory texts on graph theory. The idea is that a simple electrical network can be represented as a

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graph in which we place a fixed electrical resistor at each edge of the graph. Therefore, they can also be called resistor networks. Let us suppose that we connect a battery across the nodes. There are several parameters of an electrical graph G (V,E) u v network that can be considered in terms of graph-theoretic concepts but we concentrate here in one which has important connections with other parameters of relevance in physics, namely the effective resistance (Doyle, Snell, 1984). Let us calculate the effective resistance u,v between two nodes by using the Kirchhoff and Ohm laws. For the sake of simplicity we always consider here resistors of 1 Ohm. In the simple case of a tree the effective resistance is simply the sum of the resistances along the path connecting u and v.

Graphs and electrical networks the relation between electrical networks and graphs is very natural and appears documented in many introductory texts on graph theory. The idea is that a simple electrical network can be represented as a graph G = (V,E) in which we place a fixed electrical resistor on each edge of the graph. Let us suppose that we connect a battery across the nodes u and v. There are several parameters of an electrical network that can be considered in terms of graph-theoretic concepts but we concentrate here in one which has important connections with other parameters of relevance in physics, namely the effective resistance (Doyle, Snell, 1984). Then, let us calculate the effective resistance Ω(u,v) between the two nodes by using the Kirchhoff and Ohm laws. For the sake of simplicity we always consider here resistors of 1 Ohm. In the simple case of a tree the resistance distance is simply the sum of the resistances along the path connecting u and v. That is, for a tree Ω(u,v) = d(u,v). However, in the case of two nodes for which multiple routes connecting them exist, the effective resistance Ω(u,v) can be obtained by using Kirchhoff's laws. A characteristic of the 22 effective resistance Ω(u,v) is that it decreases with the increase of the number of routes connecting u and v . Then, in general Ω(u,v) ≤ d(u,v)

Applications in Physics

Generally, graph theory concepts are used in different electrical circuits. The current, voltage and resistance on a circuit can be drawn by using graph theory concept. When we want to show the flow of current in circuits then we can use directed graphs. Also we can connect the different physical process with the help of graph theory concepts

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DIGITAL MAPPING OF RURAL DEVELOPMENT WORKS: PURPOSE AND ADVANTAGE

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Abstract

India is called a country of villages. It is a vast country inhibited mostly by the farmers and workers. The social welfare of India depends on the abundance of the villages. Development of a nation is a complete one only with development of villages. For India's economy to be strong, the rural economy needs to grow. But the condition of the rural India, which forms the greater part of the country, has been the subject of negligence and exploitation. In India where the number of people living in rural areas, rural development programme is necessary aspect for economic betterment as well as greater social transformation of the people. After independence the different governments gave much importance to the development of villages, its agriculture and the rural economy. The slogans like 'Garibi Hatao' and 'War on Poverty' have been given to pave the way for the growth of rural development all over the country. A number of rural development programmes, schemes and projects have been launched by the various governments to achieve the goal. The conditions of the rural people with the beginning of all these programmes have been improved a bit but not satisfactory. The socially, economically and educationally backward rural people could hardly avail the opportunities to get actual benefits of these development schemes and projects. A general survey and review reveals the fact that the government of India went on changing the plans, from time to time, for rural development one after another in search of better avenues, but without doing required home work. Growing rate of corruption and bribery has become an established order of the day. The major benefits of rural development have been pocketed by economically better off, socially high-up in social stratification and politically advanced sections of the rural communities. Further, the bureaucrats and government officials attached to the rural development programme hardly remained committed and true to the spirit needed for success of the programmes. The political leaders instead of correcting and controlling the corrupt officials rather provided political patronage to them. Despite of heavy expenditure on all these programmes, neither poverty has been removed nor have the poor been helped out according to their needs. The government is now working on a new scientific technology i.e. geo-tagging of each scheme/property of government related developmental works step by step to check all these irregularities. It is expected that this effort of the government will bring transparency in the works and also ensure accountability. The present paper is an attempt to make a study of the rural development works initiated by the different governments since independence. It will find out the loopholes of the failure of all these programmes, corruptions and also to suggest possible measures. Finally the paper will investigate the importance and purpose of geo-tagging.

***Key Words**: Rural Development, Planning, Accountability, Corruption, MGNREGA, Geo-tagging.*

Introduction:

M.K. Gandhi has rightly said that the soul of India lives in its villages. Villages are the backbone of a nation. The sky scrapers in cities and in metropolitans are having their root in villages and being strait and majestic because of the backbone, villages. According to the 2011 census of India, 68.84% of Indians (around 833.1 million people) live in 640,867 different villages. The cities have grown immensely over the last 20 years; rural areas have not seen that kind of development. India is a vast country inhibited mostly by the farmers and workers. The condition of the rural India, which forms the greater part of the country, has been the subject of negligence and exploitation. Nearly 76 per cent of people live in rural areas depending mostly on agriculture. No doubt, the government abolished the system of landlordism and made the tenants real owner of the land, but in absence of proper irrigational planning, modern scientific agricultural methodology and advanced rural communication the

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conditions of the farmers remained lamentable. So far the condition of the rural poor is concerned, in absence of proper means of livelihood, it is sympathetic and vulnerable. Rural areas are still plagued by problems of malnourishment, illiteracy, unemployment and lack of basic infrastructure like schools, colleges, hospitals, sanitation, etc. Villages are the mirror of one Nation's virgin culture, social life and natural beauty. Development of a nation is a complete one only with development of villages. For India's economy to be strong, the rural economy needs to grow. If we see the early history of India, villages are in a vital position in determining the economic condition of kingdoms. But after the invasion of British the condition changed. The village economy was crushed by the Whites for their own economical interests. The artisans, weavers and the workers of cottage industries were forced to give up their professions and to move away from the villages; because of the economic policy of the Whites. The only community which left out in villages, without any support, was the farming group. That too suffered with heavy taxation and brutal suppression. This led the wiping out of entire farming sector in the villages. Big industrial towns and cities were begun to grow at the cost of villages.[1]

Rural Development- Meaning :

Improvement in the quality of life of rural people is the important agenda of rural development programme. In India- a country where the number of people living in rural areas, rural development programme is necessary aspect. Rural development implies both the economic betterment of people as well as greater social transformation. The basic objective of all rural development endeavors / programmes has been the welfare of the millions. The meaning of rural development is to improve the lot of people living outside the urban areas. In the words of P. N. Singh rural development "takes into account the forward and backward linkages between the rural and urban areas. Its main thrust is on development of rural people as an individual as well as a member of village community, and the community as a whole."[2] The major thrust of rural development consists in "fuller use of resources and skills, modernization of farming, regeneration of agricultural allied activities, institution building to fulfill the local needs, eradication of development problems and improvement in health and education."[3] Thus, it is multi-dimensional in nature.

Objectives:

The present paper is an attempt to make a study of the rural development works initiated by the different governments since independence. It will find out the loopholes of the failure of all these programmes and also to suggest possible measures. Finally, the paper will investigate the importance and purpose of geo-tagging.

Methodology of the work:

The study is based on empirical and scientific method. Qualitative research methodology has been given more preference whereas facts and data collected from secondary sources which have been classified, observed, examined, interpreted and analyzed. After thorough investigation and analysis of facts collected from different sources have been presented in the documental form. Visited of libraries, internet sites and other institutions to collect authentic relevant materials from the published government records, books, journals, magazines newspapers.

Efforts of the Government towards Rural Development:

After independence the different governments gave much importance to the development of villages, its agriculture and the rural economy. There are three phases of rural development administration in the country. These are the Community Development phase during the fifties, the Panchyati Raj phase during the sixties and the Development Administration phase during the seventies and the eighties, which is still running. As per declared goal of the Indian constitution to provide economic and social justice to the weaker and down-trodden sections of the people the government was forced to expand scope of development administration by launching various development programmes, schemes and projects all over the country. In the process of planned development in India one of the most arduous tasks has been the rural development and alleviation of poverty.

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Under such notion the government of India introduced the Community Development Programme (CDP), National Extension Service (NES) and Panchayati Raj Institution (PRI) with special intention to help the farmers and remove poverty from the rural areas. Development through planning began from 1952 under the care and control of the Planning Commission (New name: NITI Aayog, 2015). The problem before the Planning Commission was to consider the issues relating to how much to save, where to invest and in what forms to invest.[4] The First Five Year Plan (1951-1956) was formulated entirely for Agriculture. In course of time, Green Revolution and other programmes were also introduced with targeting agriculture and development of the villages. The conditions of the rural areas with the beginning of all these programmes have been improved a bit but still not satisfactory.

The call of the World Bank for redistribution of income combined with 'growth-oriented policies and realization of the government of India that some viable steps must be taken up to improve the vulnerable conditions of the rural people reflected in the Fifth Five Year Plan (1974-79) first time in the country. The slogans of Mrs. Indira Gandhi, the then Prime Minister, like 'Garibi Hatao' and 'War on Poverty' paved the way for the growth of rural development all over the country. She nationalized the 14 big commercial banks of India on the one hand, and finished the payment of the Privy purses to the Ex-Indian rulers despite hard protest and litigation on the other. The emphasis of the Planning Commission shifted from agriculture to the integrated development and rural development was redefined as a "strategy, a design to improve the economic and social life of a specific group of people living in rural areas."[5]

It has been discussed that the Integrated Rural Development Programme (IRDP, 1980) was launched and the Sixth Plan emphasized the IRDP as a 'single largest anti-thrust programme' covering various aspects of rural life and opening wide scope for people's participation in the development administration. The IRDP covered the rural areas and the people through optimum development and utilization of local resources-physical, biological and human- bringing necessary institutional changes by developing a package of services to encompass not only the economic field but also the establishment of the required social infrastructure and services in the areas of health and nutrition etc.[6] The Prime Minister Rajiv Gandhi in his inaugural speech at National Development Council Conference held on November 3, 1985 said "Our anti-poverty programme constitute the core of the 20-points programme. These will be expanded and restricted to give maximum assistance to families below the poverty line."[7] The components of the IRDP such as Industry Service and Business (ISB) and the Training of Rural Youth for Self-Employment (TRYSEM), were also launched with a view to helping the rural youths in obtaining self-employment with the help of the government. The Planning Commission reiterated its commitment for giving "a practical shape to the nation's collective will for using all the latent resources and energies of the nation for an effective attack on poverty, unemployment and inequality."[8]

The District Rural Development Agency (DRDA) was made a special agency capable of managing anti-poverty programmes of the Ministry of Rural Development and also a coordinating agency to effectively relate rural development programme to the overall efforts of poverty eradication in the district. The IRDP was brought under the control of the DRDA with its all components. The new programme, namely, the Jawahar Rojgar Yojana (JRY) was launched with the objective "to provide fuller employment opportunities to at least one member of each family living below the poverty line who seen unskilled employment" and to "ensure the fuller participation of people in the implementation."[9] Indira Awaas Yojana (IAY,1985) was also launched with the aim to provide assistance to BPL families who are either houseless or having inadequate housing facilities for constructing a safe and durable shelter in rural areas.

During the regime of the National Democratic Alliance (NDA) led by Bhartiya Janata Party (BJP) in 1999, also launched

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many rural development programmes. In Rural Development, construction of rural roads for better connectivity (Pradhan Mantri Gram Sadak Yojana, PMGSY), rural housing and drinking water programmes and restructure self-employment programmes continued to be implemented. Swaranjayanti Gram Swarozgar Yojana (SGSY), which is still in practice, replaced the earlier self-employment and allied programmes running under the JRY. The SGSY aims at "establishing large number of micro-enterprises in the rural areas" offering "perfect balance of credit and subsidy."[10] Among the Swarozgarists at least 55% must the members of the Scheduled Castes and Scheduled women and 3% disabled. Thereafter, the NDA government launched another Yojana, namely, Samagra Awaas Yojana (SAY) with a purpose "to improve the quality of life of people and over all habitats in the rural areas." Another Yojana, namely, Jawahar Gram Samridhi Yojana (JGSY) also came into being for "creation of demand driven community village infrastructure including durable assets at the village level and assets to enable the rural poor to increase the opportunities for employment" and also for "generation of supplementary employment for the unemployed poor in the rural areas."[11] A new scheme to provide 10kg of food-grains to senior citizens was proposed. Antyodaya Anna Yojana (AAY) was introduced for providing highly subsidized food grains to the poorest of the poor. Each Below Poverty Line (BPL) family was given 35 kg food-grains per month at subsidized prices. Public Distribution System (PDS, Control) Order 2001was issued to ensure timely supply of ration at fair price shops around the country. Food for Work Programme (FWP) was introduced in January 2001. The major steps have been taken for power sector development in rural areas. All villages have to be electrified by 2007 and all households by 2017. Village electrification is included in the Prime Minister's Gramodaya Yojana (PMGY)'.

The United Progressive Alliance led by the Congress again launched many rural development programmes in its two consecutive terms i.e. 2004 to 2014. National Food for Work Programme was announced in 2004 to intensify the generation of supplementary wage employment, Bharat Nirman Yojana in 2005 for the development of rural infrastructure including six components: irrigation, Water Supply, Housing, Road, Telephone and Electricity, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2006 to provide at least 100 days wage employment in rural areas etc. Sufficient funds were allotted to all these programmes with the aim to provide maximum benefit to the rural people. MGNREGA is considered as a "Silver Bullet" for eradicating rural poverty and unemployment, by way of generating demand for productive labour force in villages. It provides an alternative source of livelihood which will have an impact on reducing migration, restricting child labour, alleviating poverty, and making villages self-sustaining through productive assets creation such as road construction, cleaning up of water tanks, soil and water conservation work, etc. For which it has been considered as the largest anti-poverty programme in India.[12] The Rashtriya Gram Swaraj Yojana (RGSY) was launched during the later part of the 10th Five Year Plan in 2006-07 by the Ministry of Panchayati Raj (MoPR) with the objective of assisting the States in the capacity building and training (CB&T) of ERs and functionaries of PRIs. Almost all the States covered under Part-IX of the Constitution have availed financial assistance under this scheme. Sarva Shiksha Abhiyan (SSA) coupled with cooked Mid-day Meal scheme were also some of the important schemes launched by UPA Government.

The new NDA government under the Prime Ministership of Narendra Modi came to the power in 2014 with the slogan of Sabka Sath Sabka Vikas. The important Development Programmes which have been introduced by this government are: Pradhan Mantri Jan Dhan Yojana, (2014) with the aim to eradicate the financial un-touchability by providing bank accounts to the poor. Sansad Aadarsh Gram Yojana (SAGY, 2014) is a scheme which encourages Members of Parliament from both Houses to identify and develop one village from their constituency as a model village by 2016, and two more by 2019, covering over 2,500 villages of the 6 lakhs villages country-wide. "This is not a rupiya-paisa yojana but a

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demand-driven, people's participatory scheme. There are 800 parliamentarians and in three years, 2,500-odd villages could get covered. If States were to initiate their own similar schemes with MLAs, 6,000 to 7,000 villages could get covered. One good village can affect an entire area, and a viral effect could begin."[13] Pradhan Mantri Krishi Sinchai Yojana (PMKSY, 2015) aims to improve irrigation and water conservation in the country's rural regions and farms. Pradhan Mantri Fasal Bima Yojana (PMFBY, 2016) aims to provide a more efficient crop insurance support to the farmers with low premium insurance. Besides these programmes the present NDA government under the Clean India Mission, is set to embark on an ambitious multi-million dollar sanitation project that seeks to clean up cities and villages.

Pradhan Mantri National Skill Development and Entrepreneurship Policy of 2015 supersede the National Skill Development Policy of 2009. The objective of this policy is to meet the challenge of skilling at scale with speed, standard (quality) and sustainability. The policy links skills development to improved employability and productivity to pave the way forward for inclusive growth in the country. New scheme Rashtriya Gram Swaraj Abhiyan (RGSA) proposed with the allocation of ₹655 crore. The scheme will help Panchayati Raj Institutions to deliver more Sustainable Goals. It will also help to speed up the overall growth of development in rural areas. Pradhan Mantri Ujjwala Yojana for providing free LPG connections to women from BPL household, Pradhan Mantri Jan-Aushadhi Yojana is a campaign launched by the government to provide quality medicines at affordable prices to the masses, are some of the important schemes launched by NDA Government till date. A wide spectrum of programmes has been undertaken so far, to alleviate rural poverty and ensure improved quality of life for the rural population especially those below the poverty line. The Ministry of Rural Development places importance now on rural employment, health, education, drinking water, housing and road etc. so that the quality of life in rural areas improves and the fruit of economic reform are shared by all sections of the society.

Result of Rural Development policies and programmes:

A general survey and review of various rural development programmes launched in India during the regime of different governments, reveals the fact that the government of India went on changing the plans, from time to time, for rural development one after another in search of better avenues, but without doing required home work. All these programmes were directly related to the rural people, instead of removing poverty rather increased gap between the rich and the poor. The socially, economically and educationally backward rural people could hardly avail the opportunities to get actual benefits of these development schemes and projects. Rather, the discretionary power exercised by different categories of government officials opened up the scope for harassment, malpractices and corruption. Growing rate of corruption and bribery created the myth among the people that nothing could be done until the government servants related to the affairs are bribed. The bureaucrats and government officials attached to the rural development programme hardly remained committed and true to the spirit needed for success of the programmes. Various studies in this field made by different agencies and institutions reveal the truth that the major benefits of rural development have been pocketed by economically better off, socially high-up in social stratification and politically advanced sections of the rural communities.[14] The political leaders instead of correcting and controlling the corrupt officials rather provided political patronage to them with the result that corruption became an established order of the day.[15]All anti-corruption drives failed to control corruption and check the declining moral standard of the government officials. Thus it is very much oblivious that despite numerous programmes and projects with the marked objectives to improve the living standard the millions of rural people living below the line of poverty the results, which have come out, are not only discouraging but disappointing too. The government of India provided crores of rupees to alleviate poverty through different plans but

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most of them were on the papers to obtain money only. Most of the cases found where Mukhiyas or Pradhans, BDOs, COs, top class bureaucrats and also political leaders etc all joined their hands together to plunder the government money.

It is true that such programmes benefited numbers poor families and helped in changing the ugly rural face, but the objectives fixed have not yet been achieved. Even after 71 years of India's independence the picture of the rural India and the conditions of the poor living in the slum areas of big cities and towns, is not satisfactory. There are millions of people who are sunk into acute poverty and scarcity. Millions are yet jobless. Their dirty economic conditions and insecure dark and dirty gloomy future have not only caused worries to them but also have dampened their spirit. They are loitering hither and thither in search of jobs. On the other hand, a handful of beneficiaries are enjoying luxurious life at the cost of the poor. The process of development in the rural sections, in the words of Dandekar and Nilkantha "has benefited the upper middle and richer sections much more than the middle, the lower middle and the poorer sections."[16] According to CAG Report 2013, the scheme MNREGA has failed in Maharashtra, Madhya Pradesh, Orissa, Bihar and Karnataka due to misappropriation and subversion of funds. The view of Scott H. Young is true and very much suitable here that execution is more important than the planning. The perfect plan, poorly executed, will fail. Strategy without execution is hallucination. A lousy plan, well executed, is often successful. The former Environment minister Jairam Ramesh has rightly observed that India has produced the world's best plans to tackle issues concerning the public but has been the worst in implementing them.[17] Indian government's intention to provide assistance to poor and their upliftment is clear, but at the implementation part government fails. The reason of inefficiency can be attributed to improper monitoring, lack of accountability, corruption and misalignment of incentives.

Digital mapping of Rural Development works to stop irregularities:

The Narendra Modi government is now working on geo-tagging of each scheme/property of the government step by step, to end ambiguity about who owns what. The process of tagging something (i.e. any object, infrastructure etc) with geographical information like latitudes and longitudes, distance, place name, accuracy data in form of geospatial metadata (may be any QR code, RSS feeds SMS messages) is called Geo-tagging.[18] Every square inch of Indian earth will be digitally mapped using ISRO's high-resolution satellite imagery, GPS and GIS technology. Under this the geographical information are connected to Global Positioning System which are monitored computer internet network. ISRO's Geo-portal, Bhuvan is providing visualization services and Earth observation data to users in public domain.

Geo-MGNREGA is a unique endeavour of the Ministry of Rural Development in association with National Remote Sensing Centre (NRSC), ISRO and National Informatics Centre. A Memorandum of Understanding (MoU) was signed by Ministry of Rural Development with NRSC on 24th June 2016 for geo-tagging the assets created under MGNREGS in each gram panchayat. Strength of Space technology has been leveraged," the rural development ministry statement said. The geo-tagging exercise started from 1st September, 2016.[19] One crore assets have been geo-tagged so far and has been put in public domain in the last seven months. It is expected that this exercise will lead to greater transparency and ensure accountability at field level. Generally a Gram Rozgar Sahayak or a junior engineer takes a photo of an asset and upload it on the Bhuvan web portal run by ISRO's National Remote Sensing Centre via a mobile app. Once a photo is uploaded, time and location gets encrypted automatically. There is also an option to add more information according to laid down parameters. Gujarat was first in the country to implement GIS in MGNREGA in 2011. Assam, Uttar Pradesh, Odisha, Maharashtra, Rajasthan, Himachal Pradesh, West Bengal, Kerala and many other states have already been working on it. Around mid January 2017, Kangra, in Himachal Pradesh became the first district in the country to geo-tagged all the assets created under the MGNREGA.[20] Cooch Behar district of West Bengal is awarded

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India's best solution for Geo-Tagging all completed assets under MGNREGA in 2017.

Many cases had come to light where staffers, under whom progress of water conservation works was not satisfactory, had submitted photographs of other works to save their skin. Now, the photographs will have to be uploaded through the MRSAC software, which will tag the geographical coordinates of the work site with the photographs. Geo-tagging will ensure that photographs of one work are not used for another. An on-going process, geo-tagging not only facilitates online recording and monitoring of assets to check leakages but also serves as a tool for effective mapping of terrain for future developmental works. Geo-tagging implies that the assets created under MGNREGA, which include those of farming and agricultural facilities like canals, dams, irrigation and sanitation projects, are identified via satellite technology. This ensures credible verification and effective dealing with the complaints of non-durability of such assets. The Ministry of Agriculture also signed a Memorandum of Understanding (MoU) with National Remote Sensing Agency (NRSA), ISRO, in the month of April 2017 for geo-tagging every piece of agriculture land created under Rashtriya Krishi Vikas Yojna (RKVA) in the country.[21] Likewise signing of MoU between Ministry of Housing and Urban Poverty Alleviation and NRSC of ISRO for tagging houses under Pradhan Mantri Awas Yojana, Housing for all (URBAN) has been done.[22] Now geo-tagged house will be constructed under 'Beneficiary led Individual House Construction' component of mission. This will track progress of construction of individual houses through geo tagged photographs and these photographs are integrated with Bhuvan app and Bhuvan platform. Around 800,000 families, with disabled members in their households and no breadwinner, have been identified and geo-tagged under the PMAYG to avoid duplication of addresses. PMAYG, earlier used to known as Indira Awaas Yojana, is a scheme under which government has a commitment to provide "Housing for All" by 2022. The budget allocation for each house of about 25 square metre varies between Rs70,000 to Rs1.3 lakh depending on whether the house is in the plains or in a hilly and difficult region. The tagging does not only document the delivery of entitlements but also captures the progress of construction work of the house with photos at regular stages of construction. There is a proper monitoring mechanism in place to find eligible beneficiaries for the scheme, register beneficiaries on the portal and link their bank accounts. According to MoRD, there are more than 3.5 lakh people working at the village level under various programmes of MoRD, who may have their own smartphones or have been given smartphones by the government, who are trained in data collection. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Awas Yojana-Gramin (PMAYG), Aajeevika-Deen Dayal Antyodaya Yojana, Pradhan Mantri Gram Sadak Yojana (PMGSY), National Social Assistance Programme (NSAP), Sansad Adarsh Gram Yojana (SAGY), and Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDUGKY) etc are all connected with digital tools for effective management of work under its departments.

Flagged Work Status for MGNREGA Geo-tagging: 16/09/2018.

S No.	State	Total Assets Received From NRSC To NREGASOFT	Assets Not Yet Updated At NREGASOFT	Assets Updated	Assets Updated & Sent To NRSC
1	Andhra Pradesh	8254	8254	0	0
2	Arunachal Pradesh	123	75	20	28
3	Assam	1563	599	408	555
4	Bihar	21410	18354	1398	1649
5	Chhattisgarh	11673	8599	2465	556
6	Goa	6	3	3	0
7	Gujarat	4120	3814	98	208

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8	Haryana	1152	415	298	404
9	Himachal Pradesh	748	541	31	175
10	Jammu & Kashmir	2007	1469	3	535
11	Jharkhand	4049	2291	1215	528
12	Karnataka	25592	13112	6215	6078
13	Kerala	1069	642	149	277
14	Madhya Pradesh	10558	7073	2990	480
15	Maharashtra	3829	3470	342	17
16	Manipur	179	163	15	1
17	Meghalaya	1392	1124	192	75
18	Mizoram	471	354	104	13
19	Nagaland	211	210	0	1
20	Odisha	1424	1057	76	290
21	Punjab	190	174	9	7
22	Rajasthan	3349	2594	712	43
23	Sikkim	64	44	1	19
24	Tamil Nadu	1908	1869	23	16
25	Telangana	28304	27323	0	980
26	Tripura	130	120	2	8
27	Uttar Pradesh	16330	13236	921	1931
28	Uttarakhand	680	540	46	94
29	West Bengal	16823	12125	1586	2971
30	Andaman and Nicobar	24	22	2	0
31	Poducherry	8	8	0	0
	Total	167640	129674	19324	17939

Source: Ministry of Rural Development, Govt. of India.

Digital mapping of all villages:

India plans to prepare digital maps of all its 6,00,000 villages under the SVAMITVA (Survey of Villages and Mapping with Improvised Technology in Village Areas) Scheme. It was launched in April 2020. It would help to establish "clear ownership" of property in rural areas by mapping of land parcels using drone technology and providing a 'record of rights' to eligible households by issuing legal ownership cards to them. It is estimated that the size of the Indian Geospatial market in 2020 to be □ 23,345 Crore including □ 10,595 crore of export which was likely to grow to □ 36,300 crore by 2025. So far drone surveys have covered close to 1,00,000 villages and maps of 77,527 villages had been handed over to states. Property cards had been distributed to around 27,000 villages.

Conclusion & Findings:

More than half of Indian population lives in the rural areas. The social welfare of India depends on the abundance of the villages. The government of India from the inception of the democratic rule in the country has been talking more than enough to work for the poor and remove poverty from the country, but the results, which one sees in this regard today is different. Neither poverty has been removed nor have the poor been helped out according to their needs. Even though, the government may also be appreciated for adopting various programmes and schemes for alleviation of poverty from the country allotting huge amount of funds to achieve the purposes. These policies and programmes, which have been adopted and launched by the government from time to time with a view to help the poor people and deprived sections, has created new hope among them.

Development is such a process, which never ends. It has no limit. However, what development process needs is felt to carry on all these programmes with greater care, commitment, sincerity, honesty and impartiality. Development process should not be linked with the political motives. Especially the bureaucrats who are supposed to be neutral from party politics must not fall in temptation and must not inclined towards politicians for

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personal gains. Development of rural areas should be a priority of the government. Geo-tagging is a new scientific technology which can be applied in different fields to check the irregularities in developmental works. It will also help to bring transparency and ensure accountability**.** The Government has taken the first few steps towards improving service delivery. This eliminates the chances of village officials duping government by duplicating works.

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A STUDY ON PAPERLESS EXAMINATION IN HIGHER EDUCATION

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Abstract:
Google Forms is one of the simplest tools to use to collect data and information but as they are connected to a spread sheet (Google Sheet) they can be very powerful in terms of data analysis. There are numerous uses for Google Forms but common ones are: Collecting feedback – questionnaire , Signing up to an event Data entry - providing a more user-friendly interface, Collecting opinions on a topic, Collecting answers to a test.

Keywords: *Gmail, Certify'em , Drive , Form , Quizzes, Email, Template, Add-ons*

Introduction:

Google Drive is a free, web-based office suite and data storage service offered by Google. It allows users to create online documents and edit them collaboratively. As well as word processing, spread sheets and presentation Google Drive offers a forms option that can be used to generate online surveys and then collate and present the results. 'Google Apps for Education' is a package of free online tools, including Google Drive, compiled specifically for schools/colleges. It enables schools setup email accounts for its teachers and students, facilitates shared calendars, shared documents and even the creation of websites that could become class or project websites e.g.:a TY website. It gives the administrator control to limit access to the emails/sites. If you are considering setting up Google Apps for your school then it is advisable that it is done in consultation with the ICT Administration person in the College. For the purposes of setting up an online questionnaire (Form) then a regular Gmail account will suffice.

Opening Google Forms .

Google forms is a free Google application that allows you to quickly create and distribute a form to gather information. Form responses are saved in a Google spreadsheet in Google drive.

Step 1. Open Google Chrome.

Step 2.Go to http://drive.google.com

Step 3. Enter your full UWW email address, then click next. Step

4. Enter your UWW password, then click Sign in. You will now be signed into Google Drive.

Creating Google Form for Test

Select New > More > Google Forms from the available menu. Choose either a Blank form or From a template

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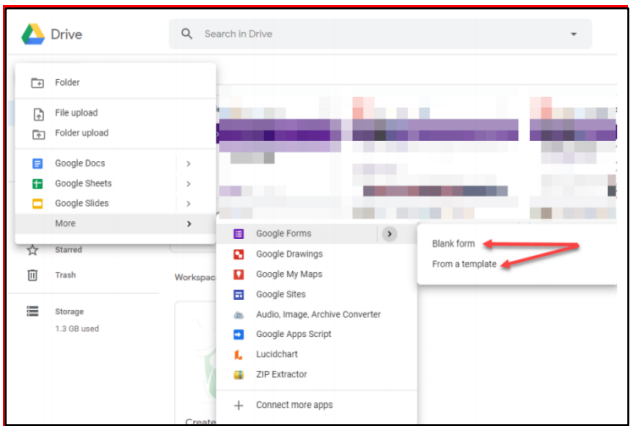


The Template gallery General tab offers a number of form templates. Or, simply click on Blank form to start from scratch.

Creating your Questionnaire (Google Form)

Types of questions

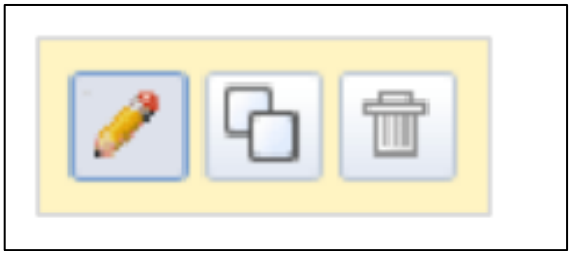
Google Forms contain 6 types of questions which should match most of your needs.

1. Text: Used for short answers
2. Paragraph text:
   Used for longer, more detailed answers
3. Multiple choice : Respondents select one option from a list.
4. Check boxes: Respondents can choose a number of options from a list
5. Scale: Respondents select a value from a rating scale e.g.: 1-5, 1-7 etc
6. Grid: Respondents make a selection considering two factors.

Questions can be added by a process of duplicating and then editing.

There are three editing buttons on the right-hand-side

- The Pencil for editing
- The Squares to duplicate questions
- The Rubbish bin to remove a question



Publishing your Questionnaire (Form)

There are basically two ways of distributing your questionnaire: send it by email or sharing the web address (Url) (e.g.: making it a link on your website.)

To distribute by email: Click on **'Email this form'** on the top right-hand-side of the page Fill in the email addresses for your recipients in the dialogue box Professional Development Service for Teacher.

To embed in a website: Embedding forms such as this in your school website can be very useful for compiling a lot of information (e.g. entrance information) very efficiently. All the information can be correlated onto a single spreadsheet.

Click on the 'More actions' button and then the **'Embed' option.** This will generate the HTML code that should be copied into your school website, however, the questionnaire acts independently of the website. How the code is copied into your website will depend on what you are using to design your site.

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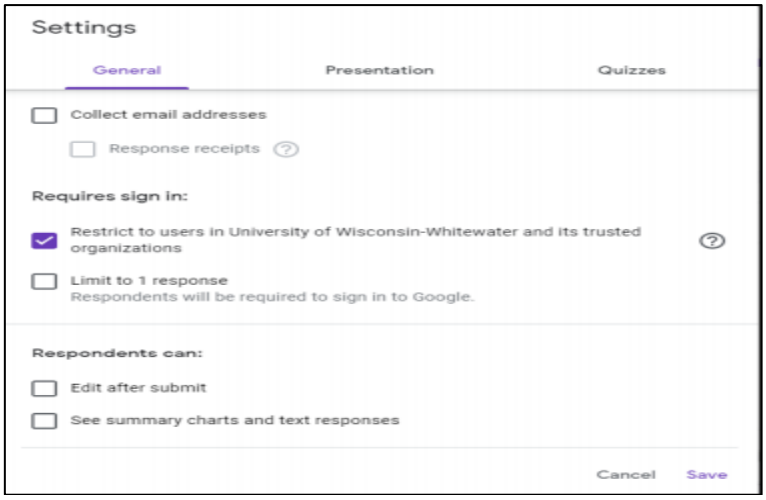
Settings menu

Let's start with what's hiding in the **Settings** menu.

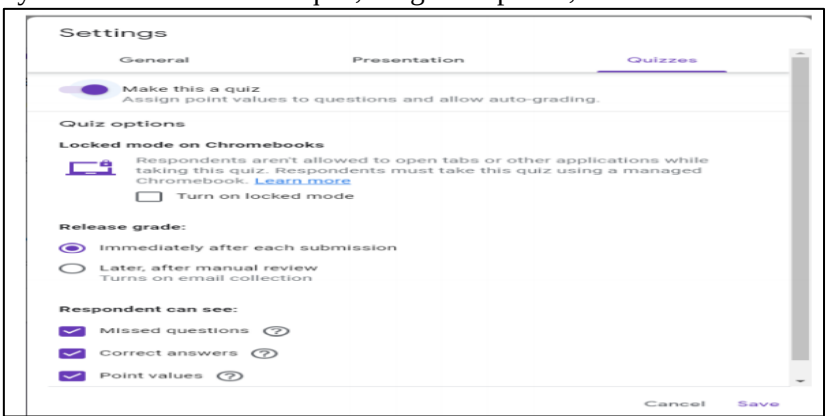
On the form edit page, click on the **cog** at the top of the screen.

General Tab: Allows you to restrict users from your form, collect email addresses of users filling out your form, limit 1 response, etc.



Presentation Tab: Allows you to display a progress bar, shuffle question order, and submit another form response. You can also modify your confirmation message once a user submits a form.

Quizzes: Allows you to set this form as a quiz, set grade options, etc.



Send Form

Click the Send button to view different ways to distribute your form.

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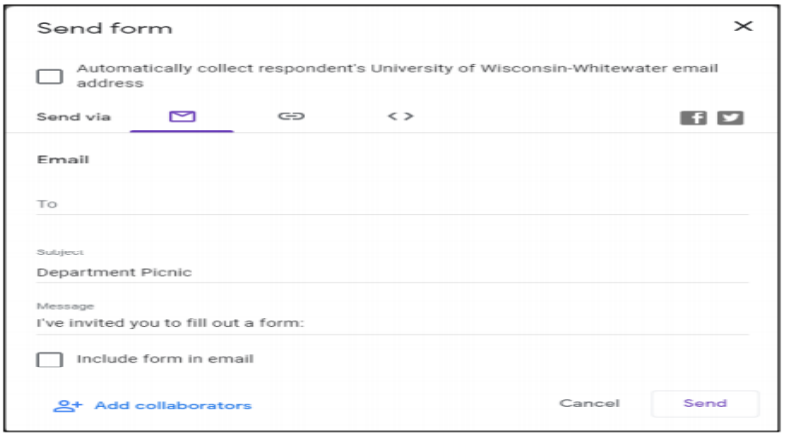
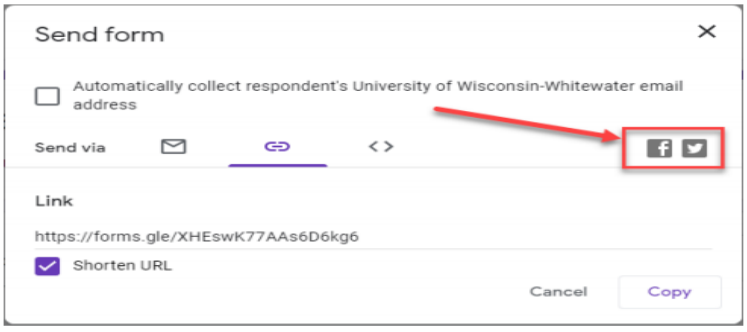
Send Via Email: You can send your form via email to recipients or send the form email to yourself, then use Outlook to forward the form link to others.



Copy Form Link: Click the "link" icon to display the Form's URL link. Select the **Shorten URL** option to display a short link option. Click the **Copy** link in the bottom right to copy the link.

Social Media: Click any one of the social media icons to share the form link using a social media platform.



Analysing the responses.
Once you create your questionnaire then it will appear in 'My Drive' in your Google Drive homepage. Once respondents start filling in the questionnaire the number completed will appear in brackets adjacent to the *'Form'*

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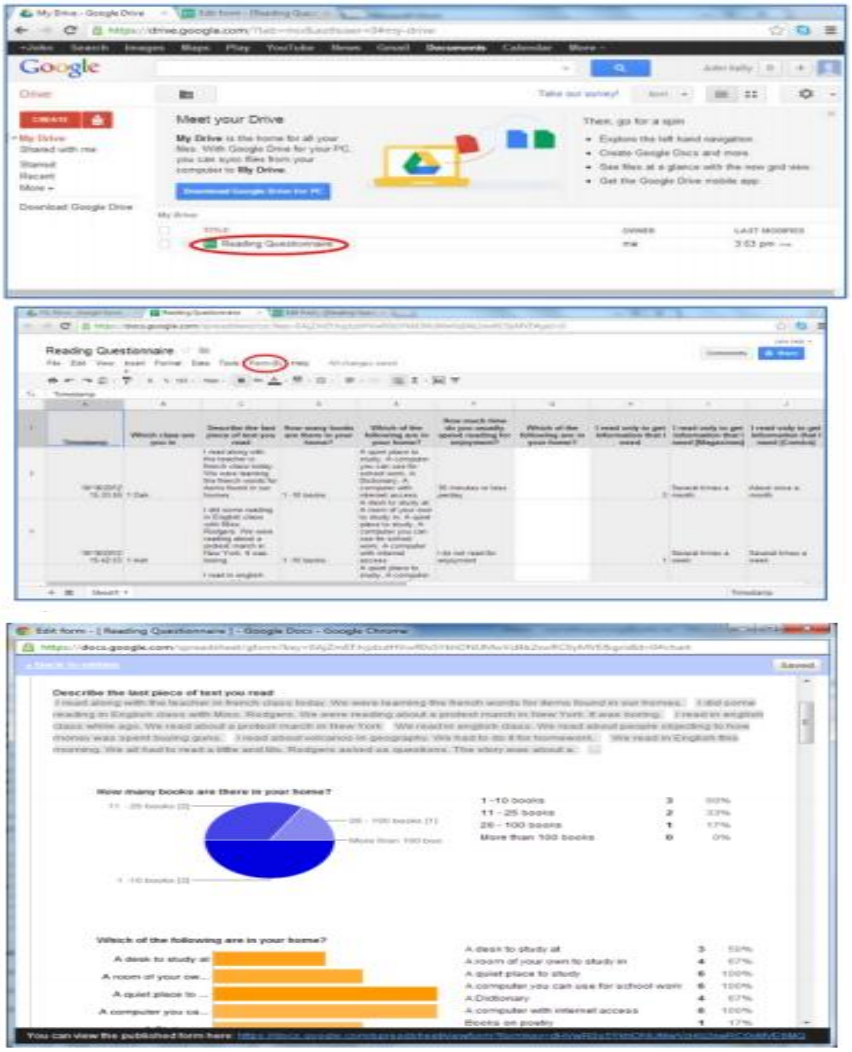
option on the menu bar. This Form options includes: **Edit form, Send form, Go to live form, Embed form, Show summary of responses, Accepting responses and Delete form.**

To see what form respondents will see go to **'live form'**. To see a graphical representation of the results then select '**Show summary of responses' f**rom the Form list. Depending on the type of question asked, the results may be presented in pie chart, vertical or horizontal bar charts or just text. Two negative features of the way the results are presented are that the paragraph text tends to run in together which can be difficult to read. The other is that the formats cannot be altered and findings reordered. This can, however, be done by coping into excel.



Spreadsheet View: Click the (Create Spreadsheet) icon to create and view form responses in Google Sheets. Select to create a new spreadsheet or add to an existing spreadsheet.

Once a spreadsheet is created, click the again to open the spreadsheet.

Note: If you wish to be notified of any new form submissions, select ***Tools > Notification*** Rules from the Google Sheet menu. Select your notification preference, then click **Save** to save your changes.

Note: *Do not modify the sheetsheet data until after you have collected all responses. Modifying the form could result in incorrect data placement.*

Close Form You can close the form for submission by selecting the **Responses tab**, then clicking the **Accepting Responses** toggle. You can modify the message respondants will see if they try to access your form while it is

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closed. Click the toggle again to reopen your form.

Conclusion:

Google Drive is a free, web-based office suite and data storage service offered by Google. It allows users to create online documents and edit them collaboratively. As well as word processing, spreadsheets and presentation Google Drive offers a forms option that can be used to generate online surveys and then collate and present the results. 'Google Apps for Education' is a package of free online tools, including Google Drive, compiled specifically for schools/colleges.

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USES OF INTERNET FACILITIES TO THE USERS OF LIBRARIES

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Abstract

The use of Internet tools and services by the libraries are changing the overall development of libraries. Libraries are using the internet mostly for acquisition cataloguing and reference functions. Librarians can increase the users of Libraries providing valuable information of library holding through internet. Internet is a joint network of thousands of millions of independent Networks; in which each network is connected through a means by which it exchanges information with other networks. Normally information and data are exchanged by the internet.

Introduction

'Knowledge is Mightier than Sword' and **'Knowledge is Power'** are two famous dictums known to almost all. Both stress the point that knowledge is omnipotent. Knowledge is the creator of the social, cultural, religious, spiritual, scientifical, technical materialistic world of today. Knowledge plays a vital role to the modern society in this modern age. The information with their traditional sources in print format is now being added to with electronic information resource. People want to get pin pointed information in speediest way. Electronic resources can organize, handle, disseminate vast amount of information effectively**. Lancaster says** 'Effectiveness must be measured in terms of how a service satisfied the demand placed upon it by its users. Electronic information services become an effective means of enriching and updating of information.'

Information

''The information you have is not what you want. The information you want is not what you need. The information you need is not what you can obtain. The information you can obtain costs more than you want to pay.''

- ***finagle***

Information is one of the most important factors in the development of human society and it is the key resources for future development. Information is universal. It is a product of human brain in action. It is a data that has been processed into a meaningful form. We receive information throughout the day. Information has been termed as one of the eight M's-Men, Material, Machinery, Money, Method, Market, Moment and Message. It is the basis of gainful decisions and an instrument of social change. Development of new information is taken place from the beginning of this century. Now information has come to occupy the central position and driving force for human development. In this age of knowledge explosion, new developments are taking at every moment in the world of information and knowledge.

Information sources are available electronically. The information available media is very important. They are mainly for print and electronic media. In the present era, all the libraries and information centre have radically changed into the conventional to electronic. The user community is getting more advantages through the electronic information resources than conventional method of information systems. Electronic resources are transforming the collection of a modern library. Now-a-days with the advancement of technology it became possible to get access the vast amount of information contained in electronic resources[i]. So the accessibility increased very much. How infact it is beyond our imagination. Thus the accessibility of electronic resources can act as catalyst for improving the quality of the research field.

Although information in electronic format was created with the advent of the computer tin the 1950's. Electronic information resources have their origin in experimental computer systems developed for

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the storage and retrieval of bibliographic data during the 1960's. By the end of that decade some of the major bibliographic data bases (such as chemical abstracts and index medicus) were available in magnetic tape version that was searchable in offline mode. During the 1970's and 1980's the increasing availability of machine readable data together with the emergence of both real time interactive computing and computer networks enabled the online information industry to emerge. The users of this database were normally trained information professionals within academic and commercial organization, searching on behalf of their clients.

During the 1980's system designers started to design their systems to facilitate search by end users. At about the same time CD-ROM emerged as an information delivery vehicle. One of the advantages of CD-ROM databases is that they are free from the constraints of connect time-charging. The suppliers of CD-ROM databases develop more user-friendly interfaces. These could be used by end users who were not information professionals. The widespread availability of CD-ROM products, together with the appearance of OPACs created a marked increase in the searching of electronic information sources.

The emergence of the **World Wide Web (WWW)** has enabled a revolution in the electronic information resources. This environment differs from the earlier situation in that:

- The available information is not restricted to text but includes large numbers of images, audio and multimedia items.
- The information available is an amorphous mass to which any one can add. Thus the available information is no longer subject to quality control mechanisms prior to publication.
- The information is not structured to facilitate retrieval, but through the hypertext links it is structured to facilitate browsing and easy moving between information objects.
- The web browser environment has continued the trend towards user friendly interfaces.

The web also provides access to quality controlled electronic information sources from information aggregators such as DIALOG. But from the side of the searcher the situation has become more complex due to the difficulty in retrieving required information from the plethora of information sources available. The latest trend in technology is wireless Internet access. It allowed cellular phones and hand held Personal Digital Assistants (PDA) to browse the web and handle E-mail.

Even though such ambitious changes took place in the field of information storage and retrieval, these were more in developed countries. Developing countries are lagging behind creating a digital divide. "Although only 6 percent of the worlds Internet users live in developing countries, 84 percent of the world's population lives in such countries".

The New Millennium

The new millennium heralds exciting opportunities to diversify the ways in which education is offered. While only a few decades ago World Wide Web was considered a privilege, today it is a necessity. Everything went electronic; today we frequently encounter words like e-health, e-government, e-shopping, e-business and e-sources among others. Furthermore, the initiatives and policies of European Union emphasize improvement of quality of life and e-inclusion of citizen, supported by advances in development of information and communications technologies. New and improved technologies opened the world of endless possibilities

Access to information has been transformed by the increased sophistication of the internet. The exponential growth in its use and applications is revolutionizing global communications, particularly in commerce and education.

Internet

Information is the most vital resource for any kind of activity. According to Neuman and Neuman, "Information is that which destroys uncertainty". Information has been the basic need of the society. Information Technology has brought in a maelstrom of change in the field of education. Among a multitude of possible new ways learning the super highway, Internet takes first position. Internet Technology influences all walks of human life. It is the gate way of information, knowledge and Research. Internet connection will help to

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access electronic Journals, Bibliographic and full text resources. It may be used in all the process of education.

"Cyber space" is another name for 'Internet'. This term was coined by William Gibson in his fantasy Novel Neuromancer to describe the world of computers, and the society that gathers around them. Gibson's fantasy of a world of connected computers has moved into a present reality in the form of the Internet.

Historically the internet is made up of millions of computers linked together around the world in such a way that information can be sent from any computer to any other 24 hours a day. These computers can be in homes, schools, universities, government departments, or businesses small and large. They can be any type of computer and be single personal computers or workstations on a school or a company network. The Internet is often described as 'a network of networks' because all the smaller networks of organizations are linked together into the one giant network called the Internet. All computers are pretty much equal once connected to the Internet; the only difference will be the speed of the connection which is dependent on your Internet Service Provider and your own modem.

Thus the Internet/cyberspace is the publicly accessible worldwide system of interconnected computer networks that transmit data by packet switching using a standardized Internet Protocol (IP) and many other protocols. It is made up of thousands of smaller commercial, academic, domestic and government networks. It carries various information and services, such as electronic mail, online chat and the interlinked web pages and other documents of the World Wide Web.

All computers on the Internet communicate with one another using the Transmission Control Protocol/Internet Protocol suite, abbreviated to TCP/IP. Computers on the Internet use client/server architecture. This means that the remote server machine provides files and services to the user's local client machine.

An Internet user has access to a wide variety of services: electronic mail, file transfer, vast information resources, interest group membership, interactive collaboration, multimedia displays, real-time broadcasting, shopping opportunities, breaking news, and much more.

Search Tools of Internet

If one is working without professional guidance, whether developing a research topic or looking for research sources, one may use the search tools created to help locate internet materials. Common ways to conduct searches with these tools are by subject and by keyword. Some search tools, such as Google and Yahoo offer hierarchically arranged subject directories through which one can navigate until one finds specific topics one wishes to explore for research.

History and Development of Web

The origin of the World Wide Web (WWW or Web) could be traced to the Conseil Europeen pour la Recherché Nucleaire (CERN). This is a laboratory for particle physics funded by twenty European countries. Tim Berners-Lee conceived of the web in 1989 at CERN as a way of connecting information resources for the particle physics community. He envisioned the web as a networked environment, which used hypertext links to connect disparate information sources. For example, the web at CERN allowed access to the telephone book, conference information, a remote library system, and helped access to files through a uniform addressing system.

In 1991, Berners-Lee and Robert Cailliau developed a web browser and server for the next operating system. To increase the web's popularity, the web browser and server code were freely available to the public. Berners-Lee announced this on Internet newsgroups such as alt.hypertext. These actions broadened the audience from a small group of high-energy physicists to broader academic community. In turn, the academic community sent reports on problems along with requests for enhancements to Berners-Lee.

Berners-Lee decided to release the code into the public domain, thus placing no restrictions on its use. This strategy worked, and within a year there were multiple browsers for UNIX systems, and browsers were appearing for Macintosh and Windows operating systems.

Berners-Lee's intention was to persuade the computing community to adopt the web. He believed that the web would be extraordinarily

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valuable to society. He did not act for his own financial gain. In fact, at several junctures, Berners-Lee decided to remain the Benevolent Father of the web. He put his vision of the web ahead of personal financial gains. Today, Berners-Lee is the head of the World Wide Web Consortium, which is dedicated to developing open standards to unlock the full potentials of the web.

Proliferation of Web-based e-Learning

The emergence of a network culture and the digital era, paved the way for innovative web usage. E-learning's convenience, reach and novel pedagogical resources can potentially improve education by providing high quality, customized instruction to the greatest number of people.

E-content is the heart of e-learning. Online articles, streaming video, audio segments, images, specially designed Web sites and unique learning objects - these electronic elements are created to enhance courses and improve learning. Learning style is more interactive, the learners having been raised with computers, the internet and video games. E-learning programmes are changing teaching levels and enhancing learning.

In the digital education environment, experts are challenged to integrate and expose their services and content into the e-learning system, and take on new duties, such as creating content and managing digital repositories.

Importance of Web-Resources

Web resources consist of numerous information resources around the world. Almost all the researchers and academic institutions are connected in someway or the other to the net. This brings pressure upon the libraries to offer net-based services. The time tested skills of information organization and retrieval are needed to make the most efficient use of the web resources. The web-resources are regarded as a valuable boon to mankind, particularly to the researchers. The web facilitates provide needed information and knowledge from the experience of others also.

Internet and World Wide Web

The Internet is a worldwide, publicly accessible series of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). IP is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked Web pages, research papers, statistical data, e-journals, e-directories, and documents of the World Wide Web.

Factors Influencing Web

Web browsing is very significant for the knowledge-based society. While speaking about the web, one should know the factors that make the people to go to the web. The most important factor that determines the web browsing practice of a researcher is his interest updating of knowledge in general and in particular research and development.

The second important factor that determines web browsing practice is awareness of the web-resources and their facilities. The most significant factor is the cost of using web. If the cost is low, then many will go and use web facilities. WWW is the resource centre for all kinds of electronic resources. It should be well managed in the best way so as to provide better service to the research community.

Role of Web-resource in Research

Many erudite persons in a community have been making some attempt to collect and organize graphic records, including some sort of a Web. Web has accompanied education, restricted or liberalized. In the advanced countries of the West, one can witness tremendous proliferation of Web as a sister service to universal education. In the majority of these countries, literacy has reached peak levels. Only in some of the Latin-American countries and Afro-Asian countries, the percentage of literacy is a little below the standard. It has been noticed that the Web grows in direct proportion to education in a community. In the under-developed countries, Web services have reached the learners only recently. Material improvements are designed as the scope of schools, colleges, universities, research institutions, libraries, museums, art galleries and other cultural bodies get expanded. The close relationship, between education and Web has been strengthened on right lines. If the society has an obligation to feed, clothe and house the people comfortably,

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it has a similar moral duty to educate them and to feed them intellectually through educational institutions and sophisticated methods.

Progress in civilization has never been uniform throughout the world. Some countries have developed considerably. Some have lagged behind. But the latter are by no means to be expected to stay behind forever. Trends of development take strong roots gradually but surely.

Types of Web-Resources

There are three major types of web-resource. They are:

a) Open Web – Anything online that can be found freely with a search engine.
b) Gated Web – Online resources accessible by subscription.
c) Invisible Web – Databases that are not found by Search Engines and can only be accessible through a particular page or front end.

Importance of Gateway sites

The user or instructor might direct one to a "metapage" or "gateway" that provides links to other sites. Examples of gateway sites from the URLs show many changes.

Voice of the Shuttle offers on its home page a menu of subjects in the humanities, anthropology, architecture, history, literature and philosophy. Selecting "media studies," for example, gives one a list of specific fields (like, journalism, television, film and video, popular music, comics and cyber culture). The choice of "media history and theory" presents links to numerous resources in these area professional organizations, bibliographies, chronologies, journal articles and papers, course descriptions, and other related sites, including some created and maintained by scholars in media studies. The home page also provides general links to libraries and museums, reference works, journals, publishers and booksellers, e-mail discussions and news groups, conferences, and travel resources.

- Social Science Information gateway likewise presents a menu of subjects like business, economics, education, psychology and sociology. If one clicks on "sociology", one receives a list of specific subject areas (like the sociology of, adolescence, children, gender, law and crime, medicine, race and ethnicity, religion, sport and work). Selecting one of these areas yields links to relevant articles, papers, reports, bibliographies, data, educational materials, government publications, journals, discussion groups, professional organizations, research projects, and research guides.
- Women studies' database allows the researcher to choose from such categories as the following: conferences, announcements, bibliographies, syllabi, film reviews, gender issues, other Web sites, and reference room. If one chooses the last of these, one receives links to academic papers, book reviews, fiction, history, nonfiction, and poetry.

Recommended Peer-reviewed Web-sites for Research

Some gateway sites are refereed. Argos for example, is a "peer-reviewed, limited-area search engine" designed for students, teachers, and scholars of the "ancient and medieval worlds". An editorial board or specialists review and approve each site before it is included in this search engine. The home page of Argos contains a list of these "associate sites", such as the following:

- Abzu: Guide to resources for the study of the ancient near east available on the Internet (Univ. of Chicago)
- Byzantium: Byzantine studies on the Internet (Ford Han Univ.)
- Diotima: Materials for the study of women and gender in the ancient world (Univ. of Kentucky)
- The Labyrinth: Resources medieval studies (Georgetown Univ.)
- The Peruses Digital Library (Tufts Univ.)

Research Activities at the Global Level

Higher education has undergone a remarkable transformation in the last few decades both in the United Kingdom and the United States. The quality of life for society at large, and individuals in the society, largely depends upon the quality of education. Higher educational institutions in the country, especially the universities, have been producing the required quality manpower as per demands made in the social system. Since India's independence in 1947, the higher education system has grown enormously. It has expanded in an unprecedented manner not experienced by any other nation in recent times. The advent of Information and

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Communication Systems (ICT) products like computer and internet have further made it possible to spread higher education even in remote corners of the country.

Research Activities atUniversities

The word 'university' is derived from the Latin Universitas Magistrorum et scholarium, roughly meaning "community of teachers and research scholars" It is an institution of higher education and research, which grants academic and research degrees at several levels in a variety of subjects. A university provides both tertiary and quaternary education. All the universities are giving due importance to the development of research also.

Research Activities at all India Level

In the Indian system, higher education includes the education imparted after the 10+2 stage - 10 years of primary and secondary education followed by 2 years of higher secondary education. The first degree, the bachelor's degree, is normally obtained after 3 years for humanities, science, commerce and 4 years in the case of professional degree (4 ½ years in case the of medicine and 5 to 6 years in the case of law). The master's course is usually of 2 years duration leading graduates to degrees like M.A., M.Sc., and M.Com. The post-graduate courses also include 1-2 years professional courses leading to degrees like M.L.I.Sc. -Master of Library and Information Science, and MPED-Master of Physical Education. The M.Phil, course is of 1 ½ year duration and is a preparatory course for doctoral level studies. In a few universities the MLIS course is run as programme 1 year after BLIS, and a few universities run an integrated 2-year course. Ph.D. degree course require research study for a minimum of 3 to 6 years and some special extension of 3 more years to complete the research work if required.

India's higher education system gives equal importance to research and development. A researcher is in need of more information in all the branches of knowledge, seeking primary and secondary level current and accurate information in a fast manner. The e-source or web-resource will be definitely helpful to the researchers for their work.

Access to the internet is becoming common in institutions of higher learning. This has been particularly true of the countries in the developed world and is becoming true of developing countries as well. Most colleges and universities in developed countries make access to the World Wide Web (Web) almost as easy and transparent as access to telephone lines. Students coming out of the high school system in some countries are increasingly aware of the opportunities offered by the Web, and are often frequent Web users prior to entering a university.

Web Sites for Research

Those who are familiar with the World Wide Web, find it highly useful and positive like a library. Therefore, whenever possible, one should follow the guidance of an instructor, and academic department, or a librarian in selecting internet sites for research. In addition to online databases available through subscription, the library may recommend important internet sources that are likely to be selected after careful evaluation and consultation. The library's Web site for links to such resources should be checked. A librarian may be able to advise one about sites relevant for a particular research. Similarly, one may find sites recommended by academic departments and individual instructors on Web pages for the department, the instructor, or the course.

Available Information Sources over the Web

The available sources of web-resources include E- Journals, Information Networks, Directories, Usenet News, Data and Software Archives, E-mail based Information Services, Campus Wide Information Services, Library Catalogues – Web OPAC s, Online Databases, Online Chatting, Guides to Information Systems, Search Engines, Subject Gateways, Web Dictionaries and Web Directories, Online Chatting, Commercial advertising, Job Portals, Bulletin Board Service, Abstracts and Full text documents, E-Marketing, E-Publications, and Government Web sites. The sources play a key role in e-research efforts.

Ways and Means of Access to Web-Resources

1. Through Search Engines
2. Through Web OPACs (Online Public Access Catalogue) and

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3. Through Specified URLs (Uniform Resource Locator) Web sites

As more and more websites maintain their information in databases and support queries on these databases through some queryable objects embedded in web page, it is becoming necessary for the new generation library systems to introduce new ways to capture such web information generated from a couple of hours with information on everything except what they need pin-pointedly. Finding the precise information is perhaps even more difficult than finding the proverbial needle in a haystack, if one does not know how to go. What strikes one clearly is the absence of a central directory on the net that can locate the entire web at any given time.

In spite of the various search engines, locating the exact information is often a hit or a miss proposition. This is because various search engines in the web are programmed to seek out new and updated information at periodic time slots. The easiest way to find anything on the internet is to use a search engine because these index the plethora of documents on the WWW. Many search engine companies also allow webmasters to submit their homepage for cataloguing by that search engine. This allows the search engine to list the web page. A search engine continuously sends out the so-called spiders, which start on the homepage of a server and pursue all links stepwise. Word indices are created from individual pages and the database is updated.

Mining the Deep Web

The search engines have access to only a small fraction of what exists on the Web. A large number of information pieces of content are hidden from the view of those search engines, says Brightplanet.com, a search company. To many search experts, this is the "invisible web." Bright Planet prefers the term "deep web," an online frontier. Its estimates may be 500 times larger than the surface web that search engines try to cover. That uncharted territory does not include Web pages that are behind firewalls or part of intranets. Some other estimates say that the Deep Web covers somewhere in the vicinity of 900 billion pages of information located through the World Wide Web in various files and formats that the current search engines on the internet either cannot find or have difficulty in accessing. The current search engines find about 10 billion pages approximately. In the last several years, some of the more comprehensive search engines have written algorithms to search the deeper portions of the World Wide Web by attempting to find files such as .pdf, .doc, .xls, ppt, and .ps.

These files are predominately used by the academic community to exchange their information **within** their organizations, or to disseminate information to the external world **from** their organization. Searching for this information using deeper search techniques and the latest algorithms allows researchers to obtain a vast amount of corporate information that was previously unavailable or inaccessible. Research has also shown that even deeper information can be obtained from these files by searching and accessing the "properties" information on these files.

To dig deeper into the Web, some new breed of search engines have cropped up that take a different approach to Web page retrieval. Instead of broadly scanning the Web by indexing pages from any links they can find, these search engines are devoted to drilling further into specialist areas. These are very specific in the sense that they focus on a very narrow concept of function. For example, when one seeks sketches of molecular structures, a search engine, www.biolinks.com may help.

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ECOFRIENDLY COLLEGE CAMPUS: A GREEN SUSTAINABLE APPROACH (NAAC PERSPECTIVE)

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Abstract

According to Merriam-Webster, the term eco-friendly is, "not environmentally harmful." Environmentally friendly, eco-friendly, earth-friendly, nature-friendly and green are some synonymous ways of saying "not environmentally harmful." Sustainable **or** sustainability means "the practice of making sure we don't deplete our natural resources while maintaining a prospering economy for future generations," says Aral. Usually a college campus is the composition of Administrative blocks, Classrooms, Laboratories, Library, Sport complex, Hostels, Canteen, Leisure parks, NCC and NSS units, open ground, Latrines, Parking blocks etc. To imbibe sustainable and green approach among the society, the college is the best place. There are many ways (Inclusion of Environmental studies course at graduation, starting some eco-friendly projects in campus like, Vermicompost, Biogas plant, and solar energy, Plantation drives, Sewage treatment plant (STP), Solid waste management, e-waste management, Rain-water harvesting, Vehicle-free campus and No vehicle Day, Nature and Adventure Clubs, Field visits, Study tours, organization of webinars, seminars, conferences regarding environmental protection and sustainable development, MoUs, Linkages and out-reach programmes, study of floral and faunal diversity of college campus etc.) by which we can aware the students and in turn society about environment and natural resources. National Assessment and Accreditation Council (NAAC) has given special emphasis in their accreditation process to maintain clean, green and sustainable college campus.

Keywords: *Eco-friendly, MoUs, NAAC, Natural resources, Sustainable development.*

Introduction:

'Green', the word which is extensively used now a days. The 'Sustainable development' and 'Green' are the two sides of the same coin. Slogans of green or greenery, green buildings, green transportation, green agriculture, green campus etc. meets the sustainable development (**Nulkar, 2014**). Gross infringements by humans leads to environmental harm (**Orenstein *et al*., 2019**). Extensive use of natural resources results in climate change, which reflects in natural environment and all living things (Ghoshal, 2011). The leading educational institutes in India *viz.* Indian Institute of Technology (IIT), Indian Institute of Management (IIM), Indian Institute of Science (IISc), Jawaharlal Nehru University, Delhi, Banaras Hindu University, Varanasi as well as universities around the world have adopted strategic concept in dealing with environment, sustainability and the green trend in their classes and teaching courses (**Alshuwaikhat and Abubakar, 2008**).

Environmental sustainability is the process of maintaining changes in environment to meet stakeholder's needs and aspirations, in which all the changes are enhances with both current and future potential. As per the Brundtland commission in UN in 1987, sustainability is 'improving the quality of human life and ensuring the capacity to support the ecosystem (http://len.wikipedia.org)'. 'Sustainable educational campuses' aims to build capacity among youth to assess environmental impact and take alleviation measures in their colleges and universities through environmental, energy and green auditing of the campuses. The project based learning (PBL) with special emphasis on floral and faunal diversity, restoration of habitats or ecosystems, sharing and learning best practices through participation in events like conferences and

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seminars create positive impact to meet sustainable development.

Activities to Maintain Eco-Friendly College Campus:

1. A Course on Environmental Studies:

A compulsory course on environmental studies should be included at graduation level with learning objectives: To understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. To adopt concepts and methods from ecological, chemical and physical sciences and their application in environmental problem solving. Students will able to understand ways in which their lifestyle and well-being are interconnected with those of diverse producers and consumers around the world and its relation with environment.

2. Vermicomposting Unit:

Vermicomposting is environmentally friendly and is widely used in agriculture. College campus is the place, where we can collect large amount of leaf litters, which can be recycled with Vermicomposting unit. College can organize awareness programmes on organic farming for farmers in collaboration with *Grampanchayat*, *Nagarpanchayat* or Muncipal Corporation.

3. Biogas Plat:

Biogas plant is an artificial system, where we can turn waste into sustainable energy with positive effects on environment. Use of kitchen as well as hostel canteen waste can be recycled and biogas can be utilized for hostels and canteens.

4. Campus Audits:

Campus audits include green audit, environmental audit and energy audit. Overall survey and campus monitoring should be done once in a year and data regarding College infrastructure, campus plant census, waste management (solid, liquid and e-waste), health and hygiene, plantation drives, Number of Solar lamps in the campus, sewage treatment plant (STP) at the Hostels and canteens, activities conducted through NSS and NCC, training and awareness programmes conducted under environmental awareness committee etc. should be compiled and kept for future needs.

5. No Vehicle Day:

At-least once in a week 'No vehicle day' should be there in the college. The parking places for two wheelers and four wheelers probably out of campus to maintain vehicle free campus.

6. Nature and Adventure Club:

Department of Zoology, Botany and Geography can collaboratively establish 'Nature and Adventure Club'. Student and Faculty registration will keep this club active. Faculty tours at forests, Historical places, wetlands, biodiversity centers as well as student's tours at Zoological parks, National sanctuaries, GIS centers, Forests to study forest ecosystem should arrange as per the rules and regulations laid down by institute. Trekking, Scuba diving, Mountain safari, Rafting, Rock climbing, Camping etc. can be organized as per their suitability.

7. Celebration of Environment-related days:

To create awareness among students, institute should prepare a calendar containing various environment-conservation days, like Ozone Day, Environment Day, Wildlife Day, Wildlife Week, Wetland Day, Sparrow Day etc. On these occasion Guest lectures, poster presentation, Exhibition of Medicinal plants, Essay competition, Slogan competition, wildlife photography competition, field visits should be organized to inculcate environment consciousness among students.

8. Organization of Webinars/ Seminars/ Conferences:

Institute can organize webinars, Seminars or/and Conferences in online/ offline/ hybrid mode related to environmental issues with maximum focus on student participation. Resource persons associated to Governmental or Non-Governmental organizations from India and abroad should be invited and to create environmental consciousness among students.

9. MoUs and Linkages:

Institute should take strong initiative to sign MoUs and Linkages with various firms associated with environmental fields to cooperate in various activities, including joint educational, training and/ or research activities, exchange of scholars. Faculties, resource personnel to exchange the information and practical training. The MoUs acts as the foundation for future student exchange agreements

10.Project Based Learning (PBL):

PBL is one of the best learning method in which students are actively participated and gain the knowledge through learning by doing. Special level students and PG students can study the floral and faunal diversity of college campus. These studies will create excellent record of campus biodiversity.

11.Rain water Harvesting:

Rain water harvesting is one of the sustainable way to conserve water. College campus includes Administrative block, Library, Laboratories, Classrooms, Hostels, Canteen, Sport complex, Staff quarters, Parking blocks etc. All the roof tops should connect with pipeline and rain water should be collect to recharge groundwater table or sub-surface zone. This water will utilize for campus plants as per requirement.

Conclusion:

Environment and sustainability is one of the important cross-cutting issues in NAAC process. To maintain eco-friendly college campus and pollution-free teaching-learning environment, institute should follow maximum measures to keep the college campus clean and green. Institute should have various environment-friendly slogans in their campus. MoUs with ZSI (Zoological Survey of India), BSI (Botanical Survey of India), NGOs like BNHS (Bombay Natural History Society), forest and Tourism departments, Sanctuaries, Nurseries, etc. will create excellent platform to maintain all the above mentioned practices live.

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Natural Tourist Centers in Aurangabad District: A Geographical Study

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Abstract

In the present research paper the progress of Natural tourist centers in Aurangabad district of Maharashtra State. A more generic term for any activity or travel experience with a focus on nature. Large jungle lodges fall into this category as do cruise ships to view penguins in Antarctica. These types of trips may or may not be environmentally sustainable or responsible. Often used inter changeably with eco-Tourism and sustainable tourism but more accurately described as "any activity or facility operating in an environmentally Friendly fashion." The International Ecotourism Society defines Ecotourism as "responsible travel to natural areas that conserves the environment and improves the welfare of local people."

Keyword: *Natural tourist center, Eco-tourism, Conservation, Environment.*

Introduction

The district of Aurangabad now a part of the Maharashtra state is situated in upper Godavari basin and in the extreme north west of Marathwada. A more generic term for any activity or travel experience with a focus on nature. Large jungle lodges fall into this category as do cruise ships to view penguins in Antarctica. These types of trips may or may not be environmentally sustainable or responsible. Often used inter changeably with eco-Tourism and sustainable tourism but more accurately described as "any activity or facility operating in an environmentally Friendly fashion."

The International Ecotourism Society defines Ecotourism as "responsible travel to natural areas that conserves the environment and improves the welfare of local people."

Study Area

The district of Aurangabad now a part of the Maharashtra state is situated in upper Godavari basin and in the extreme north west of Marathwada. It lies in between the parallels of 19° 17'30" and 20°40'10" North latitude and between the meridians of 74°39'30" and 76°40' east longitude. The district forms 3.28% of the total area of the state. Total Geographical area is 10100 sq k.ms out of 141.1 sq.km. is urban area and 99587 sq. km. is rural area (1.40% and 98.60% respectively .) A small area in the north and North West lying beyond the Satmala hills is actually situated in the Tapi basin. The northern portion lying between the satmala hills.The central hill ranges known as Jalna hills is an upland plateau the southern portion is comparatively low terminating at the banks of the Godavari. In general the district slopes down towards the south and south east

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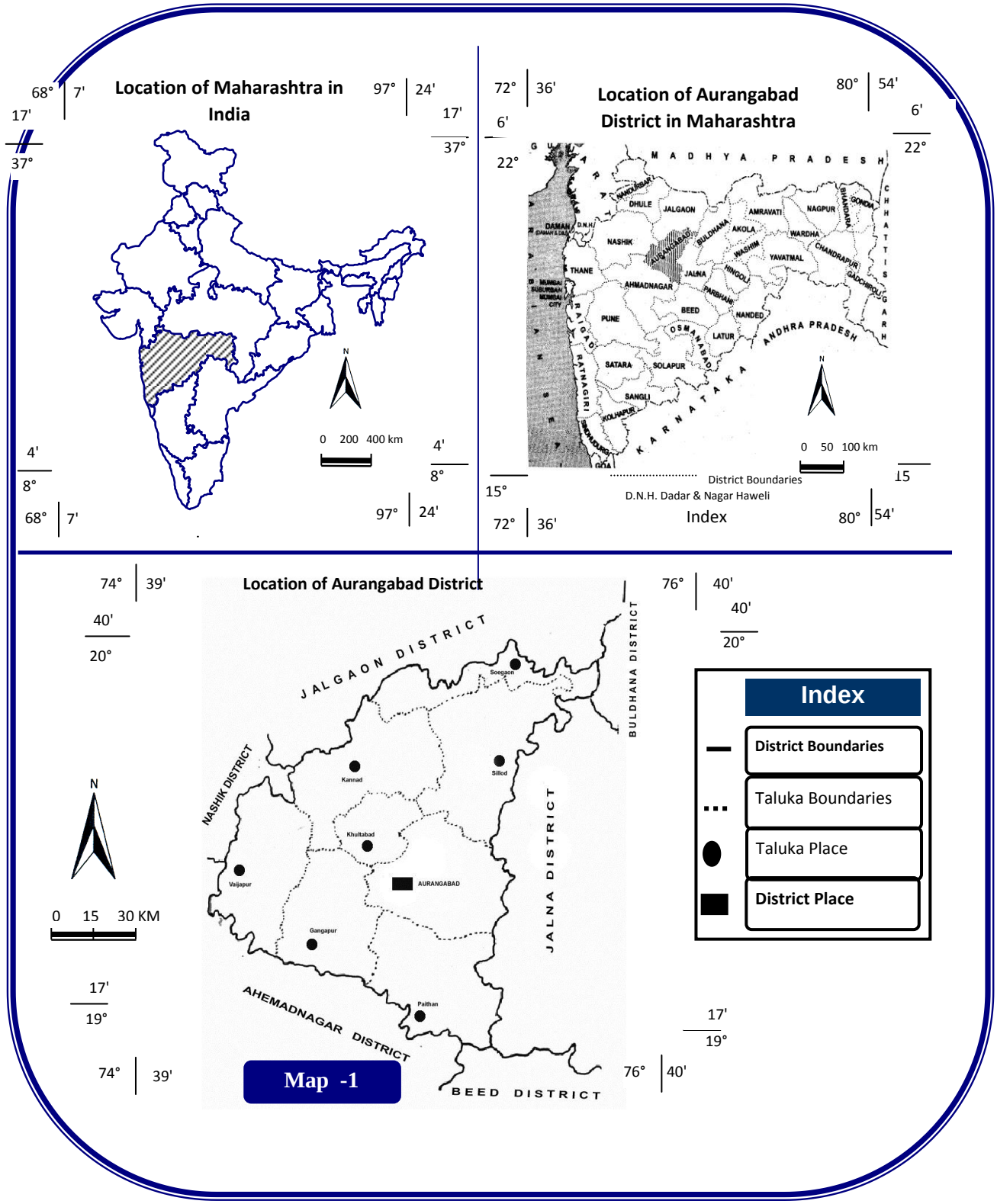
LOCATION AND BOUNDARIES IN AURANGABAD DISTRICT



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Aim& Objectives

1 To study various natural tourist centers of the district.

3 To study the biodiversity conservation natural tourist centers.

2 Isolated and small tourist places provide merge and limited tourist facilities where the Tourist spends few hours or their total journey time.

Methodology

In present research paper primary and secondary data is highly relied upon. Such data is collected from published and unpublished literature, Socio economic review, Agricultural department,The data collected and used for the period 1980-81 to 2004-05. Comes both from primary and secondary sources. the primary data is the row data collected through difference sources for which special questionnaires were designed and information collected through various offices. The data thus collected through primary and secondary source were processed and represented by statistical and cartographic technique

Discussion

Natural Tourist Centers:

A more generic term for any activity or travel experience with a focus on nature. Large jungle lodges fall into this category as do cruise ships to view penguins in Antarctica. These types of trips may or may not be environmentally sustainable or responsible. Often used inter changeably with eco-Tourism and sustainable tourism but more accurately described as "any activity or facility operating in an environmentally Friendly fashion."

The International Ecotourism Society defines Ecotourism as "responsible travel to natural areas that conserves the environment and improves the welfare of local people."

Jayakwadi Project:

This is an interesting site where one can see a number of resident and migratory birds. About 4 kms,North of Paithan Town, an earthen dam on the river Godawari has been constructed and a Large reservoir formed. The Jayakwadi dam here is a haven for avid nature lovers. Situated at the bank of a river is a very huge dam "Jayakwadi" which provides water to Aurangabad city and surrounding places.

Paithan Dam under Jayakwadi project phase I (left Cannel in is included) and granted on 31 January 1965. (The Project approximate price 36.89 million) At that time Establishment of Jayakwadi project corporation on 1965 in Aurangabad. The Inaguration of Jayakwadi Projects in the presence of Prime Minister Lal Bahadur Shashtri on 18 Oct.1965. "Nath sagar" the name is given to Jayakwadi water body in the presence of Smt. Indira Gandhi and dedicated to Nation on 24 Feb.1976. The Second phase Jayakwadi project Report has submitted to Govt. and sanctioned on 21 Oct.1974. A variety of resident and migratory birds can be sighted here. The best season for bird watching is between October and March.

Paithan in modern times has acquired importance due to the presence of the Nathsagar reservoir. The reservoir was created in 1976 with the construction of the dam on the Godawari River, also revered by the Hindus as the "Dakshin Ganga" (Dakshin Kashi) due to its religious impotence. The reservoir is a massive water body spread over 340 square Kilometer area and approximately 400 Kilometer perimeter, the reason for such a massive spread is a relatively flat terrain, which has resulted in a shallow, saucer shaped water body. The average depth of reservoir is only 1 to 2 meters which gives it a typical wetland character. Over the years the reservoir has become a refuge for many local and migratory birds. Which led to being declared as a wildlife sanctuary under the wildlife protection act of 1972 by the Government of Maharashtra 33980 hectares of the reservoir and 125 hectors of Dnyaneshwar

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Udyan become part of "Jayakwadi Bird Sanctuary" on the 10th October1986.

Biodiversity: Over two hundred species of resident and migratory birds from as per as Nepal, Tibet ,China and Russia can be spotted in Jayakwadi. Flocks of Flamingoes, Pocharads, Coots, Teals, Bar Headed Geese, Painted storks, Brahimany Duck, Spoon Bills, Demoiselle .cranes and curlew enliven the landscape in the winter months. The reservoir itself has highly diverse aquatic vegetation, 65 varieties for Fresh water fishes, Molluscs and crustaceans, which form the food for many of the water birds. Other than these, resident birds like the Indian Roller, White Breasted Kingfisher, fishing eagle, Bee – eater and Mynas also abound on the shores. The area surrounding the reservoir has a number of Neem, Mango, Jamun, Tamarind, Banyan, Albizzia, Subabul, Amaltas and Chandan Tree.

Bird Watching: The Annual rainfall ranges from 500 to 550 MM and normally occurs between June and September. The Maximum temperature in summer is 44° C, while minimum temperature in winter is 9 ° C The Best time to visit the Sanctuary is between the Months of October and February when the Migratory birds make this reservoir their winter retreat. Birds can be sighted early morning between 6 a.m. and 9.a.m. and 4 p.m. to 7 p.m. in the evening. On the north bank shewta, Bramhagavhaon., Sawkheda, Pravara Sangam, Pimpalwadi Dam site and on the south bank Sonewadi, Dahiphal, Ramdoh, Dohegaon, Antre , Tajnapur are the poins from where birds can be sighted easily. There are watch towers at Sonewadi and Bramhagarhaon.

Gautala Autramghat Sanctuary: Is a sanctuary situated at a distance of 72 Kilometers from Aurangabad is a hilly. Terrain, where in lies a sanctuary named after a well known ancient ascetic known as Gautam Rishi. There is a small cave which was his abode and many Rishi's or holy sages meditated here. The spot is very scenic as there are waterfalls and lakes, dense vegetation and Jungles. The Gautala sanctuary is spread over 260 k.m. and over two –hundred species of birds. There are a variety of wild animals like leopards, deer, wolves, Jackals etc. The diversified vegetation Scattered intermittently supports rich faunal and floral diversity. Particularly it is good for sloth bear habitat and excellent for resident and migratory birds.

Taluka wise change in forest area in Aurangabad district (Area '00'hectors)

Sr.No	Name of the taluka	Total geo Area	1981-85		2001-2005		Volume of change in %1980- 85 to 2004-05
			Area under forest	% to the total geo area	Area under forest	% to the total geo area	
1	2	3	4	5	6	7	8
1	Aurangabad	1611	268	16.63	268	16.63	0.0
2	Khultabad	518	28	5.40	20	3.86	-1.54
3	Kannad	1555	303	19.48	303	19.48	0.0
4	Soegaon	545	112	20.55	125	22.97	+2.42
5	Sillod	1517	28	1.84	28	1.84	0.0
6	Paithanr	1428	16	1.12	15	1.05	-00.7
7	Gangapur	1308	2	0.15	22	1.68	+1.61
8	Vaijapur	1594	31	1.94	30	1.88	-0.06
	Total District	10076	787	7.81	811	8.04	+0.23

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Source: *Socio-Economic Abstract, Aurangabad District.*

The total area under forest in Aurangabad district was about 1007600 hectares during 1981-05 this work out to 7.81% of to total area of the district as against a corresponding percentage of 8.04% for the whole of the district the forests are mainly divided in to following types (Table. No.1)Table no 1 indicates that about 780 thousand hectors or 7.81of the total geographical area of the study region was under forest during 1981-85. It is increased from 78 thousand hectares to 81 thousand hectares between 1981-85 to 2000-05. This shows that there is minor increase in forest area. Out of total geographical area below 1% area was under forest in Gangapur tahsil. About 1 to 2% geographical area was under forest in Sillod Paithan and Vaijapur tahsil during 2001-2005. About 2 to 20% area was observed under forest in Aurangabad, Kannad and Khultabad tahsil. Where as about 22.97% Geographical area was found under forest in Soegaon tahsil during 2001-2005. Both positive and negative changes were found in the study region. The highest positive change (2.42) in area under forest was found Soegaon tahsil where as the lowest positive change (1.61) in area under forest was noticed in Gangapur tahsil during the period of investigation. About (1.54%) negative change was recorded in Khultabad tahsil during the period under study.

The Forest Animals:-The floral wealth of Gautala includes several species of prime medicinal value. Among the 19 species of mammals and reptiles found here are the leopard, wolf, Jackal, Hyena, Nilgai, Porcupine, Common languor, Monitor Lizard and snakes. Also, more than 200 species of birds have been recorded were. Here you will sense a mysterious and piousaura. The famous caves of Pitalkhora in these Forests were once the abode of austere Buddhist monks. Bhaskaracharya, the famous Indian Mathematician,who wrote the seminal mathematical treatise "Siddhantashiroman"in the eleventh century AD.Resided in these forests. There are many ancient temples here including the Chandikadevi Temple. These forests are immensely rich in archaeological wealth.

Mhaismal

Mhaismal original colled "Maheshmal"in a village located about 12 kms. From Khultabad. An ancient temple of GigijaMata is in the village and an exact replica of Lord Balaji Temple at Tirupati is located at the top of hill. 300 feet. It is a small but beautiful hill station situated on the way to Ellora caves. Girijadevi Festival is celebrated every year in the month of March.

Accommodation facility is also available here. The atmosphere of the place is healthy. But there is scarcity of water. Durdarshan tower at Mahismal where presented the metro wahini D.D.1.The height of the tower is 150 meter.The number of Tourist visit here at evening to take the beauty of the spot. This place is known for its," Sunset point"

Sant Dnyneshwar Garden:

The huge Gyaneshwar Udyan, Maharashtra's largest garden is another attraction of this area. Recently built is a famous "Sant Eknath Garden" spread over huge 97 acres of land. This is a replica of the Vrindavan Gardens of Mysore, and is used to shoot various scenes for the Hindi and Marathi Movies, The most interesting attraction of this area is the huge Gnyaneshwar Udyan. Built on the lines of the famous Vrindavan Garden in Mysore, Pinjore in Haryana and the Shalimar in Kashmir, Paithan was famous as a seat of learning. A Trip to the Garden at the Jayakwadi Dam with its dancing fountains and special observation points for bird watching is also an option.The town is also famous for the Dnyaneshwar Udyan, which is the largest Garden in Maharashtra

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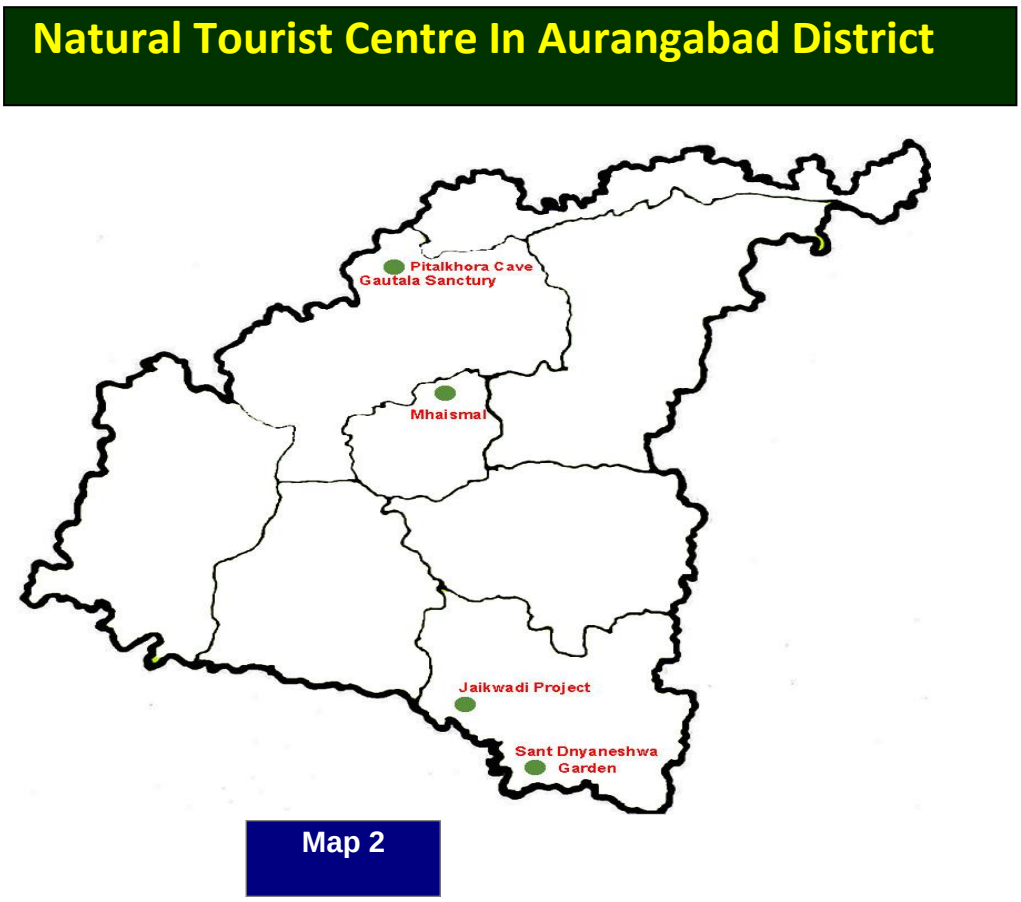
and a museum, which Treasures a fascinating collection of art.



Conclusion

The Jayakwadi dam here is a haven for avid nature lovers. Situated at the bank of a Godawari River is a very huge dam "Jayakwadi" which provides water to Aurangabad city and surrounding places. A variety of resident & migratory birds can be sighted here. The best season for bird watching is between October & March.The Gautala sanctuary is spread over 260 km and over two Hundred species of birds. There are a variety of wild animals like leopards, deer, wolves, Jackals etc. The diversified vegetation scattered intermittently supports rich faunal & floral diversity. Mhismal is a small but beautiful hill station situated on the way to Ellora caves. Girijadevi festival is celebrated every year in the month of March. The number of tourist visit here at evening to take the beauty of the spot. This place is known for its 'Sunset Point'The town of Paithan is situated on the banks of the Godawari River at a distance 56 kms.South of Aurangabad. This ancient town factures in sacred Hindu Literature under the name 'Pratisthan' a sanskrit word signifying 'The celestial abode of the Gods.'

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Human Security & Climate Change: A Study of Sundarban

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Abstract:

Human security which is an emerging concept has root embedded in different disciplines. In spite of the conflict in defining a right spectrum of human security, there should be a consensus regarding the interconnection of this aspect with climatic events. Climate change and extreme climatic events always pose serious threat to human livelihood worldwide.Considering the situation of Sundarban region which experiences the fury of Climate change and extreme climatic events repeatedly, the issue of human security becomes very relevant. People of West Bengal Sundarban are becoming insecure and vulnerable day by day due to climatic change causing significant risks in respect to their livelihood dimensions. From this background this paper tries to shed lights on the issues of human security in different parts of West Bengal Sundarban.

***Key words**: Human security, Climate change, livelihood dimensions.*

Introduction:

Human security which is an emerging concept was introduced first by UNDP in 1994. Then it has become multi-dimensional having root embedded in different disciplines. The concept of Human Security is complex as well as dynamic and can be conceptualized according to spatio-temporal framework. Central to the concept is different kinds of threat to human being as it is a human centric approach. Achievement of the Millennium Development Goals and fulfillment of Sustainable Development Goals have direct link with human security issues. Now, changing its nature from merely indicating freedom from want, freedom from fear human security covers all aspect of human livelihood, human right and human development. In spite of the conflict in defining a right spectrum of human security, there should be a consensus regarding the interconnection of this aspect with climatic change. Climate change and extreme climatic events always pose serious threat to human livelihood worldwide. Considering the situation of Sundarban region which experiences the fury of Climate change and associated events recurrently, the issue of human security becomes very critical as well as relevant. People of West Bengal Sundarban are becoming insecure and vulnerable day by day due to climate change causing significant risks in respect to their livelihood dimensions. Extreme Climatic events and associated phenomena like increase in frequency of cyclone, storm, change in rainfall pattern, tidal surge, severe bank erosion, embankment failure, soil salinity and flood create serious disruptions in the livelihood of people. Thus human security is being totally hampered.

1. **Materials & Methods:** The study area, i.e. Kakdwip Sub-division, is a part of South 24 Parganas district of the state of West Bengal, India. It is located within N 21˚32' to N 22˚0'20" of latitudes and E 87˚58'59" to E 88˚32'47" of longitudes. The study area is located in the south west part of Sundarban .It comprises of four C. D. Blocks namely, Kakdwip, Namkhana, Pathar Pratima and Sagar block. Now twelve sample villages within the four C. D. Blocks have been selected. Households have been selected at the field level on the basis of definite purpose, and sample has been taken from the villages by mixed sampling (both purposive and random). Cyclonic storms occur during pre-monsoon and post-monsoon season, which are often associated with tidal bores and high waves and cause great damage. Some

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parts of this study area are extremely vulnerable in terms of attacks of extreme climatic events arising out of climate change specially the western and southern parts of Sagar, Namkhana and Pathar Pratima block. Lohachara Island and parts of Ghoramara Island have already been eroded away resulting into a large number of environmental refugees migrating to the adjacent places. This paper tries to shed lights on the issues of human security in different parts of West Bengal Sundarban under Kakdwip Sub- division.

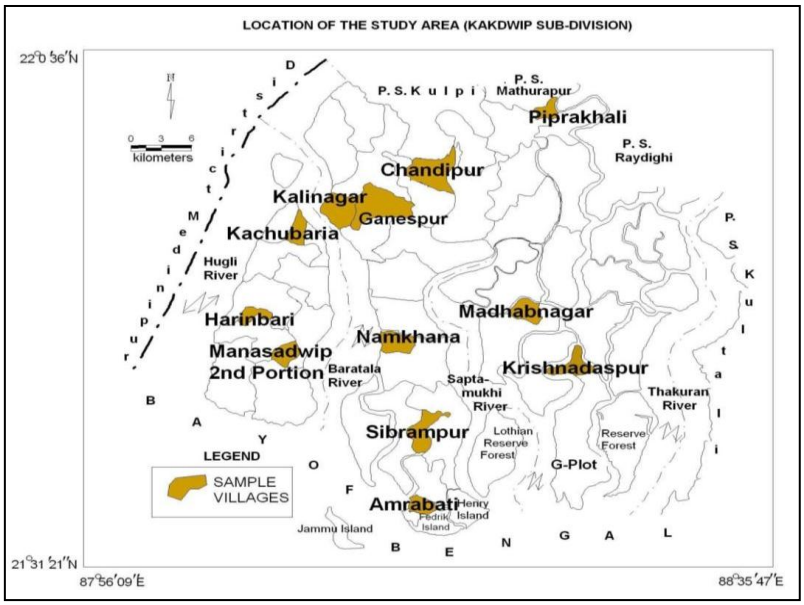

Fig.1: Location map of study area (Kakdwip Sub-division)

This paper is dependent on both Primary and secondary data. Primary data has been collected though household survey, interviewing focus group people and personal observation. The secondary data sources include books, journals, reports etc. Some of the indicators within the human livelihood dimension that can be termed as vulnerable in terms of climate change in Sundarban have been considered for this study.

Results & Discussion:

The location and other physical factors have already been marked as reasons for the marginalization and plight of the poor of Sundarban of West Bengal. Climate changeand associated phenomena add further challenge to the villagers and worsen their sufferings a bit more. Now, the physical factors including climatic change along with some non- physical factors influence on the risk, preparedness, trauma, evacuation and resilience. Thus there exists a strong synergy among climate change, human security, socio-economic and livelihood factors.

3.A Social Issues:

3.A.1 Gender:

Sample study covered 471 houses having 2973 population within which male population is 1528 (51%) and female population is 1445 (49%). Females always haveto suffer more for their traditional age old role of care givers within the family and they have to take the responsibility of safety of other members in the family. Their traditional dress also acts as barriers for speedy evacuation process. Thus climate change generates different levels of insecurity according to gender difference.

3.A.2. Family Size:

It has been found within the surveyed household that the family size is moderate to big (Fig.2) having a few earning members. Most of the families (62%) have 4 to 6 members. Literally more than 42% of the surveyed population is dependent on other family members for livelihood within which 36% is occupied by youth, and 6% is occupied by old age population. Unemployment of the sole earners in the family arising out of

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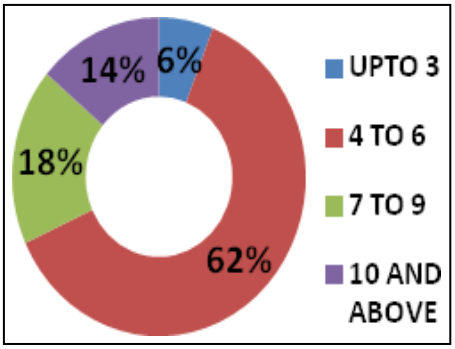
climatic shocks brings in economic insecurity.



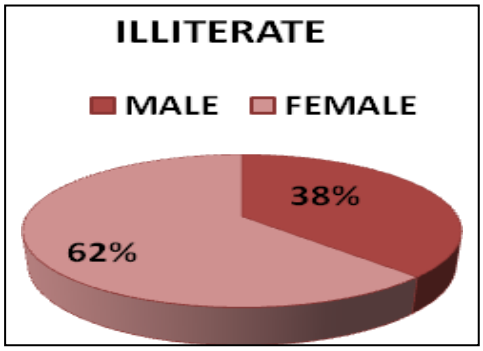


Fig.2: Family Size of Surveyed Households

Fig.3: Status of Literacy of Surveyed Population

3.A.3 Education:

Surveyed population is comprised of 79% (2361) literate and 21% (612) illiterate. Illiteracy is prominent (Fig.3) within the females (62%) than the males (38%). Proportion of both male and female decreases with rise in education level. Most of the dropping out is occurring from class IV (24%) and class VIII (21%). The proportion of drop out is less in class I, II and III but it is higher in rest of the classes. With the increase in age the demand of child as labour increases resulting in the incidence drop out. In Kalinagar and Kachubaria drop out is causing from an early age. In Chandipur village boysof upper primary drop out from school for migrating to Andhra Pradesh (for Blasting work of ONGC), Kolkata (Building Construction) to earn money. High concentration of population, low education level, large family size, and women headed household all these serve to be negative aspect during extreme climatic events for generating insecurity.

3.B. Economic issues:

Generally people of this area are economically backward. Lack of capital, proper guidance, organization has been cited as obstacles for their development. Income is of varied nature within the household starting from Rs.1000 per month, on an average to above Rs. 10000 per month.

3.B.1 Occupation:

Agriculture is the main occupation of the villagers of the study area. Within the four blocks only Kakdwip is an exception where more people (41.6%) are engaged in other works which could be because it is the block headquarters. Most of the villagers of Namkhana, Pathar Pratima and Sagar block are cultivators. It is also evident that people are engaged in multiple occupations also, like fisheries, animal husbandry, weaving, pottery, small businesses etc. In this region due to the saline soil and scarcity of sweet water during the dry seasons only one crop farming is possible and this is often threatened by natural calamities. As a result, people take up fishery, honey and wood collection from the forest as substitute sources of income. Though the economy of this region is mainly dependent on agriculture and fishery, it has tremendous potentiality as tourist spot.

3.B.2 Agriculture:

Major portion of population depends on agricultural work for livelihood. Saline soil, lack of sweet water throughout the year, lack of irrigation is the hindrances to agriculture. Extreme climatic phenomena further aggravate this situation through saline water ingression into the agricultural field either by embankment breachingor by rising tidal level. The Saline water takes a long period to recede making cultivation impossible for a long period of time after any cyclone or flood. Betel farming which is a major source of income is being destroyed during storm attack.

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3.B.3 Fishing: Apart from farming, people of this study area also depend on fishing for their livelihood. Women also take part to collect fish, prawn etc. During calamitiesfisherman are not allowed to go to deep sea for fishing leads to loss of job.

Plate 1: Woman Collecting Tiger Shrimp Seed Along The Coast-Line Of Bay Of Bengal

Plate 2 : Fisherman On Their Journey Towards Bay Of Bengal Through Saptamukhi River

Disturbance in agriculture and fishing activity results into food and economic insecurity, less income, malnutrition. Loss of job also leads to human interference within the nature. The locals intrude into the restricted zone or core areas of Sundarban in search of wood, honey, fish etc. Thus mangrove is being destroyed, forest products are being over consumed on one hand and on the other hand human animal conflict arises. Injury and even loss of human life occur due to the attack of honey Bee and the Royal Bengal Tiger. Apart from that, some people go to southern and western states of India for doing different types of works like, mining activities, constructional works (Mason), worker in Gold factory etc.

3. C. Living Condition:

3.C.1 Type of House: Some of the house types are still kuchcha in nature. Kuchcha houseswith mud floor, mud wall, roof of straw are very much vulnerable to climatic disasters. Even pucca and semi pucca houses with weak structure bear risks. People have to take shelter to nearby pucca building but they cannot move all their assets.

Plate 3: House Type Pathar Pratima Block

Plate 4: House Type Amaravati Village

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Plate 5: Spotsource Drinking Water At Baliara Village Of Namkhana Block

Plate 6: Pipe Line Water Of Amaravati Village Of Namkhana Block

3.C.2 Drinking Water: The study area does not have sufficient amount of tap water facility. Most of the villagers depend on tube well for drinking water, water of Khal (canal), pond etc. for other household and agricultural activities. Due to the attack of extreme climatic events tube wells are being worst affected. Severe crisis of safe drinking water through pollution, salinization creates health hazards.

3.C.3 Sanitation: Condition of sanitation is not fully satisfactory. Places of Safe sanitation are few. Most of them do not have proper septic tank and some of the inhabitants of the study area still practice open defecation which becomes dangerous during calamities. Unhygienic condition brings water borne diseases and generates health insecurity.

Plate 7: Poor Sanitation Of Gangasagar Village Of Sagar Block

Plate 8: Poor Sanitation Of Pailaghery Village Of Namkhana Block

Plate 9: Ferry On Hatania-Doania Of Namkhna Block

Plate 10: Patibunia Sub-Health Centre Of Namkhana Block

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3.D Infrastructural Issues:

3.D.1 Health:

The condition of health service is also poor in the study area. There are fourhospitals only; Kakdwip Hospital, Pathar Pratima hospital, Dwariknagar Hospital (in Namkhana block) and Rudranagar hospital (in Sagar block). Few Health centers are there to cater the additional demand. Most important part is played by the local medical practitioners who provide health service to the local habitants.

Plate 13: Severe Bank Erosion On Western Bank Of Ghoramara Island Of Sagar Block

Plate 14:Embankment Of Ghoramara Island Of Sagar Block

3.D.2 Transport:

A number of rivers, longitudinal and transverse creeks and khals prevail in this region which segment the region into smaller units and make communication moredifficult. Some of the gram panchayats under Namkhana (like Mousani), Sagar (like Ghoramara) and Pathar Pratima (like G-Plot, Brajaballavpur, Sridharnagar, and Achintyanagar) are isolated from each other by different rivers, tidal creeks or channels. The primary means of transportation is through the watercourses which are cheaper but time consuming. Most of the people are dependent on boat services for their daily movements but services continue to be inadequate and deteriorating due to siltation of watercourses. During storm or bad weather these services totally stop and make evacuation impossible. Difficulty in access to some parts of the study area during calamities seems to be a major problem due to the remote location with least accessibility generates vulnerability and insecurity.

3.D.3 Condition of Embankment:

Anthropogenic activities have already made large scale deforestation, premature reclamation of land, construction of unscientific embankment, lack of proper maintenance of embankments, breaching of the embankments here and there which paved the way for climatic events to affect easily. Maximum land loss is caused dueto tidal surge and bank erosion. It is observed from the field study that southwestern part of Sundarban is more open threat of storm surges as the land has become exposed. The condition is severe in parts of Ghoramara Island, Mousani Island, Patibunia and G-Plot gram panchayat.

2. **Suggestions:** Spreading awareness regarding various climate change issues including current events, possible future events, increasing intensity and their effect within the common man is most important. Communities irrespective of gender should be made well known to electronic early warning system, disaster preparedness kits, evacuation place, and adaptation skill to manage risk. Quick Communication system through social network is the prime factor for preparedness. Provision of quick transport during crisis period,arrangement for emergency vessels and speed boat for providing emergency health service are also required for evacuation and combating danger. Improvement in

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infrastructural condition is a basic requisite for ensuring human security. Electrification or supply of solar lights, proper maintenance of embankments along with regular monitoring of its condition, construction and maintenance of jetties, improvement of road condition and health care facilities are urgent need of the study area. Creating new avenues is needed as alternative income generating activities like ecotourism, salt production, apiculture, processing of medicinal products, handicraft item production. More emphasis should be given on livestock project like Goat rearing, Duck rearing, Dairy farming etc. All these can be beneficial for building resilience and to reduce their over dependence on the natural resources. Area specific disaster management plan can only serve the purpose successfully

Conclusion:

The study area Kakdwip sub-division as a part of Sundarban represents a land of dynamic environment. The process of accretion and erosion is still going on. Due to theadversity of natural environment people always have to struggle for earn their basic livelihood. Climate change and associated events aggravate the problem further leaving a question mark on their existence in near future. Recently the attack of cyclone Bulbul has destroyed their houses, agricultural production, properties everything in some parts of Pathar Pratima, Sagar and Namkhana block. Adaptation becomes more important than mitigation in this situation through adopting combating skill. Integration of multiple levels from household to global is required to remove insecurity of human being.

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Structural and Optical Properties of Cdo/Zns & Cds/Cdo/Zns Nanocomposite

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Abstract

Semiconductor nanostructures have attracted significant concern because of their exceptional optical and electrical properties. ZnS NPs, CdO/ZnS and CdS/CdO/ZnS nano composite were prepared using a simple co-precipitation method, and its photocatalytical activity has been discussed. The samples were characterized by UV-Vis, FTIR, PL, XRD. The XRD patterns confirm the hexagonal ZnS crystal structure of the prepared samples with the crystallite size in the nano size range. FTIR confirms inclusion of semiconductor namely CdO and CdS material in the prepared nanocomposite samples. Optical analysis of the nanocomposites revealed that the band gap energy decreases after the interaction of CdO and CdS to ZnS NPs and red shift in adsorption were noticed for CdO/ZnS and CdS/CdO/ZnS composite with respect to ZnS NPs. Photoluminescence study was done to study the recombination of photo-generated charge-carriers.

***KEYWORDS**: Co-precipitation; nanocomposite; band gap; Photoluminescence*.

Introduction

Modern advances suggest that various problems involving water quality could be resolved or better option can be obtained using nanoparticles, nanofiltration or other products resulting from the progress of nanotechnology. The ability to remove poisonous substances from subsurface and other environments rapidly, efficiently and within reasonable costs is the ultimate goal (Nora savage 2005). One of the most significant objectives of material scientist is to prepare a novel material. The novel material should have required morphologies for the design and development of functional properties **(**Yan et al 2017**).** Nanomaterials and nano-manufactured goods represent areas of current research along with numerous applications in industries. NP which is an example for nano material can be categorized based on single/multiple materials into core-shell or nanocomposite particles. In general, it can be said that simple NPs are made from a single material but as the name indicates, composite and core-shell particles are composed of two or more materials. The core-shell type NPs can be broadly defined as comprising a core (inner material) and a shell (outer layer material). Examples for such types of nano composite materials include inorganic/inorganic, inorganic/organic organic/organic materials. (Sheenam Thatai et al 2014)

Tremendous progress in nanocomposites using different crystal structured semiconductor materials facilitates a high degree of control over their optical and electronic properties. Among them, the core/shell nanostructure finds attention due to their ability of fine-tuning their physical and chemical properties along with their potential application in optical device (Fang F et al 2010), drug delivery (Somayeh Sadighian et al 2017) and nano catalysis (Nguyen Viet Long 2013). Till now, various kinds of core/shell nanostructures have been designed and fabricated, including Core-shell bimetallic nanoparticles (Huang 2004), metal/semiconductor (Ataee-Esfahani et al 2010), metal/inorganic particle (Duan et al 2014), semiconductor/semiconductor (Meng 2007), semiconductor/inorganic particle (Khan et al 2009). The structure, size, and composition of these particles can be easily altered in a controllable way to tailor their magnetic (Padervand 2014), optical (Chan et al 2013), magnetic-optical (Kim 2005), electrical (Dai 2013), optical-electrical (Rahulan 2013) , electrical-magnetic (Tidwell 2011), mechanical (Zhao 2012), thermal (Sunny 2010), and catalytic properties (Liu 2014).

CdS and ZnS, were one of the first discovered semiconductors (Raubach et al 2012) and has promising applications in photochemical catalysis (Braun et al 1996), gas sensor (Li et al 2017), and optical material (Eychmiiller et al 1991). Continuous researches suggest that semiconductor/semiconductor heterostructures

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will indicate a noticeable change in the luminescence and conductive properties due to elimination of surface non-radiative recombination defects (Liu et al 2011). Therefore, the design and preparation of composite materials, such as CdSe/ZnS, CdSe/CdS, ZnO/ZnS and CdS/ZnS have been attracted much more research interests (Malik et al 2002, Liu et al 2011, Fei Li et al 2009). The study of surfaces and interfaces are expanding areas of scientific studies and technological innovations. In this sense, the development of new heterostructures is still a challenging subject (Pergolesi et al 2010).

Zinc sulphide (ZnS) is an important II-VI semiconductor material with wide band gap, Eg=3.68eV (336nm), high index of refraction, high transmittance in the visible range, and large exciton binding energy (40meV). At ambient conditions, ZnS can have two different crystal structures, zinc blende (cubic) and wurtzite (hexagonal). However, ZnS is readily active only under UV region of solar spectrum. Hence, efforts are being put to make it active into the visible region, in order to make the best use of solar energy. (Wang et al 2015)

The optical properties of ZnS NPs depend basically on the band gap energy. The band gap energy and hence optical properties of ZnS NPs can be tuned either by doping an appropriate element into it or by making a nanocomposite comprising ZnS and a suitable compound. (Roychowdhury et al 2014)

An introduction of impurities as dopants can permanently modify the intrinsic properties of ZnS NPs, like optical, electrical, chemical, luminescent, and magnetic properties. The optical properties of various semiconductor QDs may also be improved by coating them with a shell of a second higher band gap semiconductor, resulting in core-shell systems. Core-shell nanocrystals contain at least two semiconductor materials in an onion-like arrangement. Thus, ZnS is used as a shell or capping layer in core-shell nanoprobes such as CdSe/ZnS, ZnO/ZnS, $CuInS_2$/ZnS, CdS/ZnS core-shell structures. The combination of different band gap semiconductor forming solid solutions is an effective way to control the potential of conduction and valence bands by consecutive changes in the composition.

Here, we have attempted to coat smaller band gap material over the higher band gap material. CdO and CdS has the band gap of 2.3 ev and 2.42 ev which may act as a core for ZnS shell which posses higher band gap (3.68 eV). The structural, morphological, photoluminescent, of ZnS nanostructures and CdO/ZnS and CdS/CdO/ZnS nanocomposites are studied in detail.

2. Experimental methods

2.1 Materials and reagents

Zinc acetate dehydrate ($Zn(CH_3COO)_2.2H_2O$) & cadmium acetate ($Cd(CH_3COO)_2.2H_2O$) was purchased from Himedia and used without further purification, sodium sulphide (Na_2S) were purchased from Hi-Media, India with high purity (99.99%) sodium hydroxide (NaOH) were purchased from Spectrum Chemicals, India. Water was used after two distillations (DDW).

CdO/ZnS nanocomposite was prepared by co-precipitation method. (Ramasamy et al 2013) In a typical procedure, 0.5 M of $Cd(CH_3COO)_2.2H_2O$) in 50ml of deionized water and an equal molar concentration of sodium hydroxide in deionized water were mixed drop by drop. The mixture was stirred magnetically at 80°C until a colloidal solution was obtained. After 30 min, 50 ml of $Zn(CH_3COO)_2.2H_2O$ solution (0.5 M) were added to the above solution. Subsequently, 50 ml of Na_2S solution (0.5 M) was added drop by drop into the above solution and striring was done for 30min to obtain the CdO/ZnS colloidal solution. Then, the precipitate was collected and washed several times with deionized water and ethanol, then dried in a

2.2. Synthesis

2.2.1 Preparation of ZnS NPs:

ZnS NPs were prepared by co-precipitation method. In a typical procedure, 2 M of $Zn(CH_3COO)_2.2H_2O$ in 50ml of deionized water and an equal molar concentration of Na_2S in deionized water were mixed drop by drop. The solution was heated about 80°C temperature under constant magnetic stirring for 2 hours. The obtained precipitate was collected and washed several times with deionized water and ethanol and centrifuged. The precipitate was dried in a hot air oven at 120°C for 4 h, ground to obtain ZnS QDs.

2.2.2 Preparation of CdO/ZnS nanocomposite

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hot air oven at 120°C for 4 h, ground to fine powder and stored in plastic vials.

2.2.3 Preparation of CdS/CdO/ZnS nanocomposite:

CdS/CdO/ZnS nanocomposite was prepared by co-precipitation method. (Ramasamy et al 2013) In a typical procedure, 0.5 M of $Cd(CH_3COO)_2.2H_2O$) in 50ml of deionized water were taken in a beaker and an equal molar concentration of Na_2S in deionized water were added drop by drop. The mixture was stirred magnetically at the temperature of 80°C until a homogeneous yellow solution was obtained. After 30 min, 50 ml of $Cd(CH_3COO)_2.2H_2O$) solution (0.5 M) were added to the above solution. Subsequently, 50 ml of NaOH solution (0.5 M) was added drop by drop into the above solution and stirred continuously for 30 min till the formation of the CdS/CdO colloidal solution. Then, 50 ml of $Zn(CH_3COO)_2.2H_2O$ solution (0.5 M) was added to the above colloidal solution. The same molar amount of Na_2S solution was added drop by drop with continuous stirring for 30 min which leads to the formation CdS/CdO/ZnS nanocomposites. Then, the precipitate was collected and washed several times with deionized water and ethanol and then dried in a hot air oven at 120°C for 4 h, ground to fine powder and stored in plastic vials.

2.3 Characterization Techniques

The crystal structure of the prepared nanocomposite samples were determined by X-ray diffraction patterns using X-ray diffractometer (XRD 6000, shimadzu Analytical, Japan) with Cu-Kα radiation source (λ=1.54 A) operated at 40 kV and 30 mA in the 2θ range 10-90° at the scan speed of 10.0° per minute. SEM (JSM 6390, JEOL, USA) equipped with EDAX (INCA, Oxford) were employed to analyse the Surface morphology and Elemental content of the nanocomposite samples. FTIR spectra on the prepared nanocomposites were examined by using FTIR-410 spectrophotometer (JASCO, Texas, USA) in the wavenumber region of 4000- 400 cm^{-1}. Optical absorption measurements were recorded with the help of Uv-vis spectrophotometer (JASCO, Japan) in the range of 200 to 800 nm. Spectrofluorometer (LS-55, Perkin-Elmer, USA) equipped with a Xenon lamp was used to observe the Photoluminescence (PL) of the samples at room temperature. The samples were dispersed in ethanol solvent, excited with a suitable wavelength of 330 nm and corresponding emission spectra were obtained in the range between 300 nm to 900 nm.

3. Result and Discussion

3.1. XRD Analysis:

The crystal structure and crystallinity of the prepared composite samples were investigated. The broadening XRD peaks indicate the formation of the nanocomposite. The change in 2θ value of nanocomposite was observed due to the interaction of CdS and CdO with ZnS. Therefore an XRD result confirms the formation of CdO/ZnS and CdS/CdO/ZnS nanocomposite. The XRD patterns of nanocomposites and NPs of ZnS are shown in Fig. 1. In this case, ZnS has hexagonal crystal structures with 2θ of 27.1562, 51.7, 45.116, 35.1, 58.95, 71.2, 81.625, 85.2. The corresponding peaks matches well with ZnS Structure (JCPDS -39-1363).

XRD Pattern of CdO/ZnS nanocomposite provides the characteristic diffraction peaks corresponding to ZnS and CdO peaks. Thus indicating the formation of CdO with ZnS. It reveals the formation of nanocomposite comprising two components namely CdO and ZnS.

In the XRD Pattern of CdS/CdO/ZnS, characteristic diffraction peaks corresponding to ZnS, CdO and CdS peaks were observed; it may be due to the formation of CdS/CdO with ZnS. It revealed that the prepared nanocomposite sample have three components namely CdS, CdO and ZnS.

The XRD data are shown in table 1. The prepared nanocomposite and NPs exhibit a zinc blende (cubic) structure with uniform size distribution of 1.51 to 3.45 nm which was calculated from XRD data by using Debye Scherrer's equation (1) (Kennedy et al 2014).

$$D = 0.94\lambda / \beta \cos\theta \text{ ----------(1)}$$

It clearly indicates the combination of CdO and CdS with ZnS has taken place. The addition of CdO and CdS makes distortion in the host lattice which has been observed through the variation of strain calculated from the Stokes – Wilson equation (2). (John & Florence 2010).

$$\text{Strain} = \beta/4\text{Tan}\theta \quad \text{----------(2)}$$

3.2. FTIR Studies:

FTIR spectra shown in Fig. 2 for the nanocomposite samples in the range 400–4000cm^{-1} were obtained to study compositions present in the synthesized composite maerials. The peaks at 470 cm^{-1}, 494 cm^{-1}, 471 cm^{-1} are assigned to the Zn–S stretching vibration (Farooqi et al 2014) in ZnS NPs ,CdO/ZnS nano composite, CdS/CdO/ZnS nano composite. Shift in the peak position and variation in their intensity were noticed in the sample indicating the composite formation of ZnS along with CdO & CdS. Band at 1010 is strongly present which is due to Zn–S vibration. (Ramasamy et al 2012).

The broad absorption peaks in the range of 3380–3400 cm^{-1} corresponds to –OH group indicates the existence of water absorbed in the surface of nanocomposite (Ramasamy et al 2012).In the entire examination, shift in peaks and variation of intensity of the peaks confirms the composite formation of CdO & CdS with ZnS NPs.

3.3. UV-Visible Spectral studies and Band gap analysis

UV-Visible absorbance spectra are shown in Fig. 3. The spectral data and band gap values for the nanocomposite samples are given in the Table 2. The band gap values of samples were calculated using the following equation (3). (Sookhakian et al 2014)

$$(\alpha h\nu)^{1/n} = C(h\nu - E_g) \quad \text{---------- (3)}$$

where h is the Plank's constant, ν is the photo-frequency, A is a constant, Eg is the band-gap and n depends on the type of transition. The n value for a direct band-gap semiconductor is 1/2, and is 2 for an indirect band-gap semiconductor. ZnS is a direct band-gap semiconductor, therefore n=1/2.Thus, the band-gap can be determined from the plot of $(\alpha h\nu)^2$ vs. hν. Absorption values of CdO/ZnS and CdS/CdO/ZnS nanocomposite shows red shift with respect to ZnS. Red shift observed in the CdO/ZnS and CdS/CdO/ZnS nanocomposite indicates the increase in particle size which leads to decrease in band gap energy compared to ZnS NPs (Reddy et al 2017). Hence confirms that band gap has a relation with particle size of the samples (Gupta & Ramrakhiani 2009). The decrease in the band gap facilitates an easy passage of electrons from the conduction band to valence band leading to an increase in the electron flow in the radiated samples. (Khawal et al 2016**)** This property is a key for the composite samples to act as an optoelectronic device as well as for achieving improved photocatalytic efficiency.

3.2.2. PL STUDIES

PL spectra are useful for revealing the transfer and separation efficiency of photogenerated electrons and holes. This property holds one of the most crucial factors for photocatalytic activity reaction. PL spectra of ZnS, CdO/ZnS and CdS/CdO/ZnS nanocomposite are shown in Fig.5. The main emission peaks are centered at about 388 nm, 520 nm and 789.5 nm for ZnS NPs, CdO/ZnS and CdO/CdS/ZnS nanocomposite. Intensity of emission peak is reduced for CdS/CdO/ZnS compared with CdO/ZnS which further lowered compared to ZnS NPs. This indicates that the formation of the CdS/CdO/ZnS composite results in the separation of photoinduced charge carriers. Decrease in the PL intensity of the composite samples demonstrates the efficient charge separation at the interface of the hetero nanostructure and thereby decreasing the recombination rate of electrons and holes. Subsequently, the photogenerated electrons and holes could migrate more effectively to the surfaces of nanocomposite surface and produce the hydroxyl radicals which could decompose the dye **(**Shi et al 2012**).** Thus phenomenon explained is consistent with the results where CdS/CdO/ZnS shows higher photocatalytic activity than ZnS NPs, CdO/ZnS nanonocomposite.

The strong UV emission at 388 nm for the samples can be attributed to the near band-edge emission, coming from the radiative recombination of electrons in the conduction band and holes in the valance band. Incorporation of CdO to ZnS nanoparticles is indicated by blue shift in PL spectra and inclusion of CdO and CdS to ZnS nanoparicles

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is indicated by red shift. This change is shift is shown by the peak 1(around 388 nm).

Formation of nanocomposite was also confirmed by Peak 2(around 520 nm), which indicates green emission (visible-light emission) due to foreign substance incorporating with ZnS structure. Green emission represents the transitions occurring from the conduction band of ZnS to the different discrete deep energy levels in the band gap formed by the point defects. Formation of Discrete levels is due to combination of CdO and CdS to the ZnS structure. (Sookhakian 2014) (Liang et al 2018).

PL emission results from the recombination of free charge carriers; generally, a weaker PL intensity implies a lower electron–hole recombination rate and corresponds to higher photocatalytic activity (Tavares et al 2014). Emission peak at 789 nm reveals the composite formed can be utilized for Near Infra red (NIR) applications.

4. Conclusion:

The prepared nanocomposite exhibit a zinc blende (cubic) structure with uniform size distribution of approximately 1.51 to 3.45 nm which was calculated from XRD data by using Debye Scherrer's equation. It is clearly indicated that combination of CdO and CdS with ZnS

UV Visible absorption spectra of ZnS shows blue shift with respect to ZnS and CdO/CdS nanocomposite along with CdS/CdO/ZnS shows red shift with respect to ZnS nanoparticle. This study suggested that composite formation is confirmed

Band gap values substantiates that prepared nanocomposite is employed for photocatalytic degradation of pollutant in the visible region due to defect formation. Band gap energy decreases for composite formation which promotes the dye degradation.

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Table 1. XRD data for Nanocomposites samples

S.No	Sample	Particle Size	Strain
1	ZnS	1.51	0.096653
2	CdO/ZnS	3.45	0.03744
3	CdS/CdO/ZnS	3.24	0.0304

Table 2. UV-Visible spectral data for nanocomposites

S.No	Sample	Absorbance	Band gap
1	ZnS	308	3.65 eV
2	CdO/ZnS	420	2.65 eV
3	CdS/CdO/ZnS	424	2.6 eV

Table 5.5: PL Intensity of ZnS Nano composite

S.No	Sample	Peak (Wavelength (nm)	Peak Intensity	Peak Wavelength (nm)	Peak Intensity	Peak Wavelength (nm)	Peak Intensity
1	**ZnS**	388	353.97	519.5	19.018	789.5	91.336
2	**CdO/ZnS**	387.5	275.32	520.5	24.359	789.5	72.978
3	**CdS/CdO/ZnS**	388.5	92.997	521	11.979	789.5	26.364

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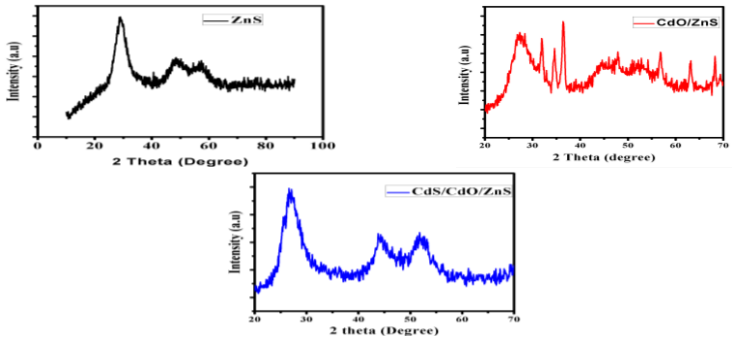

Fig 1. XRD patterns of ZnS NPs, CdO/ZnS and its CdS/CdO/ZnS composite

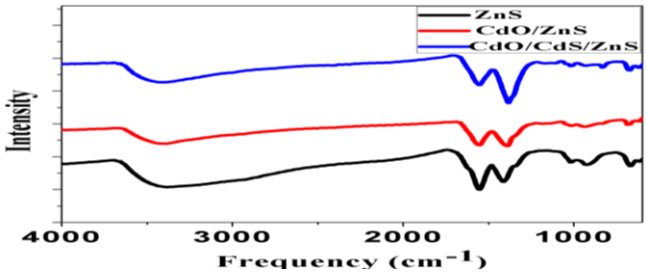

Fig. 2 FTIR Spectra of ZnS NPs, CdO/ZnS and CdO/CdS/ZnS Nanocomposite

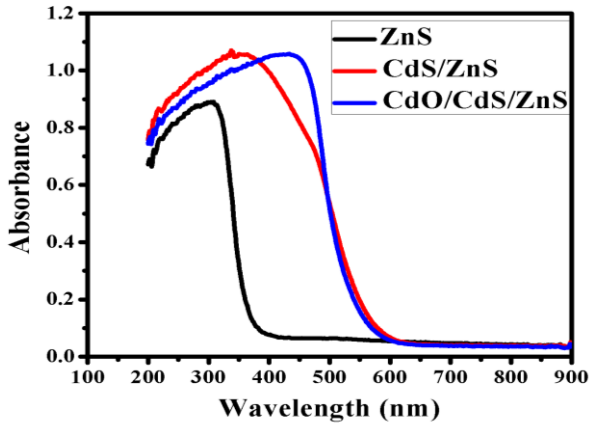

Fig 3. UV-Visible spectra for Nanocomposites

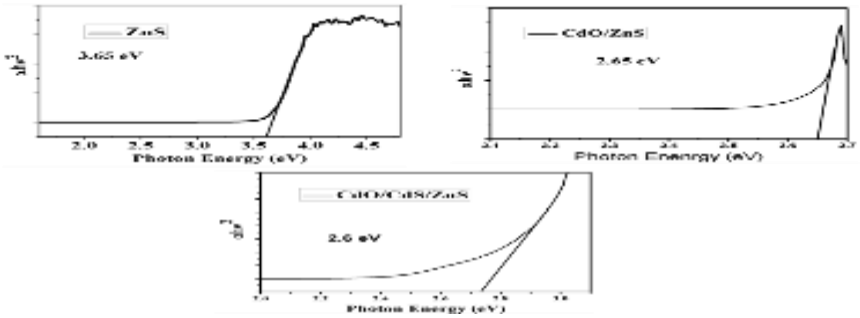

Fig. 4. Plot of (αhν)2 versus photon energy of ZnS NPs, CdO/ZnS and CdS/CdO/ZnS nanocomposite

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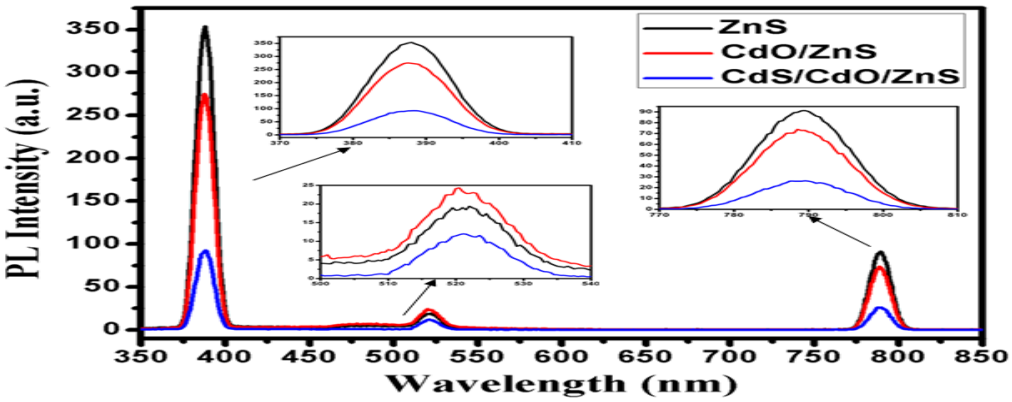

Fig. 5 Photoluminescence spectra of ZnS NPs, CdO/ZnS and CdS/CdO/ZnS nanocomposite

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A Study on Impact of Internet Advertising On Consumer Demand

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Abstract

The paper discusses on Impact of Internet Advertising on Consumer Demand. Advertising is one of the facets of mass communication. It is the largest component of any promotion activity. Marketing is used to identify the customers, to satisfy the customers. For the expressed purpose of delivering marketing message to attract customers internet advertising is a form of promotion that uses the Internet and World Wide Web. Internet is the fastest growing information channel throughout the world as it offers two-way graphical communication. The growth of online advertising is both globally and locally outpacing offline advertising. The internet holds extreme potential as marketing tool. As an interactive medium that reaches around the world, it promises an inter-personalization of advertising. At present the internet plays an important role in the consumer buying decision. Internet advertisement reaches around the world as an interactive medium between the seller and consumer. Consumers can receive information quickly for goods and services from the web. It is beneficial to consumer that he can get useful information about the goods quality, price, durability and convenience.

***Keywords**: Internet, Advertising, Online Advertising, Consumer demand*

Introduction:

Advertising is one of the facets of mass communication. It is the largest component of any promotion activity. Marketing is the process selling products and / or services to customers and promoting them via advertising to further enhance sales. Consumers play a much more active role in searching for information online with some goal in mind, and that goal can influence individual behaviours and responses to online information and advertisements. In modern days, advertising has become the most important form to promote the products and services and which is used for the purpose of communication as well. The internet emerged as a new tool in the mid-1990s. The evolution of the Internet provides the new opportunities into the globalization as well as the local region. This new technology refers the communication and information to be globalized. Online Advertising is a blooming sector on which the research is going on. According to he marketing researches, the Internet has become the "mainstream" and for the most parts, the offline world is mirrored by online world. In case of online advertising, the consumers have a direct control on what the advertisement is, when, where and for how long the ad should be posted on so that they can have a regular update. Online advertising can be considered as a valid option to traditional media and the reach and frequency acts as the standard measures for evaluating the effectiveness of online advertising.

The most significant forms of Internet marketing and advertising are banners, permission-based e-mail, keyword-targeted search engine advertising, floating animated page takeovers, interactive on-page rich media ads, streaming audio and video, and consumer-fueled 'viral marketing'

1.1 Types of Internet Advertising:

1. Display Ads.:

It is one of the Internet advertising which contains graphics, text and whitespace placed in an interesting manner. This ads. are mostly used by the advertisers because these ads help in building brand awareness when viewed by internet visitors.

2. Social Advertising:

This type of advertising is very popular on social media such as Facebook, Instagram, Twitter etc. This ads. helps to narrow down the specific target audience, who are interested in advertisements.

3. Pop –Up Advertisement:

Pop up advertisement if one of the type of online/ internet advertising on the World Wide Web. It is graphical user interface, usually a small window and it appears in the foreground of the visual interface.

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4. Pop – Under Advertisement:
Pop under ads do not interrupt to the internet users and that's why it is effective internet advertisement. Pop under ads displays in a new window behind the current browser window.

5. Search Engine Advertising:
Search engine advertising (SEA) is a type of internet advertising which is paid for ads that are mostly displayed on the search engine pages. E.g. Google.

6. Banner Advertisement:
Banner ads are attractive and popular because it is image based rather than text based. This ads uses rectangular graphic display that stretches across the top, bottom or sides of a website or online media.

7. Mobile marketing:
This type of ads also very popular because advertisers can attract the internet users through mobile and smart phones. In this advertising ads can send through text ads via SMS, or banner advertisement that appear immersed in a mobile web site.

2. Statement of Problem:-

India's huge population, the second in the world has 34 per cent millennial who are the breadwinners of their households. Its growth as a consumer economy is accelerated by the young population, increasing literacy and income levels and standard of living. With India ready for boom in Online shopping and the millennial being catalytic in this exponential growth, the study aims to understand the habits, experiences and the satisfaction level of consumer demand while shopping online. Hence, the present study is an attempt to evaluate the effect of different kinds of advertisement on the internet helps form certain attitudes, beliefs and perceptions in internet users.

3. Objectives of Study:
Following are the main objectives of the study.
1. To project the future growth of Online Advertising.
2. To understand the significance of Online Advertising.
3. To analyze what extent the online advertisement affects the Consumer buying behavior.
4. To observe effect of internet advertisement on the online shopping experience and the consequent level of consumer satisfaction.

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5. To devise Consumer Satisfaction in Online Shopping and examine its usefulness.

4. Impact of Internet Advertising on Consumers Demand

As mass communication becomes mass-interpersonal communication, marketing efforts become more efficient, effective, and extensive. Over the past decade, media planners deployed a number of media in advertising agencies in order to reach the audience. This includes Short Message Service (SMS) advertising, Multi Media Service (MMS) advertising. Auto Teller Machine (ATM), Word-of-Mouth (WOM) Marketing, In-programming (TV), In-film advertising and the Internet advertising. Internet Advertising is also known as online advertising, online marketing, digital advertising, web advertising is a form of marketing and advertising which uses the Internet to deliver promotional marketing messages to consumers. The research highlights the advantages of online advertisements, namely: 1) creative and informative, 2) cost-effective, 3) efficient, 4) wider/instant reach, 5) measurable results, and 6) outcome-oriented payments. The disadvantages are: 1) cluttered, 2) banner blindness, 3) intrusive, 4) technology barriers and 5) copyright-related issues.

Internet advertising is almost a necessity for modern businesses and especially those do business outside of their local community. Following is the impact of Internet advertising on consumers demand.

1. Internet advertising acts as information service and educated the consumer and enable the consumers to know exactly what the consumer wants and where to get it. Advertising makes the consumers possible for enjoyment of new amenities and make the life easier, more comfortable and pleasant.
2. As consumers search information from web sites about the product to satisfy their needs and it would motivate consumer to spend more time using the internet actively to make a purchasing decision.
3. Internet advertising works 24 hours per day, 7 days per week which make easier to consumers to seek information about the product at any time.
4. Internet advertising is borderless and so consumer can search information within the local vicinity.
5. Internet advertisement is a great way to consumers as they access relevant and engaging content with information which is important to them.
6. Internet advertising helps the consumers can check the price of products or services from their devices, making it easy and convenient.

Conclusion and Recommendation:

The world is constantly changing. The consumers want new trends, products, issues and needs emerge every day. In this rapidly changing world consumers need a way to stay on top of everything. Online advertisement is a great option to traditional advertisement. Internet advertisement is great way for keeping consumers current updated. They can seek and search information about the products and services and consume it quickly. When consumers access the relevant information from the internet advertisement which makes help to consumers to take purchase decisions. Even it also increases awareness and expectations to consumers about the benefits of the product. Ultimately internet advertising affects on demand by consumers by building desire for a product or brand in consumer's minds. Internet advertising is a powerful weapon of communication which play vital role in creating an effective branding conveyance. Even though every coin has two sides. Despite this internet advertisement is somehow is harmful to consumers. It is the chances of leaking private information when consumers visit the advertisement site. Online advertising fraud is also becoming a big problem to consumers. Online advertisement increases the cost and which passes them on the consumers. For overcoming from this entire consumer should know the traffic source, keep an eye on data regularly, giving preference to text ads.

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Study on Lactic Acid Bacteria from Green Waste

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Abstract
Lactic acid bacteria (LAB) are used in the food industry to produce flavors, dyes, thickeners, and to increase food value, because bacterial fermentations favor the obtention of different metabolites such as food additives and different nutritional compounds in food. Green waste to wealth is a common trend in the world today. This work reports the utilization of waste fruit peels like orange peel, mango peel, banana peel, spoilage of grapes for production of lactic acid using autochthonous lactic acid bacteria. Green waste and byproducts are generated along the entire food dispensation and storage cable. The large amount of green waste deriving from the whole process represents not only a great economic loss but also an important ethical and environmental issue in terms of failure to recycle potentially reusable materials. This review gives an overview of the biological approaches used so far to exploit green wastes and byproducts. The application of solid-state fermentation by different microorganisms to produce several value-added products was analyzed, focusing on the exploitation of lactic acid bacteria as workhorses for the production of flavoring compounds, biogas and bioenergy.

Key word: Lactic acid bacteria, food additives, Green waste

Introduction

Green waste based industry produces a large capacity of solid and liquid waste. These poses increasing disposal and pollution problems and represents loss of valuable biomass and nutrients (Mridul&Preethi, 2014). This particularly occurs where there is a lack of legislation and their enforcement on waste disposal (Omojasola*et al*., 2009). These wastes directly affect environmental interventions and municipalities because green waste is a primary source of methane gas in landfills (Gunders, 2012). Recycling green-waste to develop new products has received much attention lately. Organic waste treatment processes (Purkayastha, 2012) and anaerobic digestion processes (Shin *et al.*, 2010; Dai *et al.*, 2013; Bernstad*et al.*, 2013) are two promising technologies used in this regard. Presently, the main use of such domestic green waste is the production of valuable compounds by the controlled break down of the waste by microorganisms (Rounsefell*et al.*, 2013). Due to the importance of this organic acid, there are ongoing research efforts related to its production (Hofvendahl& Hahn- Hägerdal, 2000). Variations in temperature, pH and nitrogen sources affect lactic acid production (Pavezzi*et al*., 2008; Jörissen*et al.*, 2015). Lactic acid (LA) fermentation is considered a simple and useful form of biotechnology to keep and/or enhance the safety, nutritional, sensory and shelf life properties of vegetables and fruits (Demir *et al.* 2006).

Carnobacterium, Enterococcus, Lactobacillus, Lactococcus, Leuconostoc, Streptococcus, Clostridium and *Weissella*have been reported to produce lactic acid (Bogaert&Coscach, 2000).
Due to the importance of this organic acid, there are ongoing research efforts related to its production (Hofvendahl& Hahn- Hägerdal, 2000). Variations in temperature, pH and nitrogen sources affect lactic acid production (Pavezzi*et al*., 2008; Jörissen*et al.*, 2015). The aim of this study was to evaluate the effect of physical, chemical and nutritional parameters on the production.

Lactic Acid Bacteria

Lactic acid bacteria are Gram-positive, non-spore-forming, non-respiring but aerotolerant, which produce lactic acid as one of the key fermentation products by utilizing carbohydrates during fermentation. These bacteria produce lactic acid as an end product of carbohydrate catabolism and also make organic substances that contribute to the flavor, texture, and aroma that result in unique organoleptic characteristics. Orla Jensen (1919) The genus Lactobacillus has recently been reclassified by scientists into 25 genera. This reclassification was necessitated due to the extent of how diverse the original genus was, which made it very challenging to classify, name, and distinguish between different lactobacilli. The new genera are *Lactobacillus, Paralactobacillus* and the 23 novel genera. The twenty-three novel genera include: *Amylolactobacillus, Acetilactobacillus, Agrilactobacillus, Apilactobacillus,*

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Bombilactobacillus, Companilactobacillus,Dellaglioa, Fructilactobacillus, Furfurilactobacillus, Holzapfelia, Lacticaseibacillus, Lactiplantibacillus, Lapidilactobacillus, Latilactobacillus, Lentilactobacillus, Levilactobacillus, Ligilactobacillus, Limosilactobacillus, Liquorilactobacillus, Loigolactobacilus, Paucilactobacillus, Schleiferilactobacillus, and Secundilactobacillus

History Of Lactic Acid

Lactic acid was first found and discover in sour milk by Karl Wilhelm Scheele (1742-1786) in 1780. The German physician-chemist Johann Joseph Scherer (1841-1869) demonstrated the occurrence of lactic acid in human blood under pathological condition in 1843 and 1851.

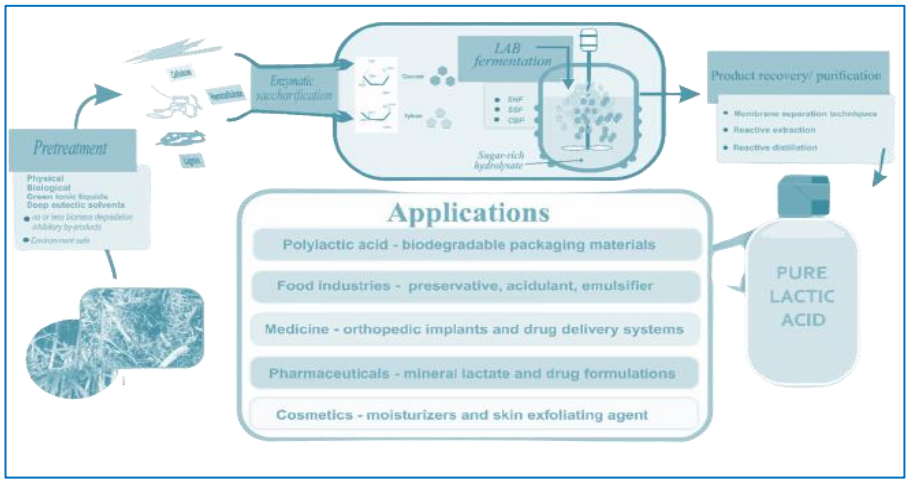

Figure-1, Application of Lactic acid

Market Overview of Lactic Acid

Universal lactic acid market is projected to grow at a CAGR of 4.2% during the prediction period.

- Lactic acid is available in various grades depending upon its purity and its application.
- Lactic acid demand in the food & beverage market is growing with the emerging technology and the growing mandate in applications. Due to various functional properties of lactic acid, it is used as a key component in food & beverage products.
- The major drivers for the lactic acid market are increased demand in food applications of lactic acid, availability of cheap raw materials, various functional properties of lactic acid and the controlling approval by international regulations.

Deprivation And Employment Of Green Waste

One-third of food intended for human consumption is lost or wasted globally at all steps from initial agricultural production to final household consumption. It amounts to about 1.3 billion tons per year. green wastes are mainly composed of carbohydrate polymers, such as starch, cellulose and hemicelluloses, plus lignin, proteins, lipids, organic acids and inorganic remainder. Total sugar and protein contents are in the range of 35.5–69 and 3.9–21.9%, respectively. Among the different food sectors, it is estimated that fruit and vegetables represent a large part of green waste production, notably in the detail that about 45% of the total produced amount is lost in the production and consumption chains, generating a great quantity of waste material. Green wastes and byproducts can be classified into four source groups, according to the step of the agri-food chain in which they are generated: (i) in the fields,

before harvesting, due to pest infestation and crops damaged by unfavorable weather conditions; (ii) in post-harvest and transport, where spoiled and bruised fruit and vegetables are discarded; (iii) in the different manufacturing steps process such as peeling, washing and slicing; (iv) in retail and the markets, due to natural spoilage at the end of shelf life LAB may grow in any environment rich in carbohydrates, so that they can be found in various food products (milk, meat and vegetables), plants, as part of the normal human and animal microbiota.

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Food wastes are potential sources of nutrients for growth of LAB and production of valuable compounds.

Large volumes of green waste generated by fishing, aquaculture or food processing are dumped into the sea without pretreatment. It causes grave environmental problems. This challenge can be met by introducing rich organic nutrients in the formulated optimum media for microbial cultivation. Enzymatic hydrolysate of octopus processing wastewater served as a good source for LAB growth (*L. lactis* and *Pediococcus acidilactici*) and synthesis of bacteriocins (nisin and pediocin, respectively). The recovery and management of these wastes are not trivial. Seasonality, distribution across a territory, and perishability due to the high content of water and nutrients and the heterogeneity of the products may represent possible difficulties and problems for green waste management.

The maximal production of biomass and nisin by *L. lactis* was observed in the media with low concentration of enzyme papain and short time of hydrolysis (4 h). In case of pediocin, the highest production was attained in the media hydrolyzed with papain, trypsin and pepsin within 10 h period. Consequently, marine peptones are promising alternative nutrients in the media and their fermentation is a possible solution of wastewater problem. Fish viscera waste can be used in preparation of silage intended as animal feed. Application of LAB makes bio-silage process simpler, faster, more environmentally friendly and cost-efficient than chemical technology. LAB strains produce metabolites and adjust pH values for bio-silage fermentation and preservation. A feasible and economically sustainable green waste recycling program requires large volumes of raw materials concentrated in the same area, a high degree of homogeneity, and a careful analysis of downstream costs. In keeping with this, industrial symbiosis could be a productive and useful strategy. The FWs generated by diverse companies could be transferred to other industries, which could transform them for other purposes in a circular economic model. These are important steps in recycling hatchery by-products into feed ingredients instead of landfilling waste. Rations with fermented hatchery wastes showed no negative effect on broiler chicken. Their body weight gain and feed conversion at all stages were comparable to the control. In some cases, the parameters such as ready to cook carcass and wing yield significantly exceeded control values. The theory of waste valorization is strictly associated with sustainable technologies for recycling and reuse. The concept behind waste valorization is to enhance the value of a product by converting waste into other resources providing an added value. The resulting products could include new chemicals, materials, fuels, and energy, just like a lot of other products advantageous to local and global economies.

Brown juice, waste of the green crop drying industry, contains nutrients such as carbohydrates, organic acids, vitamins and minerals suitable for production of L-lysine. Pretreatment is required to convert brown juice into a stable, storable product that can be used for microbial fermentation. Traditional heat sterilization at 121°C for 20 min in batch procedure or at 140°C for a few seconds in continuous process inactivates valuable enzymes and consumes a lot of energy. When LAB deplete the constituent carbohydrates, the juice can be heat sterilized and used as a nutrient and water source for L-lysine production by *Corynebacterium* after addition of a carbon source and neutralization of the lactic acid by, e.g., ammonia. Alternatively, the lactic acid present in the medium can be utilized by *Corynebacterium* and converted to L-lysine. Furthermore, the valorization and recycling potential of green wastes and byproducts can ensure sustainable food production and at the same time guarantee food security. Interestingly, some materials derived from the food industry can be reused thanks to their distinctive properties, exploitation of their physic-chemical characteristics can occur in many different industrial sectors. Lignocellulosic byproducts like soy and corn stalks or wheat straw could be used in the paper industry or as reinforcement in biodegradable polymer matrices to prepare building products with high strength.

Conclusion

LAB represents a versatile group of microorganisms. Owing to their valuable properties, LAB have been used in food production since ancient times. Development of natural sciences led to discovery of LAB as normal part of human and animal microflora. LAB is recognized as safe microorganisms and they are mainly applied in food industry for production of dairy, meat, bread, fish and vegetable products and in medicine as probiotics. LAB is known to synthesize a wide range of compounds consumed in various areas. LAB produce bacteriocins, vitamins, low calorie

sugars, EPS and other valuable substances regarded as additives improving safety, quality and flavor of foodstuffs. However, one of the main LAB products is lactic acid used in food processing, pharmaceutics, cosmetics and other industrial sectors. Steadily growing market demand for this commodity urges researchers and manufacturers to seek less expensive substrates for its synthesis. Many studies deal with industrial and household green wastes as appropriate sources for lactic acid production.

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SOCIO–POLITICAL ANALYSIS OF HUMAN RIGHTS AND WOMEN TRAFFICKING IN INDIA

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Abstract:
To deny people their human rights is to challenge their very humanity – Nelson Mandela Said is a basic human right to live with dignity and have rights protected. But since time immemorial, plight of women hasn't changed. They have always continued to suffer from aggression, Violence, exploitation, discrimination, etc. in ancient history, women glorified as Devi or goddess. But in reality this glorification is found to be mere mythical. Indian women have been long suppressed and dominated by patriarchal society. They are forced to follow rigid and obscene customs. There are various kinds of crime committed against a women, sometimes even before birth. One such crime is trafficking. It's a serious crime and grave violation of human rights. Human trafficking in India is illegal but it still poses a serious threat and remains a significant problem.

Key words: *Human rights, women, women trafficking, Immemorial, Violence, exploitation, and discrimination, etc.*

Meaning:

Trafficking means illegal trade. Human trafficking means trading of humans. Trafficking can occur within a country or may involve movement across borders. Women men and children are trafficked for a range of purposes, including forced and exploitative labour in factories, farms and private households, sexual exploitation, and forced marriage. Trafficking affects all regions and most countries of the world. Prostitution is said to be the oldest among professions in world of human beings and is rampant throughout the world. The development of definition of trafficking is necessary in order to combat the problem and be effective in preventing trafficking. Trafficking, in the dictionary is described as an illegal trade in a commodity & in case of trafficking in persons, the commodity is human beings. Art.3, paragraph (a) of UN Trafficking in Persons Protocol states that trafficking in persons: shall mean the recruitment, transportation, transfer, harboring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation.

Historical Background:

In order to understand the phenomenon of **'trafficking in persons'**, it's of utmost importance to trace the historical development of the concept. Earliest type of global trafficking began with African Slave Trade. It was the first known international flow of human trafficking. The term **traffic** was first used to refer the so-called '**white slave trade**' in women around 1900. Trade of white women from Europe to Arab and Eastern states as concubines/prostitutes was a concern for men, women, and governments of European countries. At this time, **traffic** meant movement of women for an immoral purpose i.e., prostitution, Initially, this definition required crossing of country borders, but by 1910 it changed to traffic in women within national boundaries. Traffic in women was seen as related to slavery, but also to closely linked to prostitution. The problem of trafficking can also be traced back to the time of Greek City states. Its history is full of attempts on the part of the States to regulate, control and to limit certain sections of the society of the society and certain kind of activities like prostitution.

International Aspect:

Trafficking has become the worst kind of social disease in world which has turned epidemic. Trafficking after drugs and arms

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trade is third largest organized crime across the world. To fight with this evil, various conventions and declarations have been made by different international and regional organizations. The earliest measure to combat international traffic in women was adoption of international convention for the suppression of the White Slave Traffic signed at Paris on 4th May 1910. Art. 1 and 4 of International Labour Organizaiotn Forced Labour Convention (1930) prohibits trafficking for immoral purposes. The Geneva Convention on the prohibition of the traffic in women and children signed on 11the October 1933 promised to prosecute criminals who kidnap for purpose of prostitution abroad women or girls under 21 even with their consent. This convention was replaced by United Nations Convention for the suppression of the Traffic in Persons, and of the Exploitation of Prostitution of Others, signed on 2nd December 1949. In the 9th SAARC Summit (May 1997) the member nations took initiatives to take proper administrative and legislative measures to combat problem of trafficking of children and women in the region. In the 11th summit of the Heads of State of SAARC held at Kathmandu from January 4th-6th 2002, a Convention on preventing and combating Trafficking in Women and Children Prostitution was adopted. The second most common form of trafficking is forced- labor. Trafficking often occurs from less development countries to more developed countries, where people are rendered vulnerable by virtue of poverty, conflict or other conditions. The U.S. State Department estimates that between 600,000 and 800,000 persons were trafficked across national borders worldwide between April 200 and March 2004. 80% of these were female, 70% of who were trafficked for sexual exploitation.

Nature and Extent of Trafficking:

Trafficking in persons is one of the worst forms of crime in modern day civilization. Globally more than 20.9 million people are its victims, majority of them being girls and women susceptible to sexual exploitation. Women trafficking have become an important issue transcending borders, affecting countries all over the world. They are being trafficked for various kinds of purposes which are derogatory in nature. With the increasing use of new information technologies especially the internet this problem has altogether gained a new dimension. Mostly women fall prey for trafficking but even children and even men of varying ages fall prey to this crime. Anyone can be a human trafficker. He can work alone or with a small or a large group. Frequently traffic is someone that the victim Know on a personal basis, such as a family member, friend, our community member. Poverty and economic deprivation; the gap between the rich and poor within countries and between different regions has especially made women more vulnerable to trafficking.

Women as a Victim of Trafficking:

Prey of the Business:

Trafficking is simply exploitation of vulnerability. Structural causes of trafficking are a complex precesses of linkages between poverty and gender discrimination, globalization, culture, migration and feminization of poverty that increase vulnerability of women and girls, stimulating push factors and demand in specific sectors. The traffickers take advantage of this vulnerability and lure them to solve their problems. These victims are promised work in domestic or service industry but instead are usually taken to brothels.

What Makes Women Vulnerable to Trafficking and Sexual Exploitation?

Poverty can be termed as the catalyst for sexual exploitation of women. Traffickers look for vulnerable people and therefore easier to exploit. Women experience a higher vulnerability to trafficking because they make up a disproportionate number of those who are poor, and they are often portrayed as objects of sexual gratification. But poverty isn't alone the root cause of the heinous crime. The contributing factors which fuelled up the flourish of the industry are summarized below:

- Poverty and deprivation leading to internal conflicts in developing countries.
- Frequently excluded from mainstream economic and social systems, such as employment, higher education, and legal & Political parity.
- Inadequate educational, gender disparities in access to opportunities and lack of social safety-nets. Women engaged in other low-status work or service not enough to run family gets victimized.

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- Status of violence against women in their households or in society.
- Women who are unaware of their legal rights and remedies.
- Economic disparities within countries accelerate trafficking from low income to high income areas.
- Natural disasters make women more vulnerable
- Prevalence of evil traditional and religious practices in some communities.
- Patriarchal system of society is largely responsible where males claim to be superior

Impact of Trafficking on Society and Individuals:

The human and social consequences of trafficking are compelling. From physical abuse and torture of victims to psychological and emotional trauma, to economic and political implications of unabated crime, impact on individuals and society is clearly destructive and unacceptable. Every stage of trafficking involves physical, sexual and psychological abuse and violence. Victims are so much exposed to this grievous and abusive environment that their mind becomes paralyzed with the prolonged and respected trauma.

Trafficking is understood to have medical, social, legal and economic effects on victims Trafficked persons are reportedly traumatized by their experiences. Suicidal thoughts are common for them. Besides being stigmatized as outcasts and facing moral and legal isolation, traffic people are vulnerable to HIV/AIDS infections, drug addiction, high-risk abortions, and teenage pregnancies which affects their reproductive health for life. Trafficking involves violations of laws and human rights. Trafficking threatens the very fabric of society because it involves not only criminals but also law enforcers. It's seen that women, who get back from trafficking, find it difficult to adjust to normal social life. They are afraid to freely walk back into society because of fear of being trafficked again. This fear affects choices that they make about their future.

Victims of trafficking are sometimes compelled to become criminals. Sometimes it happens, a victim who came back to society is again re-trafficked as because there is a ling chain of traffickers working behind this crime.

in position than women and treat them as **commodity.**

- Lack of strong political will and weak law enforcement industry employing large number of minor girls.
- Obscure beliefs like 'sex with virgin' will cure Sexually Transmitted Diseases, increases the vulnerability of the girl child because of the belief that they have lesser chances of being HIV/STD carriers.
- Impoverished parents selling off their daughters to get economic benefit.

It's also seen that a woman who once was a victim has now turned to the rle of a trafficker because this society didn't accept her back. Victims who try to rejoin society sometimes do not get support from their family and community. After rescue operations, wherein trafficked women are rounded up, they are accused of soliciting. These victims who are arrested are bailed out from the charge and brought back to the brothel or place from where they got arrested. Sometimes the owner of the brothels releases them from jail or even the corrupt police officers get them be re-trafficked. So these victims are accused of the crime arrested and convicted. However, sometimes positive effects are also seen. The victims who get back to society build courage and try to help other women from getting trafficked. They join several NGOs and start working for the society so that what they had gone through, do not become the fate of other girls. There are many areas where the law fail to reach or stands faulty, in those cases the role of NGOs are very commendable.

Role of Judiciary:

In **Vishal Jeet V. Union of India**, SC issued directions that all State Governments must direct their law enforcing authorities to take appropriate speedy steps against the evil and directed to set up advisory committees with experts from all fields to make suggestions regarding measures for eradicating child prostitution, for care and rehabilitation of rescued girls, for setting up of rehabilitative homes, and for a survey of the devadasi and jogin traditions. In **Gaurav Jain V. Union of India** SC ordered to constitute a committee to make an in depth study into problems and evolve such suitable schemes for rehabilitation of trafficked women. The court taking a

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proactive view believe and hoped that directions would relieve human problem by rehabilitation of the unfortunate fallen woman caught in the trap of prostitution; their children would be brought into the mainstream of social order; these directions would enable them to avail of the equality of opportunity and status, with dignity of person which are the arc of the Constitution.

In **Geeta Kancha Tamang V. State of Mahrashtra**, while denying release of a women trafficker, on mercy grounds, who had served 14 months imprisonment the court stated that the first aspect that the Court has to consider for such a heinous crime is that trafficking in persons is prohibited under Art.23 of Constitution of India. It's, therefore, Fundamental Right of every Indian citizen not to be trafficked. Such act constitutes grossest violence of the Human Rights of the victim. In **Budhadev Karmaskar v. State of West Bengal** [28], SC stated that the Central and State Governments should, through Social Welfare Boards across the country, create rehabilitation programs for women commonly known as "prostitutes" and for physically abused women. The court instructed the Central and State governments to prepare schemes for providing technical and vocational training for sex workers and sexually abused women in all cities of India.

Conclusion and Recommendation:

In spite of a desperate try from all spheres to combat this racket, we are far from achieving success. The rescue operations could only save a negligible proportion of the victims; the courts could provide justice only to a fraction of the million sex workers who are exploited every day. But according to my point of view, if there is no general awareness amongst every citizen of the country, nothing can be achieved. We all have to work together to make this mission a success so that no women of tomorrow is found in a brothel but is seen in an educational institution and hence some concrete measures must be taken as soon as possible. **They are as follows:**

- Prevention of Poverty and equitable distribution of national income among all classes of society.
- Proper employment facilities must be given.
- The loopholes in ITPA 1956 must be filled up by a subsequent amendment.
- The ITPA must provide for a rehabilitation of the children of the sex workers who are badly affected by the environment in the brothels.
- The media should be used more effectively to create awareness among the people about the trafficking business.
- Regular programs and campaigns should be conducted in every region of the country to raise awareness.
- The legislature must enact laws to prohibit all forms of prostitution rather than banning prostitution only in public areas listed in S.7 of ITPA.

Thus, if initiatives are taken, problems can be combated; the menace can be eradicated from our society. If this mission can be accomplished, only then our country can prosper and we must not stop till we reach our object following the great words of Swami Vivekananda, arise, awake and stop not till the goal is reached. If the goal can be achieved, in near future, India will become a nation where the mind is without fear and the head is held high.

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VARIATION OF SECONDARY GAMMA RADIATION FLUX DUE TO CHANGE OF HUMIDITY IN ATMOSPHERE OF EARTH IN MONTH OF FEBRUARY, 2021 AT UDAIPUR, INDIA

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Abstract

To observe effect of humidity in atmosphere of Earth on secondary gamma radiation an experimental study in month of February, 2021 was conducted at Udaipur (27^0 43' 12.00" N, 75^0 28' 48.01" E), Rajasthan, India using ground based NaI (Tl) Scintillation detector. Data files were stored in the computer for half hour duration between time 17.30 IST to 18.00 IST on the dates February 11, 12, 13, 15, 17, 19, 23 and 24. After analyzing data we observed significant variation of secondary gamma radiation flux (SGR). Analyzing data showed variation of secondary gamma radiation flux (SGR). We interpret such variation of SGR flux counts on the basis of change of humidity in the atmosphere of the Earth.

Key Words: *Cosmic radiation, solar radiation, secondary gamma radiation, humidity in the atmosphere of the Earth.*

Introduction

The electromagnetic radiation contains about 89% nuclei are protons, 10% nuclei of helium, and 1% of others heavier elements (Lithium, Beryllium and Boron) [1, 2, 3] known as cosmic radiation. Such radiation lies in energy range between 10^9- 10^{20} eV or more [4]. Simpson (1983) [5] gave information about chemical abundances of cosmic radiation. Electromagnetic radiation above 50 km from the surface of the Earth is called primary cosmic radiation. About 20 km from surface of the Earth when this radiation interacts with atmospheric particles then there is formation of secondary radiation [6]. Secondary particles have X- rays, protons, alpha particles, pions, muons, electrons, neutrinos and neutrons [7, 8]. In atmosphere of Earth secondary particles formed secondary particles shower [9]. In this shower one of part is electromagnetic component [10, 11, 12]. This electromagnetic component has electrons, gamma particles [13]. Secondary radiation flux can be detected using appropriate detector on surface of the Earth [14, 15].

Celestial events and variation of radiation flux

During different celestial events such as Solar eclipses, Lunar eclipses, appearance of comet in sky, phases of moon, closest approach of celestial objects, transit of celestial objects etc many experimental studies showed variation of secondary radiation.

Bhattacharya et al [16], Kandemir G. et al [17], Nayak. et al. [18], Bhaskar et al [19], Pareek et al [20] conducted experimental studies during solar eclipses.

Lunar eclipses studies were conducted by Pareek et al. [21], Raghav et al. [22], J.N. Ananda Rao et al. [23], Pareek et al. [24], Pareek et al. [25].

During celestial event of transit of Venus June 6, 2012 at Udaipur India Pareek et al [26] observed 2 % decrement in secondary solar radiation gamma ray flux.

In the month of September, 2000 Pareek et al. [27] conducted experimental study moon phases and observed abrupt change in energy spectra on 9^{th} and 10^{th} September 2000, when Moon was in background of Capricorns **constellation.**

During transit of Sun across constellation Pareek et al [28], Pareek et al [29] observed variation of secondary flux on the surface of the Earth. In an experimental study during closest approach of Mars towards Earth, Mars at opposition and transit of Moon across different constellations, planets Pareek et al [30] observed Appearance of Comet Hyakutake in the month of March, 1996 Pareek et al. [34] observed variation of secondary cosmic radiation flux in energy spectrum of specific energies of about1.127 MeV, 2.29 MeV and 3.66 MeV. Different seasons the weather and atmospheric conditions are different therefore formation of secondary gamma radiation may different. Hence it is very interesting to observe secondary gamma radiation in different seasons. A seasonal study on the cosmic radiation was carried out by

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the Victor francis hess [32] and he observed production of ionization in the atmosphere of the Earth due to cosmic radiation. Another seasonal variation experimental study conducted by F. Ronga [33] and observed rate of multiple-Muons in the underground and variation in muon particles in different seasons. N. Agafonova [34] observed Seasonal variations on cosmic radiation muon flux using opera detector and discovered correlation with the seasonal cycle of atmosphere and muon flux modulation. With the fact that during different celestial events happening in sky and different weather conditions modulate terrestrial secondary flux of cosmic and solar radiation, we attempted to see effect of secondary radiation due to change of humidity in the atmosphere of Earth.

Experimental Set-up and Observations

In this experimental study we used scintillation detector of (SD 152 F) flat type with Size of the NaI (Tl) crystal of 2" x 2" of Nucleonix make (Figure 1). Scintillation detector optically coupled with photo multiplier tube (MC 1000) having 1024 channels. The integral line was connected to 1k multi-channel analyzer of Nucleonix make with usb interface built in high voltage and shaping amplifier. Using gamma ray software Anuspect data files were collected in computer. This Scintillation counter system kept open to collect the counts for half hour on roof of Astronomy Laboratory of Department of Physics, Bhupal Nobles' University Udaipur (Rajasthan) India. For this experimental study data files were stored in computer for half hour duration from time 17.30 IST to 18 IST on the dates February 11, 12, 13, 15, 17, 19, 23 and 24.

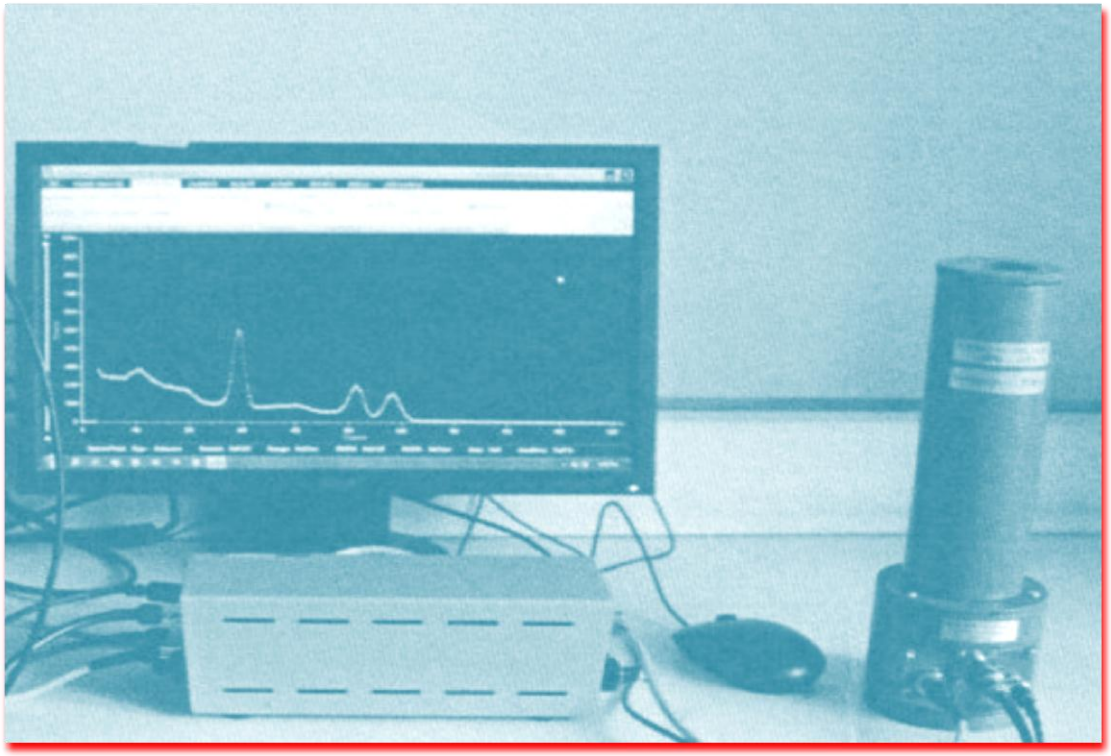

Figure 1 (Scintillation Counter System)

Analysis and Results

As depicted in figure - 2 the panels of SGR flux integrated data files between channel and integrated counts for half hour duration from time 17.30 IST to 18 IST on the dates February 11, 12, 13, 15, 17, 19, 23 and 24

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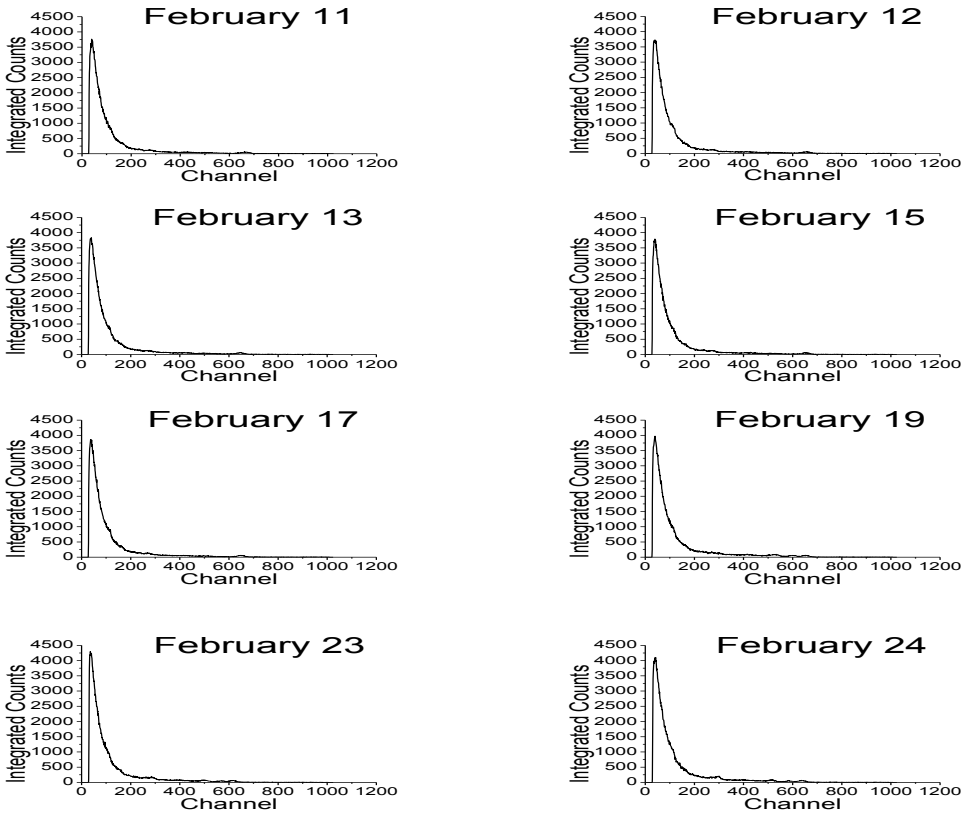

Figure- 2 (Panels of SGR flux integrated data files)

Using Figure 2 we made the table 1 which represents integrated counts of secondary gamma radiation flux with respect to the humidity and dates February 11, 12, 13, 15, 17, 19, 23 and 24.

Sr. No.	Date	Humidity in %	Integrated Counts
1	11	20	245765
2	12	21	245731
3	13	20	246576
4	15	24	241834
5	17	19	247347
6	19	19	271058
7	23	14	263529
8	24	20	281231

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Table 1

Using figure 2 and table 1 of SGR flux integrated data files, we made figure 3 which represents integrated counts of secondary gamma radiation flux with date for the month of March, 2021.

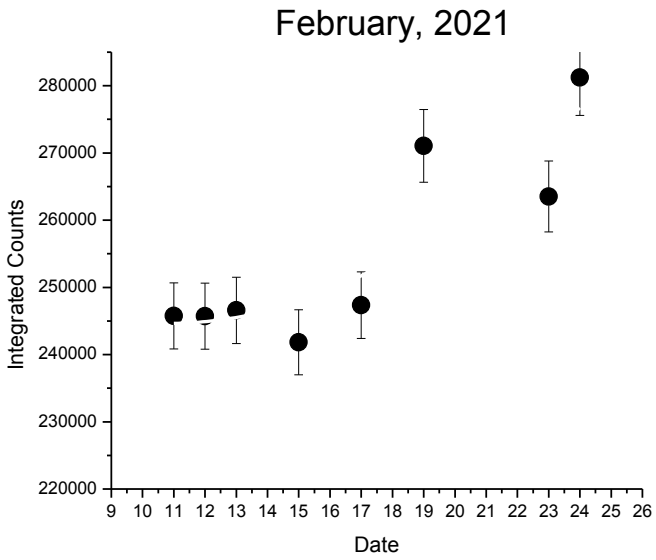

Figure 3 (Integrated counts of secondary gamma radiation flux)

Discussions

The probable reasons in this present experimental study for the variation of SGR flux counts in the month February, 2021 are as follows:

(1) Table 1 and figure 3 clearly showed that on February, 15 there were lowest counts in this experimental study. On this date in the atmosphere of Earth humidity was highest (24%). Therefore, formation of secondary shower was less. On comparison to this date in the atmosphere of the Earth less humidity was present and hence we observed more secondary gamma radiation flux.

Conclusion

This experimental study gave the conclusion that during change of humidity in the atmosphere of the Earth on the surface of the Earth secondary gamma radiation flux varies.

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SENSITIVITY TO ECOLOGICAL COGNIZANCE THROUGH THE LENSES OF ECO POETRY: A SELECTIVE EXCERPT

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Abstract:

The conception of existence which is a complete unification or fusion of all the genus including the human beings and the natural world with animals, birds and greenery in the larger intellect signifies the natural, corporeal and spiritual basis of living that demands for an environmental equilibrium or stability in the most active, conclusive and critical way. Amidst different categories of literature, Eco poetry occupies a unique place, distinct in its fundamental feature of poignantly reflecting the poetic relics that exemplify the natural necessity for subjective thoughtfulness in addition to social change gaining massive consciousness in contemporary times. The expression, "Ecology" surmounts with its significant stimulus occupying a momentous stature at the peripheries of augmented globalization and industrial upgrowth. It has been accurately depicted in the fictional volumes of distinguished poetic maestros like Shelly, Keats, Wordsworth, Byron etc.in the comprehension of sensitivity to ecological cognizance in human existence. This paper attempts to probe into the works of a selective Romantic poets who have bestowed the essentials of nature juxtaposing with the eco tone of subjectivity and objectivity. This paper showcases the province of ecological cognizance with the critical analysis of eco poetry.

Keywords: *eco poetry, ecological consciousness, subjectivity, literary interpretation, ecological disaster*

Introduction-

The genre of Eco poetry has been documented to be one of the persuasives and progressively significant arena of literature. By way of explanation, Eco poetry could be mirrored as a branch of established, conventional nature poetry. In the book, *Ecopoetry: A Critical Introduction*, Bryson (2002) asserts: Ecopoetry is a mode that, while adhering to certain conventions of traditional poetry, advances beyond that tradition and takes on distinctly contemporary problems and issues, thus becoming generally marked by three primary characteristics: an ecological and biocentric perspective reorganizing the inter-dependent nature of the world; a deep humility with regard to our relationships with human and nonhuman nature; and an intense skepticism towards hyper rationality a skepticism that leads to an indictment of an over technologized modern world and a warning concerning the very real potential for ecological catastrophe.(pp 5-6) To be noted that, from the classical times the theme of nature has been emerged in the perception and realization of the authors' works specifically in the platform of poetry. The genre of Poetry is strengthened with the appealing running influence within it right from Biblical times till present times to have drawn us into the domain of nature. Nature being ornamented with different visions, essence, and potentials has been apparent in different undertones by numerous poets. According to Shelly, the innovative radical, the metaphor of wind seemed to be rough that moaned, as the poet is seen in the similar tone himself, since the world was wrong. Shelly is confronted with his own heavy thoughts that would scatter like leaves, like the tanned debris across the world in an apocalyptic insight and prophecy of the Utopian notion. Likewise, Keats yearned with the feeling of heart ache, the splendor, magnificence and delight pursued in the nightingale's song that awakened and stimulated a penetrating but amazing mindfulness of impenetrable proclivities. Those were the poets who were oblivious to the ferocity and vices of the city that surrounded them. They did not confront the anarchy of the overcrowded streets, the contaminated air. To those literary personalities the world assumed to be an exciting, stirring, wonderful place to breathe in. They could appeal incredible ruminations of nature encompassed of extraordinary virgin woodlands, primordial torrents and the splendor of natural world instilling the whole lot into a rich simulated wonderland giving predominant scope for creative manifestation.

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This would principally infuriate the poetic receptivity between the poet and the natural world. Such poets observed nature intimately, flourishing simultaneously in its foremost way of beauty being enthralled and mesmerized by their natural milieus.

In the poem, *Ode to the West Wind* (1819), Shelley gives vivid pictures of the cyclical variation determined by the wind dynamisms, while speaking it as "thou breath of Autumn's being" the one raging the decedent drops from the trees like ethereal influences. These mysterious and murky symbols, images and allegories of Autumn creating mourning by Winter, is then set against with "Thine azure sister", Spring, the one revitalizing the disintegrated seeds, transferring refreshing life. Shelley's influential imageries in unfolding how "black rain and fire and hail will burst" in the course of a hurricane, stimulates a daunting depiction of anarchy or the end of the creations and survival; whereas "the Atlantic's level powers/cleave themselves into chasms" generating surfs abundantly to plunge "palaces and towers". These representations of disparaging natural supremacies arouse fear and trepidation. Moving into more details, Wordsworth outlines a more acquiescent interpretation of nature in *Tintern Abbey* (1798) in which Wordsworth yields to the country side after a long span of five years and wits a sensitivity of reminiscence and longing as he observers "These waters, rolling from their mountain-springs'. The natural surroundings offer him a tranquil restoration from "the din / of towns and cities".

The marks of subjectivity portrayed through Wordsworth and Shelley while picturing Nature in *Tintern Abbey* (1798) and *Mont Blanc* (1817) respectively deserve note of esteem and admiration at nature's magnificent power and beauty. But, in both the master pieces it has been presented with a note of different imageries and interpretations of nature and the manner in which manhood ought to have indulgence in it. In the belief of Shelley, the realm of nature is at the same time magnificent and noxious; a vigorous force which cannot be restrained by man. In the process of intensifying nature's creative grandeur, Shelley restraints man not to analogous beauty with that of quietude. In the poem, *Tintern Abbey* Wordsworth has commended to position man and nature not in antagonism but has construed them as congruent barebones of a whole, recognizing man as an essential fragment of nature. Shelley inserts with the splendor of nature's alluring influence or authority to craft *Mont Blanc*, fighting against nature the supremacy of his own understanding to recognize *Mont Blanc*'s sublimity and thereafter to eloquent its regal daintiness in his own artistic ways.

Wordsworth enunciates the invigorating powers of Nature as it soothes and refurbishes his soul:

In hours of weariness, sensations sweet,
Felt in the blood and felt along the heart,
And passing even into my purer mind
With tranquil restoration: - feelings too
Of unremembered pleasure; .... (ll. 27-31)

Wordsworth in his narrative piece of legendary maneuver, *The Prelude* (1799), re-counts the understandings of his infantile time expended with nature which has conferred upon him "a cheerful confidence in things to come".

In the opinion of Byron, Nature was an important channel or passageway to human consciousness, rejoinder and evolution. Conflicting Wordsworth, who sentimentalized Nature and primarily sanctified it, Byron professed Nature more as an associate and consociate to civilization. Indisputably, natural daintiness was remarkably required to human maliciousness and the matters consequential upon civilization, but Byron also accredited Nature's traitorous and retaliatory elements. Byron's *The Prisoner of Chillon* (1816) connects Nature to freedom and self-fortitude, while instantaneously presenting Nature's suppositionally lethal elements in the castigatory waves that seem to prowl to flood, the oubliette. *Childe Harold's Pilgrimage* (1812) dispenses expressions to Nature as a sanctuary from human skirmish, nevertheless, amongst the blizzards, the simmering forcefulness of the natural world.

Dissimilar to the poets of nature in the time departed who persuaded more in the course of the countrified and tranquil, the nature poets in present-day times are poignant extensive environmental and preservation themes. Scrutinizing the writings of the past several years, thought-provoking and evocative

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creative maneuver have been produced that examines this poetry from the angle that has prompted to slapdash the underpinning for research in eco poetics. Eco poetry brings forward a comprehensive representation of innumerable conservation standpoints thereby constructing and countersigning cognizance of the ecological milieu.

It is the humanitarianism in man that privileges to concede and esteem the human affiliation and recurrent bond between man, nature and the environment. Eco poetry stipulates the flawless podium to righteousness and comprehend this memorandum. Eco poetry stances with the stout pronouncement in generating salutation for the human interdependence on the earth. It is not just the curious experiment by eco poets with pictorial and textual enterprise. But they articulate an aesthetic ecstasy, the stream of thoughts by crafting a molten message through structured verses, triplets and couplets.

While going through the creative pieces, one treasures such pulsating measure in Chaucer's *Canterbury Tales* convivial of the year's season into the spirit's:

When April with its showers sweet
Has pierced March drought down the root.
Then people long to go on pilgrimage.

When Wordsworth saw
A host of golden daffodils,
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze,
We too rejoice in the beauty of nature. And when Keats' Nightingale's
…plaintive anthem fades
Past the near meadows, over the still stream,
Up the hill-side; and now 'tis buried deep
In the next valley-glades:
Was it a vision, or a waking dream?"

Consequently, one understands that desire cannot last persistently and that mourning, mourning and death is but an unescapable and foreseeable truth of life.

John Felstiner (2010) explores the humorous inheritance of poetry that receives nature as their subject, and he authenticates their effectiveness, vitality and exquisiteness. In the contemporary times of ecological catastrophe, he battles, poetry has an incomparable magnitudes to redecorate one's sensitivity to the milieu in its endangered condition.

Felstiner observes:

Once alerted, our eye and ear find environmental imprint and impetus running through a long legacy…. Poetry more than any other kind of speech reveals vital signs of our tenacy on earth. (p. 4)

It is accredited that the Idealistic poets are concerned principally in nature and in its extensiveness, not just in the breathing of intelligence, but also in the mystical and philosophical imitation, nature's resourceful sovereignties that inducement to an ensuing scrutiny of the state of humankind and individual's affiliation with the conception of world. Their literatures also prone the poet's commotion to understand countryside, wildlife, landscape and man's groundbreaking, pioneering and disparaging equivalent powers, which eternally persists in the present time, in the framework of man's unappeasable need to paradigm the monarchy of summit to the augmentations of an ever swelling populace which has been lengthily witnessed to be quenching the earth's network of ecology and eventually himself, either by means of pollution or the manipulation of natural resources. However, in voicing their yearning for an epitome world, the Romantic poets also remains unrestricted in inkling the light of hope, with the proclaim that if man abstains from this ferocity, nature can be conserved.

Nature is an indispensable and crucial component of our life. But while understanding, conceding and acknowledging the beatifications and consecrations she deliberates on us, we condone that we are plundering her reserves and thus inhibiting our descendants the penchant proclivity of glorifying nature in all her profusion and diversity in the impending. The elegance of nature has been engraved in the works of literature by musicians, sculptors and poets. The meager poetic enunciation demonstrates such flexible touch. Then how miraculous in visualising the force of the true nature itself!

The unrelenting pummeling on the natural world by human inhabitation has aroused the awareness in many thoughtful people, the sensitivity of the precondition for therapeutic action to cessation the sabotage of our world. Erudite researches and scholarly innovative works have performed a significant role in questioning into these daunting ecological issues. In the words of Bryson, Eco poets help

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Reorient us within our world, when they render their conceptions of the world in such a way that their poems become models for how to approach the landscape surrounding us so that we view it as a meaningful place rather than abstract space. (12)

Poetry liquefies in dissolving the limitations between the divided human minds and the natural world, softens the antagonism between individual welfares and the welfares of nature. Eco poetry with its fine fabrics of intense ecological worth and implication attempts to convey the message of sustainable development in the society thereby nurturing humane feelings, concerns for the protection of greenery, the beauty of inner growth towards peace, harmony, progress in the self, in the communities and in the making of a beautiful world to live in.

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THE SOCIAL PROGRESS OF WOMEN IN ANCIENT INDIA -FROM THE HISTORICAL PERSPECTIVE

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Abstract

No matter how the world changes, no matter what country and social system people are in, no one can refuse women's importance in history. But it does not mean that women are always managing well and fairly. The women's role in history has go through several changes. In the post few decades' women were considered to be a part of wealth and property. She used to be sold and purchased like any property or cattle. Till recently women were treated on different footing depriving them of their rights but reminding them of their duties. But with the changing times, the role of women in ancient has changed from child bearing to rearing to bread earner. Thus the new cultural milieu is making it unpreventable for them to face the emerging reality in contemporary Indian society. This article is an attempt to throw light on the role of women in ancient India. It also tries to explain the position of women on the basis of historical evidences. Throughout the Indian history the double standard regarding the role of women is evident. In Literature and religion of India women are highly placed. But in the domestic, political and economic scenario women occupy a lower status and are subjected to discrimination and exploitation. Indian women who were once considered to be the masters in the art of home making are now considered to be the forces that shape the country, which is the size of a continent.

Keywords: *Women and men two face of the coin, Better half of the society, women's role in Ancient Indian History*

Introduction

Women are the gifted to the society. During ancient period of India women played an important role. The rig Vedic women in India enjoyed high status in throughout the history. Continued enjoying full freedom and equality with men. The position of wife was an honored one in the household. Superior over men in religious ceremonies. Their condition was considerable. The women were provided opportunity to attain high intellectual and spiritual standard. There were many women rashes during this period. Though monogamy was mostly common, the richer section of the society indulged in polygamy. There was no sati system and early marriage. But from enjoying free and esteemed position in the Rig Vedic society, women started being discriminated against since the later Vedic period in education and other rights and facilities. Power in religious ceremonies getting lowered. Religious ceremonies increasingly were conducted by the priests resulting in losing her preeminent position in the household. This was the period during which the importance of rituals increased and so did the importance of the Brahmans. Child marriage, widow burning, the purdah and polygamy further worsened the women's position.

The epics and puranas educated women with property. The women were allowed to sing, dance and enjoy life. Sati was not generally prevalent. Widow Remarriage was allowed under certain circumstances. Even Buddhism did little for women. Though the Mourya king often employed female bodyguards, spies and 'stri adhyaksha mahamatras' their status was still quite bad. Upper caste ladies had to accept the purdah. Stridhan was usually in the form of jewelry, which among many cultural groups was a convenient way of carrying surplus wealth but include certain rights to immovable property. Widows could remarry. When they did so, they lost rights to any property inherited from their deceased husbands. During this period man was polygamous and widow burning was an accepted norm. Arthashastra imposed more stigmas on women as Kautilya dismissed women's liberation and they were not free even to go elsewhere without husband's permission The Gupta Empire is seen as the classical

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age of Indian culture because of its literary and artistic accomplishments.

Some information on roles for elite women comes from the Kama Sutra, a manual about the many ways to acquire pleasure, a legitimate goal for Hindu men in the householder. Women were expected to be educated, to give and to receive sexual pleasure and to be faithful wives. Courtesans were trained in poetry and music as well as the skills of sexual pleasure and were esteemed members of society. Role of women in ancient India they become worse off in the Gupta period. The Smritishastras abused them, "Manu dictated a woman would be dependent on her father in childhood, on her husband in youth and on her son in old age". Apart from child marriage and sati, prostitution and devadasi system became widespread.

Ancient Women and Education

The role of women in ancient Indian Literature is immense. Ancient India had many learned ladies. There were two types of scholarly women

Brahmavadinis:- The women who never married and cultured the Vedas throughout their lives.

Sadyodvahas:- Who studied the Vedas till they married.

Panini mentioned of female studying Vedas. Katyana called female teachers Upadhyaya or Upadhayi. Asoka got his daughter, Sangha Mithra inducted into preaching Buddhism. From the jain texts, we learn about the kousambi princess, Jayanthi, who remained a spinster to study religion and plilosophy. Often, Buddhist nuns composed hymns. Women often enjoyed prominent roles in politics. Megasthenes mentioned the Pandya women running the administration. The Satavahana queen, 'Nayanika ruled the kingdom on behalf of her minor son. So did Pravabati daughter of Chandragupta II on behalf of the minor Vakataka prince. A little after the Gupta period, queens used to rule in Kashmir, Odisha and Andhra. Princess Vijayabhattarika acted as the provincial ruler under the Chalukya King Vikramaditya I. Women was provincial and village administrators in the Kannada region. Women from the aristocratic classes enjoyed education and other privileges but the common artifacts are being used to reconstruct the lives of women. "The earliest materials found by archaeological excavations suggest the worship of goddesses. The earliest recorded religious texts call on the life giving power of goddesses to give life and to nurture sustains it. After the Aryan invasion and the development of Hinduism and Buddhism, India's extant written texts add greatly to our knowledge. Centered on the Indus River Valley the oldest known civilization in India.

Today most of these cities of archaeological interest are now in Pakistan due to Indian Independence and partition in 1947, although the ancient city-state of Lothal is in the Indian state of Gujarat. Extensive remains at Mohenjo-Daro, Harappa and Lothal show a well-organized prosperous agriculture and commercial society that traded with other civilizations in the near East. The most famous ancient human creation is that of a young scanty girl posing confidently. Many toys found convey a society that valued family life. While their inscribed ancient seals have not been deciphered to determine the actual meanings, extensive female images have been found that suggest goddesses played a central role. "Often called fertility goddesses, very few depict pregnant women, women giving birth and nursing their children. Several of the seals suggest a goddess associated with vegetation and fertility". Apparently this civilization succumbed to major natural disasters that changed the course of the Indus River. Hitherto it was thought that the invading Aryans conquered these indigenous people, but the Indus Civilization was already in a state of decline when these assume without proof as self-evident came in from the Hindu Kush. These Aryans were light skinned compared to the natives and over time enslaved them, resulting in the caste system. Aryans highly hierarchical society was led by the Brahmin priests, who imposed political and religious power over the rest. The Brahmins composed sacred literature, the Vedas that glorified the

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beliefs that continue to be revered today by the Hindus.

The Rig Veda, oldest of these texts, composed mostly by priests, but a few women too gives us the first ancient Indian writing with apprehensible information about their various gods and goddesses. There is a formation story where the goddess Aditi gives birth to the earth also humanizes as a goddess, pruthvi. Mother Earth's role was to be tender to the dead and Aditi was to be prayed to for release from sin. Much of the ideal role of women can be discover from the images of a maiden and bride in the Rig Veda. A daughter and maiden were praised for the attribute of beauty, sparkle and attractive embellishing. This description suggests interest in womanly sensuality, childbearing capacity of the young girl. At festival gatherings, young virgins met eligible men, with flirtatious cooling after initiating a relationship. They then turned to their parents for approval and marriage arrangements were made. Practical advice was given to the new bride including her not to be angry she was to be kindly, amicable, marvelous and mother of sons. The famous statement "May you be the mother of a hundred sons", was conceptualized. A woman's role as outlined in Hinduism at this time was to be a good wife so that the gods and goddesses would respond to the couples requests and needs.

An altar tended mainly by the father, was overseen by the wife when he was gone the home. Her job was to keep the sacred flame burning2 24/7. It was also the woman's responsibility to recite and sing hymns to the deities a duty ascribed to women in most all other cultures. Divine couples like Indra and Indrani and Soma and Surya acted as models. Goddesses were generally viewed positively although occasional glimpses of their darker side surface. Other early goddesses were the sisters dawn and night. In the next segment of ancient texts, the Upanishads writers began to reinterpret earlier Vedic literature. Now a person was able to reach the universal soul Brahman through self-knowledge not just through ritualistic knowledge performed by the Brahmin priests. There is evidence of two learned women participating in theological discussions. How different this is compared to the same time frame in the Near East where Pandora and Eve are doing evil. Women in India are doing theological inquiry. Unfortunately, current Indian scholars have commented unfavorably about these two women.

The texts that speak about women in Ancient India are the Laws of Manu. Like earlier law codes in the Ancient near east, we can gain insights into the legal status of women but not necessarily what was actually practiced. Law codes are nearly always prescriptive not descriptive literature. As in other ancient societies, women were under the guardianship of male's father, husband and son. When a woman married, it was regarded as her second birth, with a new name. In successful religious rituals the wife was to be present to utilize her fertility powers. Adultery was not punished as severely as in other ancient cultures. Divorce was possible for the woman too but only if he was important. As true of ancient Rome, a wife could be divorced if she drank was rebellious was unproductive and was a profligate. There is some evidence of the **levirate marriage** practice used by the ancient **Hebrews** and **Hittites.** However, the majority of widows apparently did not remarry. Women's economic contributions were important in ancient India. As India was an agricultural country women were needed to assist the men folk in the various seasonal activities.

As today in the past India was made up of thousands of villages. It was the family not the individual that was the basic unit. Usually three generations of the family lived together in an essentially patriarchal structure except along the Malabar Coast in the southwest where matriarchal social organization prevailed. Poetry written by Tamil women in the south spoke of their singing while at work their family and religious rituals. The Indians practiced a form of ancestor worship, where by the oldest male was responsible for conducting the rites on a regular basis in the home. It was the eldest sons responsibility to late his parents funeral pyre. Women could not serve as Brahmin priests or study the sacred Vedas.

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Some women could be seers, though. Courtesans and prostitutes were part of ancient Indian society. As in ancient Greece, courtesans were often literate and skilled in music and dancing besides the usual sexual services. Regular prostitutes engaged in their trade in busy places. Later on prostitutes will come from a certain caste. Repentant courtesans and prostitutes sometimes went into Buddhist nunneries. As Hinduism developed certain facets became dominant the caste system, karma, dharma and reincarnation. There were originally four main castes and women were represented in all of them.

Caste determined whom you associated with who you could marry and your diet. In certain cases a man was allowed to marry a woman of a lower caste, but women could not without disgracing her family and impair her. Because of the relative lower status of women in India if you did not do your proper duty, then you did not accrue good enough karma to be reincarnated in a higher caste or life form, including being reborn as a woman who was inferior to a man. Hindus came to think the various deities were manifestations of the Brahma, the world soul. Each god has had many rebirths. Goddesses of special reverence were Kali, Sarasvati, Parvathi, Lakshmi, Druga and Devi. Sarasvati was the consort to Brahma who set the world in motion but lost importance with the emergence of the gods Shiva and Vishnu. Sarasvati was the goddess of learning, writing, knowledge preacher of great power and eloquence. She created the first alphabet.

Many consider her the mother of all life since it was her divine energy that united with the awareness of Brahma, who was born from the golden egg from sea. Thus the two created all knowledge and all creatures of the world. Sarasvati was also a river goddess and her name translates as the flowing one. She is usually shown seated on a lotus blossom throne accompanied by a white swan. She has four arms showing that her power extends in all directions. Two of her arms hold books and beats with the other two arms and hand she is playing the Vienna an Indian lute. In some of her avatars she is also Druga the ten armed goddess of battle Kali the beautiful one who rides on a tiger. Parvathi means mountain girl and she is considered the daughter of the Himalaya Mountains. Lakshmi was the wife of Vishnu the preserver. She is often shown seated on a lotus as she was born from an ocean of milk standing on a lotus flower. She is the goddess of good substance, wealth, riches, prosperity and beauty. Representing all that is feminine while her consort Vishnu represents all that is masculine.

Many paintings show them riding on the back of Garuda, the eagle, the giant king of birds, as they fly across the land. Lakshmi chose Vishnu. They had a son, Kama who was the god of romantic love and in many paintings he looks similar to the cupids on valentine cards. Her attendants are white elephants. Lakshmi is also worshiped as Seta, the reincarnation of the perfect wife to Rama in the Indian epic, The Ramayana. Once a year on the night of the new moon in November Indian women clean their homes and hang tiny lanterns outside that look like stars. Women hope that Lakshmi will be attracted to their homes, blessing them with good fortune and prosperity for the coming year. Lakshmi lives in the sky with the most beautiful jewels of all, the stars. Drugathe warrior goddess is one of the avatars of Devi. She is invincible in battle and was created by the gods to destroy the buffalo monster that was threatening their power.

The goddess Devi was the essence of being and in this she was the Shakti less anthropomorphic than the conception. She was the one great mother goddess and she was responsible for fire, water, earth and air. Devi is unknowable, omnipotent and the myth of Devi as Kali dates back to goddess worship in the early Indus Valley cultures. Kali is the most terrible aspects of Devi. Sent to earth to destroy the race of demons Kali caused such devastation that many died. To bring an end to the slaughter her husband, Shiva threw himself upon the dead bodies. Only when Kali realized She was trampling on Shivas corpse did she come to her senses. She has four arms and hands a holy book and prayer beads with her dark skin reflecting the dark soil of earth. Her teeth are Kalinghat temple in Kolkata, the city named for her.Shiva as the destroyer and giver of life and Varuna as the Lord of Universal order were the two most popular male gods. Varuna also appears as Vishnu, who was reborn as the great hero Krishna.

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In the two famous epics of India the Mahabharata and Ramayana women are shown as having more freedom and competency than in the religious and legal literature. In the Mahabharata there is evidence of both polyandry and polygamy. Events in these stories demonstrate women's managing and problem solving skills. In the Ramayana the heroine Seta is the example of the good wife who still shows determination to manage her life. Public opinion still negates her innocence, forcing her to go into exile where she goes back to her mother Earth. This ritual suicide then becomes the prototype for sati, the self sacrifice of a wife on her husband's funeral pyre, which occurs later in Indian history. Just as in the medieval west, wives and daughters could become ascetics if their present life was untenable. During the 6th and 7th centuries, two new religions developed in India Buddhism and Jainism that will have an enormous impact on not only in India but in other religions of Asia. Buddha grew up as Sddhartha Gauthama, a prince in a powerful tribe in the foothills of the Himalayas, what is now Nepal. Kept purposefully ignorant by his parents of the omnipresent poverty when Siddhartha became aware of this he renounces his tribal wealth and prestige and went in search of the causes of this. Turning first to the Brahmin sages, he then tried extreme ascetic meditation.

Arriving at a papal tree, which is now in Saranatha on the outskirts of Varanasi, he experienced a flash of understanding and at this point became the Buddha, the enlightened one. His goal was to eliminate suffering in this world and over time his four Noble Truths and Eight fold path attracted adherents and followers. Buddha regarded himself as a philosopher and teacher rather than a founder of a religion. He did not attack the Hindu rituals. For Buddha he wanted the elimination of the caste system, ritual sacrifices and fulfilling ones dharma according to the Brahmin regulations. Buddha did feel that our actions in life affect others thereby maintaining the Hindu idea of Karma. Nirvana was possible for everyone to achieve. Teaching for forty-five years until his death around 483 B.C, Buddhism developed monasticism like the west will do nearly a thousand years later, but Buddha discouraged women becoming nuns. Buddhism stressed that the proper relationship in India was between a married couples. Wives should be encouraged to provide the home atmosphere conducive to the maintenance of society.

Conclusion

At the end we can conclude that although the changes are occurring slowly but there is an advent of social reforms and strengthening of women in India in ancient period and later also we can hope for the invariable future of women in India whereby they can claim to be really unequal to the men in every field of life. The women occupied a very important position in the ancient Indian History. In fact, far superior position to the men of the time. '**Shakti'** a feminine term means '**Power'** and **'strength'.** Literary evidence suggests that kings and towns were destroyed because the rulers troubled a single woman. For example Valmiki Ramayana teaches us that Ravana and his entire kingdom were wiped out because he abducted seta. Veda Vyasa Mahabharha teaches us that all the kauravas were killed because they humiliated Draupadi in public. Elango Adigals Silapadhigaram teaches us Madurai the caoital of the Pandya was burnt because Pandyan Nedunchezhiyan mistakenly did harm to Kannaki. In Vedic times women and men were equal in many aspects. Women participated in the public sacrifices alongside men. One script mentions a female rishi Visvavara. Some vedic hymns are attributed to women such as Apola the daughter of Atri, Ghosa, the daughter of Kaksivant or Indrani, the wife of Indra. Apparently in early Vedic times women also received the sacred thread and could study the Vedas. The Haritasmrti mentions a class of women called Brahmavadinis who remained unmarried and spent their lives in study and ritual. Paninis distinction between acarya and Acharyani, Upadhaya and Upadhyani indicates that women at that time could not only be students but also the teachers of sacred Vedas. There were several noteworthy women scholars of the past such as Kathi, Kalapi and Bahvici. The Upanishads refer to several women philosophers, who disputed with their male colleagues such as Vacaknavi who challwnged Yagnavalkya. The rig Veda also refers to women engaged in welfare. One queen Bispala is mentioned and even as late a

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witness as Megasthenes mentions heavily armed women guarda protecting Chandraguptas palace. Hindu religion has been occasionally criticized as encouraging inequality between men and women, towards the detriment of Hindu women. This presumption is inaccurate. In the Vedic period, we come across female scholarslike Ghosha, Lopamudra, Ramasha and Indrani. In the Upanishad period, names of women philosophers like Sulabha, Maitreyi, Gargi are encountered. In religious matters, Hindus have elevated women to the level of divinity. One of the things most misconstrued about Indi and Hinduism is that it's a male dominated society and religion and the truth is that it is not so. It is a religion that has attributed the words for the strength and power to feminine. 'Shakti 'means 'strength'. All male power comes from the feminine. Brahma, Vishnu and Shiva the thrimurti are all powerless without their female counterparts. Indian Women have travelled with the time for centuries and have proved to the world that the hand that rocks the cradle can rule the world. To make a success of defeat is the most interesting project in the world. Indian women have that kind of resilience to turn the tide in their favor. The status of women in a society is the true index of its cultural, social, religious and spiritual levels. It is one of the most important criteria for estimating with precision the degree of civilization attained by a particular society in various periods of its history. Today India is the most sought after outsourcing destination for any country or business firms. It is not just because the costs are low in India, but the world has also realized the reliability and skills of Indians particularly the positive work climate prevailing in India. The most comforting and encouraging factor is that.

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GEOGRAPHICAL STUDY OF BIODIVERSITY AND ITS CONSERVATION IN INDIA

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Abstract:

Earth is known to be the only living planet due to the life it supports. "Biodiversity" or "biological diversity" is referred to the vast range of life forms, from simple, microscopic, unicellular to the evolved, complex and multi-cellular forms on earth. India is located in South Asia, between latitudes 6^0 and 38^0 and longitudes 69^0 and 97^0 E. India's landmass extends over a total geographical area of about 3029 million hectares .It is bounded by Himalayas in the north, the Bay of Bengal in the east ,the Arabian Sea in the west, and Indian Ocean in the south. The wide variety in physical features and climatic situation has resulted in a diversity of ecological habitats.

Key words: Biodiversity, Conservation, Ecosystem, ecological habitats.

Introduction

India is one of the 12 mega Bio-diversity countries of the World. The Country is divided into 10 bio geographic regions. Trans Himalayan, Himalayan, Indian Desert, Semi-Arid Western Ghats, Deccan Peninsula, Gangetic Plains, North East India, Islands and Coasts and this diversity create rich Bio-diversity in the Country. The wide variety in physical features and Climatic situations have resulted in a diversity of ecological habitats like forests, grassland, wetlands, coastal, marine and desert ecosystem, which harbor and sustain the immense Bio-Diversity. With only 2.4% of the total land area of the world, the known biological diversity of India contributes 8 % to the known global biological diversity. Currently available data place India in the tenth position in the world and fourth Asia in plant diversity. In terms of number of mammalians species, it ranks eleventh. It stands seventh in the world for the number of species contributed to agriculture and animal husbandry.

Indian region is a treasure house of wild genetic resource. Wild species and relatives of crop plants contain valuable genes that are of immense genetic value in crop improvement programs. The important wild related species and the types in various crop groups, prevailing under different photographic zones of the country needs particular attention in the agro bio-diversity management system for a sustainable use to help maintain food, nutritional and agriculture economic security to explain the variety of biodiversity.

Objectives

1) To study the levels of Biodiversity in India.
2) To study the value of Biodiversity.
3) To study the causes for the loss of Biodiversity.
4) To study the conservation of Biodiversity in India.

Significance Of The Study

Earth's plants, animals, and microorganisms-interacting with one another and with the physical environment in ecosystems - form the foundation of sustainable development. Biotic resources from this wealth of life support human livelihoods and aspirations and make it possible to adapt to changing needs and environments. The steady erosion of the diversity of genes, species, and ecosystems taking place today well undermine progress toward a sustainable society to explore the biodiversity and its conservation. With this view, the present study has been undertaken.

Data Base & Methodology

The present study is based on the secondary data. The secondary data is collected from the reference books, journals and research papers. The methodology primarily includes preparation of Table

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employing relevant data. The data collected are processed and analysed using appropriate, ratios and other standard statistical techniques.

Discussion

Diversity Of Life

Biodiversity is the totality of genes, species, and ecosystems in a region. The wealth of life on Earth today is the product of hundreds of millions of years of evolutionary history. Biodiversity can be divided into three hierarchical categories-genes, species, and ecosystems-that describe quite different aspects of living systems and that scientists measure in different ways:

Genetic Diversity

Refers to the variation of genes within species; this covers distinct populations of the same species (such as the thousands of traditional rice varieties in India) or genetic variation within a population (which is very high among Indian rhinos, for example and very low among cheetahs). Until recently, measurements of genetic diversity were applied mainly to domesticated species and populations held in zoos or botanic gardens, but increasingly the techniques are being applied to wild species.

Species Diversity

Refers to the variety of species within a region; such diversity can be measured in many ways, and scientists have not settled on a single best method. The number of species in a region-its "species richness"-is one often-used measure, but a more precise measurement, "taxonomic diversity," also considers the relationship of species to each other. For example, an island with two species of birds and one species of lizard has greater taxonomic diversity than an island with three species of birds but no lizards. Thus, even though there may be more species of beetles on earth than all other species combined, they do not account for the greater part of species diversity because they are so closely related. Similarly, many more species live on land than in the sea, but terrestrial species are more closely related to each other than ocean species are, so diversity is higher in marine ecosystems than a strict count of species would suggest.

Ecosystem Diversity

Ecosystem diversity is harder to measure than species or genetic diversity because the "boundaries" of communities-associations of species-and ecosystems are elusive. Nevertheless, as long as a consistent set of criteria is used to define communities and ecosystems, their number and distribution can be measured. Until now, such schemes have been applied mainly at national and sub-national levels, though some coarse global classifications have been made. Besides ecosystem diversity, many other expressions of biodiversity can be important. These include the relative abundance of species, the age structure of populations, the pattern of communities in a region, changes in community composition and structure over time, and even such ecological processes as predation, parasitism, and mutualism. More generally, to meet specific management or policy goals, it is often important to examine not only compositional diversity - genes, species, and ecosystems - but also diversity in ecosystem structure and function. Human cultural diversity could also be considered part of biodiversity. Like genetic or species diversity, some attributes of human cultures (say, nomadism or shifting cultivation) represent "solutions" to the problems of survival in particular environments.

Value Of Biodiversity

The Value of Biodiversity's Components From both wild and domesticated components of biodiversity humanity derives all of its food and many medicines and industrial products. Economic benefits from wild species alone make up an estimated 4.5 percent of the Gross Domestic Product of the United States-worth $87 billion annually in the late 1970s. Fisheries, largely based on wild species, contributed about 100 million tons of food worldwide in 1989. Indeed, wild species are dietary mainstays in much of the world. In Ghana, three out of four people look to wildlife for most of their protein. Timber, ornamental plants, oils, gums, and many fibers also come from the wild.

1) **Consumptive use:** it is very difficult to even think of the harmful effects of "Bio-diversity" on our survival.
2) **Productive use:** Biodiversity Comprises of a number of varieties of species.
3) **Ethical value:** Each species in the nature has definite role to play in the task of bringing balance in the ecosystem.

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4) **Aesthetic value:** In the sense earth is the only planet which has life in it. This life on earth has made the planet rich with its beauty
5) **Optional value:** we do not know the exact number of species that exists on this planet. Most accepted number is About 10 million,

BIO-Diversity at Different Levels

Global Level

It is estimated that there exist 5-30 million species of living forms on our earth and of these, only 1.5 million have been identified. It include 3,00,000 green planet,fungi,800000species of insect.40000 species of vertebrates and 360000 species of microorganisms, insect alone may be as high as 10 million.

Country Level

India is located in South Asia, between latitudes 6^0 and 38^0 and longitudes 69^0 and 97^0 E. India's landmass extends over a total geographical area of about 3029 million hectares .It is bounded by Himalayas in the north, the Bay of Bengal in the east ,the Arabian Sea in the west, and Indian Ocean in the south. The wide Varity in physical features and climatic situation has resulted in a diversity of ecological habitats.

Table 1: Number of Recorded Biota in India

TAXON FLORA	NO.OF SPECIES
Bacteria	850
Algae	2500
Fungi	2300
Lichens	1600
Bryophyte	2700
Pteriophyta	1022
Gymnosperms	541
Angiosperms	7000
Total	**48736**
Protozoan's	257
Peripheral	519
Cnidarians	237
Ctenophore	10
Platyhelminthes	1622
Nematode	2350
Rotifer	2350
Kinoryncha	10
Gastrotrich	88
Acanthocephalan	110
Sipuncul	38
Mollusca	5042
Echiura	33
Annelia	1093
Onychophora	01
Arthopoda	57525
Phoronida	03
Bryozoa	170
Entoprocta	10
Brachiopoda	03
Chaetognatha	30
Echinodermata	765
Hemichordata	12
Protochordata	116
Fishes	2546
Amphibians	204

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Reptiles	428
Birds	1228
Mammals	372
Total	**126188**

(Source: Based on www.wwfindia.org data)

Table 2: Endemic Species in India

	Group	No. of. Species
Plants	Pterdophyta	200
	Angiosperms	4950
Animal	Parasitic	500
Protozoa	Free Living	90
	Lepidoptera	9
Mollusca	Land & Freshwater	967
Pisces	Freshwater	64
	Marine	14
	Amphibian	123
	Reptilian	182
	Aves	60
	Mammalian	44

(Source: Based on www.nwf.org data)

In India, about 1, 15000 species of plants and animals have been identified and described.

Table 3: Bio-diversity in Animal Species

Group	Number of Species		World Percentage
	World	India	
Mammals	4231	372	8.79
Birds	12450	1200	9.63
Reptiles	6300	435	6.90
Amphibians	4184	181	4.32
Fishes	23000	2000	8.69
Insects	800000	60000	4.50
Molluscs	100000	5000	0.50

(Source: Based on www.nwf.org data)

A Mega Bio-Diversity Country: India

India is one of the 12 mega Bio-diversity countries of the World. The Country is divided into 10 bio geographic regions. Trans Himalayan, Himalayan, Indian Desert, Semi-Arid Western Ghats, Deccan Peninsula, Gangetic Plains, North East India, Islands and Coasts and this diversity create rich Bio-diversity in the Country.

Causes For The Loss Of Biodiversity

Biological diversity is being eroded as fast today in as at any time since the dinosaurs died out some 65 million years ago. The crucible of extinction is believed to be in tropical forests. Around 10 million species live on earth, according to the best estimates, and tropical forests house between 50 and 90 percent of this total. About 17 million hectares of tropical forests-an area four times the size of Switzerland-are now being cleared annually, and scientists estimate that at these rates roughly 5 to 10 percent of tropical forest species may face extinction within the next 30 years. (Figure 2)

This estimate may prove conservative, however. Rates of tropical forest loss are accelerating, and some particularly species-rich forests are likely to be largely destroyed in our lifetime. Some scientists believe that about 60,000 of the world's 240,000 plant species, and perhaps even higher proportions of vertebrate and insect species, could lose their lease on life over the next three decades unless deforestation is slowed immediately. Tropical forests are by no means the only sites with endangered biodiversity.

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1) Destruction of habitat
2) Wildlife Hunting
3) Over exploitation
4) Collection for Zoo and research
5) Introduction of exotic species
6) Control of Pests and Predators
7) Pollution
8) Deforestation
9) Other factors

- Development Pressure
- Encroachment(Land use)
- Exploitation
- Human Induced Disasters
- Management of Natural Resources
- Management of Human Resources
- Political and Policy Issues
- Habitat Loss and Fragmentation
- Introduced species
- Introduced species are responsible for many recorded species extinctions, especially on islands.
- Over-exploitation of plant and animal species
- Pollution of soil, water, and atmosphere
- Global climate change
- Industrial agriculture and forestry

Conclusion & Suggestions

The Goal of Biodiversity Conservation successful action to conserve biodiversity must address the full range of causes of its current loss and embrace the opportunities that genes, species, and ecosystems provide for sustainable development. Because the goal of biodiversity conservation-supporting sustainable development by protecting and using biological resources in ways that do not diminish the world's variety of genes and species or destroy important habitats and ecosystems-is so broad, any biodiversity conservation strategy must also have a broad scope.

- Conservation of Bio-diversity through a network of protected areas including National Parks, Sanctuaries, Biosphere Reserves, Marine Reserves, Gene Banks, Wetlands, coral Reefs etc.
- Conservation of microorganism, which help in reclamation of wastelands and revival of biological potential of land.
- Protection of domesticated plant and animal species in order to conserve indigenous genetic diversity.
- Maintenance of corridors between different nature reserves for the possible migration of species in response of climatic, or any other disturbing factor.
- Rehabilitation of rural, poor tribes displaced due to creation of protected areas.
- Protection and sustainable use of genetic resource Germplasm through appropriate laws and practices
- By establishing database at various levels to document support for protecting traditional skills and knowledge for conservation.
- Multiplication and breeding of threatened species through modern techniques of tissue culture and biotechnology.
- Discouragement of Monoculture introduction;
- Control of over exploitation through cities and other agencies.
- Restriction on introduction of exotic species without adequate investigation.
- To establish conservation parks for the rare, endemic, document local resources and support for threatened species.

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GENDER EQUALITY AND SUSTAINABLE DEVELOPMENT

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Abstract

Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development. There is a dual rationale for promoting gender equality. Firstly, that equality between women and men equal rights, opportunities and responsibilities is a matter of human rights and social justice. And secondly, that greater equality between women and men is also a precondition for sustainable people-centred development. The perceptions, interests needs and priorities of both women and men must be taken into consideration not only as a matter of social justice but because they are necessary to enrich development processes We recognize that gender equality and women's empowerment are important for sustainable development and our common future. We reaffirm our commitments to ensure women's equal rights, access and opportunities for participation and leadership in the economy, society and political decision-making. We underscore that women have a vital role to play in achieving sustainable development. We recognize the leadership role of women, and we resolve to promote gendernequality and women's empowerment and to ensure their full and effective participation in sustainable development policies, programmes and decision-making at all levels.

Introduction

Women, who make up half of the world's population, have benefited more than men from the progress in economic and social development in the last three decades. Nevertheless they continue to be overrepresented among the world's most vulnerable groups, as access to resources and power remains highly skewed towards men. Gender equality is a goal in its own right but also a key factor for sustainable economic growth, social development and environmental sustainability. By providing the same opportunities to women and men, including in decision-making in all kinds of activities, a sustainable path of development can be achieved to ensure that women's and men's interests are both taken into account in the allocation of resources. In 1992, the United Nations Conference on Environment and Development (UNCED) made important provisions for the recognition of women's contributions and their full participation in sustainable development. Principle 20 of the Rio Declaration (quoted at the outset of this paper) and Chapter 24 entitled "Global Action for Women towards Sustainable and Equitable Development" of Agenda 212 make commitments to strengthening the position of women.

What are gender equality and sustainable development and how do they link?

What is women's empowerment and gender equality?

Empowerment can be defined as a "multi-dimensional social process that helps people gain control over their own lives. It is a process that fosters power (that is, the capacity to implement) in people, for use in their own lives, their communities, and in their society, by acting on issues that they define as important" The discussion about women's empowerment & gender equality in this paper is held against the backdrop of women's continued disadvantage compared to men. This disadvantage is apparent in the different spheres of economic, socio-cultural and political life in all societies in the UNECE region. Empowerment in this context means women gaining more power and control over their own lives. As such, it can be conceptualized as an important process in reaching gender equality.

Gender equality is understood to mean that the "rights, responsibilities and opportunities of individuals will not depend on whether they

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are born male or female" What is expected of a man or a woman, a girl or a boy, differs depending on the socio-cultural context in which they live. Gender roles are learnt by each person through socialization processes. In other words: what he or she learns from others through the social interactions they have with their families, peers and society at large. This means that gender roles and gender role expectations are not fixed and can change over time in the same way that they differ across different societies.

What is sustainable development?

In the late 1980s the report Our Common Future by the World Commission on Environment and Development defined the concept "sustainable development" as development which "meets the needs of the present without compromising the ability of future generations to meet their own needs" While aiming to maximize the well-being of today's generation, it is important to take a long-term perspective, taking into account the consequences of our actions for our children, their children and grandchildren, ensuring that the resources they will require for their own well-being are not depleted, and that the natural environment into which they will be born will not be polluted or destroyed. Sustainable development is conceptualized as resting on three inter-related pillars: economic development, social development and environmental protection.

The Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs". It therefore encapsulates the needs of both women and men. Intra-generational equity cannot be achieved without addressing the gender relations which underlie prevailing inequity. Nor can inter-generational equity be obtained, or responsibility to pass on a more equitable world to future generations be met, if inequalities continue to be perpetuated. Gender disparity is among the most pervasive form of inequality in the world and without serious steps to tackle it, sustainable development cannot be achieved How can women be empowered in the context of sustainable development? The remainder of this paper looks at the question of what concretely needs to be done, and is being done, for women's empowerment, both through building an enabling policy environment and through enhancing women's capacity as active agents of change for sustainable development. Empowering women for sustainable development Women's empowerment is a process. The discussion in this section is structured along four steps in this process. Firstly, the nature of the problem is identified. This means that the prevailing gender gaps where women continue to be at a disadvantage are identified and recognized as important. In this process it is important to consult women themselves to better understand their needs and concerns. International norms and standards on women's and girls' human rights and gender equality provide a solid basis for advancing action to strengthen the vital role of women in achieving sustainable development The World Survey articulates what sustainable development with gender equality could mean for policies, programmes and decision-making at all levels in the current global juncture. In doing so it reflects on the early twenty-first century global context, when entrenched poverty and hunger, rising inequalities, ecosystem destruction and climate change, all of which are consequences, in large part, of prevailing economic models and paradigms, pose unprecedented challenges for the realization of women's rights and risk undermining further the sustainability of their households, communities and societies. Dominant development patterns have both entrenched gender inequalities and proved unsustainable as regards many issues covered in the World Survey, including economic growth and work; population and reproduction; food and agriculture; and water, sanitation and energy. Yet the overall message of the World Survey is one of hope in the possibilities of constructing, through vigorous democratic deliberation that involves states, women and men, civil society organizations, the private sector and global institutions, alternative development trajectories within which gender equality and sustainability can powerfully reinforce each other. Turning promises into action: Gender equality in the

2030 Agenda for Sustainable Development promises into action: Gender equality in the 2030 Agenda for Sustainable Development", UN Women's new flagship report, provides a comprehensive and authoritative assessment of progress, gaps and challenges in the implementation of the (SDGs) from a gender perspective. The report monitors global and regional trends in achieving the SDGs for women and girls based on available data, and provides practical guidance for the implementation of gender-responsive policies and accountability processes. As a source of high-quality data and policy analysis, the report is a key reference and accountability tool for policymakers, women's organizations, the UN system, and other stakeholders.

showing how gender equality is central to the achievement of all 17 SDGs and arguing for an integrated and rights-based approach to implementation; explaining gender data gaps and challenges for robust monitoring and establishing starting points and trends across a range of gender-related indicators. providing concrete guidance on policies to achieve two strategic targets under SDG 5 (violence and unpaid care) and outlining how these policies are synergistic with other goals and targets; and setting an agenda for strengthening accountability for gender equality commitments at global, regional, and national levels.

Conclusion

In the end it could be concluded that, Economic, social, cultural and environmental concerns need to be approached in an integrated and holistic manner. From a gender perspective, it is particularly important not to consider gender equality as a socio-cultural issue alone but to give it due consideration in the economic and environmental realms as well – treating gender equality as a cross-cutting objective to attain sustainable development.

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ETHNO -VETERINARY PLANTS OF KHED AREA, PUNE DISTRICT, MAHARASHTRA, INDIA

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Abstract:

The study is an ethno-veterinary work to gather information usage of specific herbs for the treatment of various illnesses in livestock by tribal people. The various visits conducted at Khed region in Pune district. Locals were used herbs that would cure veterinary ailments that were common in the area. These individuals are skilled in administering plant-based herbal medicines and the dosages are quite successful in treatment. A total of 52 plant species from 32 families were documented for varied medical purposes for animals in the area, using plant parts such as root, stem, leaves, fruit, rhizome, and seed.

Key Words: *ethno-veterinary, livestock, ailments, herbal.*

Introduction:

In India, the RigVeda is one of the ancient literatures that mention cattle and their management. Ehthano-veterinary practices are especially used for curing animals. Livestock owners have a information of plant. Ethno-veterinary practices include the use of local medicinal plants to cure animals. Herbal medicine is made from a plant parts. Traditional information relevant to ethno-veterinary from various locations has recently been accorded prominence by researchers. Pandey et al. (2000), Reddy et al. (2000), Chitralkha and Jain (2006), Ravikumar R. K, Rao B. S, Bose S. C and Sudhakar K, (2004), Kulkarni and Kumbhojkar (2002), P. B. Kamble and D. K. Kulkarni (2013), Patole S. N. (2021), Pawar N. B. (2020), Patole S. N. (2021), Shivamanjunatha M. P. (2021) reported plants used to treat domestic animals.

Methodology:

Study Area:

Khed tehsil is situated in the Pune District and lies between Lat. 18^0 37' 1"- 19^0 17'4" N and Long.73^0 30' 51" –74^0 3' 5" E on the north – western part of Deccan plateau and is composed of undulating hilly country. It is bounded on the north by Ambegaon tehsil, on the south by Maval and Haveli tehsils and on the east by Shirur tehsil. The western boundary is formed by the range of Sahyadris. Bhimashankar, Vandra, Tambarvadi etc. are some of the areas covered by Sahyadris in the tehsil. The crest of the hills is about 1,060 metres in these areas forming rounded buffs and clear cut ridges while in other places like Khed town, Mahalunga, Alandi, etc., it falls down to 600 to 625 metres above mean sea level.

The present study has been conducted in two steps:

Step I- A survey was conducted among the tribal peoples of Khed region Pune district during 2019- 2021 to gather knowledge on plants used for treatment on different disorders as used by them.

Step II- Plants of flowering and fruit were identified by the help of Cooke, T. (1958), Hooker, J. D. (1872-1897). The tribals of Khed tehsil shared their expertise of plant medicinal uses and the plant species they utilised to treat various ailments.

Results And Disscussion:

The present study brought knowledge of tribal for the treatment of different disorders of domesticated animals. The plant specimens have been identified by the flora, the plants species are alphabetically arranged.

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1. *Abelmoschus ficulneus* (L.) Wt. and Arn. Family- Malvaceae, Local name- Ran-bhendi, Part used- Stem bark, Use- Bark powder infusion is used as remedy for diarrhoea.
2. *Achyranthes aspera* L. Family- Amranthaceae, Local name- Aghada, Parts used- Seeds, Uses- Seeds juice is given in luke-warm water in gastric ailments.
3. *Adhatoda vasica* Nees. Family- Acanthaceae, Local name-Adulasa, Parts used- Stem and leaves, Uses- Decoction of leaf and stem are given to treat fever and cough.
4. *Aegle mormelos* (L.) Correa, Family – Rutaceae, Local name- Bel, Part used- Fruit, Uses -Crushed fruits are given in diarrhea.
5. *Allium cepa* L. Family- Liliaceae, Local name-Kanda, Parts used- Bulbs, Uses- Bulbs are given for retention of placenta
6. *Alove vera* Mill. Family- Liliaceae, Local name- Korphad, Part used- Leaf, Uses-Leaf juice and used on burns, itching and Wounds.
7. *Andrographis paniculata* Nees Family- Acanthaceae, Local name- Bhuineemb, Part used-Whole plant, Use- Decoction of whole plant is used to treat fever and cough
8. *Annona squamosa* L. Family- Annonaceae, Local name-Sitaphal, Part used- Leaves, Uses- Paste of fresh leaves is applied on wounds.
9. *Aristolochia bracteolate* Lam Family- Aristolochiaceae, Local name -Kidmari, Part used- Leaves, Use- Paste of leaves is applied on parasites on skin.
10. *Asparagus racemosus* Willd. Family- Asparagaceae, Local Name- Satavari, Part used- Root, Use-Roots are used to increase the milk in cows and buffaloes.
11. *Azadirachta indica* A. Juss. Family- Meliaceae, Local name- Kadu neem, Parts used- Stem bark, Leaves, Use-Decoction of leaves and bark is applied on itching and skin infections.
12. *Bauhinia variegata* L. Family- Caesalpiniaceae, Local name-Kachnar, Part used-Stem bark, Use- Bark powder is applied topically on wounds.
13. *Brassica campestris* L. Family- Brassicaceae, Local name- Mohri, Part used- seed, Use- Few drops of seed oil are poured into the nasal cavity of animal to lubricate the nasal passage to enhances breathing.
14. *Bryophyllum pinnatum* (Lam.) Oken, Family- Crassulaceae, Local name- Panphuti, Part used- Leaves, Use- Paste of leaves are given in Urinary and stomach problems.
15. *Butea monosperma* (Lam.) Taub. Family- Fabaceae, Local name-Palas, Part used- Stem Bark, Use- Bark powder is applied topically on wounds.
16. *Calotropis procera* (Aiton) Dryand. Family- Asclepiadaceae, Local name- Rui, part used- Leaf, Use- Leaf is applied on joint inflammation, leaf latex is used to cure the wound and skin problems.
17. *Cassia fistula* L. Family- Caesalpiniaceae, Family-Amaltas, Part used- Seed, Use-Seeds are given for stomach problems.
18. *Cassia tora* L. Family – Caesalpiniaceae, Local name - Tarota, Part used- Seed, Use- Seed is mixed with water and ground into paste and applied to cure skin diseases.
19. *Cissus quadrangularish* L. Family- Vitaceae, Local name -Haddijodi, Part used- Stem, Use- Stem are used to treat the bone fracture and muscular pain.
20. *Citrullus colocynthis* L. Family - Cucurbitaceae, Local name - Indravan, Part used- Root, fruit, Use- Root is ground with water and the decoction obtained is given to cure cough. Dry Fruit powder is given in the treatment of diarrhea and dysentery.
21. *Cissampelos pareira* L Family - Menispermaceae, Local name - Pahadvel, Part used- Leaves, Use- An extract from tender leaves in warm water is given internally with a pinch of rock salt and also applied topically on the bitten region of goats and sheep for relieving pains of scorpion bite.
22. *Clematis gauriana* Roxb. ex., Family- Ranunculaceae, Local name-Morvel, Part used - Stem, Leaves, Use-Leaf paste and stem boiled in water and used to treat parasites on animals.
23. *Curcuma amada* Roxb. Family- Zingiberaceae, Local name-Ambe Halad, Part use- Rhizome, Use- Rhizome paste applied on joint inflammations, bone fractures.
24. *Curcuma longa* L. Family- Zingiberaceae, Local name- Halad, Part used - Rhizome Use- Rhizome paste applied as antiseptic on wounds due to cut or any skin problem due to infection.

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25. *Datura metel* L. Family- Solanaceae, Local name- Dhotra, Part used-Leaves, Use-Paste of leaves is applied on injuries of ankle bone

26. *Eclipta alba* (Lamk.) Hassk. Family-Asteraceae, Local name-Brungraj, Part used-Leaves, Use- Paste of leaves is applied topically on wounds.

27. *Ficus benghalensis* L. Family-Moraceae, Local name-Vad, Part used- Stem bark, Use-Paste of Bark applied on fractures.

28. *Ficus racemosa* L. Family-Moraceae, Local name- Umbar, Part used- Stem bark, Use- Paste of Bark is used on wounds.

29. *Ficus religiosa* L. Family- Moraceae, Local name-Pimpal, Part used- Stem bark and leaves, Use-Bark and leaves Juice is given for urino-genital problems.

30. *Gliricidia sepium* (Jacq.) Kunth ex Walp. Family - Fabaceae Local name- Undirmari, Part used - Leaves, Use- Leaves are crushed and paste is used to wash livestock's to remove external parasites.

31. *Holoptelia integrifolia* (Roxb.) Planch. Family - Ulmaceae, Local name- Papada, Part used -Stem bark, Use- Bark paste mixed with coconut oil and applied externally to treat inflammation and skin diseases.

32. *Mangifera indica* Lam. Family-Anacardiaceae, Local name-Amba, Part used-Stem bark, Use-Bark ash is given in cough.

32. *Mimosa pudica* L. Family- Mimosaceae, Local name - Lajalu, Part used- Leaves, Use-Leaf is ground with pepper, garlic and onion then fed to cows to cure fever.

34. *Murraya koenigii* (L.) Spreng. Family-Rutaceae, Local name-God neem, Part used-Leaves, Use-Leaves are given during diarrhea.

35. *Ocimum sancum* L. Family-Lamiaceae, Local name-Tulas, part used-Leaves, Use-Leaves used as antiseptic and antibacterial.

36. *Plumbago zeylanica* L. Family-Plumbaginaceae, Local name- Chitrak, Part used- Root, Use-Root paste is externally applied on local inflammation.

37. *Pongamia pinnata* (L.) Pierre Family - Fabaceae, Local name - Karanji, Part used-Stem and leaves, Use-Leaf is ground with pepper and given to cure fever. Decoction of stem bark is given orally to treat dysentery.

38. *Prosopis julifera* (Sw.) DC. Family-Mimosaceae, Local name- Bangali Babhul, Part used- Leaves and pods, Use- Paste of leaves and pods applied on skin infections.

39. *Pueraria tuberosa* (Willd.) DC. Family-Fabaceae, Local name- Vidari kand, Part used- Tuber, Use-Tubers are given to increase milk production.

40. *Punca granatum* L. Family-Punicaceae, Local name- Dalimb, Part used- Fruit, Use Decoction of fruit is given in diarrhea.

41. *Ricinus communis* L. Family - Euphorbiaceae, Local name - Erand, Part used-Leaves, use-The fresh 50 gm leaves are given to the goat and sheep to get relief from the indigestion. 42. *Semecarpus anacardium* L. Family-Anacardiaceae, Local name- Bibba, Part used- Fruit, Use-Fruits are given to treat retention of the placenta.

43. *Solanum xanthocarpum* Schrad. & H. Wendl. Family- Solanaceae, Local name- Bhui ringani, Part used- Fruit, Use-Fruits are given for curing cough

44. *Syzygium cumini* (L.) Skeels Family-Myrtaceae, Local name, - Jambhul, Part used-Stem bark, Use-Stem bark is mixed with curd and made into a paste and given to cure dysentery.

45. *Tagetes erecta* L. family- Asteraceae, Local name- Zendu, Part used- Flower, Use-Paste of flowers are applied to cure wounds.

46. *Tamarandus indica* Family: - Mimosaceae, Local name- Chinch, Part used- Leaves, Uses - The leaves are used to treat the stomach problems in goat, cow, bull and buffalos.

47. *Terminalia bellirica* (Gaertn.) Roxb. Family- Solanaceae, Local name - Behada, Part used- Stem bark, Use- The dried stem bark powder is boiled in a water and the decoction obtained is given orally to the goats for curing blood dysentery.

48. *Tridax procumbens* L. family-Asteraceae, Local name-Unhali, Part used- leaves, Use-Leaves extract is applied topically on wounds

49. *Vitex nugundo* L. Family-Verbenaceae, Local name- Nirgudi, Part used- Leaves, Use-Paste of leaves applied topically for inflammation.

50. *Wattakaka volubilis* (L. f.) Stapf. Family-Asclepediaceae, Local name - Malkani, Part used- Leaves, Use- Leaf paste is mixed with common salt and applied on affected places to treat all types of swellings and wounds.

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51. *Withania somnifera* (L) Dunal in DC. Family- Solanaceae, Local name- Aswagandha, Part used- Root, Use- Mixture of root powder is given along with fodder for curing weakness and maintaining animal in healthy condition. 52. *Woodfordia fruticosa* (L.) Kurz. Family- Lythraceae, Local name- Dhayati, Parts used - Flower, Use-Fresh flowers extract given in treatment of dysentery.

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Conclusion:

Ethno-botanical research work is an enlist the plants for the treatments of different disorders to domesticated animals with the help of tribals. In this investigation 52 plants belonging 32 families have been documented.

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A ROLE OF PRIME MINISTER EMPLOYMENT GENERATION PROGRAMME IN MARATHWADA REGION

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Abstract:
In India there is a still one potential power which is unconscious; if it becomes awake India can become the superpower. There are many self-employment opportunities for the youth and government of India has been providing all the possible assistance for them since Independence. Government always tries to provide the information and necessary assistance to the youth through the various channels. It also aims to reduce the unemployment in a minimum period of time. Many times government fails in providing the necessary assistance in the expected time and thus the problem of unemployment remains unsolved this is the major reason in the implementation of the skin the information about the scheme is given through radio, newspaper and people. Such information given is very insufficient to start with. Therefore there as several institutions, organization, corporations and Central and state government trying to provide all the required information to all unemployment youth in all the corner of the nation.

Keyword : DIC, PMRY, PMEGP, REGP, KVIC

Introduction:

On the occasion of Independence Day of India in 1993, then prime minister Shri. Narshinha Rao, addressing the nation said that an effective scheme for the unemployed youth of the nation would soon be introduced. Following this the ministry of industries of the central government introduced the scheme and it was known as Prime Minister Employment scheme. The scheme was introduced nationwide on 2 nd October, 1993 which was the birth anniversary of Mahatma Gandhi. The scheme is being implemented with the cooperation of Reserve Bank of India, state government, and other financial institutions.Earlier it was decided that the scheme would be implemented only in urban areas but from 1st April 1994 it was implemented both in rural and urban areas of the state. The scheme has taken the place of the other schemes of the state govt. for the unemployed youths.

The scheme was implemented in the selected 1,752 blocks of the Maharashtra state. The blocks were selected from the desert area, hilly regions and drought prone area. The objective of the scheme is to provide the employment opportunities to the rural unemployed youth, to decrease the uncertainties among the people and improve their living standards. There are several types of works of development undertaken by the gram panchayat and panchayatsamiti. The cost of the scheme is shared 20% and 80% by state and central government respectively. The central government gave Rs.1000 crore in the year 1993-94 for the scheme."

Implementation of the scheme:

The DIC has been established at every district for providing facilities to all the entrepreneurs in the district. The scheme is being implemented under the supervision of directorate of district by the District Industries Centre. The scheme is implemented by Asst. Directorate (industry) Mumbai Metropolitan Region, Warali for Mumbai and Mumbai suburban district. The micro small and medium enterprises ministry of central government introduced Prime Minister Employment Generation Programme on 15th Aug. 2008. It is a progrmme related to the financial grants of central government. This programme is union of Prime Minister RozgarYojana (PMRY) and Rural Employment Generation Programme (REGP)

The scheme is implemented at the central level under the Nodal Agency Khadi and rural industries commission. In the state Khadi rural industries Commission, Khadi rural industries Board run the scheme with the help of district industries centre in both rural and urban areas. The scheme is run through nationalized banks.

Objectives of the Scheme:

1. To provide employment and self employment opportunities to unemployed youth from rural and urban areas.
2. To provide employment opportunities to unemployed youth from rural and urban areas and give employment opportunities to the traditional artisans along with urban and rural youth.

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3. To stop the migration of the unemployed youth and traditional artisans to urban areas.
4. To help the employment generation in rural areas.

Overview of Literature:

Arumuangam, S. (2008).[(1)]studied in regard to the importance of education and training in entrepreneurship development. It revealed that training and educating are important component of entrepreneur development.

Prof. Gunnar, Myrdal (1968).[(2)] suggests the implementing such a strategy based on predominantly labour-intensive method in under developed countries on the basis that "the large volume of untapped labour possessed by these countries has a productive potential, capable of generating capital and increasing production".

Kumari, I. (2014).[(3)]analyzed the entrepreneurship development process in India and role of entrepreneurship development programme in economic growth of nation. The study was based on secondary sources. The study analyzed that an entrepreneurial development is to stimulate a person for adopting entrepreneurship as a career and to identify and exploit the opportunities successfully for new ventures.

Tende, S.B. (2014).[(4)] assessed the government policies and programmes towards the developing of entrepreneurship in Nigeria. This study was primary and collected the data of 1159 beneficiaries of EDP and NDE programme random through structured questionnaire. This study discovered that government credit policies and programmes have no significant effect on the development of entrepreneurial beneficiaries of the EDP and NDE programme.

Moinak, M. (2015).[(5)] found that there is an imbalance between rural and urban employment, and sector wise employment. Due to growth in population will reduce the economic growth and this leads to jobless growth. To counter act government has launched many projects but most of them are not fully implemented or partially successful. As a result of all of these policies the rather than creating the bumps in skilled labour and unskilled labours.

Gupta, S. (2013).[(6)] studied that the impact of development programme of future entrepreneurs attitude, motivational level, personal control and self esteem sample of 28 students were taken from one of the leading private autonomous university of Rajpurnon random deliberate sampling was used. Entrepreneurial attitude orientation scale was used 70 measures entrepreneurial traits. To study the attitude of entrepreneurs T test was used for test. Suilpi successful establish a relationship between development courses or attitude development of potential entrepreneurs.

Shukla, S.S. and **Mishra,** (2013).[(7)] tried to establish a link between employment generation programmes with the eradication of poverty. Secondary data was used various employment generation schemes were mentioned in the paper. They found employment growth transfer from primary sector to secondary sector Corruption, political challenge, illiteracy reservation were some of the challenges in employment generation in India were highlighted. Researchers found high work force, economic, literal exchange rate etc. are some of opportunities in Indian economy for employment generation.

Buragohain, S. (2017).[(8)] explored that the KVI sector plays a vital role in generating employment opportunities to the unemployed youth in the district by providing financial and technical assistance under its various implemented scheme for setting up small and micro enterprise. The growth rate of KVI sector in the district in terms of employment production and profitability is development of KVI is necessary for generating employment because limitation of organized sector in absorbing growing labour force.

Objectives of the Research Study:

1. To understand the role played by the PMEGP in living standards, generating self-employment and employment opportunities in the select district of Marathwada region.
2. To study the role of Prime Minister Employment Generation Programme in Marathwada Region.

Research Methodology:

To research study was exploratory and descriptive types. The researcher wants to find out the basic or fundamental objectives views of the schemes from Marathwada region.

Data Collection:

The research study is based on secondary data only. The researcher has collected information from available sources. Thedata were collected from District Industrial centre (DIC) of Marathwadaregion, KVIC, KVIB, Various Governmental and Non-Governmental reports, Economic survey of Maharashtra and India, well Published Books, Journals, Research Papers, Articles, Newspapers, Internet and Various Websites.

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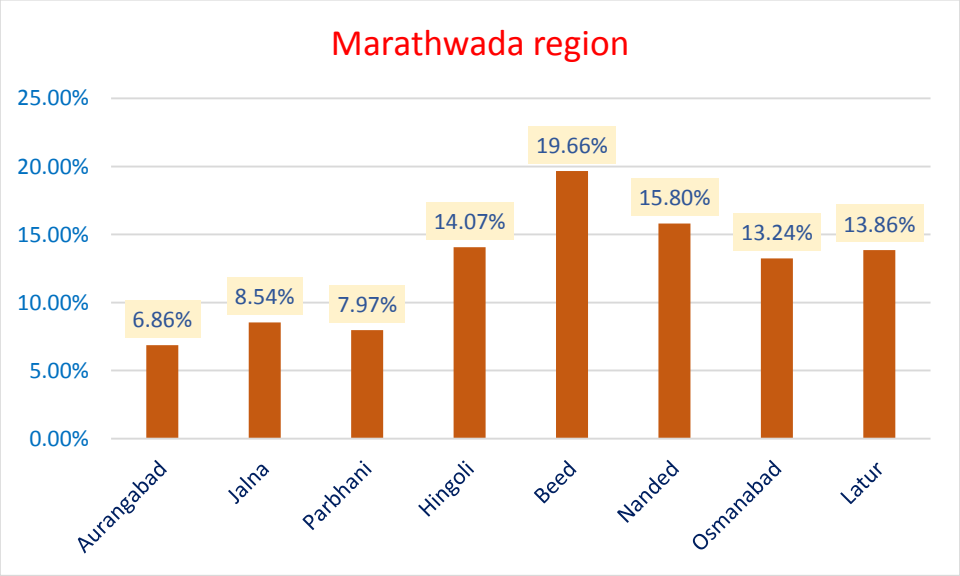
Table 1.1 : Select DistrictwiseDistribution of Projects in Marathwada under PMEGP (From 2008-09 to 2018-19)

Sr.No	District	Beneficiaries	Percentage (%)
1	Aurangabad	352	6.86 %
2	Jalna	438	8.54 %
3	Parbhani	409	7.97 %
4	Hingoli	722	14.07 %
5	Beed	1008	19.66 %
6	Nanded	809	15.8 %
7	Osmanabad	679	13.24 %
8	Latur	711	13.86 %
Total Beneficiaries		**5128**	**(100%)**

Source: *DICs annual reports -2008-09 to 2018-19.*

The district wise data regarding above stated beneficiaries is given in the District Industries Centre's reports. To maintain the authenticity of the researchselect district samples are extracted from the DIC's reports for the year 2008-09 to 2018-19.

Graph 1.1 : Percentage to grand total in terms of select district-wise Distribution of projects



As per above graph the total project for Marathwada region is (5128 Project) Beed at 19.66%, is at the highest followed by Nanded (15.80%), Hingoli district 14.07% Latur (13.86%), Osmanabad (13.24%), Jalna (8.54%), Parbhani of (7.97%) and Aurangabad (6.86%).

Conclusion :-

PMEGP programme is one of the best self-employment initiatives among all schemes launched. It provides financial assistance to the educated unemployed and highly qualified individuals in rural and urban areas which leads to establish own ventures as a result rural development gets boosted.The economy of the Marathwada region is mostly based on agriculture. By studying different parameters of the socio-economic profiles of the study area it is ascertained that for the industrial development

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the PMEGP scheme is proved very significant. Many tiny and small businesses are established through the implementation of the PMEGP scheme in turn it became advantages for the improvementin living standard. The scheme is a boon for the society and found effective in removing poverty, reducing social and economic disparity, unemployment by ensuring sustainable livelihood.

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SUSTAINABLE CHANGES IN SUGARCANE INDUSTRY AND AGRICULTURE CLIMATE ANALYSIS IN KARNATAKA

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Abstract

Sugarcane (*Saccharum officinarum* L.) is an important crop for sugar and bioenergy worldwide. The increasing greenhouse gas emission and global warming during climate change result in the increased frequency and intensity of extreme weather events. Climate change is expected to have important consequences for sugarcane production in the world, especially in the developing countries because of relatively low adaptive capacity, high vulnerability to natural hazards, and poor forecasting systems and mitigating strategies. Sugarcane production may have been negatively affected and will continue to be considerably affected by increases in the frequency and intensity of extreme environmental conditions due to climate change. The degree of climate change impact on sugarcane is associated with geographic location and adaptive capacity. In this paper, we briefly reviewed sugarcane response to climate change events, sugarcane production in several different countries, and challenges for sugarcane production in climate change in order for us to better understand effects of climate change on sugarcane production and to propose strategies for mitigating the negative impacts of climate change and improving sugarcane production sustainability and profitability.

Introduction

A combination of long-term change in the weather patterns worldwide (i.e., global climate change), caused by natural processes and anthropogenic factors, may result in major environmental issues that have affected and will continuously affect agriculture. Atmospheric CO_2 concentration ($[CO_2]$) has increased by about 30% since the mid-18th century due to increases in combustion of fossil fuels, industrial processes, and deforestation [1]. Projections indicate that atmospheric $[CO_2]$ would increase to about 550 ppm in a low emission scenario or could double (800 ppm) from current levels in a high emission scenario by the end of the 21st century. Global warming is directly associated with increasing atmospheric $[CO_2]$ and other greenhouse gases (GHG). Global surface mean temperatures had increased from 0.55 to 0.67°C in the last century and are project to rise from 1.1 to 2.9°C (low emission) or 2.0 to 5.4°C (high emission) by 2100 relative to 1980–1999, depending on GHG emission level, region, and geographic location [2].

Increases in atmospheric $[CO_2]$ and air temperature can be beneficial for some crops (especially C_3 plants) in some places [3, 4]. Climate variability and climate change are projected to result in changes in sea levels, rainfall pattern, and the frequency of extreme high- and low-temperature events, floods, droughts, and other abiotic stresses [5, 6] as well as tornados and hurricanes [7]. High temperatures accompanied by drought stress have been two of the major issues influencing agricultural production and economic impacts in many regions of the world. The challenges, faced by the agricultural sector under the climate change scenarios, are to provide food security for an increasing world population while protecting the environment and the functioning of its ecosystems [8]. For most countries that are highly dependent on rainfall with limited or no proper irrigation conditions and/or that have poor mitigation systems, these challenges may be amplified [9].

Agriculture is vulnerable to climate change through the direct effects of changing climate conditions (e.g., changes in temperature and/or precipitation), as well as through the indirect effects arising from changes in the severity of pest pressures, availability of pollination services, and performance of other ecosystem services that affect agricultural productivity. Reduction of crop productivity is universally

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predicted in most status reports on effects of climate change [10]. Climate change poses unprecedented challenges to agriculture because of the sensitivity of agricultural productivity and costs of improving growth environmental conditions. Adaptive action offers the potential to manage the effects of climate change by altering patterns of agricultural activity to capitalize on emerging opportunities while minimizing the costs associated with negative effects.

Sugarcane Response to Climate Change Events

Water availability at different growth stages of agricultural crops is crucial for obtaining a normal yield. A correlation analysis of yield vs. kharif and rabi season rainfall was conducted for the five dominant rainfed crops of Karnataka. It is evident from the analysis that the correlation between yield and rainfall varies across districts and seasons.The results obtained in this study for correlation between yield and rainfall are in concurrence with those reported by Revadekar and Preethi (2012), wherein the correlation between kharif rainfall and yield was reported to be stronger than that between rabi rainfall and yield. This is because the yield of crops grown during the rabi season is dependent on not only the kharif season precipitation but on the northeast monsoon as well. A similar correlation analysis was conducted for yield vs. summer maximum temperature for the top five crops. However, no correlation was found for any of the crops. Jacoby et al. (2011), Guiteras (2007), and Schlenker and Roberts (2006) have also reported that the effect of temperature on crop yield is generally non-linear, as found in this study. Notably, many of the Karnataka districts were affected by droughts and floods during the period 2007–08 to 2017–18. About 63 lakh hectares of cropped area is reported to have been affected by natural disasters as of 25/03/2019 (Disaster Management Division, Ministry of Home Affairs). The Karnataka districts are prone to two extreme calamities—droughts and floods. Drought has been recorded in several districts of the state since 2001. In 2019, the Karnataka districts faced the dual wrath of droughts and floods, with 16 districts bearing the impact of both climate extremes.

Projected Climate Change in Karnataka

In this section, the results of a modelling analysis for temperature and rainfall over the future period of 2021–2050 (2030s) are presented and compared with the corresponding data for 1990–2019. The likely changes are also discussed. The results of this assessment form the basis for a climate risk analysis of three dominant crops grown under rainfed conditions in Karnataka, the details of which are presented in Section 5. Climate-related hazards manifest locally, and the impacts of climate risk need to be understood in that context. Climate risk creates spatial inequality, as it may simultaneously benefit some regions while adversely impacting others. In this context, an analysis of climate at the district level for Karnataka has been conducted to assess the emerging climate risks.

Approach and Methods

Data modelled by the Coordinated Regional Climate Downscaling Experiment (CORDEX) South Asia (Appendix 1) on rainfall and temperature have been analysed for districts of Karnataka. The ensemble mean values from bias-corrected 15 CORDEX simulations of 0.5° × 0.5° resolution are used for estimating climate change projections. All data in this analysis are first re-gridded to a common 0.25° × 0.25° resolution to agree with the resolution of IMD data. The analysis has been conducted for two of the four Intergovernmental Panel on Climate Change (IPCC) climate scenarios or representative concentration pathways (RCPs), namely, RCP 4.5 and RCP 8.5. These pathways refer to a range of future anthropogenic greenhouse gas emissions and their atmospheric concentrations.

•**scenario:** This scenario is described by the IPCC as an intermediate scenario with emissions peaking in 2040 and then declining. This scenario will quite likely result in a global temperatu re increase of 2°C.

• **scenario:** This is the worst-case scenario in which emissions continue to rise throughout the 21st century. This is likely to result in a global temperature increase of up to 2.6°C. Changes in temperature and rainfall during the projected period are computed as a difference between the model-simulated 15-model ensemble5 average values for the 30-year

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historical period and the projected 30-year period. District-level averages of climatic variables are obtained using outputs from the re-gridded 0.25° × 0.25° resolution data. The mean value for a district is obtained as the mean of the values for multiple grids that may cover a district. For this computation, only grids that fall fully within a district and those with >60% area falling within a district, are considered. If a district falls within only one grid cell, that single grid cell value is considered.

4. Projected Changes in Temperature

Summer maximum and winter minimum temperatures are analysed as they are crucial for agricultural crop growth and productivity.Summer Maximum Temperature An increase in the summer maximum temperature of 0.5°C–1.5°C is projected in the short term, considering RCP 4.5 and RCP 8.5 scenarios (Figure 9). Under the RCP 4.5 scenario, (for the 2030s), warming is projected to be in the range 0.5°C–1°C for the Western Ghats districts. In the northern districts, and some of the central and eastern districts such as Chitradurga, Tumakuru, and Davanagere, warming in the range 1°C–1.5°C is projected for the short term. Under the RCP 8.5 scenario, warming is projected to be in the range 0.5°C–1°C for the Western Ghats districts. For all the northern and eastern districts, warming is projected to be higher—in the range 1°C–1.5°C for the short term. An increase in the winter minimum temperature of 0.5°C–2°C is projected in the short term, considering the RCP 4.5 and RCP 8.5 scenarios Under the RCP 4.5 scenario, warming in the range 0.5°C–1.5°C is projected across the districts. The warming is higher in the northern districts—in the range 1°C–1.5°C. In the southern and central districts, lower levels of warming—in the range 0.5°C–1°C—are projected. Under the RCP 8.5 scenario, warming in the range 0.5°C–1°C is projected for the southern and eastern districts; 1°C–1.5°C for the central and western districts; and 1.5°C–2°C for the northern-most districts.

Projected Changes in Rainfall

Rainfall is analysed for kharif and rabi seasons separately. In addition to the total quantum of rainfall during a season, the variability of rainfall and extreme events—high-intensity rainfall and rainfall deficiency—are also projected.

Projected Changes in the Frequency of Occurrence of Extreme Events

According to IMD, a rainy day is defined as one receiving >2.5 mm rainfall. In Karnataka, an increase in the number of rainy days is projected for almost all the districts, under both RCP 4.5 and RCP 8.5 scenarios. The increase in the number of rainy days under RCP 4.5 and RCP 8.5 scenarios is ≥5 days annually in 4 and 16 districts, respectively. The following sections present an analysis of the number of days likely to receive high (51–100 mm/day) or very high (>100 mm/day) intensity rainfall during the 2030s, and the number of years likely to be rainfall deficient during the same period in comparison to the historical period of 1990–2019

Heavy Rainfall Events

For this analysis, rainfall events are categorized on the basis of the intensity of rainfall received per day: 100 mm (very high intensity). In this section, changes in the number of rainfall events—relative to the historical period—in the highland very-high-intensity categories are presented, as they have implications for crop growth and productivity. High-Intensity Rainfall (51–100 mm/Day)

Scenario

An increase in high-intensity rainfall events—relative to the historical period—is projected for all the Karnataka districts, except Vijayapura. The increase is in the range 1–5 events annually over the projected 30-year period. A higher increase in high-intensity rainfall events (3–5 events annually) is projected for the high rainfall districts of Dakshina Kannada, Udupi, Uttara Kannada, and Kodagu.

Scenario

An increase in high-intensity rainfall events—relative to the historical period—is projected for all districts in the state. The increase is in the range 1–7 events annually over the projected 30- year period. A higher increase in high-intensity rainfall events (4–7 events annually) is projected for the high rainfall districts of Dakshina Kannada, Udupi, and Uttara Kannada.

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Scenario
An increase in very-high-intensity rainfall events—relative to the historical period—is projected for 25 of the 30 districts. The projected increase is in the range 1–2 events annually over the projected 30-year period. No change relative to the historical period is projected for Kolar, Ballari, Bagalkot, Vijayapura, and Udupi.

Scenario
An increase in very-high-intensity rainfall events—relative to the historical period—is projected for all the districts, except Gadag and Uttara Kannada. The increase is in the range 1–3 events annually over the projected 30-year period. The occurrence of high-intensity rainfall is an indicator of flood-causing rainfall events. More than 100 mm of rain/day may cause excessive runoff and even flooding, leading to crop damage. These high-intensity rainfall events could damage the soil and water conservation structures that may have been created.

Risks of Climate Change to Crop Production and Implications

Climate determines the growth and productivity of crops. The crop–weather relationship has been studied by several scientists (Varma et al., 2007; Sarkar, 2005; Sarkar and Thapliyal, 2003). Studies have also investigated the impact of droughts and floods on food grain production (Krishna Kumar et al., 2004; Selvaraju, 2003; Kulshreshtha, 2002) and the resulting impact on economy (Gadgil et al., 1999; Kumar and Parikh, 1998). The potential crop yields in the tropical and subtropical regions are projected to decline under increased temperatures. An increase in temperature, depending on the current ambient temperature, can reduce crop duration, increase crop respiration rates, alter photosynthate partitioning to economic products, and affect the survival and distribution of pest populations, developing a new equilibrium between crops and pests. Increased temperature coupled with reduced rainfall may lead to upward water movement, resulting in accumulation of salts in the upper soil layers (Xu et al., 2019). An increase of 1°C in global temperature would reduce the global yield of rice by an average of 3.2 ± 3.7%, maize by 7.4 ± 4.5%, and wheat by 6 ± 2.9% (Zhao et al., 2017). In their analysis of the impacts of global warming on farmers in Brazil and India, Sanghi and Mendelssohn (2008) conclude that by the next century global warming can reduce annual crop yield in India by 4–6%. Kumar et al. (2004) assessed the effect of monsoon droughts on the production, demand, and prices of rice, sorghum, pearl millet, maize, pigeon pea, groundnut, and cotton, and concluded that the greatest impact of drought is on the yield of pearl millet and sorghum. A drought of 10% intensity is projected to result in a decline in the pearl millet yield of 7.6%; sorghum, 6.8%; and maize, 2.8%. Similarly, heavy rainfall events that lead to stagnant flooding or flash floods restrict the growth of crops; growth is restored only after water removal. Thus, deviations from normal temperature and rainfall have adverse effects on crop growth, yield, and productivity. The impact of these events on crops is determined by the length of the growing period (LGP). LGP for a given district or region represents the climatically determined number of days during which a crop receives enough moisture from soil for its growth. Venkatesh et al. (2016) have determined the LGP for various taluks of Karnataka to range from 90 to 120 days. During this period, any deviation in temperature and rainfall from the normal will impact crop growth. For example, a temperature increase for a short period around pollen formation can lead to partial or complete sterility of the rice crop (Endo et al., 2009; Horie et al., 1996). An increase in temperature would also lead to increased evapotranspiration, which may result in lowering of the groundwater Crops also need adequate moisture, especially during critical stages of germination and fruit development. In Karnataka,

Policies and Programmes for Rainfed Agriculture and Crop Insurance

Many policies are in place for rainfed agriculture both at the national and state levels. The Department of Agriculture, Cooperation & Farmers Welfare of India, under the Ministry of Agriculture, has a division—

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Rainfed Farming System—that specifically works on the development and/or rejuvenation of the rainfed agriculture sector in India. Further, under the National Action Plan on Climate Change, one of the eight missions is the National Mission for Sustainable Agriculture (NMSA). This mission focusses on integrated farming, soil health management, and resource conservation synergy. Among the many schemes under NMSA, Rainfed Area Development Programme (RADP) is aimed at enhancing productivity and minimising risks associated with climate variabilities. Appendix 2 provides district-wise achievement details under RADP in Karnataka for the FY 2019–20. Below we present policies and programmes relevant to rainfed agriculture at the national and state levels

The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), with the motto of 'Har Khet Ko Paani', is a scheme that focusses on creating sources for not only assured irrigation but also protective irrigation by harnessing rainwater at the micro-level through 'Jal Sanchay' and 'Jal Sinchan'9.

• The On-Farm Water Management (OFWM) programme is focussed on enhancing water use efficiency by promoting efficient on-farm water management technologies and equipment. This programme emphasises effective harvesting and management of rainwater, and provides assistance for adoption of water conservation technologies, efficient delivery and distribution systems, etc.

• The Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking (CCSAMMN) programme is aimed at bidirectional (land/farmers to research/scientific establishments and vice versa) dissemination of climate-change-related information and knowledge by way of piloting climate change adaptation/mitigation research/model projects in the domain of climate smart sustainable management practices and integrated farming systems suitable for local agro-climatic conditions. 6.1. Karnataka State—Rainfed Agriculture Schemes Karnataka framed a rainfed farming policy in 2014. The salient features of this policy relevant to rainfed farming are as follows:

• Focus on small and marginal farmers who account for 76% of the holdings and operate 40% of the area • Increasing public investment in rainfed agriculture

• Preserving the germplasm of dryland crops and developing resource conservation technologies

• Developing systems for efficient medium- and long-term prediction of weather

• Market intelligence and price forecasting ahead of the sowing season.

Karnataka State—Rainfed Agriculture Schemes

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Conclusion

The government of India recently announced that it is planning to re-evaluate crop planting across the country to align agricultural practices with changes in climate and rainfall patterns. This requires a better understanding of the risks posed by climate change to agriculture in general, and more importantly for different crops at the state or district level. This study is an effort in that direction.

Risks of climate change have been analysed for only the three dominant rainfed crops—maize, sorghum, and groundnut—grown in Karnataka. There is a need to expand this analysis to all the rainfed crops grown in Karnataka. There is also a need for more information on actual yield losses due to variability and climate change. Further, changes in rainfall will need to be looked at in conjunction with other physiographic characteristics such as soil quality and slope to quantify the risks of climate change in the districts of Karnataka. However, on the basis of changes in temperature and rainfall

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projected for the short-term period of 2030s (2021–2050), several strategies could be implemented at the district level, considering the crops and projected risks due to climate change in the projected period.

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Host Selection Behavior of Insect Parasitoid

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Introduction: Parasitoidis defined as insect species which eventually kills its host in development and the immature stages are parasitiods and adults are free living. Vinson, (1976, 1984a, 1985) reported the charecters, which were divded into habitat of host, hostfinding, and prayreceipt.

Host Selection:

This depends on both the biology of the host population and the strategies evolved by the parasitoid population to exploit their hosts.

Parasitoids use a various of chemicals and physical cues in the foundation of habitat,prey habitats and prey inspection stages,choose of hosts (Vinson, 1984; Schmidt, 1991; Vet and Dicke, 1992; Turlings*et al.*, 1993; Powell *et al.*, 1998; Rehman, 1999).

Artropods prey preference is predictor concentrates on the approaching mechanisms such as female finds and chooses a conceivable insect through egg laying.

Environmental elements containsun light, maximum and minimum temperature, relative humidity, wind, and chemicals

Prey findingcharecters of natural enemies of arthropods:

Definition:

- Carnivore: Aarthropod species shall ate on single or many insects to complete its life stages.
- Parasite: Insect parasite oforganisms where they are dependent on other organisms in undeveloped stages and adults are nectar feeders.
- **Characters in prey choose:** area location of host, position of prey, host acceptance and fitness of prey.
- Two significant kinds of signals :
- Attractant impulses
- Arrestantimpulses
- **Attractant impulses:**It is the kind of signals given by an organismswhichurge change in forager characters which causes in inclination of regionswhich include host or are may include host.
- **Arrestant Stimuli:**It is an liberatingminimimumin region travelled per unit time by insect into locality,eg., grubs of *Chrysoperlasp*feed essentially on aphids, several of them that found on *Gossypium sp*.Cotton crop releases caryophyllene which is volatile chemical that attracts adults of *Chrysoperla sp*.
- Egg parasitoidscounter to smell of prey of adults viz., wings of moths,semiochemicals.

Position ofPrey:

- Host position is procedure for determining appropriate hosts within the correct location. aromatic. Eg. adult*Chrysoperlasp*on induce on honeydew production of *Aphis craccivora*.
- **Kairomones:**
  Kairomones are also called as Contact chemicals. Chemicals produced by one insect that elicitereaction in one more insect which is favarobleto reciver.
  Eg.*Phthorimaeaoperculella*

Prey Approval:

- **Host Acceptance:**Parasitiod/ carnivore determines / approaches a known correct host/ prey, which the insect will not attack if the correct stimuli contain insufficient.

Pray can be discarded because,

a) over juvenile stage or over aged
b) Incorrect size
c) Sick or deleterious pray
d) The insect which is alredyparasitized by the identical or one more species

Suitability of Host:

- Parasite or predator was found the important host / prey intotheir surrounding and choosed for the host-parasite or prey-predator cwill not get significant host areresistant or undesirable.

Increased Immature Development:

- The growthof egg parasitoid may be slow down in labrotaryraising situations but accelerated if kept in anspecialized media.

Delayed Host Development:

- *Telenomusheliothidis*issingle oophage of many lepidopteran species of *Heliothis sp.*

Oviposition only in Young Hosts:

- Parasitiodsexamine all prey, but discardtoo agedhost.

Oviposition Only in Young Hosts:

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- Parasitiods find all insects, but discard aged insect hosts.

SUSTAINABLE DEVELOPMENT FOR SOCIETY, INDUSTRIAL DEVELOPMENT, MATERIAL, ENERGY AND ENVIRONMENT: KEY ISSUES, OPPORTUNITIES AND CHALLENGE

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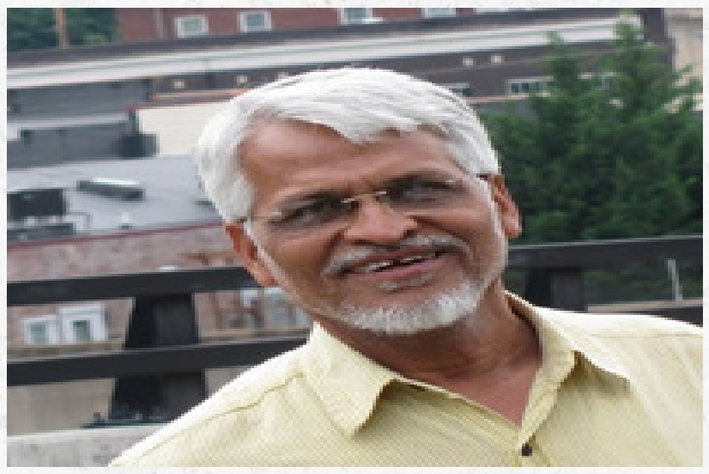

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