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Proceedings

National Seminar

CONSUMERISM, SOCIAL EQUITY AND ENVIRONMENTAL SUSTAINABILITY

(उपभोक्ता, सामाजिक न्यायपरस्ता तथा पर्यावर्णीय सततता)

(NSCSEES-2019)
(1-2 February 2020)
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Shri Rakesh Chandra

Message

It is a matter of great pleasure that the proceedings of the two day national seminar on "Consumerism, Social Equity and Environmental Sustainability", sponsored by Higher Education Department, Government of Uttar Pradesh, and successfully organized by the Academic Development Committee of the college on 1-2 February, 2020 is being published. I extend my congratulations to the organizing committee of the seminar and best wishes to the editors of the proceedings with the expectation that this publication comprising the scholarly papers on the topic concerned would be a significantly useful and relevant document for acquiring knowledge, reference, and research purpose.

Once again I express my best wishes and blessings to the editors.

R Chandra

Rakesh Chandra
Principal

Schedule

National Seminar on "Consumerism, Social Equity & Environmental Sustainability"(NSCSEES-2019)

Day-1, February 01, 2020, Saturday

9:00-10:00 A.M.	**Registration& Tea**	
10:00-11:30 A.M.	**Inaugural Ceremony**	
	10:00-10:05-Welcome to all present **10:05-10:10-**Lighting of the lamp by the Dignitaries and Garlanding of idol of Goddess Saraswati followed by Saraswati Vandana **10:10-10:20-**Welcome of the dignitaries on the dais and presentation of flower/plant **10:20-10:23-**Welcome by the **Convener**, **Dr. D.K. Srivastava** **10:23-10:25-Release of Souvenir by All Dignitaries** **10:25-10:30-** Introduction of the Theme by the **Organizing Secretory-Dr. Jyoti Kala** **10:30-10:50-** Address by **Chief Guest-Group Captain D. N. Bajpai,** Director, Apeejay Institute of Technology, School of Computer Science, Greater Noida **10:50-11:10-** Key note address by **Dr.A.K. Tangri** Coordinator–Institute of Hydrocarbon, Energy and Geo-resources ONGC Centre for Advanced Studies, University of Lucknow **Title:** ***Space borne technology–an essential tool in Environmental Sustainability*** **11:10-11:15**- Address by the Manager-**Shri Ratnakar Shukla** **11:15-11:20**- Address by President-Chairperson-**Shri T. N. Misra** **11:20-11:30-** Vote of thanks by the **Principal, Shri Rakesh Chandra**	**Dr. O.P.B. Shukla (Anchor)**
11:30A.M.- 12:00	**HighTea**	
12:00-1:30 P.M.	**Plenary Session: Technical Session-1**	
Chair-Prof. S.K. Kulshreshtha **Co-chair-** **Dr. Rajiva Dixit**	12:00-12:25- **Plenary Address by Dr. Sanjay Shukla** **Head, Deptt. of Geology, KKV** **Title:** ***An approach to Sustainable Mining : Need of the Day*** 12:25-12:40- **Invited Lecture by Dr. V. C. Srivastava** **Deputy Director General(Retd.), GSI**	**Dr. NeerjaMisra (Anchor)**

	Title:*Environmental Impacts of Mining in Bundelkhand Region, Uttar Pradesh* 12:40-12:55- **Invited Lecture by Dr. Huma Yaqub** Maulana Azad National Urdu University Lucknow Campus, Lucknow **Title: *Conservation and Environmental Ethics in Sarah Joseph's Gift in Green*** 12:55-01:30**5 Presentations** **(7 minutes each for out station presenters)** Dr. Shweta Dubey (BanasthaliVidyapith), Vaishali Bhrigu(BanasthaliVidyapith), Dr. Avinash Singh (Symbiosis Law School, Hyderabad), Yashashvi Singh (BHU), Dr. Satyarth Tripathi (Amity University)	
01:30-2:15 P.M.	**Lunch Break**	
02:15-03:30 P.M.	**Technical Session-2**	
Chair-Dr. B. K. Dwivedi **Co-chair-Dr. Sanjive Shukla**	2:15-2:45- **Invited Lecture by Dr. Ram Kumar Tiwari** **Associate Prof. & Head, Deptt. of Physics, KKV, Lucknow** **Title:** ***ICT driven development strategies for growth and sustainability in India*** 2:45-3:05- **Invited Lecture by Dr. Shashwat Saxena** **MD, Psychiatry, King Georges Medical University, Lucknow** **Title: *Consumerism and Happiness*** 3:05-3:20- **Dr. V. V. Singh** **Prof. & Former Director, Management Centre &Bureau of Market Research, LBS Group of Management Institutions** **Title: The Happiness Quotient** 3:20-3:45- **5 Presentations(5 minutes each)** **(Available Out Station Presenters, OP-1 to OP-32)**	**Dr. G. K. Misra (Anchor)**
3:45-4:00 P.M.	**Tea Break**	
4:00-5:00 P.M.	**Technical Session-3**	
Chair-Dr. Sanjay Shukla **Co-chair-Dr. N. K. Awasthi**	04:00-04:20-**Invited Lecture by Er. Puneet Srivastava** **Deptt. of Civil Eng.,RSMU, Barabanki** **Title: *Water insecurity of Uttar Pradesh in context of India and World*** 04:20-04:40-**Invited Lecture by Dr. Deepak Kohli** **Deputy Secretary, Forest & Wild Animal Deptt., UP Govt., Lucknow** **Title:** प्रदूषण का मानव, पौधों एवं जंतुओं पर प्रभाव	**Dr. Pranav K.Misra (Anchor) & Dr. Deepak Kr. Pandey**

	4:40-5:00- **4 Presentations(5 minutes each)** **(Available Out Station Presenters, OP-33 to OP-64)**	
5:00P.M.	**Tea/End of Day-1**	

NOTE: 1. OP stands for Outstation Participants/Presenters. Codes(OP-1 to OP-64) may be checked from list of abstracts attached with final schedule.

2. Interested presenters must ensure their presence at the slot specified in technical sessions.

Schedule-NSCSEES-2019

Day-2, 02 February 2020, Sunday

8:30-9:00AM	**Tea**	
09:00-11:00 AM	**Student's Competition Session-4**	
Chair-Dr. Sazia Khan **Co-chair- Dr. O.P.B. Shukla,** **Smt Rashmi Gupta,** **Dr. Amrita Singh** **Judges-Smt Sajni Misra,** **Dr. Sanjive Shukla** **Dr. SatyarthTripathi**	**Oral Presentation- Students (PG)** **Prize Session** **Venue- Smart Class Room No. 4 (Ground Floor), Near Physics Department**	**Dr. D.K. Gupta (Anchor)**
Chair-Dr. Ritu Tripathi Chakravarty **Co-chair-Dr. Veena P. Swami** **Judges-Dr. M.A. Ansari** **Dr. Gunjan Pandey** **Shri Sneh Pratap Singh**	**Oral Presentation- Students (UG)** **Prize Session** **Venue- New Seminar Hall, Second Floor, Above Commerce Department**	**Mr. Maneesh Kumar (Anchor)**
Chair-Dr. Richa Shukla **Co-chair-Dr. Sanjay Shukla**	**Poster Presentation** **Prize Session** **Venue- Department of Geology (First Floor)**	**Ankit Pandey (Anchor)**
Chair-Dr. Sanjay Misra **Co-chair-Dr. Meera Vani**	**Oral Presentation- Teachers & Research Scholars (5 minutes for presentation and 2 minutes for discussions)** **Venue-Seminar Hall (Ground Floor)**	**Dr. Madhu Bhatia (Anchor)**
11:00-11:30A.M.	**High tea**	
11:30A.M.-2:00PM	**Technical Session-5**	
Chair- Dr. Sudhesh Chandra **Co-chair-Dr. K.K. Bajpai,** **Dr. C. L. Bajpai**	**11:30-11:50- Invited Lecture by Dr. Parul Saxena, DSMNRU, Lucknow** **Title:** ***Mathematical modelling of the effect of air pollution on human brain*** **11:50-12:05- Invited Lecture by Dr. Anupama Singh, DDU Govt. P.G. College, Sitapur, UP**	**Dr. Anjali Asthana (Anchor)**

	Title: ***Be Happy Always*** **12:05-12:25- Invited Lecture by Dr. Karuna Pandey, President, Green City Welfare Society, Haldwani, UK** **Title:** प्रदूषण का निदान हमारी प्राचीन आस्थायें **12:25-12:45- Prof. M.A. Khalid, Head, Environmental Sciences, Integral University, Lucknow** **Title:** ***Climate change and its impacts on biodiversity and ecosystems*** **12:45-1:45- 10 Presentations(6 minutes each) (Available - OP/LP)**	
1:45-2:30 P.M.	**Lunch Break**	
2:30-04:00	**Valedictory Ceremony**	
Prize Distribution will take place in this session	**Chief Guest- Dr. Pradeep Kumar Srivastava Senior Principal Scientist(Retd.) CDRI, Lucknow(Scientoonist)** **Invited Speaker- Prof. Sudhir Mehrotra, Head, Deptt. of Biochemistry, University of Lucknow** **Shri Ratnakar Shukla, Secretary, B.S.N.V. P.G. College, Lucknow** **Shri Rakesh Chandra, Principal** **Dr. Jyoti Kala, Organizing Secretary** **Dr. D. K. Srivastava, Convener**	**Dr. Rajiva Dixit (Anchor)**
4:00 PM	**Tea with Light Snacks**	

NOTE- 1. OP-Outstation Participants/Presenters, LP-Local Participants/ Presenters

2. Interested paper presenters must ensure their presence at the slot specified in technical sessions

Seminar Report

Two day national Seminar on

"Consumerism, Social Equity and Environmental Sustainability"

Day 1: 1st Februrary 2020 (Saturday)

The seminar began at 10:30 a.m. with the inauguration ceremony observing the tradition of lighting of the lamp by the dignitaries, saraswativandana, felicitation and formal welcome by the Convener, Dr. D.K. Srivastava, and introduction of the theme by the organizing secretary, Dr. Jyoti Kala, along with the release of the souvenir.After that in his address "We and the Nature: Environment Sustainability and Ecology" the chief guest Prof. D. N. Bajpai, Director, A.P.J. Institute of Technology, School of Computer Science, Noidarecalled that the idea of co-existence of human and the nature has been an integral part of Indian philosophy. The sense of duty to protect the nature was inbuilt and inherited in the consciousness of Indianpeople. But in the present era of materialistic globalization we have become oblivious of rich legacy of environmental conservation and developed a fallacy that someone else will save the environment. He mentioned about the Articles 48A and 51A of our constitution related to ecological integrity and limits and emphasized on the meaningful participation and inter-connectedness. Dr.Bajpai emphatically stated that the ecological management is a must as our environment is a closed system. He categorically criticized 'consumption driven use and throw culture' and forced on developing the habit of 'reduce, recycle and reuse'. He also mentioned of techniques like cloud-seeding for obtaining rain, religious impediments, role of global and national organizations, United Nations Environment Programme (UNEP) and urged for climate justice.

The key note speaker, Prof. A.K. Tangri, Co-ordinator, Institute of Hydrocarbon, Energy and Geo-resources, ONGC centre for Advanced Studies, University of Lucknow, Lucknow made an emphatic presentation on the topic- "Space borne technology- an essential tool in Environmental sustainability". Prof. Tangri demonstrated how satellite technology is helpful in maintaining environmental sustainability using research data. He traced the changing situation of Gangotri glacier, soil erosion due to deforestation, and role of space technology in sustainability of

water resource and meet out the requirement of agricultural irrigation for high productivity. Prof. Tangri also emphasized on the credit availability for the hard core agriculture sector and far friendly non- agricultural use of space technology for sustainable environment, like identification of forestation and plantation land etc.

The Inaugural session ended with the address by the President of the Managing Committee of the College, Sri T.N. Misra and vote of thanks extended by the Principal, Sri Rakesh Chandra.

The plenary session, presided over by Prof. A.K. Tangri, began at 11:45 a.m. with lecture of Dr. Sanjay Shukla, Head, Dept. of Geology, B.S.N.V.P.G. College on the topic "An Approach to Sustainable Mining: Need of the Day". Dr. Shukla emphasized upon the devising new mineral policy for the sustainable development. In his lecture on "Environmental Impacts of Mining in Bundelkhand Region, U.P., Dr. V.C. Srivastava, Deputy Director General (retd.), GSI, Luckow, pointed out the measures and precautions taken in the mining process and their impact on the development. Dr. HumaYaqub, Maulana Azad National University, Lucknow Campus, Lucknow, presented her paper on "Conservation and Environmental Ethics in Sarah Joseph's Gift in Green" and explored the ethical aspects of environmental studies. Her lecture was followed by a talk by Dr. S.P. Tripthi, Amity University, Lucknow, on "Sustainability". The session ended with the last presentation by Miss Yashashvi Singh, B.H.U., Varanasi on the topic "Upbhoktavaad: ParyavarniyaSatatatakeliyeEkChunauti".

The third technical session, chaired by Dr. Sudhish Chandra, began from 2:15 p.m. with invited lecture by Dr. ShashwatSaxena, M.D., Psychiatry, K.G.M.U., Lucknow who elaborately told about how to remain satisfied and manage stress for a healthy and sustainable life in his lecture "Consumerism and Happiness". His thoughts were expanded by Dr. V.V. Singh, Prof. and former Director of Management Centre and Bureau of Market Research, LBS group of Management Institutions. His topic of discourse was "The Happiness Quotient" in which he cited example of Bhutan and stated that over consumption cannot make us happy. In his invited lecture Dr. Deepak Kohli, Deputy Secretary, Forest and Wild Animal Department, U.P. Govt., Lucknow, mentioned the importance of adopting a holistic development strategy for the environmental balance in the lecture "Pradushan ka Manava, Paudhon avam Jantuyon par prabhava". There were two more paper presentations by Rajiv Shukla, Dept. of Environmental Sciences, Kamla Nehru Institute of Physical and Social Sciences, Sultanpur on the topic "Overpopulation: Imbalance in Human Diversity"; and the last presentation by Dr. Pragya Mishra, Asst. Prof., Dept. of Maths, DDU Govt. P.G. College, Lucknow, on the topic "Introduction to Mathematical Modeling".

Day 2: 2nd February 2020

The second day of the seminar began with Technical session 4 comprising Post graduate students' paper presentation competition under the chair person Dr. ShaziaKhan, co-chair Dr. Rashmi Gupta, The Judges were Dr. SanjiveShukla, Dr. SatyarthTripathi and Dr. Geeta Rani and the moderator Dr. D.K. Gupta. Next session of Under graduate students' paper and power point presentation competition was held under the chair person Dr. RituTripathiChakravarty, and Co-chair Dr. Veena P. Swamy, The judges for this session were Dr. M.A. Ansari, Dr. SnehPratap Singh and Dr. D.K. Srivastava and the moderator was Mr. Maneesh Kumar. Another students' competition of paper presentation was also held adjudged by Dr. RichaShukla, and Dr. Sanjay Shukla and moderator Dr. AnkitPandey. The session of Oral presentation by Teachers and research scholars was chaired by Dr. Sanjay Misra, and co-chaired by Dr. MeeraVani and conducted by Dr. Madhu Bhatia.

The technical session 5, presided over by Dr. Sudheesh Chandra started with the invited lecture by Dr. Parul Saxena, DSMNRU, Lucknow, on the topic "Mathematical modelling of the effect of air pollution on human being". Following it were the lectures by Dr. Anupma Singh, DDU govt. P.G. College, Sitapur on the topic "Be Always Happy"; and Dr. KarunaPandey, President Green City welfare Society, Haldwani, Uttarakhand on the topic " Pradushan ka nidan hamari praachin Aasthayen". Prof. M.A. Khalid, Head, Environmental Sciences, Integral University, Lucknow made his impactful presentation on "Climate change and its impact on biodiversity and ecosystems". The session also comprises eight paper presentations from research scholars too.

Dr. Jyoti Kala

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1

ADDICTION OF VIDEO GAMES AMONG YOUNG ADULTS : AN INTERVENTION

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ABSTRACT

Addiction is an endless issue with psychological, biological and environmental factors affecting one's development and livelihood. Bigger portion of addiction and fixation comes from heredity (APA). As addiction is a condition in which one involves himself or herself in the consumption of substance abuse or any other kind of behavior (Like Gambling and Internet addiction), which is being rewarded, affectively resulting in the fixed stimulus more than once, regardless of unfavorable outcomes. Until now, the spread of drug abuse has been relatively inescapable. Now-a-days common drugs like marijuana is easily available. The aim of this research was to assess the level of gaming addiction among male and female individuals within the different age groups of 18-22, 22-26, 26-30 and 30+. The results showed a significant gaming addiction in males rather than females. The research also encompass the intervention plan for the individuals who's the prior subject of matter in the gaming addiction criteria. The reason for gaming addiction could be plenty of free time, to avoid or escape a stressful situation or any other personal problem. With the inclusion of the intervention plan,

the individuals plans to reduce or eliminate the addiction problem to the limit which does not harm the one-self or others for instance.
Keywords:- gaming addiction, intervention.

INTRODUCTION

Addiction is an endless issue with psychological, biological and environmental factors affecting one's development and livelihood. Bigger portion of addiction and fixation comes from heredity (APA). As addiction is a condition in which one involves himself or herself in the consumption of substance abuse or any other kind of behaviour (Like Gambling and Internet addiction), which is being rewarded, affectively resulting in the fixed stimulus more than once, regardless of unfavourable outcomes. Until now, the spread of drug abuse has been relatively inescapable. Now-a-days common drugs like marijuana is easily available.

Addiction can be simplified as an aroused tendency to re-use the drug or behaviour, potentially impacted by mental (e.g., strain, history of psychic trauma), social (e.g., family or companions' utilization of a substance), and environmental elements (e.g., availability of a substance, low cost) which can prompt habitual utilization leading to psychological changes with long use (Bavelier, 2012).

Definitions, even when are created by scientific concerns, are not value free. They are implanted in a conceptual view of the phenomenon and hence are legitimately part of that hypothetical approach. In this manner it should not be surprising that the definition of addiction varies and changes as science develops and evolves with time (McCrady, 2013).

We practice the term "addiction" in acknowledgment of the way that people can create fixation to certain type of products and events, for example, food or sexual activity or betting, in addition to general substances, for example, liquor, cocaine, tobacco and internet. The biological changes which takes place during this fixation in an individual's mind and body can apparently be understood by us. The changes happening in the brain involve modifications in cortical (pre-frontal cortex) and sub-cortical (limbic system) areas including the neuro-circuitry of reward, motivation, retention, drive control and opinion/judgement. This can prompt sensational increments in desires for a drug or behaviour, and hindrances in the capacity to effectively control this drive, regardless of the information and experience of numerous outcomes

associated with the addictive conduct. Substance use and addictive behaviour have a considerable probability of being joined by psychological health conditions, for example, depression and anxiety or other pre-existing concerns (APA).

When it comes to addiction how no one can forget about Internet in recent years. The internet has exploded to become a daily part of our lives. It has turned into an indivisible element of our daily life, and has inflated the speed and accuracy of executing simple day-to-day tasks. Improper utilization of Internet causes numerous physical and psychological issues, for example, anxiety, exhaustion, social separation (isolation), depression and so on. Negative outcomes of this modern-day disorder which is known as Internet Addiction (IA) in people has influenced the general public (Haghighi, 2013).

Over use of internet has led people into gaming habits which intern has become an addiction amongst the internet users. People have started their new interest in video gaming as well, which is becoming the new problem in the general society. The addiction stay disconnected from society to some extent. One reason that these people don't get the assistance they require is because of this isolation, which usually goes unobserved by other people. Like every other addiction, video game addiction crosses every single traditional limit (e.g., culture, sex, ethnicity, and so on) (Vammen, 2007).

Individuals with such fixation endanger their academic or job functioning on account of the measure of time they spend playing video games. Such individuals even encounter symptoms of withdrawal when kept from gaming (APA).

Internet gaming in DSM-5

Addiction to gaming is depicted in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5), which is used by psychological health experts to analyse mental disorders. There was not adequate evidence to decide if the condition is a specific mental issue or the best criteria to order it at the time the DSM-5 was distributed in 2013. In any case, it recognized internet gaming disorder in the segment suggesting conditions for further research, alongside caffeine use disorder and different conditions.

The DSM-5 notes that gaming must cause "momentous impairment or distress" in a few parts of an individual's life. This proposed condition is restricted to gaming and does consider issues with general utilization of the internet, online based betting, or use of social media or smartphones. The proposed symptoms of internet gaming disorder include:

- Distraction with gaming.
- Withdrawal symptoms when gaming is taken away or impractical (bitterness, nervousness, irritability).
- Resilience, the need to invest more time gaming to satisfy the desire.
- Failure to cut down playing, unsuccessful attempts to stop gaming.
- Surrendering other activities, loss of enthusiasm for previously enjoyed activities because of gaming.
- Proceeding to gaming regardless of issues.
- Misleading relatives or others about the amount of time spent on gaming.
- The use of gaming to assuage negative states of mind, for example, guilt or sadness.
- Hazard, having endangered or lost an occupation or relationship because of gaming.

REVIEW OF LITERATURE

The researcher has studied 11 research articles from the journals which are related to the topic of the presentwork that is Video gaming addiction among adults: An intervention and these researches are arranged from latest to the oldest (year wise).Sussman et.al. (2018) have highlighted the fact that there has been significant increment in accessibility and use of digital technologies, including the Internet, computer games, smartphones and social media.Štavljanin (2017) analysed whether distinctive classifications of primary motivation can influence the product placements effects and whether players' attitudes towards product placement varies, depending upon the primary motivation.Vella (2016) classified the relationship between video games with positive well-being by looking at the social setting of play and its effect on the player's experience utilizing self-determination theory (SDT) and social capital theory (SCT). The study demonstrated that playing with others was related to greater feelings of relatedness in respect to playing alone, while those playing alone experienced more prominent autonomy and nearness.Ahmed Inam(2013)classified his study in Information Technology, Computer Science and Media Entertainmentcomputer games being most prevalent and popular type of media entertainment. In the result of the research paper it has been concluded that due to the major attractive force towards video games, positive and negative effects goes side by side.Griffiths (2012) demonstrated in his study that gaming habit has turned into

an interesting and expanding topic of research.Wang (2011) focused his research among the University students according to which a large portion of the students are having issues with mental health and studies due to online gaming; and some of them are having awful relationship with loved ones, however, some of them have a good relationship with their guardians. According to Weinstein (2010) video gaming addiction or ambitious utilization of computer and video games may interfere with day to day life.Rooij (2010) affirms the existence of a little group of addicted online video gamers (3%), representing around 1.5% of all children with age group of 13–16 years in the Netherlands. In spite of the fact that these gamers report addiction like problems, relationships with reduced psychosocial health were less evident. Beckham (20019) talked about the danger of video gaming which can be outlined into single word: fixation. Virtual pleasures like computer games, TV, and artificial intelligence are sublime when it is done in moderation. The issue with video gaming is that unless it is controlled or constrained by a third party, it's both chemically and mentally addictive.Anderson (2006) concluded in his research the effects of video games into positives and negatives. In children it has been considered as the "training wheels" for computer literacy. On the other half it has been observed that violent games increase physiological arousal and cognition aggression. Griffithset.al.(2006)classified in their study that excessive Internet usage can result in neurotic and behavioural changes.

Rationale of the Study

The research has been conducted on two different variables i.e., 'Addiction and Video Games'. The researcher wanted to find out the combined effect of both the variables on the mental well-being. To the best knowledge of the researcher there are few researches done in this area may be because it is one of the latest entries in the field of Psychology and mental health. So, it becomes necessary to study the addiction of video games. Taking these variables together will help people to know the ill-effects of Video games and it's addiction. Thus, this research is an attempt to explore the effects of these combined variables in the India. This study would also be beneficial for further researches on the topic and working more in the same direction will also generate awareness regarding the video gaming addiction in young adults and it's intervention plans. If video gaming actually affects an individual's life and overall growth in a negative direction people should be much more aware of this as an addiction and should be working on the intervention plan for it.

Although, the researcher could not find any Indian based research work on the due topic as per his best knowledge. The researcher was addicted to video games

when he was in class 10, due to which it had affected his academics and personal life. The researcher also noticed significant negative changes in his brother who use to spend minimum of five hours a day in gaming which affected his academics and his relationship with his mother. And this motivated the researcher to take up addiction of video gaming as his research topic.

METHODOLOGY

Hypothesis 1: Video games addiction will lead to mental health issues.

Hypothesis 2: Intervention plan will be effective in dealing with mental health issues of individuals with addiction of video games.

Objective: To plan an intervention for individuals with addiction of video games.

Variables:

Independent Variable: Video Games, Intervention

Dependent Variable: Mental Health

Sample:

Purposive sampling

Sample size: 40

102 people had responded and participated in the survey of Video Gaming Addiction, out of which 40 people were found to be addicted to Video gaming Addiction. Of the 40 respondents, all of them agreed to undergo the intervention plan.

Operational Definition of addiction: An individual who spends time playing video games, either online or offline, with a minimum duration of 3 to 4 hours at a stretch and playing the it in multiple patches.

Age limit: (18-30 years)

Tool:

Gaming Addiction Survey (2009).

About the tool: The following survey was published by a research study at the Iowa State University directed by Douglas Gentile, PhD. The study incorporated an 11-item pathological gaming scale for obsessive gaming.Since there is no clear standard for how to measure pathological gaming or how to score symptoms check-list of pathological gaming, subjects were permitted to respond ‘’yes’’ or ‘’no’’ to each symptom.

If the respondent answered "yes" to at least six of these questions, at that point the subject is in all likelihood have a video gaming addiction. "Video gaming addiction" and "Internet addiction" are not yet official medical diagnoses with standardized criteria. Behaviours turn towards becoming "addictions" when they disturb the real life, for example, school or work place, real-life relationships, and activities of everyday living.

Inclusive Criteria

Those who scored 6 out of 11 in the questions.

Intervention

An intervention can encourage somebody to look for help for alcohol or substance abuse, or other addictive behaviour. It's challenging to help a friend or family member battling with addiction. Sometimes a direct, heart to heart discussion can start the way to recovery. Although when it comes down to addiction, the individual with the issue struggles to see it and recognize it. A more focussed approach is often required. One may need to unite with others and make a move through a formal intervention.

(Mayo Clinic)

Intervention

An intervention is a cautiously planned process that might be done by family and friends, in discussion with a specialist or expert, for example, an authorized addiction counsellor or directed by an intervention professional (interventionist). During the intervention, these individuals meet the addiction counsellor and request him or her to accept the treatment.

(Mayo Clinic)

Intervention

The researcher used some of the techniques from Behaviour Modification to develop the intervention plan which was executed with 40 individuals (36 males and 4 females). These individuals were willing and cooperative for intervention.

Behaviour Modification is the process of changing or altering a behaviour of an individual using various techniques which are based on the principles of learning. It is used to increase desirable behaviour using rewards, and decrease undesirable behaviour using negative reinforcement.

The undesirable behaviour in the present intervention was excessive video gaming whereas the desirable behaviour was spending time productively, like spending time with family, grounding, and developing new skills (like drawing and craft for creativity).

The intervention was done through telephonic conversation and e-mai. It was successful because the individuals understood they had the need to terminate the addiction especially with the help of self-help and self-empowering technique.

The rewards:

(a) Primary reward: spending the money saved by not playing video games on eatables.

(b) Self reward: patting own's back for successfully achieving the target each day.

(c) Investment of money saved: For example, good and fancy stationary.

Negative Reinforcements:

(a) No gaming at all the next day if the daily target is not achieved (self-discipline).

(b) Extra reduction in the time spent on gaming, for example, instead of playing game in the alloted time slot of three and half hours, next day to be reduced to two and half hours.

Procedure:

(a) Consent for the participation in the intervention plan.

(b) Willingness to take responsibility for their own behaviour.

(c) Psycho-education about behaviour modification technique.

Duration:

(a) The individuals followed the intervention plan for twenty one days, time enough to develop new neuronal pathway in the brain for habit development.

(b) The researcher was in regular contact with each individual through phone and e-mail and feedback and guidance were regularly exchanged.

Final result:

Out of the forty, who participated in the intervention plan, eight still remained addicted to video gaming though for a lesser time duration even after one month. They reported that though they were able to reduce the time spent on playing games still

they were not able to reduce it fully. One-on-one intervention may have helped them better.

RESULT & DISCUSSION

The result of the present work has been presented in three tables with their explanation below each table.

Table 1.0

(Pre-Intervention)

Males	79
Females	23

The total number of individuals were 102, to whom the questionnaire was provided. Out of 102 (79 males and 23 females) 40 individuals stood out with video gaming addiction.

Table 1.1

(Participants of Intervention)

Males	36
Females	4
Total	**40**

All the forty individuals were ready to follow the intervention plan. (36 males, 4 females). After an intervention plan of 21 days, the individuals were once again asked to fill out the same questionnaire to check the change in their behaviour regarding the addiction.

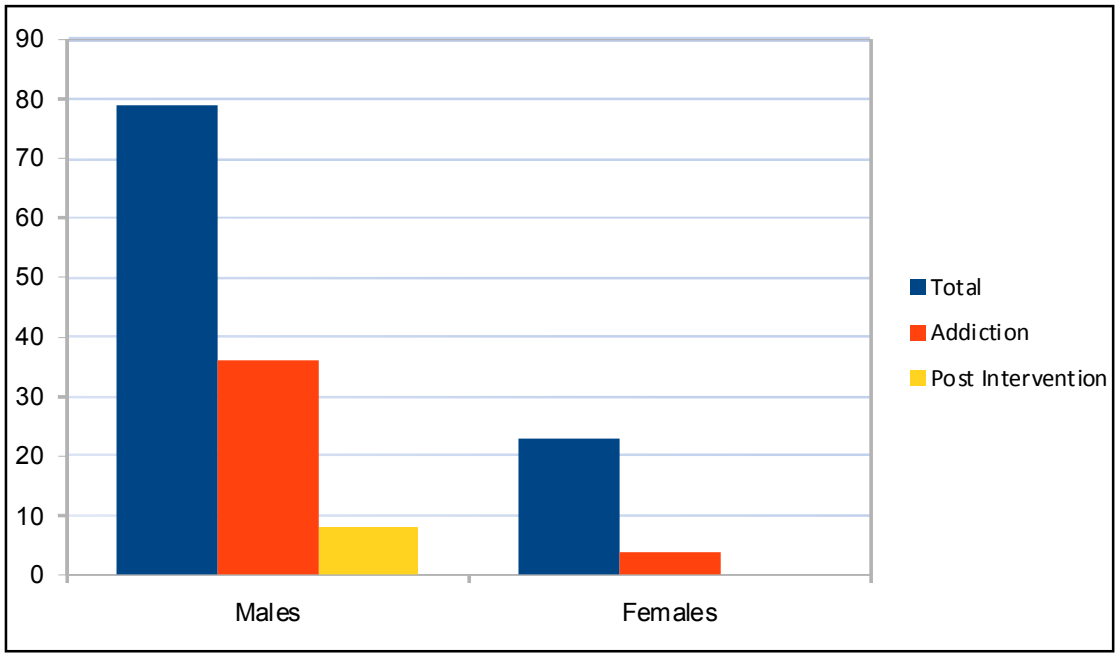
Table 1.2

(Further Intervention required)

Males	8
Females	0

It turned out, that the number of individuals addicted to video gaming has decreased to a very certain limit in both the gender's. Out of 36 males, only 8 males were still addicted to video gaming with lesser time spent on video gaming. And out of 4 females all of them have limited their video gaming habit and have achieved control over it.

(Graph 1.0)



Graphical presentation of the complete intervention program wherein blue bar represents the total number of participants who had filled the questionnaire, red bar represents the individuals who were found to be addictive to video games and participated in the intervention, and yellow represents the who were not able to completely reduced the addiction.

Because the research topic is still new to the field, it came out to be very difficult for the researcher to directly find the researches involved in it, as the researcher concluded the result to the best of his knowledge.

Following are the researches that support the present dissertation:

Rooij (2010) discussed about how gamers report addiction as the problem, which is affecting the relationships of the individuals, with reduced psychosocial health.

Griffiths &Widyanto (2006) have classified in their research that excessive internet usage and video gaming can result in neurotic and behavioural changes, which affects the behaviour of an individual very drastically with time.

Other researches mentioned in the Review of Literature indirectly support the present research indirectly.

Statement from one of the individuals,"This whole intervention plan about video gaming addiction was a success for me. In these 21 days of practise, I have actually controlled my video gaming behaviour." All of this intervention plan turned out to be very successful for all the subjects, as majority of them have come good out of it by the end.

Limitations:

(a) Time limitation due to busy schedule of under Graduate Program.

(b) One-on-one intervention would have given better results, in comparison to distance intervention.

Implications:

(a) The present work is one step closer to creating an awareness regarding Video Gaming Addiction and how people can bring themselves out of this addiction with self-help techniques.

(b) The intervention plan presented is helpful for changing old habits and developing new habits.

Conclusion

The present work has been completed in two semesters, the fifth semester was devoted to introduction and review of literature and sixth semester was devoted to data collection and result analysis.

This division between these two semesters has helped the researcher get a better understanding about research work and the hardship it entails. This dissertation has also helped developed patience and perseverance along with paying attention to details in the researcher. Moreover, researcher feels like there is an urgent need of for such kind of research and intervention amongst the youngsters.

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APPENDIX

1. Link to the Gaming Addiction Survey. https://temeculaca.gov/DocumentCenter/View/136/Take-the-Gaming-Addiction-Survey-PDF?bidId=

Gaming Addiction Survey

1. Over time, have you been spending much more time playing video games, learning about video game playing, or planning the next opportunity to play?
2. Do you need to spend more time and money on video games in order to feel the same amount of excitement as other activities in your life?
3. Have you tried to play video games for shorter durations of times but have been unsuccessful?
4. Do you become restless or irritable when you attempt to cut down or stop playing video games?
5. Have you played video games as a way to escape problems or negative feelings?
6. Have you lied to family or friends about how much you play video games?
7. Have you ever stolen a video game from a store or a friend, or stolen money to buy a video game?
8. Do you sometimes skip household chores in order to play more video games?
9. Do you sometimes skip homework or work in order to play more video games?
10. Have you ever done poorly on a school assignment, test, or work assignment because you have spent so much time playing video games?
11. Have you ever needed friends or family to give you extra money because you have spent too much of your own money on video games, software, or game Internet fees?

2

ROLE OF CSR IN FACILITATING THE BUSINESS ETHICS : WITH SPECIAL REFERENCE TO ENVIRONMENTAL SUSTAINABILITY

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ABSTRACT

'CSR is measured in terms of businesses improving conditions for their employees, shareholders, communities, & environment. But moral responsibility goes further, reflecting the need for corporations to address fundamental ethical issues such as inclusion, dignity, & equality.'

- *Klaus Schwab* (Founder, World Economic Forum)

The increasing globalization trends in the world economy has not only bring more value & interests to the business units, but also motivated them to rethink their concerns of social, ethical & environmental issues, popularly known as Corporate Social Responsibility (CSR). The CSR principles provide the foundations for various modern concepts for work, business & organisations, which broaden the individual & corporate priorities far beyond the traditional profit motive & shareholder enrichment only. The modern enterprises are supposed to have a focused CSR approach on their fundamental goal & to provide a systematic process for bringing coherence & discipline to CSR strategies.

This paper aims to explore CSR as a concept & as a set of actions embedded in facilitating the business ethics. Special emphasis has been made on to provide a general understanding on how the CSR practices can be helpful to protect people, biodiversity & ecosystems services.

Key Words- Corporate Social Responsibility (CSR), Business Ethics, Environmental Sustainability, Triple Bottom Line.

Introduction

'There is one & only one responsibility of business: to use its resources & engage in activities designed to increase its profits so long as it stays within the rules of the game.'

- Milton Friedman (Nobel Laureate)

Having an artificial separate legal entity corporate unit is also responsible towards the society. CSR *is an embedded voluntary commitment of business units to integrate in their corporate practices the economic, social, & environmental aspects & actions, which are above & beyond the legislative requirements & related to a wider concept of stakeholders—everyone influenced by their activities. CSR concept is based on* the Triple Bottom Line (TBL) Approach which provides a framework for measuring & reporting corporate performance against economic, social & environmental performance & to align the corporate goal with the sustainable global development. The perspectives taken by a unit must be sustainable, financially viable & secure, minimize (or ideally eliminate) the negative environmental impacts & act in conformity with the societal expectations. A corporate unit fulfilling its responsibility towards all the three sectors; INVESTORS (towards Profit), SOCIETY (towards People), ENVIRONMENT (towards Planet) is called SUSTAINABLE (Fig.1). This sustainability refers to meet the needs of present without compromising, the ability of the future generations to meet their own needs[1].

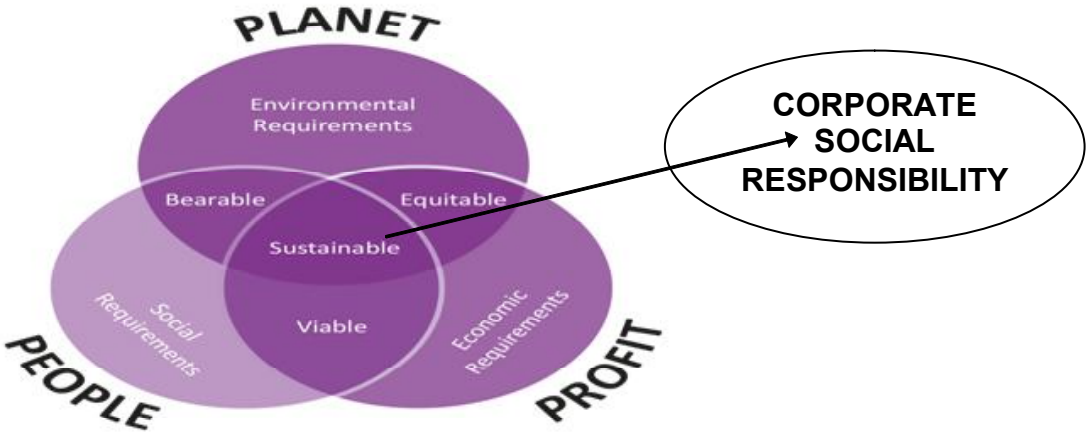


Fig. 1: Triple Bottom Line of CSR

CSR is not just an activity but it's a combination of several social responsibilities. The United Nations Industrial Development Organization has defined following functions of CSR[2]:

- Eco efficiency
- Environmental protection & management
- Responsible sourcing of materials & supplies
- Community (stakeholders) relations management
- Adherence to labor standards & working conditions
- Anti-corruption measures
- Upholding social equity, gender equity & other human rights goals
- Conservation of resources i.e., water & energy, in production
- Good governance

Dahlsrud (2008) attempted to define CSR with in-depth analysis of 37 definitions of CSR gathered through literature reviews covered a time span from 1980 to 2003. As per his interpretation CSR has five dimensions (Table-1). His analysis shows that CSR is not a nothing new at a conceptual level, whereby businesses have always social, environmental & economic impacts that had been concerned by stakeholders & dealt with the regulations. However, at the operational level, as a results of globalisation & fast-paced business environment, stakeholders & different national legislations are putting new expectations on business & approaching them to optimally balance social, environmental & economic impacts in the decision making process[3].

Table-1: Dahlsrud Five dimensions of CSR[4]

Dimensions	What element of CSR does the dimension refer to?	Example phrases
Environmental	The natural environment	• 'a cleaner environment'· • 'environmental stewardship'
Social	Relationship between Business & Society	• 'contribute to a better society'· 'integrate social concerns in their business operations
Economic	Socio-economic or financial aspects	• 'contribute towards economic development' • 'preserving profitability'

Stakeholder	Stakeholders or stakeholders'	• 'interaction with their stakeholder' • 'how organizations interact with their employees, suppliers, customers & communities
Voluntariness	Actions not prescribed by law	• 'based on ethical values'· • 'beyond legal obligations'

Business Ethical Standards: A Journey from Compassion to Commitment

'Ethics is the new competitive environment.'

-Peter Robinson (American Writer)

Business ethics are the code of conduct for business units. It is a broader concept encompassing many interrelated issues except CSR i.e., corporate governance, fairtrade, ethical management & leadership, sustainability, social enterprise, mutual cooperatives, employee ownership, micro-finance, globalisation (addressing its negative effects). CSR has been part of ethical & responsible business practices for long. However, the concept has gained added traction in the wake of the globalised nature of the economic environment today. CSR operates on the principle that corporate units are obliged to meet their responsibilities to a larger array of stakeholders than its shareholders. CSR should not be an add-on policy by a company, but be integrated into its governance structure & strategy.[5]

Table-2: Changing Philosophies of CSR

Genera-tion	Time frame	Philosophy	Dimensions & Core Characteristics
I	**Till 1850**	Monarchial Rule & advent of Industrialisation	• Transition to new manufacturing processes in Europe & USA (1760 to sometime between 1820 & 1840)· • Charity form by monarchs
	1850-1914	Religious & Humane philosophies	• Driven by family values, traditions, culture & religion· • Setting up temples & religious institutions· • Unregulated philanthropy
	1915-1950	Corporate Philanthropy	• Restructuring the world economic base after World War I & II • Unregulated philanthropy

II	**1951- 1970**	Socialism & Welfarism	• Community development • Poverty alleviation • Obligation to the society
	1971– 1990	Regulatory framework	• Extension of CSR commitments CSR as symbol of Corporate citizenship • Stakeholder relationship management • Corporate reputation • Socio-economic priorities • Regulated CSR • Bridging the governance gap • Stakeholders rights • Legal & ethical responsibilities
III	**1991 to till now**	Instrumental/ Strategic CSR	• Competitive strategy • Environmental protection • Sustainability • Internationalisation of CSR standards • Transparency & accountability • Multi National Corporations (MNCs) • Emphasis on LPG model

The tradition of CSR dates back to the monarchial era when the monarchs emphasized on ethical business practices. In the **first generation** CSR has been informally practiced in the form of charity to the deprived section of society, based on the principle of *'Sharing & Caring'*. It was totally driven by the family values, traditions, culture & religion along with the support of advent pioneers or propagators of industrialization. The havoc created by the world wars demanded the reconstructive activities & noble deeds to be pursued by the philanthropists[6].

In the **second generation**, greater stress was laid on social accountability, transparency & reporting. Community development activities i.e., setting up of charitable foundations, educational & healthcare institutions, & trusts were undertaken by the rich business titans. This was the time to have a regulatory power & enforcing authority to force companies to put in place a CSR strategy; in particular to be more responsible. Several international standards have been released i.e., ISO 9000 family of quality management systems[7].

The **third generation** was driven by the company's integrated CSR approach turned into a sustainable business strategy. With the advent of LPG model the increased momentum in industrial growth, enabled the companies to contribute more towards social responsibility. What was started as a form of charity has now understood & accepted as a responsibility. Numerous accreditations, protocol, & principles have been issued in this regard.

Table-3: Few Examples of CSR Standards worldwide

Issues	Standards
Environment	• Kyoto protocol • ISO 14000 family management series
Labour	• Fair labour association at workplace, code of conduct
Corporate Governance	• OECD principles of corporate governance • Principles of corporate governance in common wealth
Money Laundering	• Basel committee on banking supervision • Wolfsberg Anti Money Laundering Principles
Bribery & Corruption	• OECD convention combating bribery of foreign public officials in international business transactions
Human Rights	• Amnesty international Human Rights principles
Corporate Reporting	• Global reporting initiative guidelines on social economic & environmental reporting

Companies have changed their approach & became more responsible for all the stakeholders including environment, community, customers, shareholders, suppliers & employees. CSR has undergone a drastic change but some of the traditional features are still prevalent[8]. This is how a philanthropy & charity-based CSR model transformed into a multi-stakeholder perspective (Table-2)

CSR: A Catalyst in enforcing Social Obligations

I wear two hats. The one is business & increasing my shareholders' value; the other is social responsibility.

- Guler Sabanci (Turkish businesswoman)

CSR has proved to be a catalyst in enforcing the corporate social obligations.

But here a question arises how CSR could be measured. It can be done following a systems model of a business into three levels. **Level one** is about the relationship between society at large & adherence of *principles of social responsibility*. Social responsibility is a legitimate concern of a business as a social institution & its processes & outcomes must be embedded within the framework of its organisational principles. **Level two** is about the *corporate social responsiveness* which is a business's capacity to respond to social pressures. It suggests the surviving power of a business in long run which is totally dependent on proper business environment scanning, stakeholder management, & motivating factors of the business. **Level three** is the level of finding the answer to the question if CSR makes a difference (*measurement of outcomes*). It could be measured by identifying the positive effects of CSR policies on stakeholders (internal & external both) & certain external institutional effects i.e., mitigation of environmental threats.

With the enactment of Companies Act, 2013 India became the first country in the world to mandate CSR provisions by imposing statutory obligation on companies to take up CSR projects. It was one of world's largest experiments to mandate specific spends on CSR for all corporate entities based on its income, or profit, or net worth criteria. All the corporate units with net worth above ' 500 crore, turnover over ' 1000 crore, or net profit over ' 5 crore are required u/s 135 to spend at least 2% of their annual profits (averaged over 3 years) & to establish a CSR committee to oversee the spending[9]. It gave a quick boost to the CSR reporting in India (Table-4)

Table-4: CSR reporting in India

Year	2014-15		2015-16		2016-17*	
	No. of Comp. Reported for CSR	CSR Expenditure (₹ Crore)	No. of Comp. Reported for CSR	CSR Expenditure (₹ Crore)	No. of Comp. Reported for CSR	CSR Expenditure (₹ Crore)
PSUs	315	2673.85	397	4163.09	132	1325.83
Other Companies	14629	6890.92	18787	9664.77	6154	3393.17
Total	**14944**	**9564.77**	**19184**	**13827.86**	**6286**	**4719**

Source: Open Government Data (OGD) Platform, India

*provisional

This is a unique initiative as compared to the practices followed in the US, Britain or Europe, where CSR regulations follow a more 'philosophical' approach of

'doing well by doing well'. The cumulative amount of CSR spend in India is approximately ` 47000 during FY 2014-15 to 2017-18 (average of ` 12000 crore/ year) which is about 125% of the GoI budget for 2019-20 on higher education[10].

Businesses can invest their profits in areas i.e., education, poverty, gender equality, hunger, environment concerns as part of their CSR compliance. On a positive note, this enactment must be given credit on several counts: firstly, the smaller units would not have to bother about the social development at all; or at best done some ad hoc & sporadic work round their areas of operation; secondly, the emphasis on governance, stricter reporting & monitoring of CSR obligations have made for a more systematic approach to social development, encouraging companies to look at policy, structures, processes & projects as an integrated whole instead of just trying to meet targets[11].

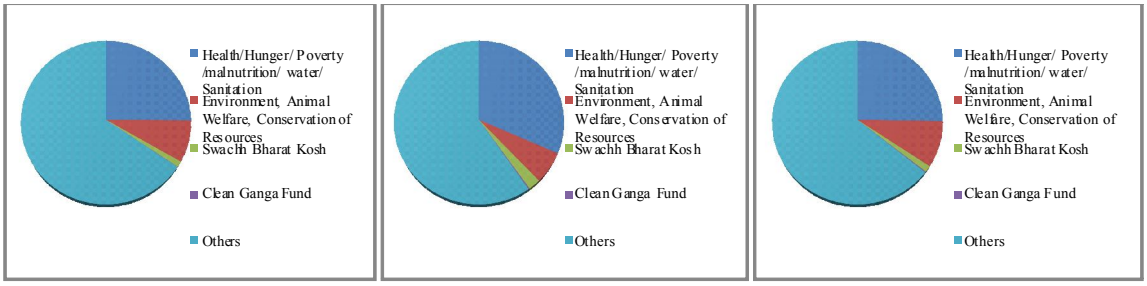
Table-5: Sector wise CSR allocation in India

Sectors	Allocation (₹ Crore)		
	2014-15	**2015-16**	**2016-17**
1. Health/Eradicating Hunger/ Poverty & malnutrition/ Safe drinking water/ Sanitation	2525.93	4545	3396.88
2. Education/ Differently Abled/ Livelihood	3188.09	4881.26	5123.66
3. Rural development	1077.47	1427.14	1550.24
4. Environment, Animal Welfare, Conservation of Resources	835.88	905.62	1239.52
5. Swachh Bharat Kosh	113.86	324.73	165.09
6. Any Other Funds	277.1	326.89	412.4
7. Gender equality/ Women empowerment/Old age homes/ Reducing inequalities	189.92	337.45	434.78
8. Prime Minister's National Relief Fund	228.18	213.7	150.71
9. Encouraging Sports	57.62	137.58	172.56
10. Heritage Art and Culture	117.37	117.58	296.86
11. Slum Area Development	101.14	14.31	49.8
12. Clean Ganga Fund	5.47	32.65	24.23
13. Other Sectors (Technology Incubator & Benefits To Armed Forces, Admin Overheads & others*)	1347.9	1102.38	447.57
Total Amount	**10065.93**	**14366.29**	**13464.3**

Source: Open Government Data (OGD) Platform, India

Environmental Sustainability: A CSR Approach

Environmental sustainability has now turned into the key issue for the corporate economic growth, environmental management & community development. Ignorance of environmental problems may lead to degradation & depletion of natural resources which could have detrimental to both the corporate sector & the society. Major environmental threats are climate change, carbon footprint, **greenhouse gas emissions, waste production, air, water & soil pollution, ozone layer depletion, deforestation, threat to flora & fauna, ocean acidification etc. Recognizing this** CSR is now based on the mindset how the corporate sector can help to reach a sustainable development path. In this context India has set an exemplary initiative of mandating CSR provisions to ensure the environmental sustainability, ecological balance, protection of bio-diversity, animal welfare, agro-forestry, conservation of natural resources & maintaining the quality of soil, air & water (Fig. 2).



A (2014-15) **B (2015-16)** **C (2016-17)**

Fig. 2: Environmental Allocation of CSR in India

Many tools have been developed to better quantify corporate performance & actions in terms of sustainable development i.e., corporate sustainability reporting, TBL accounting, Global Green Economy Index, Environmental Performance Index, Environmental Sustainability Index etc[12]. Companies can use Life Cycle Assessment to quantify their greenhouse gas emissions & their impacts on the environment & to make sustainability reports. Besides this companies can serve significantly in areas i.e., reduction in waste, water, energy, emissions, transport, travel & packaging, supply chain, recordkeeping, maximizing energy efficiency & productivity & minimizing the practices that may lead to depletion of natural resources (Table-6). These mediums can tackle the environmental challenges facing the world.

Table-6:

(Corporate Concerns to be environmentally sustainable)

Aspects	Concerns
Products	• Eco-designing products that better respect the environment & can be reused & re-purposed before being recycled
Packaging	• Use of eco friendly & recyclable packaging material to avoid carbon footprint i.e., biodegradable plastics, plant-based plastics, recycled products, alternative energy sources, post-consumer recycled polyethylene bags made from recycled waste, recycled molded packaging • Highlighting the environmental initiatives
Renewable Energy Source	• Alternate & renewable wind & solar energy panels to generate electricity • Photovoltaic panels • Reduce greenhouse gas emissions
Digital Recordkeeping	• Digitalization to eliminate/reduce paper consumption
Soil Concerns	• Using regenerative practices
Eco-Friendly Usage	• Building Management System to provide natural & proper lighting, heating, & ventilation in buildings • Eco friendly use of digital tools
Be Water-wise	• Installation of waterless urinals, low-flow toilets • Gray water recycling systems, investment in rainwater harvesting, xeriscape landscaping • Upgrading equipments i.e., dishwashers, cooling towers etc
Waste Management	• **Proper waste management system** • **Segregate separate types of waste especially chemical waste** • Consolidate shipments to fully utilize containers & transportation**. Recycle & Reuse.** • **Donate, Don't Discard**
Reduce Fossil Fuel Use	• By purchasing hybrid or alternative fuel company fleet vehicles • Optimize supply routes to reduce fossil fuel consumption
Supply Chain	• Efficient supply & demand planning to reduce overproduction • Transparency to ensure ethical sourcing of suppliers • Streamlining supply chain processes to reduce waste • Use of non-polluting transportation

These few small concerns will surely have big results. Pollution prevention, clean manufacturing practices, energy efficiency, eco-friendly design, & industrial ecology will equip companies with an attractive proposition to reduce their carbon footprint & to project a 'green' image.

CSR: Enhancing the value of a Corporate Unit

'It takes 20 years to build a reputation & five minutes to ruin it. If you think about that, you'll do things differently.'

-Warren Buffett (American Investor & Philanthropist)

The recent developments imply that the organizations' commitment to responsible behaviour may represent a transformation of business into a truly sustainable unit adding value to the business itself & also to the society & environment. It demands eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency & ecological equity[13]. These imperatives must be structured & integrated into the value system of business to get result in a better financial performance. It also creates some intangible assets to the business i.e., brand value, corporate image, & employee loyalty which could be difficult to quantify.

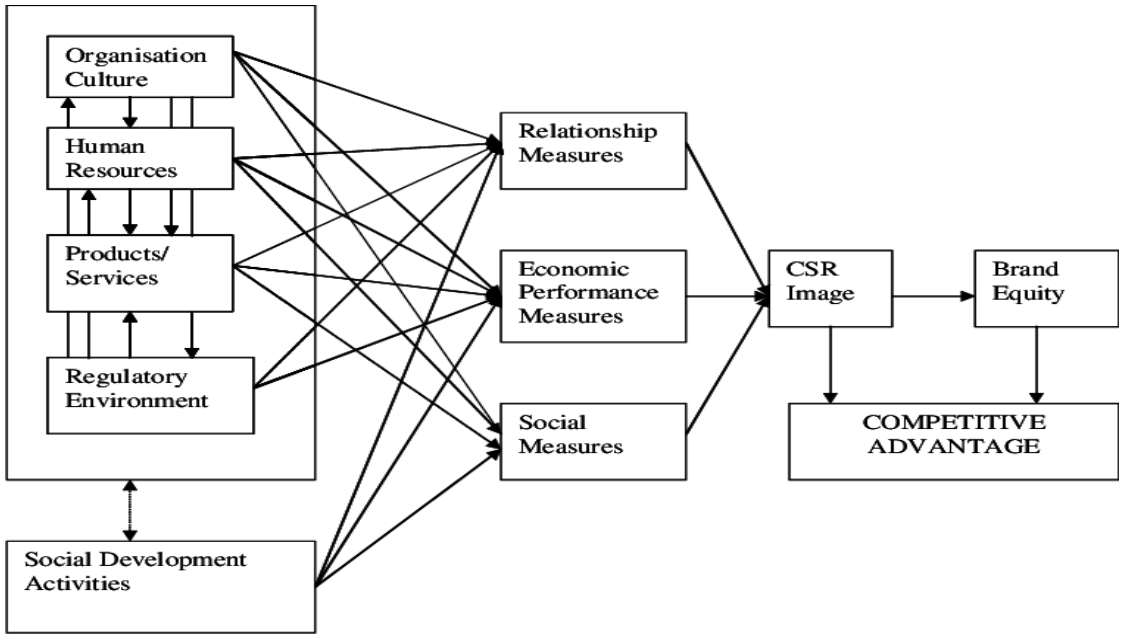


Fig.-3: Value Creation through CSR

This is the whole system how companies integrate CSR as part of its' overall corporate strategy to enhance brand value & competitive advantage. CSR works as a *proactive value creation tool* to innovate the business, develop human resource, enhance energy & manufacturing efficiency & develop shared values with customers & the society at large. CSR is responsible for generating competitive advantage through these measures (Fig.-3):

A. **Relationship Measures- The corporate units should make green thinking as a part of their corporate culture & agenda & should** engage their employees in this vision. By making employees aware of the company's efforts to give back to society, it will boost up employees' morale, efficiency, & faith on the employers. Better bonding with employees would help to increase employees' loyalty, retention, & organizational commitment in the long run. It will also make the company more attractive for the new aspirants & prospective employees.

Besides this a good corporate image will help the companies to have a greater connection with the consumers. The more socially responsible the company is, the more supportive the community & consumers will become.

B. **Economic Performance Measures-** Sustainable use of resources will lower the operational costs which will increase the financial performance. It will have a direct effect on the share prices of the company. Better corporate image will strengthen the brand value & stabilize the stock prices in both the short & long run. Greater corporate legitimacy will help in accessing a greater market share. Ethical practices will create less legal hurdles which mean lesser legal formalities & financial burden thereon. Better image among the consumers will lesser the marketing costs & even help to increase the sales revenue.

C. **Social Measures-** It will generate a kind of self regulation & ethical action in the companies which will limit the state's involvement in corporate affairs. The companies can directly invest in the community development activities**.** Companies demonstrating willingness to increase its' accountability & transparency through providing credible, verifiable, & accessible information can garner increased trust among the stakeholders. And most importantly the consumers who are consuming the products or services being offered by these corporate units will also serve the society indirectly.

Conclusion:

'Creating a strong business & building a better world are not conflicting goals - they are both essential ingredients for long-term success.'

-Bill Ford (Ex-Chairman, Ford Motor Company)

Thus in a nutshell it could be concluded that a properly implemented CSR strategy can bring along a variety of competitive advantages i.e., greater access to capital & markets, increased sales & profits, enhanced operational efficiency, improved productivity & quality, efficient manpower base, improved brand equity, enhanced customer & employees' loyalty, better decision making & risk management. CSR addresses proactive & positive responsibilities which could protect & create a sustainable & just world. To reap the benefits of becoming socially responsible leading corporations are continuously re-articulating their codes of conduct, certifiable standards, corporate programmes, industry initiatives, & documentaries about sustainability

Although the economic value of a sustainable & responsible business could be materialised in long run, but the momentum is important to reach the necessary tipping points in public opinion, policy response & business action[14]. A fourth generation of CSR is needed to have a greater emphasis on the global challenges which are still present today i.e., climate change, water depletion, biodiversity loss, bribery & corruption, & poverty & income inequality.

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3

CARBON FOOTPRINT : AN INDICATOR OF CLIMATE CHANGE

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ABSTRACT

The relationship between climate change and carbon footprint i.e. the release of carbon dioxide and other greenhouse gases (GHGs) from human activity is being well established . Unabatedly rising global temperature makes it mandatory to analyse the sources which increases the carbon emissions and take immediate actions either collectively or individually to reduce it.

Keywords : Carbon footprint, GHGs, Carbon emmisions.

Introduction

The carbon footprint concept is related to and grew out of the older idea of ecological footprint, a concept invented in the early 1990s by Canadian ecologist William Rees and Swiss-born regional planner Mathis Wackernagel . An ecological footprint is the total area of land required to sustain an activity or population. It includes environmental impacts, such as water use and the amount of land used for food production.[1] In contrast, a carbon footprint is usually expressed as a measure of weight, as in tonnes of CO_2 or CO_2 equivalents emitted over a given period of time.

Greenhouse gases (GHGs) occur naturally in the Earth's atmosphere, but human activities, such as the burning of fossil fuels, are increasing the levels of GHGs in the atmosphere, causing global warming and climate change. The Kyoto Protocol is an international treaty for controlling the release of GHGs from human activities, and the GHGs controlled under the treaty are shown in Table : 1.

Table : 1

	Greenhouse Gas	Global Warming Potential (GWP)
1.	Carbon dioxide (CO_2)	1
2.	Methane (CH_4)	25
3.	Nitrous oxide(N_2O)	298
4.	Hydrofluorocarbons (HFCs)	124 – 14,800
5.	Perfluorocarbons (PFCs)	7,390 – 12,200
6.	Sulfur hexafluoride (SF_6)	22,800
7.	Nitrogen trifluoride (NF_3)[3]	17,200

It is worth noting that different greenhouse gases last in the atmosphere for different lengths of time, and they also absorb different amounts of heat. The "global warming potential" (GWP) of a GHG indicates the amount of warming a gas caused over a given period of time (normally 100 years). GWP is an index, with CO_2 having the index value of 1, and the GWP for all other GHGs is the number of times more warming they cause compared to CO_2 for e.g. 1kg of methane causes 25 times more warming over a 100 year period compared to 1kg of CO_2, and so methane as a GWP of 25.

Carbon dioxide (CO_2) is the most common GHG emitted by human activities, in terms of the quantity released and the total impact on global warming. Carbon dioxide equivalent (CO_2e) is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. A quantity of GHG can be expressed as CO_2e by multiplying the amount of the GHG by its GWP, e.g. if 1kg of methane is emitted, this can be expressed as 25kg of CO_2e (1kg CH_4 = 25kg CO_2e). "CO_2e" is a very useful term for a number of reasons: it allows "bundles" of greenhouse gases to be expressed as a single number; and it allows different bundles of GHGs to be easily compared.

Carbon is a chemical element which is present in many gases and compounds. For example, carbon combines with oxygen to make carbon dioxide (CO_2), and combines with hydrogen to make methane (CH_4). "Carbon" is used as a shorthand for referring to CO_2, or greenhouse gases in general (although not all GHGs contain carbon!). The atomic weight of a carbon atom is 12 and the atomic weight of oxygen is 16, so the total atomic weight of CO_2 is 44 (12+16=44). This means that a quantity of CO_2 can be expressed in terms of the amount of carbon it contains by

multiplying the amount of CO_2 by 0.27 (12/44). E.g. 1kg of CO_2 can be expressed as 0.27kg of carbon, as this is the amount of carbon in the CO_2. [2]

Carbon footprint is the amount of carbon dioxide (CO_2) or its equivalents emissions associated with all the activities of a person or other entity (e.g., building, corporation, country etc.). It includes direct emissions, such as those that result from fossil-fuel combustion in manufacturing, heating, and transportation, as well as emissions required to produce the electricity associated with goods and services consumed. [3]

Everyone's carbon footprint is different depending on their location, habits and personal choice. Each of us contributes to the greenhouse gas emissions either by the way we travel, the food we eat, the amount of electricity we consume and many more.For example, when you drive a car and burn fuel, it generates certain amount of CO_2 in the atmosphere. When you heat your house, it also generates CO_2 assuming that electricity is coming from coal powered plants and similarly when you eat food, it also generates some quantities of CO_2 as the food gets processed.

Main Contributors to Carbon Footprint

Climate scientists and global campaigners for the reduction of greenhouse gas emissions argue that there is more than enough evidence to suggest that enough damage has already been done. So, they say, whether measurements need to be taken or not, action needs to be taken today. These are just some of the main contributors to today's carbon footprint.

- **Agriculture** – Most agricultural processes within developed and developing nations are still being carried out commercially with the result that mass production of livestock has led to large levels of methane gas being released into the atmosphere.
- **Energy** – Here, carbon footprint emissions are collective, coming from a variety of sources, namely fast growing industrialization, urbaniztion, transport and consumption of electricity and fuel which leads to CO_2emmisions to rise unchecked and at alarming rates.
- **Waste** – No matter which process or activity is being carried out, the waste from these is excessive and disposal of these increases carbon footprint.
- **Human action (and inaction)** – Ultimately, the way humankind has become accustomed to doing things every day, keeping pace with the need to do things more quickly and with more convenience, has contributed towards the exponential increase in carbon footprints on an annual basis. [4]

International Energy Agency (IEA) report shows China,U.S. & India together accounted for nearly 70% of the rise in energy demand. India emitted 2,299 million tonnes of carbon dioxide in2018, a 4.8% rise from last year. India's emissions growth this year was higher than that of U.S. and China, the two biggest emitters in the world.[5]

Ways to Reduce Carbon Footprint

The situation of annual (large) increases in greenhouse gas emissions is serious. It warrants immediate action, no delays and without compromise. Huge gatherings at conferences designed to have a conversation about the carbon footprint are encouraging. Invariably, groups discuss ways and means to reduce their carbon footprints without adversely affecting their vested interests or the communities or nations they represent.

Done correctly, the reduction of carbon footprints is going to change lives.And it will be for the greater good in the long term. Here are some of the most effective ways to make an immediate impact on reducing carbon footprint, whether individually, domestically or commercially.

- **Buy green energy** – Switch to Renewable energy sources like solar power panels and wind farms that replace coal-fired power plants.
- **Energy efficiency at home** –Energy-efficiency improvements, such as increasing insulation in buildings to reduce heat loss or using more-efficient vehicles for transportation.[4] All appliances and electrical outlets that are not being used must be switched off immediately. These are simple, yet practical lifestyle habits which are easy to adopt.
- **Instead of driving** – The popular and healthy advice is to walk instead of driving. Those who have too far to travel can do carpooling, but better to use public transport services.
- **Less red meat** – The great variation in how foods are produced, processed and transported means their footprints are very different. The vast majority of emissions, typically around 80%, occur during food production. This means how your food is produced is the most important factor in your food footprint.[6]
- **Buy local** – Adding to the above remark, buying local, organic produce effectively counters mass-produced agricultural outcomes. There is a dramatic reduction in the amount of plastic being used to package products and fuel usage during long road transits is also reduced.
- **Recycle and re-use** – Vegetable produce can be converted into compost (or manure) for gardens, even vegetable gardens. Instead of buying more food containers, plastic containers sourced from the supermarket can be refashioned

as ideal kitchen utensils. Also, where plastic waste is no longer required, seek out recycling depots rather than relying on your supplied garbage disposal units.

- **Plant a Tree** – One of the best way to give it back to the environment is to plant trees. Plants absorb $CO_2$and release oxygen that is then used by humans and animals.

Conclusion

The threat climate change poses to society, the economy and the natural world is quite well understood. Based on current trends the earth is expected to warm by around 2°C to 4°C (3.6°F to 7.2°F) this century. Due to the incomplete understanding of the complex climate system, and uncertainty about future emissions, we can't be sure how great this warming will be. The risk underlying this uncertainty is the key reason we need urgent action to reduce emissions that will insure against the possibility of catastrophic warming. The urgency required to react to government's slow responses to legislating carbon footprint-reducing initiatives is now widely known. Individual emission reductions are only part of the bigger picture and depends very much on one's own skills, work and interests and it is not easy . But this challenge is exactly what we must do both individually and collectively in order to limit the risks of climate change.

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4

BIODIVERSITY : ITS LOSS AND CONSERVATION

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Biodiversity is a combination of two words, Bio(life) and Diversity (variety). Biodiversity is formally defined by the convention on biological diversity (CBD) as:"the variability among living organism from all sources including terrestrial, marine andother aquatic ecosystem and the ecological complexes of which are part; this includes diversity within species, between species and of ecosystem. [1]

According to WWF, biological diversity is the term given to the variety of life on earth. 'It is the variety within and between all species of plant, animal and micro-organisms and the ecosystem within which they live and interact'. [2]

The earth is populated by an incredible number of different living creature. The term that is used to define this "crowd" of organization that populate every corner of the planet, and that have adopted even to the most extreme environment, is biodiversity or biological diversity. Biodiversity measures the variety of animal and vegetable species in the biosphere and is the result of long evolutive process. [3]

There are three kinds of biodiversity: -

1. **Species diversity: -** Species diversity refers to the variety of plants and animal species present in a community or ecosystem. Species diversity varies across the world and in different ecosystem. It is very high in tropical rainforest and coastal zones and low in small isolated island and polar regions.
2. **Genetic biodiversity: -** It refers to the differences in the genetic heritage of a species. The morphological characteristics, i.e. the visible characteristics of

living organism, such as for example the colour of the eyes and fur of a cat, whichare examples of variety, from a genes level,in each single species. [5]

3. **Ecological diversity: -** It defines the diversity observed among the ecosystems in a particular region. Different ecosystem like mangroves, rainforests, deserts etc. [6]

Biodiversity is indeed, very important to the wellbeing of planet earth, the importance of healthy ecosystem and rich biodiversity can be understood by the following points: -

- Increase ecosystem productivity.
- Support number of plant species.
- Protect fresh water resources.
- Promote soil formation and protection.
- Provide for nutrient storage and recycling.
- Aid in breaking down pollutants.
- Provide pharmaceutical drugs.
- Offer environmental for recreation and tourism. [7]

BIODIVERSITY LOSS

Biodiversity loss is the death of entire ecosystem which is destroyed because of human intervention – including deforestation, urban development and farming – or enough key species in an ecosystem die that the ecosystem collapses on its own [8]. It is estimated that the current rate of biodiversity loss is 100 to 1000 times higher than the natural occurring extinction rate and is still expected to grow in future [9]. The biological wealth of the planet has been declining rapidly. The colonization of tropical pacific island by human is said to have led the extinction of more than 2,000 species of native birds. The IUCN red list documents the extinction of 784 species (including 338 vertebrates, 359 invertebrates and 87 plants) in the last 500 years. Some examples of recent extinction include the Dodo (Mauritius), Quagga (Africa), Thylacine (Australia), Steller's sea cow (Russia) and three subspecies (Bali, Javan, Caspian) of tiger. The last twenty years alone have witnessed the disappearances of 27 species. [10]

According to the UN Conversation on Biological Diversity the major cause for the biological diversity loss are the following: - Habitat loss and fragmentation, Alien species invasion, Overexploitation of biological resources, Co-extinction,

Collection for zoo and research, Control of Pests and predators, Introduction of non-native species (or biological invasion), Global climate change.

- **Habitat loss and fragmentation: -** Which is any thinning, fragmentation or destruction of an existing natural habitat - reduces or eliminate the food resources and living space for most species. Species that cannot migrate are often wiped out. [11]
- **Alien species invasion: -** When alien species are introduced unintentionally or deliberately for any purpose, some of them turn invasive and cause decline or extinction of indigenous species.
- **Overexploitation of biological resources: -** Unsustainable use of ecosystem and over-exploitation of biological resources are also major threats [14]. Changing consumption pattern of human is after cited as the key reason for this unsustainable exploitation of natural resources. [15]
- **Co-extinction: -** When a species become extinct the plant and animal species associated with it in an obligatory way and also becomes extinct, its unique assemblage of parasites also meets the same fate.
- **Collection for zoo and research: -** Animals and plants are collected for zoos and biological laboratories in order to research in science and medicine.[16]
- **Control of pests and predators: -** Generally, non-targeted species that are a components of balanced ecosystem may also get killed by the predators and pest control measures.[18]
- **Global climate change: -** Climate change is the result of human activities anddue to which conditions of climate are changing so quickly that species cannot adopt such changing quickly, so they are dying out. [19]
- **Hunting and poaching: -** Because of hunting and poaching not only particular species become prone to extinction but also the other species dependent on that species. [19]
- **Natural calamities: -**Flood, drought, forest fires, earth-quakes and other natural calamities sometimes causes the heavy fall of plants and death of animal life.[20]

BIODIVERSITY HOTSPOT

The concept of biodiversity hotspot was given by **Dr. Norman Myers** in 1988 number of epidemic species. If such an area is also threatened with habitat loss and other factors, it is called a biodiversity hot spot.

According to Conservation International, there are two strict criteria for declaring an area as a biodiversity hotspot: -

1. The area must have at least 1500 vascular plants or high percentage of plant life as epidemics. In other words, a hotspot is irreplaceable.
2. The area must have 30% or less of its original natural vegetation. In other words, it must have threatened.

Thus, hotspots are identified based on species richness, endemism and threat perceptions. There are 36 biodiversity hotspot in the world [22] and four are present in India. These are: -

1. **Himalaya:** Includes the entire Indian Himalaya region (and that falling in Pakistan, Tibet, Nepal, Bhutan, China and Myanmar.
2. **Indo-Burma:** Includes entire North-eastern India, except Assam and Andaman groups of island.
3. **Sundaland:** Includes Nicobar group of island (and Indonesia, Malaysia, Singapore, Brunei, Philippines.
4. **Western Ghats and Sri Lanka:** Includes entire Western Ghats (and Sri Lanka). [23]

BIODIVERSITY CONSERVATION

Over the year, the depletion of biodiversity has been quite active. In order to correct this scenario, biodiversity conservation has been majorly stressed by government and social organization. Biodiversity conservation has three prime objectives: -

1. Maintain crucial ecological processes as well as life support system.
2. Preserve the variety of species.
3. Make sustainable exploitation of ecosystem and species.

There are two approaches in biodiversity conservation: -

1. **In Situ conservation: -** It is approach of protecting an endangered plant or animal species in its natural habitat. Some methods under its are: -

- Biosphere reserve
- Wild life sanctuaries
- Community reserve
- Elephant reserve

- Important bird areas
- Sacred groves
- National park
- Conservation reserve
- Tiger reserve
- Marine protected areas
- Protected forest

2. **Ex- Situ conservation: -** In this approach, threatened animals and plants are taken out from their natural habitat placed in special setting where they can be protected and given special care.

   The most common methods are: -

- Storage of seeds in banks.
- Breeding of captive animal species in zoos.
- Setting up botanical gardens aquarium and research institute.

To protect biodiversity, various environmental conservation organization are working world wide: -

1. World conservation union – bring 83 states together.
2. United nation environment program(UNEP) has been at the forefront of assessing and monitoring global biodiversity.
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5

THE PERSPECTIVES OF WASTELAND CONVERSION WITH REFERENCE TO SOCIAL EQUITY AND ECOLOGICAL BALANCE

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Land and soil is one of the most basic ingredients of our ecological system and human sustenance. Land is a scarce commodity and unfortunately India is facing the problem of the Wastelands. One-sixth of India's land is either barren or overgrown with vegetation that has turned wild. Land areas that are unproductive, waterlogging, saline, or unfit for cultivation, grazing and other economic uses are called the Wastelands. These wastelands are economically unproductive, ecologically unsuitable and subject to environmental deterioration. Land degradation is natural as well as an anthropogenic induced activity. Wastelands are formed by both natural and man-made reasons such as snow-covered areas, coastal saline area forest blank, barren hill-ridges, etc. The loss of fertility due to soil erosion also converts marginal forests into a wasteland. Deforestation, overgrazing, over-cultivation and unskilled irrigation also majorly contribute to the formation of wastelands. "Ironically, these wastelands are further increasing in 11 states, including Odisha, Assam, and Telangana."[1]The issue of land degradation and deterioration of its quality has always been a matter of concern for both the Central and State Governments. Land assessment undertaken by various agencies generated databases helpful in devising requisite measures for the conservation of the land resource and conversion of the wastelands for useful purposes. The National Waste Land Development Board also took steps to map the wastelands for development. "In FY16, Jammu & Kashmir had the largest area of wastelands in the country, which was more than double of wastelands in Rajasthan, the state with the second-largest area of wastelands in the country. These two states are followed by Madhya Pradesh and Maharashtra in terms of the maximum area of wastelands."[2]

Categories of Wastelands in India[3]

	Category & Area (in sq. Kms.)
Snow Covered/Glacial	55788.49
Barren Rocky/Sheet Rock	64584.77
Sands-inland/coastal	50021.65
Land affected by salinity/alkalinity	20477.38
Gullied/or ravinous land	20553.35
Upland with or without scrub	194014.29
Water logged & Marshy	16568.45
Steep sloping area	7656.29
Shifting cultivation land	35142.20
Mining/Industrial Wastelands	1252.13
Degraded/pastures/grazing land	25978.91
Under utilised/degraded notified forest land	140652.31
Degraded land under plantation crop	5828.09
Grand Total:	**638518.31 sq. kms**

The concept of wastelands in India originated during the colonial period. It includedall lands that were not under cultivation through the process of settlement as all land held underdifferent property regimes. No one can deny the relevance of the common lands (wastelands) from the ecological and economic perspectives. With the competing demand of production oriented lands the use of such wastelands for commercial purposes has raised a debatable issue. The environment researchers and social activists propound that many pastoralists, fishermen and nomadic farmers not only depend on such traditional common-lands for their livelihoods but also act as a buffer against floods, droughts and pollution. These areas protect unique biodiversity resources which help in maintaining ecological balance.

It has been observed by the researchers that degraded and wastelands have immensely damaged productive lands, water sources and environmental ecosystem. "It is now well-recognized that in Asia, poverty has been mainly a rural phenomenon, where nearly three-fourth of the poor food-insecure live and are dependent on the natural resources for employment and income. South Asia has a poverty incidence of 43% (or about 520 million people), and only here 40% of the world's poor reside.

Also, severely degraded lands are mostly inhabited by marginal farmers and tribal populations, who are poor and less literate. These people are devoid of land-based amenities and infrastructure in comparison with the farmers who cultivate better lands."

National Wasteland Development Board was established in 1985 under the Ministry of Forests and Environment mainly to tackle the problem of degradation of lands, restoration of ecology and to meet the growing demands of fuel wood and fodder at the national level

The degradation of environment in the fragile Indian sub-topical eco-system is basically attributed to:-

- Increasing biotic pressure
- Absence of adequate investments and appropriate management practices.
- High rate of Population growth and high incidence poverty in rural areas.
- Over-exploitation of National Resources.
- The break-down of traditional institutions for managing common property resources and failure of new institutions to fill the vacuum.
- Faulty land use practices.[4]

India has a much smaller geographical area in comparison to the population growth in the country, which generates the need for quick urbanization. A large cattle population in India is a major reason behind the overgrazing of the farmlands. These pressures have influenced the proportion of land used for farming and construction over time.

The consequences of the conversion of the wasteland for other purposes

- Soil Erosion Land Degradation
- Depletion of natural resources
- Lower productivity
- Ground Water Depletion
- Shortage of Drinking Water
- Reduction in Species Diversity
- Increase in the extent of Wastelands

Hence there is urgent need to stop the increasing wastelands and rejuvenate the existing ones. The wastelands can be recovered by various measures after which they can contribute to the economic and social development of the country. By improving the physical structure and the quality of the soil, improving the quality of

water and make it available, and by preventing soil erosion and landslides, such lands can be utilized in productive ways. Sometimes the wastelands have the problems of nitrogen and phosphorus deficiency that can be improved by adding these micronutrients rich fertilizers. One important strategy is watershed development. "Watershed development refers to the conservation regeneration and the judicious use of all the resources – natural (like land, water plants, animals) and human – within the watershed area. Watershed Management tries to bring about the best possible balance in the environment between natural resources on the one side and man and animals on the other. Since it is the man which is primarily responsible for degradation of environment, regeneration and conservation can only be possible by promoting awakening and participation among the people who inhabit the watersheds."[5]

Integrated development schemes can be an effective measure to protect and develop the wastelands for the productive use. Development of wastelands mainly in non-forest areas aimed at checking land degradation, putting such wastelands of the country to sustainable use and increasing bio-mass availability especially that of fuelwood, fodder , fruits, fiber & small timber. Government of India is taking up this colossal task through its INTEGRATED WASTELAND DEVELOPMENT PROJECT SCHEME (IWDP) by revitalizing & reviving village level institutions & enlisting people's participation. It is people's own programme which aims at giving them actual decision making powers in terms of project implementation and fund disbursal.

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6

प्रदूषण का पौधों और जंतुओं पर प्रभाव

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सम्पूर्ण विश्व आज 'प्रदूषण' की समस्या से ग्रस्त है या हम कह सकते हैं कि संसार का कोई भी हिस्सा पूर्णतया प्रदूषण रहित नहीं है। सरल शब्दों में पर्यावरण प्रदूषण को इस प्रकार परिभाषित किया जा सकता है– ''मानव गतिविधियों के फलस्वरूप पर्यावरण में अवांछित पदार्थों का एकत्रित होना, प्रदूषण कहलाता है। जो पदार्थ पर्यावरण को प्रदूषित करते हैं उन्हें प्रदूषक (Pollutant) कहते हैं।" प्रदूषण का प्रभाव सभी जीव–जन्तुओं एवं पर्यावरण पर पड़ता है। अगर पर्यावरण जीवन है तो प्रदूषण मृत्यु है। प्रदूषण को चार भागों में बांटा जा सकता है–वायु प्रदूषण, जल प्रदूषण, भूमि प्रदूषण एवं ध्वनि प्रदूषण। इन सभी प्रकार के प्रदूषण का प्रभाव मानव, पौधों और जन्तुओं पर पड़ता है।

वायु में जब जहरीली गैसें तथा अवांछनीय तत्व इतनी अधिक मात्रा में मिल जाते हैं कि मनुष्य, जीव–जंतु और वनस्पतियां विपरीत रूप से प्रभावित होने लगती हैं तो यह स्थिति वायु–प्रदूषण कहलाती है। वायु प्रदूषण के प्रमुख कारकों में प्रथम है, ईंधनों का जलना। जिनके दहन से कार्बन मोनो ऑक्साइड, कार्बन डाई ऑक्साइड, सल्फर डाई ऑक्साइड व अनेक हाइड्रोकार्बन जैसे बैंजीपाइरिन आदि उत्पन्न होते हैं। परिवहन माध्यमों द्वारा उत्सर्जित धुआँ, कार्बन कणों, सल्फर डाई ऑक्साइड, नाइट्रोजन के ऑक्साइड, लैड कणों आदि के कारण भी वायु निरन्तर प्रदूषित हो रही है। इस प्रकार का प्रदूषण महानगरों में अधिक देखने को मिलता है। जहाँ अनगिनत छोटे–बड़े कारखाने अपनी चिमनियों द्वारा वायुमंडल में धुएँ के बादल बनाते रहते हैं। इसके अतिरिक्त परमाणु ऊर्जा प्रक्रम एवं तापीय बिजली घरों द्वारा भी उत्सर्जित पदार्थ वायु प्रदूषण का प्रमुख कारण बनते हैं। आज अत्यन्त प्रचलित शब्द यथा– 'ग्रीन हाउस प्रभाव', 'अम्लीय वर्षा' एवं 'ओजोन परत छिद्र' वायु प्रदूषण के प्रभाव से ही जनित हैं। वायु प्रदूषक विषैली गैसों से साँस की बीमारियाँ–ब्रॉंकाइटिस, फेफड़ों का कैन्सर हो सकता है। श्वांस रोगों के अतिरिक्त कैंसर, हृदय रोग, सिर दर्द एवं आँखों के सामने अंधेरा छाना आदि रोग भी हो जाते हैं।

सल्फर डाई ऑक्साइड से एम्फॉयसीमा नामक रोग होता है, यह एक प्राणलेवा बीमारी है। वाहनों के धुएँ में उपस्थित सीसा कण शरीर में पहुँचकर यकृत, आहार नली, बच्चों में मस्तिष्क विकार, हड्डियों का गलना जैसे रोगों का कारण बनते हैं। बहु केन्द्रित हाइड्रोकार्बन भी कैंसर का कारण बनते हैं। इस संदर्भ में 'स्मॉग' का उल्लेख आवश्यक है, जिसके कारण सैकड़ों व्यक्तियों का स्वास्थ्य प्रतिकूल रूप से प्रभावित होता है। वर्तमान में जैसे–जैसे वायु प्रदूषण में वृद्धि हो रही है उससे फैलने वाली बीमारियों एवं मृत्यु संख्या में भी वृद्धि होती जा रही है।

वायु प्रदूषण से पौधे भी अछूते नहीं हैं। पेड़–पौधों पर भी वायु प्रदूषण का प्रभाव पड़ता है। वायु प्रदूषण के कारण पौधों को प्रकाश कम मिलता है जिससे उनकी प्रकाश संश्लेषण (Photosynthesis) की क्रिया पर विपरीत प्रभाव पड़ता है। जो पौधे कोहरे के क्षेत्र में पनपते हैं, उनका विकास कम हो जाता है। उनकी पत्तियां विकृत एवं सफेद होकर गिरने लगती हैं। इसी प्रकार सौंदर्यवर्द्धक फूल एवं लताएँ वायु प्रदूषण से प्रभावित होती हैं। जहरीली गैसों के कारण फूल बदरंग होकर मुरझा जाते हैं एवं लताएँ सूख जाती हैं। वायु प्रदूषण के कारण पत्तियों में विद्यमान स्टोमेटा को धूम्रकण अवरूद्ध कर देते हैं, फलतः पौधे की जीवन संबंधी प्रक्रियाएँ रूक जाती हैं और पौधे क्षतिग्रस्त हो जाते हैं। कुछ पौधे इस प्रकार के होते हैं जिन्हें 'प्रदूषक सूचक' पौधे कहा जाता है। लाइकेन एवं मॉस प्रजाति के पादप प्रदूषण से अत्यंत संवेदनशील होते हैं। लाइकेन सल्फर डाई ऑक्साइड की मात्रा बढ़ने से प्रभावित होते हैं और इनकी वृद्धि कम हो जाती है। ये वायु प्रदूषण के अच्छे सूचक होते हैं, अत्यधिक वायु प्रदूषित क्षेत्रों में लाइकेन विलुप्त हो जाते हैं। लाइकेन के समान कुछ ब्रायोफाइट्स पौधे जैसे मॉस भी वायु प्रदूषण के अच्छे सूचक पौधे माने जाते हैं। यह पौधे प्रदूषण के कणों को अधिक जल्दी और ज्यादा मात्रा में अवशोषित कर लेते हैं। परिणामतः वह एक अच्छे जीव सूचक का कार्य करते हैं।

आज जल प्रदूषण खतरनाक स्तर तक पहुँच चुका है और व्यापक रूप से जीव–जंतुओं को प्रभावित कर रहा है। घरेलू तथा औद्योगिक दोनों ही कारणों से लगातार जल प्रदूषित होता जा रहा है। घरों में साबुन, सोडा, ब्लीचिंग पाउडर एवं डिटर्जेंट का अत्यधिक प्रयोग या उद्योगों में धात्विक, अम्ल, क्षार या लवण के प्रयोग से जल प्रदूषित हो रहा है। कृषि में प्रयुक्त कीटनाशकों एवं रासायनिक उर्वरकों ने भी जल प्रदूषण की समस्या को बढ़ाने में अपना योगदान दिया है। जल प्रदूषण के कारण मानव तो बुरी तरह प्रभावित होते ही हैं, जलीय पौधों एवं जलीय जंतु तथा पशु–पक्षी भी प्रभावित होते हैं।

विश्व भर में 80 प्रतिशत से भी अधिक रोगों का कारण प्रदूषित जल ही है। प्रदूषित जल से हैजा, पेचिश, टायफायड, पीलिया, पेट में कीड़े और यहाँ तक कि मलेरिया, जो कि गंदे ठहरे पानी में पाये जाने वाले मच्छरों के कारण होता है। आजकल जल प्रदूषण के कारण भारत की अधिकांश नदियां अत्यधिक प्रदूषित हो चुकी हैं। नदियों में कारखानों द्वारा छोड़े गये प्रदूषित जल से पानी विषाक्त हो जाता है तथा बड़े पैमाने पर जलीय जीव–जंतु जैसे–मछलियां, कछुए आदि जंतु मृत्यु को प्राप्त हो जाते हैं। महासागरों एवं समुद्रों में तैलीय पदार्थों एवं हाइड्रोकार्बन के सागरीय सतह पर फैल जाने की वजह से जलीय जीवों को ऑक्सीजन नहीं मिल पाती और वे मर जाते हैं। हालात इतने चिंताजनक हो चुके हैं कि कई जलीय जीवों की प्रजातियां समाप्ति के कगार पर हैं। प्रदूषित जल, जलीय जीवों की प्रजनन शक्ति पर भी नकारात्मक प्रभाव डालता है। भारी धातुओं जैसे–पारा, सीसा, तांबा, जस्ता, कैडमियम,

क्रोमियम आदि द्वारा प्रभावित मछलियों को खाने से मनुष्य के मस्तिष्क एवं स्नायु तंत्र को क्षति पहुंचती है। घरेलू वाहित मल आदि से फास्फेट्स एवं नाइट्रेट्स की मात्रा जल में अधिक हो जाती है। जिसके कारण जल में नील हरित शैवाल (Blue-green algae) की संख्या बढ़ जाती है व जल में ऑक्सीजन की मात्रा में कमी हो जाती है। इस कारण जलीय जीव–जंतु मर जाते हैं।

जीव–जंतुओं के अतिरिक्त जलीय पौधे भी जल प्रदूषण से प्रभावित होते हैं। प्रदूषित जल में काई की अधिकता से सूर्य का प्रकाश गहराई तक नहीं पहुँच पाता, जिससे जलीय पौधों की प्रकाश संश्लेषण क्रिया और उनकी वृद्धि प्रभावित होती है। जल प्रदूषण के कारण जल में फास्फेट एवं नाइट्रेट युक्त कार्बनिक यौगिकों के मिलने से जल में पोषक तत्वों की अप्रत्याशित वृद्धि होती है। इसे 'यूट्रोफिकेशन' कहा जाता है। यूट्रोफिकेशन के चलते जलकुंभी या आइकार्निया पौधों से जल की सतह पट जाती है। जिससे धीरे–धीरे स्वैम्प, मार्श गैसों आदि का निर्माण होता है और अन्ततः जलस्रोत में उपस्थित पानी सड़ने लगता है। इसके अलावा औद्योगिक बहिस्रावों में पाये जाने वाले विषैले पदार्थों की उपस्थिति के कारण जल में पाये जाने वाले लाभदायक जीवाणु मर जाते हैं जो कि जल के जैव–शुद्धिकरण (Bio-purification) के काम आते हैं। जल में उपस्थित सूक्ष्म फाइटोप्लेन्कटॉन्स भी जलीय प्रदूषण के कारण प्रतिकूल रूप से प्रभावित होते हैं। ये फाइटोप्लेन्कटॉन्स सूक्ष्म जंतुओं एवं मछलियों का भोजन होते हैं। इनके प्रतिकूल रूप से प्रभावित होने से पूरा जलीय पारिस्थितिक तंत्र प्रभावित होता है।

वायु तथा जल प्रदूषण के प्रभावों के पश्चात् अब भूमि प्रदूषण के संबंध में चर्चा करते हैं। भूमि का प्राकृतिक संसाधनों में अपना महत्वपूर्ण स्थान है। विभिन्न प्रकार के रासायनिक प्रदूषणों तथा अन्य अपशिष्ट पदार्थों का विलय प्रायः भूमि में होता रहता है। जिसके कारण भूमि प्रदूषित हो जाती है। भूमि प्रदूषण के कारकों में जीवनाशक रसायन, कृत्रिम उर्वरक, नगरीय अपशिष्ट पदार्थ, जहरीले अकार्बनिक पदार्थ व कार्बनिक पदार्थ प्रमुख रूप से उल्लेखनीय हैं। भूमि प्रदूषण का प्रभाव भी पौधों एवं जंतुओं पर पड़ता है।

भूमि प्रदूषण फसलों और पौधों की पैदावार को कम कर देते है। यह मिट्टी और प्राकृतिक पोषक तत्वों के नुकसान का कारण बनता है, जिससे फसल उत्पादन में कमी आती है। भूमि प्रदूषण से मिट्टी के भौतिक और रासायनिक गुण प्रभावित हो रहे हैं। आम तौर पर ठोस अपशिष्ट पदार्थों को मिट्टी के नीचे दबा दिया जाता है। इससे मिट्टी की उत्पादन क्षमता पर प्रतिकूल प्रभाव पड़ता है और पेड़–पौधों की वृद्धि रूक जाती है। कभी–कभी लोग गटर के पानी से खेतों की सिंचाई करते हैं। इससे दिन–प्रतिदिन मिट्टी में मौजूद छिद्रों की संख्या कम हो जाती है। बाद में एक स्थिति ऐसी आती है कि भूमि के प्राकृतिक मल–जल उपचार प्रणाली पूरी तरह से नष्ट हो जाती है। जब भूमि ऐसी स्थिति में पहुँचती है तो उसे बीमार भूमि कहा जाता है। ऐसी भूमि पर होने वाली कृषि पर विपरीत असर पड़ता है।

भूमि की एक ग्राम मिट्टी में लगभग 100 मिलियन बैक्टीरिया, अनेक प्रकार के कवक, शैवाल, कीट व केंचुए इत्यादि होते हैं। भूमि प्रदूषकों जैसे रसायनों, कीटनाशकों के प्रयोग से मिट्टी में पाये

जाने वाले सूक्ष्म जीवों का जीवन–चक्र प्रभावित होता है। जिसका असर भूमि की उर्वरा क्षमता पर पड़ता है तथा साथ ही भूमि का परितंत्र भी प्रतिकूल रूप से प्रभावित होता है।

भूमि में कूड़ा करकट एवं गंदगी की अधिकता हो जाने से उनमें कीड़े–मकौड़े के पनपने की स्थितियां उत्पन्न हो जाती हैं। परिणामस्वरूप मच्छर, मक्खी, चूहों, बिच्छुओं की संख्या बढ़ती है, जो पेचिश, हैजा, आंत्रशोध, टाइफाइड, यकृत रोग, पीलिया आदि के कारण बनते हैं।

रूस, चीन और भारत दुनिया के ऐसे देशों में से हैं जहाँ जहरीली जमीन का प्रदूषण तेजी से फैल रहा है। यूक्रेन में चेरनोबिल को दुनिया के सबसे बड़े परमाणु दुर्घटना के लिए याद किया जाता है। परमाणु ऊर्जा दुर्घटनाओं के बाद प्रदूषक भूमि में प्रवेश करते हैं जिससे लाखों एकड़ कृषि भूमि क्षतिग्रस्त होती है। दक्षिण अफ्रीकी देश जाम्बिया में कबार्ड की जमीन, 1987 में भारी धातुओं के प्रदूषण से बुरी तरह प्रभावित हुई थी। पेरू में ला ओराया स्थान पर सीसा, तांबा और जस्ता के अत्यधिक खनन से मिट्टी विपरीत रूप से प्रभावित हुई थी। मिट्टी में आर्सेनिक जैसे विषाक्त रसायनों के अत्यधिक होने, कोयला खनन और अन्य प्रदूषकों के कारण चीन की लिनफेन सिटी की भूमि अत्यधिक प्रदूषित हो गई। भारत में गुजरात के वापी शहर में पेट्रोकेमिकल्स, कीटनाशकों जैसे रसायनों के अत्यधिक उत्पादन के कारण वहाँ की जमीन विषाक्त हो गई है। भूमि प्रदूषण के कारणों में काँच, प्लास्टिक, पालीथीन बैग्स, टिन आदि भी आते हैं। एक ही स्थान पर एकत्रित होने के कारण सूक्ष्म जीवों द्वारा इनका पूर्ण विघटन संभव नहीं हो पाता है, फलस्वरूप भूमि प्रदूषित होती है। पॉलीथीन बैग्स पर यद्यपि सरकार ने प्रतिबंध लगा दिया है, फिर भी इनका इस्तेमाल हो रहा है। इन्ही पॉलीथीन बैग्स के कारण कई जीवों जैसे गाय, भैंस, बकरी आदि की जान भी चली जाती है।

वायु, जल एवं भूमि प्रदूषण की तरह ध्वनि प्रदूषण भी मानव, जीव–जंतुओं एवं पादपों के लिए हानिकारक होता है। पर्यावरणीय स्वास्थ्य मानक के अनुसार ध्वनि प्रदूषण या शोर एक ऐसी अवांछनीय ध्वनि है, जो कि व्यक्ति, समाज के लोगों एवं जीव–जंतुओं के स्वास्थ्य और रहन–सहन पर प्रतिकूल प्रभाव डालती है। ध्वनि की तीव्रता मापने के लिए डेसीबेल इकाई निर्धारित की गयी है। सामान्य वार्तालाप में ध्वनि का स्तर 55 से 60 डेसीबेल होता है। राकेट इंजन में ध्वनि का स्तर 180 से 195 डेसीबिल तक पहुँच जाता है।

विभिन्न वैज्ञानिक प्रयोगों के आधार पर यह ज्ञात हुआ है कि जब ध्वनि की तीव्रता 90 डेसीबेल से अधिक हो जाती है तो लोगों की श्रवण क्षमता पर प्रभाव पड़ता है। उच्च शोर के कारण लोगों में उच्च रक्तचाप, उत्तेजना, हृदय रोग, आँख की पुतलियों में खिंचाव, मांसपेशियों में खिंचाव, पांचन तंत्र में अव्यवस्था आदि हो जाते हैं। विस्फोटों तथा सोनिक बूम से अचानक आने वाली ध्वनि के कारण गर्भवती महिलाओं में गर्भपात भी हो सकता है। दीर्घ अवधि तक ध्वनि प्रदूषण के कारण लोगों में न्यूरोटिक मेंटल डिसआर्डर हो जाता है। स्नायुओं में उत्तेजना हो जाती है।

अन्य जीव–जंतुओं पर ध्वनि का असर मानव जाति से अधिक होता है। चूँकि इंसानों के पास अन्य विकसित इंद्रियां हैं, उसे केवल सुनने पर निर्भर नहीं रहना पड़ता, परंतु जानवर अपने जीवन–यापन के लिए काफी हद तक अपनी सुनने की शक्ति पर ही निर्भर करते हैं। जानवरों पर ध्वनि

का असर तो हम अपने घरों में पालतू जानवरों पर ही देख सकते हैं। ये जानवर तेज आवाज से काफी डर जाते हैं या भड़क जाते हैं। यह उनकी सेहत पर सीधा प्रभाव डालता है। जंगलों में रहने वाले जंतु भी ध्वनि प्रदूषण से अछूते नहीं हैं। इन जानवरों की सुनने की शक्ति में कमी के कारण ये आसानी से शिकार बन जाते हैं। जो स्वाभाविक रूप से पूरे पारिस्थितिक तंत्र को प्रभावित करता है। इसके अतिरिक्त जो वन्य जीव प्रजनन के आमंत्रण के लिए ध्वनि पर निर्भर करते हैं, उन्हें भी खासी दिक्कत आती है क्योंकि मानव निर्मित ध्वनियों यानि शोर की वजह से उनकी ध्वनि दूसरा जीव सुन नहीं पाता। इस तरह ध्वनि प्रदूषण वन्य जीवों की जनसंख्या में गिरावट का कारण भी बनता है।

ध्वनि प्रदूषण वाले क्षेत्र जैसे सड़कों के किनारे, औद्योगिक क्षेत्रों और राजमार्गों के आस–पास क्षेत्रों में 4–6 पंक्तियों में वृक्षारोपण कर ध्वनि प्रदूषण को कम किया जा सकता है। घने पेड़ ध्वनि को फिल्टर करते हैं और इसे लोगों तक पहुँचने से रोकते हैं। अशोक एवं नीम के पेड़ ध्वनि प्रदूषण को कम करने में सहायक होते हैं।

औद्योगिकीकरण, शहरीकरण, अवैध खनन, विभिन्न स्वचालित वाहनों, कल–कारखानों, परमाणु परीक्षणों आदि के कारण आज पूरा पर्यावरण प्रदूषित हो गया है। इसका इतना बुरा प्रभाव पड़ा है कि संपूर्ण विश्व बीमार है। पर्यावरण की सुरक्षा आज की बड़ी समस्या है। इसे सुलझाना हम सबकी जिम्मेदारी है। इसे हमें प्राथमिकता प्रदान करनी चाहिए तथा प्रदूषण पर्यावरण की सुरक्षा में योगदान देना चाहिए। स्वच्छ एवं प्रदूषण रहित पर्यावरण आज की आवश्यकता है। यदि पर्यावरण निरोग होगा तो हम, जीव–जंतु और पौधे भी निरोगी रहेंगे।

7

CORPORATE SOCIAL RESPONSIBILITY AND ITS ROLE IN COMMUNITY DEVELOPMENT AND VALUE CREATION- A SUBJECTIVE STUDY OF COAL INDIA LIMITED

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"Businesses need to go beyond the interests of their companies to the communities they serve."

Ratan Tata

Corporate Social Responsibility is not an unfamiliar term. Over the last few years, several Indian companies have been trying to bring about a positive change in the society by engaging in CSR initiatives. It is a win –win situation for companies: they get to do well, and increase brand awareness while they are at it. Expenditure by Indian companies towards CSR has increased after the enactment of *Section 135 of the Companies Act, 2013*, which mandates corporations to direct two percent of their net profit towards social causes.

Concept of CSR:

Corporate social responsibility (CSR) refers to strategies corporations or firms conduct in a way that is ethical, society friendly and beneficial to community in terms of Development. CSR is evolving in its meaning and .It can be defined as operating a business in a manner that meets or exceeds the ethical, legal, commercial and public expectations that society has of business and it is viewed as a comprehensive set of policies, practices and programs that are integrated throughout business operations and decision- making processes that are supported and rewarded by top management.

Public sector enterprises have legal responsibilities to maximize shareholders profits, but a shift in corporate mindset led by social expectations and pressure is causing business leaders to rethink their responsibilities with respect to corporate performance measured in terms of economic impact, social impact and environmental impact commonly called Triple Bottom Line.

Some initiatives taken to bring this transitional approach were:

- *In 1992, the UN conference on Environment and Development (UNCED), Rio de* Janeiro attended by 172 countries was a key global landmark for CSR initiatives.
- The UN Global Compact (UNGC) the world's largest corporate social responsibility initiative was launched in 2000.Has over 13000, corporate participants across 170 countries.
- India became 1st country to have CSR mandated by law for specific companies under Clause 135 of the Companies Act 2013.
- CSR activities must be taken up by companies in project mode and cover activities given under ScheduleVII of the Companies Act 2013.

The increased interest in CSR has been accompanied by a substantial growth in the number of external standards produced for business by governmental, non-governmental, advocacy and other organizations. These standards are designed to support, measure, and assist in implementation and enhance accountability of corporate performance on CSR issues. Some standards are:

- Social Accountability 8000(SA8000)
- The Global Reporting's Initiative (GRI)
- United Nations Global Compact(UNGC)
- International Organisation for Standardisation (ISO-26000-2010).

CSR and Corporate Governance:

CSR can be viewed by businesses as a form of investment that helps to differentiate a company and its goods and services .The bottom line is that a prudent business may tend to regard CSR in the same way it treats most investment decisions. A rigorous and systematic approach to CSR investment is likely to yield the most positive results for both the business and society as it is likely to demonstrate the most efficient allocation of resources from the perspective of both the business and society.

Literature Review:

Mining operations damage the environment and ecology to an unacceptable degree, unless carefully planned and controlled.Therefore there is a need for balance between mining and environmental requirements. Further the problem of mining induced displacement and resettlementwhich poses major risks to social sustainability.

CIL is duly implementing CSR projects all over the country, matching with the local needs to win the confidence of the public, to facilitate the mining activities through its subsidiary companies scattered all over the country. Coal India Limited was formed as holding Company with 5 subsidiaries on 21.10.1975. The company is incorporated under the Companies act, 1956 and is wholly owned by the Government of India.CIL the holding Company with its headquarters at Kolkata, is the synonym of coal sector in India contributing 86 per cent of coal production.

About the Company*:*

Coal India today is the single largest coal producer in the world. Operating through 82 mining areas CIL is an apex body with 7 wholly owned coal producing subsidiaries and 1 mine planning and consultancy Company spread over 8 provincial states of India. It also manages 200 other establishments 'like workshops, hospitals etc.Further it also owns 26 Technical and Management Training Institutes and 102 Vocational training Institutes Centres. Indian Institute of Coal Management (IICM) as a state of the art Management Training 'Centre of Excellence'-the largest Corporate Training Institute in India-operates under CIL and conducts Multi disciplinary management development programmes.CIL is now Maharatna company –a privileged status conferred by GoI to select state owned enterprises in order to empower them to expand their operations and emerge as global giants.

The Indian Subsidiary companies of CIL are:

- Eastern Coal fields Limited
- Bharat Cooking Coal Limited
- Central Coalfields Limited
- Western Coalfields limited
- South Eastern Coalfields Limited
- Northern Coalfields Limited
- Mahanadi Coalfields Limited

One mine planning and consultancy company of CIL is Central Mine Planning & Design Institute Limited (CMPDIL).

Implementation, Governance and Monitoring Of CSR Activities:

The Board of every company which falls under the criteria of sub-section (1)of sec 135 shall after taking into the considerations the recommendation of CSR Committee, approve CSR Policy of the company and disclose its contents in its report and place it on the website of the company.The CSR Policy should be established as relevant to the context of company and compatible with law, in consultation with relevant stakeholders.

The main objective of the CSR policy is to lay down guidelines for the coal companies to make CSR a key business process for sustainable development for the Society. It aims at supplementing the role of the Govt.in enhancing welfare for the measures of the society based on the immediate and long term social and environmental consequences of their activities .CIL will act as a good Corporate Citizen, subscribing to the principles of Global Compact for implementation.

CSR Policy Implementation Mechanism*:*

CSR Sustainable Development Committee including CSR Committee was constituted by CIL Board of Directors in its 282nd meeting. This Committee was renamed as CSR Committee in pursuant to Section 135 of the Companies Act, 2013 and the Companies (Corporate Social Responsibility) Rules, 2014. In addition to CSR activities, this committee will also look after Sustainable Development. During the year 2017-18, four meetings of the committee were held on 12-06-2017, 02-08-2017, 16-02-2018 & 16-03-2018 respectively. Coal India's aim is to embrace peripheral community and disadvantaged sections of the society, through economic empowerment based on the capacity building.

CIL has its CSR policy approved by CIL Board. CSR policy sums up the strategy which CIL follows in the implementation of its CSR activities. The policy on CSR has been framed after incorporating the features of the Companies Act 2013 and as per notification issued by Ministry of Corporate Affairs, Govt. Of India as well as DPE's guidelines and covers the following:

- Welfare measures for the community at large so as to ensure the poorer section of the society derive the maximum benefits.
- Contribution to the society at large by way of social and cultural development ,imparting education ,training and social awareness specially with regard to the economically backward class for their development and generation of income to avoid any liability of employment.
- Protection and safeguard of environment and maintaining ecological balance.

As per CSR policy, the company's objective is to make CSR a key business process for sustainable development of the society. It aims at supplementing the role of the Govt. in enhancing welfare measures of the society based on the immediate and long term social and environmental consequences of their activities. The aim is to act as a good corporate citizen.

CIL is duly implementing CSR projects all over the country, matching with the local needs to win the confidence of the public, to facilitate the mining activities through its subsidiary companies scattered all over the country. Apart from improving the quality of lives of people, Coal India's CSR initiatives, also take them along towards the company's goal by partnering with them. While pursuing the enhancement of Coal production, CSR is being undertaken for inclusive growth of villagers and the nearby affected communities. Major activities undertaken are:

1) Training and preparation of Sports persons for Olympics and Para Olympics at project outlay of ' 75 crores ('25 crores per annum) through Ministry of Youth Affairs, Govt. of India.

2) Setting up 16 Continuous Ambient Air Quality Monitoring Stations in 10 cities at an outlay of ' 65 crores.

IMPLEMENTATION:- The Company has now a defined system of implementation and monitoring of CSR activities..For implementation of the CSR activities a CSR committee has been constituted at CIL, Subsidiary Headquarters and Area Level to interact with the concerned State officials, to confirm the areas for undertaking activities under CSR and to ensure avoidance of duplicity of the job.

MONITORING:- For monitoring of CSR activities a CSR cell was framed under Welfare Department at CIL corporate level and subsidiary level. Board Level Committee on CSR and Sustainable Development of CIL as well as subsidiaries shall review the implementation of CSR activities in every six months and recommend amount of expenditure to be incurred on CSR activities. Utilization Certificate with statement of expenditure duly certified by a Practicing Chartered Accountant/ Authorised Auditor will be submitted by the Organisation /Institution to whom CSR fund is allocated.

SOCIAL AUDIT & IMPACT ASSESSMENT OF THE PROJECTS

In order to have a look upon the ongoing activities related to CSR the company on normal basis performs social audit and also checks the impact of the activities on the society .Social Audit refers to a process for measuring, understanding and improving the social performance of an activity of the organization. It also measures and reports the social performance in order to achieve improvement and suggest course correction.

It is also an independent evaluation of the performance of an organization and an instrument to measure social accountability. Social Auditing enables an organization to assess and demonstrate its social, economic and environmental benefits. It is a way of measuring and evaluating the extent to which an organization or an entity has lived up to the agreed common social objectives.

The CSR Act, 2013 mandated Companies to undertake the programs on a project mode in accordance with its approved CSR policy, Social Audit become even more prominent to track and report the progress. Therefore, every corporate company has to evolve mechanisms to track and report the progress of social development programs mentioned under Schedule VII of the Act.

CSR ACTIVITIES OF CIL:

PREMASHRAYA – A home for underprivileged Cancer patients:

The objective is to provide accommodation for free or at highly subsidized rates to underprivileged cancer patients and their families that is neat, clean and hygienic.Itlincludes giving a sense of security and hope to the patients and thus aim to reduce the treatment dropout rates. Vocational training and education will also be provided. Special cancer awareness sessions are aimed at preventing and early detection of the disease.

Parameters of selection: India's National Cancer Registry reveals that a significantly large number of cancer cases are from Eastern India, with the highest incidence in some specific cancers in the region. Registration data of the past few years at various prominent cancer hospitals indicate that 25 to 30% of the patient registrations are from the eastern and north-eastern parts of the country. Hence, Kolkata is chosen for the intervention as after Tata Medical Centre (TMC) was founded, a large chunk of patients from these geographical regions come to TMC for cancer treatment. Most underprivileged people find it hard to arrange for accommodation and often resort to unhygienic places in some cases to streets also which negatively affects their ongoing treatment. Hence, the poor and underprivileged cancer patients are the targeted beneficiaries. Healthcare is chosen as a thematic area because cancer is increasingly becoming a leading cause of death in India with over 10 lakhs new cases every year and over 7 lakhs deaths every year.

FLAGSHIP PROJECT: Holistic Development of Forty Villages in Purulia District, West Bengal.

The objectives of the above project include:

- Installation of 11,483 Integrated Domestic Energy Systems (IDES) (An IDES

includes two components: One Solar Household Light (SHL) and one Improved Cook Stove (ICS)) in 40 villages and installation of 100 solar street lights at community places of these villages.

- Promotion of livelihood activities of 1250 households through different agriculture and greening activities and also to scale up innovative income generating activities that can be undertaken by poor farmers in their villages with resources at their command.
- Construction of individual household toilets in 40 villages in conjunction with the Govt. programme to make the villages Open Defecation Free (ODF).
- Creation of 40 KRCs **(**Knowledge cum Recreation Centres) in 40 schools for children with the aim of imparting them basic computer education and providing them contemporary knowledge through books on General Knowledge also to develop their reading habits.

Parameters of selection: Rural development project thematic area provides the scope of working holistically for the development of a rural area and transcends the sectoral boundaries. Hence, it was decided to choose this thematic area.

Beneficiary group for Energy, Agriculture and KRCs is the whole population of these villages. Since the problems which these interventions intend to solve are uniform for whole of the population of the village, the whole village population was selected as the beneficiary group. The agriculture activity covers 1250 households in 10 villages. These were shortlisted based on the primary occupation being agriculture, availability of land and favourable soil conditions for the intervention. Other intervention in this category are also based on these factors.Purulia district is one of backward districts of West Bengal as per the erstwhile Planning Commission. Also, a part of the district close to the two blocks of project implementation lies close to the coal field areas of Eastern Coalfields Ltd. (ECL), a subsidiary of CIL.

The following are the benefits that accrue from the above project to the society:

- All the interventions are replicable but some interventions like System of Rice Intensification (SRI), Fish farming, Handicraft and Pattal Dona Making can be readily replicated in other villages of the district also due to favourable weather and soil conditions and raw material availability.
- The Energy, Sanitation and KRC interventions exhaustively cover the 40 villages i.e. all the households/schools have been covered. However, under the Agriculture component, 1250 households in 10 villages have been covered and the activity can be scaled up to cover other villages also.

- Improved Cook Stove (ICS) is an innovative stove which produces less smoke and ignites fuel quickly. Less smoke improves the quality of life of women and reduces the chances of lung diseases in future while quicker combustion helps in use of less fuel and hence adds to household savings. Also, SRI has been used commercially for the first time in these villages.

Apart from the above Coal India through its various programs is working in different states on the following sectors:

- Education
- Water Supply including drinking water
- Health care by providing Indoor medical facilities and medicines
- Environment
- Infrastructure for village Electricity/ Solar Light/PawanChakki etc.
- Sports and Culture
- Generation of employment and setting up Co-operative Society
- Infrastructure Support
- Heritage Sites in the CSR purview ensuring involvement of employee's representatives in this project
- Empowerment of Women for education/health and self employment
- Relief of victims from Natural Calamities
- Disaster management Activities including those relating to amelioration/ mitigation.
- Collection of old clothes from the employees and distribution in the nearby village by utilizing the platform of MahilaSabha of the Company, Club and Women in Public Sector
- Development of smokeless fuel out of coal
- Adoption of village for carrying out the activities like infrastructural development eg road, water supply, electricity and community centre etc.

The above list is illustrative and not exhaustive.

CIL plans to prioritize sectors for CSR fund utilization. Since CIL and its subsidiaries operate in some of the remotest areas of the country which lack in basic infrastructure, CILs priority will be to develop basic healthcare, water supply and education infrastructure in these areas. A significant amount of the CSR budget for a particular year (say 70%) will be utilized on these priority areas.

Moreover, CIL intends to contribute significantly to the projects of national priority. One such upcoming project is Transformation of aspirational districts coordinated by NITI Aayog. Under this programme, 115 districts have been identified for undertaking development projects at a fast pace. Out of these 115 districts, CIL is operating in 13 districts. CSR is planning to undertake major works for infrastructure development and overall development of these districts through its CSR funds in the FY 18-19.

OUTCOME AND IMPACT OF CSR ACTIVITIES OF CIL:

CIL's CSR activities have positively impacted the society in various fields. CSR activities of CIL have helped in creation of basic infrastructure, have made people aware on key issues such as healthcare and sanitation, helped people fight fatal disease such as Cancer and Thalassemia and have made people employable through skill training. CIL has also contributed to women empowerment, environment conservation and welfare of armed forces veterans and war widows, Divyangjan and the elderly people. Providing good education facilities has been one of the core areas of CSR activities of CIL. SCs and STs form a sizeable chunk of beneficiaries of CSR activities of CIL and hence providing them opportunities for development. Overall. CSR activities of CIL and its subsidiaries have helped the poor, downtrodden and needy sections of the society taking a leap towards their holistic development**.**

FINDINGS AND RECOMMENDATIONS:

As a responsible business organization over the years, CIL is improving its business performance not only towards quality coal production in a sustainable manner, but also disclosing its business activities through Sustainability Reports as a part of the Annual Report of the company. CIL has been disclosing its business activity parameters through Sustainability Reports since 2011-12. Over the years it has improved its disclosures of business activities to comply with the SEBI mandate and the prevailing Global Reporting Initiative (GRI) guidelines. The report has covered the materiality issues, sustainability management, targets and achievements of CIL and steps taken to address the concerns raised by the stakeholders.

CIL has engaged ICFRE, Dehradun for Environmental Audit of OC Mines of CIL. The scope of work includes review of compliance of conditions laid down in Environment Clearance, approval by MoEF&CC for mitigation of environmental pollution. CIL has signed MoU with National Environmental Engineering Research Institute (NEERI), Nagpur on 3rd Dec. 2015 to carry out studies, monitoring and collaborative research work for "Sustainable Coal Mining in CIL". CIL is committed

for continual improvement of its business performance for strengthening the backbone of India's economy with continued support from its stakeholders.

CIL is already spending more than the statutory requirement of 2% of profit of last three years on CSR. It's important to have strict and accurate monitoring and evaluation plan as part of any successful project implementation and CSR projects are no exception.

CONCLUSION

CILs CSR activities have positively impacted the society in various fields. CSR activities of CIL have helped in creation of basic infrastructure, have made people aware on key issues such as healthcare and sanitation, helped people fight fatal disease and have made people employable through skill training. CIL has also contributed to women empowerment, environment conservation and welfare of armed forces veterans and war widows, Divyangjan and the elderly people. Providing good education facilities has been one of the core areas of CSR activities of CIL. SCs and STs form a sizeable chunk of beneficiaries of CSR activities of CIL hence providing them opportunities for development. Overall. CSR activities of CIL and its subsidiaries have helped the poor, downtrodden and needy sections of the society taking a leap towards their holistic development.

Being a coal giant & with one of the largest CSR budget, CIL has the opportunity to be more innovative and implement innovative CSR programmes which are scalable and replicable in bigger num.The company has launched a beta version of an online project monitoring mechanism for all CSR projects.

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8

पौराणिक साहित्यों में पर्यावरण की महत्ता

सरोज अनिल कुमार
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प्रस्तावना – **पौ**राणिक साहित्य का अर्थ है– प्राचीन कथाओं का विशद वर्णन। भारतीय जनमानस और विश्वजनमानस पर पौराणिक साहित्यों और चरित्रों का बहुत गहन प्रभाव परिलक्षित होता है। पुराण विश्व साहित्य के प्राचीनतम ग्रंथ है। उनमें लिखित ज्ञान और नैतिकता की बातें आज भी प्रासंगिक है। ये मानव सभ्यता की आधारशिला है। पुराणों का विषय नैतिकता, भूगोल, खगोल, राजनीति, संस्कृति, सामाजिक परम्परायें, विज्ञान, पर्यावरण तथा अन्य विषय है। विशेष तथ्य यह है कि पुराणों में देवी–देवताओं, राजाओं और ऋषि मुनियों के साथ साथ जन साधारण की कथाओं का भी उल्लेख किया गया है जिससे पौराणिक काल के सभी पहलुओं का चित्रण मिलता है। पौराणिक चरित्रों को मिथक भी कहा जाता है। मिथक शब्द अंग्रेजी के 'मिथ' का हिन्दी रूप है। यह शब्द हिन्दी जगत को आचार्य हजारी प्रसाद द्विवेदी से मिला। मिथ मूलतः ग्रीक भाषा का शब्द है जिसका अर्थ है– 'वाणी का विषय' वाणी का विषय से तात्पर्य है– एक कहानी, एक आख्यान जो प्राचीन काल में सत्य माने जाते थे और कुछ रहस्यमय अर्थ देते थे। मिथ शब्द के कुछ कोशगत अर्थ भी हैः– कोई पुरानी कहानी अथवा लोक विश्वास, किसी जाति का आख्यान, धार्मिक विश्वास, विश्वासों एवं प्रकृति के रहस्यों के विश्लेषण से युक्त देवताओं तथा वीर पुरूषों की पारंपरिक गाथा, कथन, वृत्त, किवदंती, परंपरागत कथा आदि।

पर्यावरण– परि+आवरण अर्थात् वह वातावरण जो हमें चारों ओर से ढके हुए हैं। इस प्रकार पृथ्वी का स्थल मण्डल, जलमण्डल तथा वायुमण्डल सभी पर्यावरण के अंग है। यदि यह कहा जाए कि यह संपूर्ण सृष्टि वृक्षों पर आश्रित है तो अतिश्योक्ति न होगी। जहाँ वृक्षों की उपेक्षा हुई वहाँ विनाश हुआ, जहां इन्हें महत्व दिया गया वहाँ सतयुगी सुख की अविरल गंगा प्रवाहित होती रही। प्रकृति भारतीयों के लिए सदा से पूजनीय रही है, चाहे कांति प्राप्ति के लिए सूर्य का पूजन हो, चाहे नारी को स्वामी की दीर्घायु का वरदान मांगना हो या निर्धन को कुबेर बनने का स्वप्न अथवा विद्यार्थी को विद्या प्राप्ति की कामना अथवा हमें जीवन प्रदान करने वाली नदियों की उपासना हो, इन सबके लिए हमें वेदों

की शरण में ही जाना पड़ता है। वेदों में वर्णित नदी, सागर, सूर्य, चंद्र, जल और वायु ये सभी हमारी आस्था के स्रोत रहे हैं। हमने तो वृक्षों से वरदान मांगना भी अपनी संस्कृति में समाहित कर लिया है। प्रकृति के अनेक वृक्षों का समय–समय पर पूजन करके हम यश और कीर्ति के अनुगामी बनते हैं। पुराणों के अनुसार वृक्षों की सेवा से सम्पूर्ण सृष्टि की सेवा करने का पुण्य फल प्राप्त होता है। वृक्षों की सेवा में जल से सिंचन का स्थान सर्वोपरि है। पर्याप्त जल पाने से वृक्ष के जीवन की रक्षा होती है। इन पर आश्रित प्राणियों को सुख मिलता है तथा पर्यावरण की रक्षा होती है। स्कन्दपुराण, भविष्योत्तर पुराण में तथा अन्य पुराणों में भी तुलसी, पीपल तथा बेल इत्यादि वृक्षों में धार्मिक मान्यताओं में जल सिंचन का प्रावधान मिलता है जो आज भी प्रचलित है। इसी तरह विभिन्न पुराणों में पर्यावरण संरक्षण तथा उनके महत्व को बताया गया है।

मूल शब्द

पौराणिक साहित्य, पर्यावरण संरक्षण, पुराण, संपूर्ण सृष्टि, वृक्षों की सेवा।

शोध का उद्देश्य

1. पौराणिक साहित्यों की प्रासंगिकता का वर्णन करना।
2. पौराणिक साहित्यों में वर्णित पर्यावरणीय दृश्यों के महत्व को स्पष्ट करना।
3. पर्यावरणीय प्रदूषणों की व्याख्या करना।
4. पर्यावरणीय संतुलन की बाधाओं का अध्ययन करना।
5. पर्यावरणीय विकास की योजना प्रस्तुत करना।
6. पौराणिक साहित्य एवं पर्यावरण के मध्य सम्बन्धों की व्याख्या करना।

विधितंत्र

किसी भी शोधपत्र की सफलता में उसके विधितंत्र का विशेष स्थान होता है। विधितंत्र के माध्यम से शोध निष्कर्षों में प्रमाणिकता की पुष्टि होती है। प्रस्तुत शोध पत्र में प्राथमिक एवं द्वितीयक स्रोतों से प्राप्त आंकड़ों को सम्मिलित किया गया है। आगमनात्मक एवं निगमनात्मक शोध विधियों का प्रयोग किया गया है। पौराणिक साहित्यों में पर्यावरण की महत्ता में पर्यावरण का विशेष ख्याल रखा गया है।

विश्लेषण एवं व्याख्या

यद्यपि वेद हिन्दू–धर्म का मूल और उपनिषद उसके अध्यात्म ज्ञान के भण्डार माने जाते है, पर वास्तव में इस समय देश में हिन्दू धर्म का जो रूप प्रचलित है उसका आधार पुराण ही है। वेद मुख्यतया कर्मकाण्ड का प्रतिपादन करते हैं, उपनिषदों ने ज्ञान की गंगा बहाई है और पुराणों ने भक्ति मार्ग को जन्म दिया है। आजकल की जनता कर्मकाण्ड को भूल चुकी है, ज्ञान मार्ग पर चलना उसके लिए कठिन है इसलिए भक्ति का सरल और सुगम मार्ग ही साधारण लोगों के चित्त में समा गया है और वे विष्णु,

शिव, गणेश, देवी, सूर्य आदि किसी देवता के साकार रूप की आराधना और नाम कीर्तन द्वारा ही धर्म साधन की चेष्टा किया करते है। पुराणों की संख्या 18 है, इनके नाम हैं– 1. ब्रम्हपुराण, 2. पद्मपुराण, 3. विष्णुपुराण, 4. शिवपुराण, 5. भागवतपुराण, 6. नारदपुराण, 7. मार्कण्डेयपुराण, 8. अग्निपुराण, 9. भविष्यपुराण, 10. ब्रम्हवैवर्तपुराण, 11. लिंगपुराण, 12. वराहपुराण, 13. स्कन्दपुराण, 14. वामनपुराण, 15. कूर्मपुराण, 16. मत्स्यपुराण, 17. गरूड़पुराण, 18. ब्रह्मांडपुराण।

इनके अतिरिक्त 29 उपपुराण भी हैं जिनमें वायुपुराण, नरसिंहपुराण, ब्रह्मांडपुराण देवी भागवत आदि का नाम प्रसिद्ध है। इनमें से कुछ पुराणों में विष्णु को प्रधान बतलाया गया है और कुछ में शिव को तथा लगभग सभी पुराणों में पर्यावरण को विशेष महत्व दिया गया है। जो हमारे लिए आज उपयोगी और प्रासंगिक है।

पौराणिक साहित्यों में वर्णित पर्यावरणीय दृश्य का महत्व

पर्यावरण के संतुलन में वृक्षों के महान योगदान एवं भूमिका को स्वीकार करते हुए मुनियों ने बृहत चिंतन किया है। मत्स्य पुराण में उनके महत्व को स्वीकार करते हुए कहा गया है कि दस कुओं के बराबर एक बावड़ी होती है, दस बावड़ियों के बराबर एक तालाब, दस तालाबों के बराबर एक पुत्र है और दस पुत्रों के बराबर एक वृक्ष होता है।

दश कूप समा वापी, दशवापी समाहद्रः।
दशहद समः पुत्रो, दशपुत्रो समो द्रुमः।।

इसी तरह अन्य पुराणों में भी पर्यावरण के घटकों को पूजनीय माना गया है। प्रकृति के इन घटकों में देवत्व का भाव भी दर्शाया गया है। यहाँ मिट्टी प्रस्तर के पहाड़ को देवात्मा हिमालय बताया है तो नदियों को देवी का पर्याय माना है, जिसमें पुण्यतोया गंगा का स्वरूप तो अवर्णनीय है। पुराणों के अनुसार ईश्वर संसार के कल्याणार्थ कभी मत्स्य का आकार ग्रहण करते हैं तो कभी कछुआ, हंस बनकर इनकी महत्ता प्रतिपादित करते हैं। सिंह और वाराह के रूप में आकर सभी जीवों की श्रेष्ठता घोषित करते हैं। इसीलिए भारतीय संस्कृति में सभी जड़ चेतन को दिव्य माना है। पुराणों की रचना का आधार भी सृष्टि के तत्वों को लेकर बना है। अनेक पुराणों का नामकरण भी इन तत्वों के नामों को लेकर हुआ है। अग्निपुराण, वायुपुराण आदि में यही भाव दिखाई देता है। इन सभी पुराणों में दिव्य प्रकृति का सहज वास है। ब्रम्हपुराण में गंगाजल की विशेषता खासतौर पर परिलक्षित होता है। वृक्ष मानवमात्र के लिए सतत प्राणदायक वायु का संचार करते हैं। यही वजह है कि भारतीय ऋषियों महर्षियों ने वृक्षों के प्रति अगाध अनुराग भावना प्रदर्शित की है। यहां पर वृक्ष पूजा का प्रचलन अति प्राचीन है। देवदार को देवताओं का प्रिय वृक्ष कहा जाता है। तुलसी को वायु के शोधन एवं पवित्रता के लिए हर आंगन में रोपने की प्रथा है। पौराणिक मान्यता के अनुरूप ही अपने यहाँ पीपल, पलाश, नीम, अशोक, बरगद, कदंब–आंवला आदि अनेक वृक्षों को देवता के सदृश पूजा जाता है। प्राचीनकाल में तो वृक्षों के साथ वनों की भी पूजा होती थी। इसीलिए मधुवन, वृहदवन, बहुलवन, कुमुदवन, श्रीवन, नंदनवन आदि वनों का वर्णन मिलता है। इन सभी उपक्रमों एवं प्रयासों के पीछे पर्यावरण को संरक्षित करने की विशेषता

ही झलकती है। पुराणों का समय वेदकाल से प्रारम्भ होकर सोलहवीं शताब्दी के अंतिम कालखंड तक माना गया है। इतनी लंबी अवधि में भी पर्यावरण के प्रति पर्याप्त सजगता एवं जारूकता का रूझान मिलता है। इसके अलावा इतिहास के पृष्ठों में दबे तमाम तथ्यों को देखने पर पता चलता है कि इन दिनों भी पर्यावरण को कानूनी संरक्षण प्राप्त था।

वेदों को सृष्टि विज्ञान का मुख्य ग्रंथ माना गया है। इनमें सृष्टि के जीवनदायी तत्वों की विशेषताओं का काफी सूक्ष्म व विस्तृत विवरण है। यजुर्वेद का अध्ययन इस तथ्य की ओर संकेत करता है कि उसके शांति पाठ में पर्यावरण के सभी तत्वों को शांत और संतुलित बनाए रखने का भाव है, वहीं इसका तात्पर्य है कि समूचे विश्व का पर्यावरण संतुलित और परिष्कृत हो। इसमें उल्लेख है कि पृथ्वी के सभी जैविक–अजैविक घटक संतुलन की अवस्था में रहें। अदृश्य आकाश, पृथ्वी एवं उसके सभी घटक, जल, औषधियाँ, वनस्पतियां व संपूर्ण संसाधन एवं ज्ञान शांत रहे। पर्यावरण के प्रति इतना गहन एवं सूक्ष्म ज्ञान का दिग्दर्शन अन्यत्र दुर्लभ है। ऋग्वेद में वायु के औषधीय महत्व को स्वीकारा गया है। ऋग्वेद की ऋचा कहती है– हे वायु ! अपनी औषधि ले आओ और यहाँ सब दोष दूर करो, क्योंकि तुम ही सभी औषधियों से भरपूर हो। ऋग्वेद का एक अन्य मंत्र जल की शुद्धता का वर्णन करते हुए कहता है, आओ सभी मिलकर प्रवाहित जल के प्रशंसा के गीत गाएं जो हजारों धाराओं से बहकर आंखों को आनंद देता है। उपनिषदकारों ने ऊर्जा के अपरिमित स्रोत सूर्य को जगत की आत्मा कहकर उसकी अभ्यर्थना की है, सूर्य को प्राण की संज्ञा दी है। यज्ञों के माध्यम से वायुमंडल को शुद्ध करना भी वेदों का विषय रहा है। वैदिक काल में पर्यावरण के परिष्कार के लिए यज्ञ–हवन संपन्न किए जाते थे। सामवेद में जीवन की मंगल कामना और प्रकृति की अविरल उपासना के भाव वर्णित है। इसमें वनस्पतियों और पशुजगत तथा औषधि विज्ञान के सुंदर मंत्रों के उद्धरण हैं। सामवेद कहता है– हे इंद्र, सूर्य रश्मियों और वायु से हमारे लिए औषधि की उत्पत्ति करो। हे सोम, आपने ही औषधियों, जलों और पशुओं को उत्पन्न किया है। अथर्ववेद में भी पर्यावरण संरक्षण और संवर्धन संबंधी चिंतन का गौरवगान हुआ है। पृथ्वी सूक्त में अथर्वण ऋषिधरा की महानता, उदारता, सर्वव्यापकता आदि अनंत गुणों पर विस्मित हो कह उठते हैं, हे माता ! आपके लिए ईश्वर ने शीत, वर्षा तथा बसंत ऋतुएं बनाई हैं। दिन–रात के चक्र स्थापित किए हैं। इस कृपा के लिए हम ईश्वर के आभारी हैं। वे खनन से पूर्व धरती माता से प्रार्थना करते है कि हे माँ जीविकोपार्जन के लिए हम ऐसा करने को बाध्य हैं, किन्तु हम ईश्वर से प्रार्थना करते हैं कि वह तुम्हें पुनः हरा–भरा कर दे। हम भूमि के जिस स्थान पर खनन करें वहाँ शीघ्र ही हरियाली छा जाए। आपसे प्रार्थना है कि ऐसी सद्बुद्धि दें जिससें हम आपके हृदय स्थल को न तो आहत करें, और न ही आपको दुःख पहुँचाएं। व्यक्ति स्वस्थ, सुखी दीर्घायु रहे, नीति पर चले और पशु वनस्पति एवं जगत के साथ साहचर्य रखे, यही वैदिक साहित्य की विशेषता है। वैदिक कर्मकांडों की अनेक विधाओं ने भी पर्यावरण संरक्षण और सुरक्षा का दायित्व निभाया है। अरण्यों में रहकर पर्यावरण के प्रति विशेष जागरूक रहने वाले ऋषियों ने आरण्यक साहित्य का सृजन कर विश्व में पर्यावरण के महत्व को रेखांकित किया है।

उपनिषदों में जल, वायु, पृथ्वी और अंतरिक्ष का विशद् वर्णन हुआ है। इसमें प्रकृति की महत्ता को पर्याप्त मान्यता प्रदान की गई है। इनके अनुसार पदार्थ की उत्पत्ति एवं जीव–जगत की सृष्टि अग्नि जल और पृथ्वी के विनियोग से हुई है। छांदोग्य उपनिषद में स्पष्ट उल्लेख है कि पृथ्वी, जल और पुरूष सभी प्रकृति के घटक हैं। पृथ्वी का रस जल है और जल का रस औषध है। औषधियों का रस पुरूष है, पुरूष का रस वाणी, वाणी का ऋचा, ऋचा का साम और साम का रस उद्रीथ है, अर्थात पृथ्वी तत्व में ही सब तत्वों को प्राणवान बनाने के प्रमुख कारण है।

रामायण काल में भी पर्यावरण चेतन पर्याप्त सक्रिय थी। बाल्मीकि रामायण में राम के वन गमन के समय प्रकृति के मनोरम दृश्य का उल्लेख किया गया है। इस समय पर्वत प्रदेश, घने जंगल एवं रम्य नदियों के किनारे सारस और चक्रवाक पक्षी आनंद में विचरण कर रहे थे। सुंदर जलाशय में कमल दल खिले हुए थे। जंगलों में झुंड के झुंड हिरन, गैंडे, बाराह और हाथी निर्भय घूम रहे थे अर्थात् उन दिनों पर्यावरण अत्यंत समृद्ध था। रामचरितमानस के उत्तरकांड में वर्णन मिलता है कि चरागाह, तालाब, हरित भूमि, वन, उपवन के सभी जीव आनंदपूर्वक रहते थे।

महाभारतकालीन मनीषियों ने भी पर्यावरण की गौरव गरिमा को महिमा गंडित किया है। इस काल में भगवान कृष्ण द्वारा गीता में प्रकृति को सृष्टि का उपादन कारण बताया गया है। श्रीकृष्ण कहते हैं प्रकृति के कण–कण में सृष्टि का रचयिता समाया हुआ है। प्रकृति के समस्त चमत्कारों को परमेश्वर का स्वरूप बताते हुए श्रीकृष्ण कहते हैं कि मैं ही पृथ्वी में प्रवेश करके सभी प्राणियों को धारण करता हूँ। चंद्रमा बनकर औषधियों का पोषण करता हूँ। महाभारतकाल में प्रत्येक तत्व को देवता सदृश स्वीकार कर उनकी अभ्यर्थना की जाती थी। उन दिनों वृक्षों की पूजा का प्रचलन था। वृक्षों को काटना महापाप समझा जाता था।

महाकवि कालिदास ने भी अपने नाटकों एवं काव्यों में पशु–पक्षी वृक्षादि से मानवीय जीवन का अपूर्व संबंध स्थापित किया है। अभिज्ञान शकुंतलम् ने तो इन रिश्तों व संबंधों को सजीव कर दिया है। कण्व आश्रम में पली बढ़ी शकुंतला अपने चारों ओर के परिवेश एवं वातावरण से इतना एकात्म हो गई थी कि उसका विछोह सभी को विहल कर रहा था। उसकी विदाई के समय पशु–पक्षी ही नहीं वनस्पति जगत भी उदास हो गया था।

पर्यावरणीय प्रदूषणों की व्याख्या

पर्यावरण को प्रत्यक्ष अथवा परोक्ष रूप से प्रदूषित करने वाला प्रक्रम जिसके द्वारा पर्यावरण (स्थल, जल अथवा वायुमंडल) का कोई भाग इतना अधिक प्रभावित होता है कि उसमें रहने वाले जीवों के लिए अस्वास्थकर, अशुद्ध, असुरक्षित तथा संकट पूर्ण हो जाता है अथवा होने की संभावना होती है। पर्यावरण प्रदूषण सामान्यतः मनुष्य के इच्छित अथवा अनिच्छित कार्यों द्वारा पारिस्थितिक तंत्र में अवांछित एवं प्रतिकूल परिवर्तनों के परिणामस्वरूप उत्पन्न होता है, जिससे पर्यावरण की गुणवत्ता में ह्रास होता है और वह मनुष्यों, जीवों तथा पादपों के लिए अवांक्षित तथा अहितकर हो जाता है। पर्यावरण प्रदूषण

में भौतिक प्रदूषण जैसे स्थल प्रदूषण, जल प्रदूषण, वायु प्रदूषण, ध्वनि प्रदूषण आदि आते हैं। आधुनिक परमाणु, औद्योगिक, श्वेत एवं हरित क्रान्ति के युग की अनेक उपलब्धियों के साथ–साथ आज के मानव को प्रदूषण जैसी विकराल समस्या का सामना करना पड़ रहा है। वायु जिसमें हम सांस लेते हैं, जल जो जीवन का भौतिक आधार है एवं भोजन जो ऊर्जा का स्रोत है–ये सभी प्रदूषित हो गए हैं।

पर्यावरणीय संतुलन की बाधाओं का अध्ययन

पूरे विश्व का लालन–पालन करने के लिए पृथ्वी पर प्रकृति जन्य वे सभी चीजें जो उसमें जीवन के लिए आवश्यक है, पृथ्वी पर मनुष्य, पशु–पक्षी, पेड़ पौधे एवं अन्य सभी जीव–जंतु एक ऐसे प्रकृति प्रदत्त चक्र से बंधे हुए हैं, जिसमें वे अपने जीवन को सफलतापूर्वक चला सकें। लेकिन कभी–कभी पर्यावरण संतुलन की बाधाओं में दैनिक आपदाओं, प्रकृति जन्य बदलाव के कारण या कभी मानवीय क्रिया–कलापों के कारण प्रकृति चक्र टूटते हैं, जिससे पर्यावरण असंतुलित होता है और सभी प्राणी असंतुलन से प्रभावित होते हैं। इस असंतुलन से पैदा हुई विषमताओं के कारण बड़ी–बड़ी सभ्यताएं समाप्त हो गई। पशु–पक्षियों, पेड़ पौधों एवं अन्य जीवों की पूरी जाति समाप्त हो चुकी है। वर्तमान में भी पेड़ पौधों एवं पशु–पक्षियों की कई प्रजातियाँ समाप्त हो चुकी हैं या समाप्त होने के कगार पर हैं और इसमें बहुत बड़ा योगदान मानव जाति के क्रिया–कलापों का है। मनुष्य के क्रिया–कलापों में मुख्य रूप से युद्ध के कारण प्रयोग किए गए रासायनिक एवं आणविक हथियारों ने प्रकृति को दुष्प्रभावित किया है। इस प्रयास में प्रकृति का आवरण छिन्न–भिन्न हुआ है, जिससे प्रकृति का संतुलन बिगड़ा है। लेकिन वर्तमान में जहाँ सुख–सुविधा के लिए प्रयुक्त होने वाली सामग्री तथा विद्युत आदि के निर्माण, उत्पादन के लिए कार्यरत कल–कारखानों, ताप विद्युत गृहों से निकलने वाली विषैली गैसों, दूषित पानी तथा अन्य विषाक्त पदार्थों से भी प्रदूषण फैल रहा है वहीं दूसरी ओर इन्हें रोकने या कम करने वाले पेड़ों और पौधों को अंधाधुंध काटने के कारण प्रकृति प्रदूषण रोकने में सफल नहीं हो पा रहे हैं। जिस प्रकार ऊर्जा के स्रोतों का उपयोग किया गया है उससे जल और वायु के प्रदूषण में वृद्धि, भूमि का अनउपजाऊ होना, नदियों के जल का कम तथा दूषित होना, ध्वनि प्रदूषण, रेडियोधर्मी विकिरण का बढ़ना आदि समस्याएं मुख्य हैं। इनके कारण पृथ्वी का पर्यावरण संतुलन छिन्न–भिन्न हो गया है। ये सब कारण है जो पर्यावरणीय संतुलन में बाधा उत्पन्न कर रहे हैं। इन सबसे छुटकारा पाने की आवश्यकता है।

पर्यावरणीय विकास की योजना

पर्यावरणीय विकास एवं संरक्षण हेतु भारतीय संविधान विश्व का पहला संविधान है जिसमें पर्यावरण संरक्षण के लिए विशिष्ट प्रावधान है। पर्यावरण से संबंधित समस्याओं और विकास हेतु भारत सरकार ने चौथी पंचवर्षीय योजना के दौरान विशेष ध्यान देते हुए 1972 में विज्ञान एवं प्रौद्योगिकी के तहत राष्ट्रीय पर्यावरण आयोजन एवं समन्वय समिति का गठन किया। अनुच्छेद 48ए(छ) राज्य, देश के पर्यावरण की सुरक्षा एवं संरक्षण तथा उसमें सुधार करने का और वन तथा वन्य जीवों की रक्षा करने का प्रयास करेगा। अनुच्छेद 51ए(छ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी और वन्य

जीव है, रक्षा करें और उसका संवर्द्धन करें तथा प्राणिमात्र के प्रति दया मान रखें। भारतीय दंड विधान की धारायें 268, 269, 272, 277, 278, 284, 290, 298 तथा 426 में प्रदूषण के लिए दंडात्मक प्रावधान है।

पर्यावरणीय विकास हेतु भारत सरकार ने कुछ कार्यक्रम चलाये हैं जो निम्न हैं–

(1) राष्ट्रीय स्वच्छ वायु कार्यक्रम

वायु प्रदूषण को रोकने के लिए अलग–अलग नीतियों वाले दृष्टिकोण को बदलना होगा तथा इसके स्थान पर व्यापक और एकजुट कार्ययोजना लागू करनी होगी। राष्ट्रीय स्वच्छ वायु कार्यक्रम के अंतर्गत 100 से अधिक शहरों का विकास किया गया है तथा स्वच्छ वायु योजनाएं लागू की गई हैं।

(2) एक बार इस्तेमाल किया जाने वाला प्लास्टिक

एक ही बार इस्तेमाल में आने वाले प्लास्टिक पर वर्ष 2022 तक प्रतिबंध लगाने के संकल्प को अमल में लाना होगा।

(3) स्वच्छ भारत अभियान

सरकारें आती–जाती रहती हैं लेकिन सफल कार्यक्रमों को जारी रखना चाहिए। स्वच्छ भारत अभियान ऐसा कार्यक्रम है जिसे स्थाई बनाने के लिए इसे मजबूत करना होगा। भारत सरकार पर्यावरणीय विकास एवं संरक्षण हेतु इस तरह की कई योजनाएं चला रही हैं।

निष्कर्ष

पौराणिक साहित्यों में पर्यावरण की महत्ता शीर्षक से विवेचित–विश्लेषित तथ्यों के आधार पर यह निष्कर्ष निकलता है कि चारों ओर से परिव्याप्त आवरण या घेरा ही पर्यावरण, वातावरण या परिवेश है। यह वह परिवेश है जिसका प्रत्यक्ष अथवा परोक्षतः मानव अनिवार्य रूप से उपभोग करते हैं। सामान्यतः पर्यावरण के अन्तर्गत प्रकृतिजन्य सभी तत्व, अंतरिक्ष, जल, वायु, अग्नि, ऋतुएं, पर्वत, नदियां, सरोवर, फूल, पत्ती, वृक्ष, वनस्पति, पशु–पक्षी, जीव–जन्तु, ग्रह–नक्षत्र आते हैं। वातावरण के ये सभी तत्व मानव जीवन को प्रभावित करते हैं और ये स्वयं भी मानवीय कृत्यों से प्रभावित होते हैं। मानव का नैसर्गिक, जन्मसिद्ध तथा मौलिक अधिकार है कि वह ऐसे स्वस्थ, स्वच्छ और शुद्ध पर्यावरण में रहे, जिसमें पारिस्थितिकी संतुलन हो तथा उसका परिवार, उसका पशुधन, उसकी कृषि योग्य भूमि उसके जलस्त्रोत सभी तरह के प्रदूषण से मुक्त रहे।

वैदिक काल से ही भारतीय सभ्यता जीवन निर्वाह की अर्थ व्यवस्था के बजाय समृद्धि के अर्थदर्शन पर आधारित थी। संहारक जलवायु की तबाही के बावजूद प्रकृति काफी हद तक उदार थी। प्रकृति और समाज में एक संतुलन था। मनुष्य और प्रकृति के बीच समरसता थी। राम और कृष्ण विषयक काव्यों में पारिस्थितिकी की यह समरसता देखने को मिलती है। मानव के यह मानवीय गुण उसके ह्रदय की कोमलता उसे प्रकृति के प्रति अनुदार नहीं होने देती थी।

इस प्रकार निष्कर्ष रूप में हम कह सकते हैं कि पौराणिक साहित्यों में पर्यावरण को विशेष महत्व दिया गया। वेद, पुराण, महाभारत, रामायण तथा रामचरित मानस जैसे पौराणिक साहित्यों में पर्यावरण की महिमा को बताते हुए संरक्षण दिया गया है। जिसे आज के आधुनिक दौर में हमें पौराणिक साहित्यों से आदर्श रूप में ग्रहण करने की जरूरत है तभी हम पर्यावरण को आगे आने वाले जीवन के लिए सुरक्षित कर पायेंगे।

संदर्भ सूचीः–

रघुवंशी, डॉ अरूण	–	पर्यावरण और प्रदूषण
ठाकुर, छाया	–	अथर्ववेद में पर्यावरण की अवधारणा
श्रीवास्तव, उर्मिला	–	महाकवि कालिदास की शकुन्तला और पर्यावरण (आलेख)
शुक्ल, हीरालाल	–	प्राचीन संस्कृत साहित्य में पर्यावरण चेतना की पारिस्थितिकी (आलेख)
दास, तुलसी	–	रामचरित मानस
शर्मा, डॉ. श्याम सनेही लाल	–	वैदिक साहित्य में पर्यावरण चिन्तन पौराणिक साहित्य में पर्यावरण चिंतन

9

नगरीकरण का भारतीय महिलाओं पर प्रभाव

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सारांश

सामान्य अर्थों में नगरीकरण से अभिप्राय उस प्रक्रिया से है जिसमें ग्रामीण समुदाय के लोग नगरों में निवास करने लगते है तथा कृषि कार्यों को छोड़कर अन्य व्यवसाय अपनाने लगते है। इस प्रक्रिया में ग्रामीण समुदाय, नगरीय समुदाय में परिवर्तित होने लगता है। जिससे नगरों का विकास एवं प्रसार होता है। ग्रामीण से नगरीय बनने की इस प्रक्रिया में लोगों के व्यवसाय, समाज, संस्कृति, जीवन और रहन – सहन के स्तर तथा अन्य मानव मूल्यों में गुणात्मक और परिमाणात्मक परिवर्तन आते हैं। इन परिवर्तनों एवं प्रभावों का संपूर्ण स्त्री और पुरूष पर असर होता है। नगरीकरण की प्रक्रिया के प्रभाव से स्त्रियों के जीवन में अनेक परिवर्तन आये हैं। उनकी स्थिति समाज में अब पहले से मजबूत हुई है। वे शिक्षा, स्वास्थ्य, रोजगार एवं जीवन के समस्त अवसरों का समानता के साथ उपभोग करने लगी है। परन्तु इस प्रभाव एवं परिवर्तन का महिलाओं पर नकारात्मक प्रभाव भी देखने को मिला है जिसने उन्हें अनेक समस्याओं ने जकड़ लिया है।

प्रस्तुत शोध पत्र के माध्यम से नगरीकरण का भारतीय महिलाओं पर क्या प्रभाव पड़ा है, यह जानने का प्रयास किया गया है। प्रभावों के अध्ययन में नगरीकरण के सकारात्मक एवं नकारात्मक दोनों ही प्रभावों को जानने का प्रयास किया गया है।

शब्द संकेत – नगरीकरण, भारतीय महिलाएं, नगरीकरण के सकारात्मक एवं नकारात्मक प्रभाव।

नगरीकरण का भारतीय महिलाओं पर प्रभाव

नगरीकरण वह महत्वपूर्ण प्रक्रिया है जिसने भारत के परंपरागत सामाजिक ढांचे को बदलने में व्यापक योगदान दिया है। परिवर्तन की इस प्रक्रिया के कारण भारत की परंपरागत सामाजिक संस्थाओं, धार्मिक मनोवृत्तियों, आर्थिक व्यवस्था, परिवार के संगठन तथा सामाजिक संगठन में अनेक परिवर्तन

उत्पन्न होने लगे हैं। इसके अतिरिक्त नगरीकरण ने अनेक नयी सामाजिक समस्याओं को प्रोत्साहन देकर भी समाज की संरचना में परिवर्तन पैदा किये है। इसी कारण सामाजिक परिवर्तन के एक प्रमुख आधार के रूप में नगरीकरण को देखा जाता है।

नगरीकरण का अर्थ

सामान्य शब्दों में नगरीकरण वह प्रक्रिया है जिसके द्वारा ग्रामीण क्षेत्र नगरीय क्षेत्रों के रूप में बदलने लगते है तथा जनसंख्या के एक बड़े भाग में नगरीय जीवन की विशेषताओं का समावेश होने लगता है। इस आधार पर बर्गेल ने लिखा है ''ग्रामीण क्षेत्रों का नगरीय क्षेत्रों में बदलने की प्रक्रिया का नाम ही नगरीकरण है।''[1] एम0एन0 श्रीनिवास ने लिखा है कि ''नगरीकरण का तात्पर्य किसी क्षेत्र में नगरीय जनसंख्या के बढ़ने से ही नहीं होता बल्कि यह वह प्रक्रिया है जिसके द्वारा लोगों के सामाजिक और आर्थिक संबंधों में परिवर्तन होने लगता है।'' इन दोनों कथनों से स्पष्ट होता है कि नगरीकरण एक दोहरी प्रक्रिया है इसका तात्पर्य है कि गाँवों का नगरों के रूप में बदलना, छोटे नगरों का विशाल नगरों में बदल जाना और नगरीयता से संबंधित विशेषताओं का दूसरे क्षेत्रों में विस्तार होना ही नगरीकरण के मुख्य आधार है।

फेयरचाइल्ड ने समाजशास्त्र के शब्दकोष में लिखा है ''नगरीकरण का अर्थ नगरीय बनने की प्रक्रिया से है अर्थात् व्यक्तियों का नगरीय क्षेत्रों की ओर बढ़ना तथा नगरीय विशेषताओं में वृद्धि होना ही नगरीकरण है।''[2] थॉम्पसन ने लिखा है ''नगरीकरण वह प्रक्रिया है जिसके द्वारा कृषि से संबंधित समुदाय के बहुत से लोग धीरे –धीरे ऐसे समूहों के रूप में बदलने लगते है जिनकी क्रियाएं उद्योग, व्यापार, वाणिज्य और सरकारी कार्यालयों से संबंधित हो जाती हैं।''

उपर्युक्त परिभाषाओं से स्पष्ट है कि समाज में जब एक बडी संख्या में लोग खेती को छोडकर दूसरे व्यवसायों के द्वारा आजीविका उपार्जित करने लगते है तथा उनके संबंध व्यक्तिवादी, स्वार्थ प्रधान तथा औपचारिक बनने लगते हैं तब इस दशा को हम नगरीकरण कहते हैं।

भारतीय समाज में स्वतंत्रता के बाद नगरीकरण की प्रक्रिया में तेजी से वृद्धि हुई। स्वतंत्रता के समय भारत की जनसंख्या में नगरों में रहने वाले लोगों की आबादी केवल 6 करोड़ थी लेकिन सन् 2011 की जनगणना के अनुसार आज यह आबादी बढ़कर 30 प्रतिशत अथवा 36 करोड़ से भी अधिक हो चुकी है। सन् 1941 में यहाँ एक लाख या इससे अधिक जनसंख्या वाले नगर केवल 49 थे, वहीं सन् 2011 की जनगणना के समय तक एक लाख से अधिक आबादी वाले नगरों की संख्या बढ़कर 400 से भी अधिक हो गयी। सन् 1951 में भारत में 10 लाख से अधिक आबादी वाले केवल 4 नगर थे लेकिन सन् 2011 की जनगणना के समय तक इनकी संख्या बढ़कर 42 हो गयी।[3]

भारत में नगरीकरण – भारत में नगरीकरण सिंधु घाटी सभ्यता के युग से ही हड़प्पा और मोहनजोदड़ो जैसे नगरों के रूप में देखने को मिलता है। माना जाता है कि नगरीकरण का दूसरा दौर बुद्ध और महावीर के समय तथा तीसरा दौर मध्ययुग से शुरू हुआ। 18 वीं शताब्दी में यूरोपियों के भारत आगमन के बाद नगरीकरण की प्रक्रिया में तेजी आई।

प्राचीन नगरों की बात की जाए तो भारत में 2000 से अधिक वर्षों की ऐतिहासिक पृष्ठभूमि वाले अनेक नगर है। इनमें से अधिकांश का विकास धार्मिक अथवा सांस्कृतिक केन्द्रों के रूप में हुआ है। वाराणसी इनमें से सर्वाधिक महत्वपूर्ण नगर है। प्रयाग (इलाहाबाद), पाटलिपुत्र (पटना), मदुरै, कुरूक्षेत्र आदि प्राचीन नगरों के कुछ अन्य उदाहरण है। इसी तरह मौजूदा कई नगरों का इतिहास मध्यकाल से जुडा हुआ है। इनमें दिल्ली, हैदराबाद, जयपुर, लखनऊ, आगरा और नागपुर महत्वपूर्ण है। पश्चिमी देशों से आए नए शासकों ने भारत में अनेक नगरों का विकास किया। शुरूआती दौर में तटीय क्षेत्रों में दमन, गोवा, पुडुच्चेरी इत्यादि जैसे व्यापारिक पत्तन विकसित हुए। ब्रिटिश सरकार ने तीन शहरों बंबई, मद्रास और कोलकाता पर अपनी पकड़ मजबूत की और उनका अंग्रेजी शैली में निर्माण किया। ब्रिटिश सरकार ने प्रशासनिक केन्द्रों व ग्रीष्मकालीन विश्रामस्थालों के रूप में पर्वतीय नगरों का विकास किया। इनमें शिमला, नैनीताल, डलहौजी आदि प्रमुख है। आधुनिक उद्योगों के विकास के साथ भी अनेक नगरों का जन्म हुआ जैसे – जमशेदपुर, राउरकेला आदि। आजादी के बाद अनेक नगर प्रशासनिक केंद्रों के रूप में अस्तित्व में आए। इनमें मुख्यतः विभिन्न राज्यों की राजधानियां सम्मिलित हैं। कुछ पुराने नगर महानगरों के चारों ओर सहायक नगरों के रूप में विकसित हुए जैसे – दिल्ली के चारों ओर गाजियाबाद, फरीदाबाद, बहादुरगढ और गुरूग्राम इत्यादि।[4]

नगरीकरण को प्रोत्साहन देने वाले कारक

1. जनसंख्या वृद्धि के फलस्वरूप गाँवों में खेतों का विभाजन बढ़ने लगा। इसके फलस्वरूप एक बड़ी संख्या में ग्रामीणों ने रोजगार पाने के लिए नगरों की ओर बढ़ना शुरू किया।
2. औद्योगीकरण के फलस्वरूप ग्रामीण उद्योग धंधों पर प्रतिकूल प्रभाव पड़ा। ग्रामीण कुटीर उद्योगों तथा दस्तकारी में लगे व्यक्ति भी बेरोजगार हो जाने के कारण नगरों में आकर रहने लगे।
3. यातायात तथा संचार के साधनों में वृद्धि होने से सभी ग्रामीण और नगरीय क्षेत्र एक – दूसरे से जुड़ने लगे। फलस्वरूप एक बड़ी संख्या में ग्रामीणों ने नगरों में श्रमिकों के रूप में काम करना शुरू कर दिया।
4. राजनीतिक दशाएं नगरीकरण का एक प्रमुख कारण है। लोकतांत्रिक व्यवस्था में उन नगरों में लोगों को विकास के अधिक अवसर प्राप्त होते हैं जो राजनीतिक क्रियाओं के केन्द्र होते हैं। यही कारण है कि दिल्ली तथा अन्य प्रदेशों की राजधानियों में नगरीकरण की प्रक्रिया सबसे अधिक तेज हुई है।
5. ग्रामीण गुटबंदी के कारण गाँवों में तनाव और संघर्ष बढ़ रहे हैं, जिससे ग्रामीण जीवन को असुरक्षित समझनें लगे हैं परिणामस्वरूप बहुत से ग्रामीण नगरों में आकर रहने लगते हैं।
6. नागरिक सुविधाएं भी नगरीकरण का एक अन्य कारण है। जिसकी वजह से नगर, गाँव एवं कस्बों के लिए आकर्षण का केन्द्र बने हुये हैं जो नगरीकरण का आधार है।[5]

नगरीकरण का भारतीय महिलाओं पर प्रभाव –

सकारात्मक प्रभाव

1. वैवाहिक तथा पारिवारिक प्रस्थिति पर प्रभाव

नगरीकरण द्वारा आज महिलाओं का स्थान अबला अथवा दासी की तरह नहीं है बल्कि परिवार में उनके अधिकारों में लगातार वृद्धि हो रही है। आज स्त्रियां परिवार से संबंधित महत्वपूर्ण निर्णय लेने के साथ ही अपने पति की एक अच्छी सलाहकार, सहयोगी और मित्र बन गई हैं। नगरीय परिवारों में हमें एक नया श्रमविभाजन देखने को मिलता है जिसमें यदि पुरूष आजीविका उपार्जित करता है तो महिलाएं एक अधिकार सम्पन्न ग्रहणी के रूप में परिवार का प्रबन्ध करती हैं। परिवार में कामकाजी महिलाओं की प्रतिष्ठा में विशेष वृद्धि हुई है। उनके द्वारा घर से बाहर निकलकर अजीविका कमाना एक प्रतिष्ठा की बात मानी जाने लगी है। नगरों में चूंकि एकाकी परिवार होते हैं तो संयुक्त परिवार के अनेक शोषणों से उनको मुक्ति मिली है।

विवाह के क्षेत्र में भी नगरीकरण का स्पष्ट प्रभाव दिखाई देता है। आज ऐसी अनेक लड़कियां हैं जो खुलकर दहेज प्रथा और बाल विवाह का विरोध करती हैं यहाँ तक कि घर आई बारात को लौटाने में भी नहीं हिचकती। जीवन साथी के चुनाव में भी पूरी सहभागिता के साथ निर्णय लेती हैं। आज अन्तर्जातीय विवाहों की संख्या बढ़ी है साथ ही विधवा पुनर्विवाह को अब धार्मिक दृष्टि से नहीं देखा जाता आज महिलाएं भी पुरूषों के समान पुनर्विवाह करने के लिए स्वतंत्र है। महिलाएं आज परिवार में रहकर शोषण सहन नहीं करती वे अपने वैवाहिक संबंधों को समाप्त कर इस शोषण से मुक्ति पा सकती हैं अर्थात् महिलाओं में भी तलाक लेने की प्रवृत्ति में वृद्धि हुई है।

2. सम्पत्ति अधिकारों पर प्रभाव

नगरीकरण ने महिलाओं को संपत्ति संबंधी अधिकार देकर एक महत्वपूर्ण कार्य किया है। कानूनी रूप से हिन्दू उत्तराधिकार अधिनियम 1956 के द्वारा स्त्रियों को पुरूषों के समान अधिकार मिलने के साथ ही एक विधवा को परिवार की सम्पत्ति में से अपने पति के हिस्से की संपत्ति को प्राप्त करने का पूरा अधिकार है। स्त्रियों को एक पुत्री, पत्नी तथा माँ के रूप में अपने पिता, पति और पुत्र की संपत्ति में से हिस्सा प्राप्त करने का अधिकार मिला है। पति की मृत्यु हो जाने पर उसकी पत्नी को अपने नाबालिग बच्चे का संरक्षक होने तथा उसकी सम्पत्ति का प्रबंध करने का भी पूरा अधिकार है। महिलाओं को अपनी सम्पत्ति बेचने, खरीदने एवं हस्तांतरित करने की पूर्ण स्वतंत्रता है।

परिवार के संचालन तथा अपनी जरूरतों को पूरा करने के लिए आर्थिक साधन प्राप्त करने का पूरा अधिकार है। यह उनका नैतिक आधार है, आर्थिक निर्भरता नहीं। कामकाजी महिलाएं अपने द्वारा कमाई गई संपत्ति तथा पैसों पर अपना पूर्ण अधिकार रखती हैं वे इसे अपनी मर्जी से उपयोग करने के लिए स्वतंत्र हैं। आज महिलाओं की आर्थिक निर्भरता पुरूषों पर कम हुई है।

3. विश्वासों तथा अनुष्ठानों पर प्रभाव

स्त्रियों की प्रस्थिति को एक विशेष रूप देने में विभिन्न विश्वासों एवं अनुष्ठानों की महत्वूपर्ण

भूमिका रही है। विश्वास हमारे ज्ञान अथवा सोचने की एक विशेष प्रणाली है जिसके द्वारा हम तमाम ऐसी घटना को समझने का प्रयास करते है जिन्हें हम तार्किक रूप से नहीं समझ सकते। अधिकांश विश्वास ईश्वरीय इच्छा, भाग्य अथवा अलौकिक जीवन से संबंधित होते हैं। इन विश्वासों के आधार पर जो धार्मिक क्रियाएं की जाती हैं, उन्हीं को अनुष्ठान कहा जाता है। भारतीय समाज में स्त्रियों की परम्परागत प्रस्थिति को प्रभाशित करने में यहाँ के विश्वासों और विभिन्न अनुष्ठानों का विशेष योगदान रहा है। उदाहरण के लिए, बाल विवाह का प्रचलन, विधवाओं का एकाकी जीवन, स्त्रियों की पुरूषों पर निर्भरता, प्रत्येक दशा में पति के प्रति पूर्ण समर्पण, पुत्री के जन्म पर दुःख आदि कुछ ऐसे विश्वास हैं जिनकी विवेचना धार्मिक आधार पर होती रही है। इन्हीं विश्वासों के आधार पर हमारे समाज में पुत्री के विवाह के अवसर पर कन्यादान करना, स्त्री के विधवा होने पर उसके सिर के बाल काट देना, अनेक धार्मिक क्रियाओं से स्त्रियों को वंचित रखना, सतियों की गाथाओं के साथ सती होने वाली स्त्रियों की पूजा करना आदि कुछ विशेष अनुष्ठान विकसित हुए।

परन्तु नगरीकरण द्वारा इन सभी विश्वासों एवं अनुष्ठानों में परिवर्तन आया है। विश्वासों का संबंध अब ईश्वरीय इच्छा से नहीं माना जाता बल्कि इन विश्वासों को ऐसी सामाजिक नीति का हिस्सा समझा जाता है जो पुरूष प्रधान व्यवस्था को बनाये रखने के लिए विकसित की गयीं। इसी कारण नगरों में एक दुश्चरित्र और अन्यायी पति को उसकी पत्नी द्वारा अपने भगवान के रूप में नहीं देखा जाता। अब यह विश्वास समाप्त होता जा रहा है कि पुत्र के जन्म के बिना व्यक्ति को मोक्ष प्राप्त नहीं हो सकता।

4. सामाजिक मूल्यों पर प्रभाव

समाज में व्यक्ति के व्यवहारों का निर्धारण सामाजिक मूल्यों के आधार पर ही होता है। मूल्य ही यह बताते हैं कि कौन सा व्यवहार उचित है और कौन सा अनुचित। परंपरागत रूप से भारतीय समाज में स्त्रियों को बचपन से ही ऐसे मूल्यों का प्रशिक्षण दिया जाता रहा है जिससे वे अपने आप को पूरी तरह पुरूषों के अधीन समझें तथा किसी भी प्रकार के अधिकारों की मांग किये बिना परिवार के सभी सदस्यों की सेवा करने को ही अपना धर्म समझती रहें। आज सभी नगरों में ऐसे संगठनों की संख्या बढ़ती जा रही है जो स्त्रियों में जागरूकता पैदा करके उन्हें परिवार और समाज में शोषण के विरूद्ध आवाज उठाने के लिए तैयार करते हैं। विभिन्न स्त्री गोष्ठियों में होने वाले विचार – विमर्श से स्त्रियों को अपने साथ किये जाने वाले भेदभाव का विरोध करने की प्रेरणा मिलती है। अब स्त्रियां संगठित होकर उन व्यवहारों का विरोध करने लगी हैं जिनके कारण उनका जीवन अपमानित होता रहा था। नारी मुक्ति के लिए होने वाला आंदोलन अब सामान्य स्त्रियों के जीवन को भी प्रभावित करने लगा है।

5. आदर्शात्मक प्रतिमानों पर प्रभाव

व्यवहार के जिन तरीकों को कोई समुदाय अपना आदर्श मानता है, उन्हीं को हम आदर्श प्रतिमान कहते हैं। भारतीय समाज में स्मृतिकाल से लेकर स्वतंत्रता से पहले तक अनेक ऐसे आदर्श प्रतिमान फलते – फूलते रहे जो स्त्रियों को कमजोर, मूर्ख और दुराचारी सिद्ध करने से संबंधित थे।

आज नगरीकरण के प्रभाव के कारण नगरों में अधिकांश स्त्रियां ऐसी जनरीतियों, लोकाचारों और प्रथाओं को नहीं मानती जो धर्म के नाम पर अंधविश्वास को बढ़ावा देते हैं। व्यवहार के जिन तरीकों को कुछ समय पहले तक आदर्श रूप में देखा जाता था, उन्हें अब केवल एक अंधविश्वास और व्यवहार का पिछड़ा हुआ तरीका माना जाता है।

6. सामाजिक सहभागिता पर प्रभाव

नगरीकरण द्वारा महिलाओं के सामाजिक जीवन में एक भारी परिवर्तन आया है। परिवर्तन की यह प्रक्रिया तब शुरू हुई जब महिलाओं ने घर की चार दीवारी से बाहर निकल कर स्वतंत्रता आंदोलन में भाग लिया था। जैसे – जैसे शिक्षा और सामाजिक चेतना में वृद्धि हुई उनके सामाजिक संपर्क का क्षेत्र भी बढ़ने लगा। आज महिलाएं घर में खाली समय बर्बाद न करके, विभिन्न संगठनों में अपना समय बिता रही हैं। घर से बाहर निकलकर विभिन्न प्रकार के उद्योगों तथा व्यवसायिक प्रशिक्षण में रूचि ले रही हैं। सामाजिक उत्सवों में पति – पत्नी अब संयुक्त रूप से हिस्सा लेते हैं। पुरूषों के जीवन में जैसे – जैसे व्यस्तता बढ़ रही है, अधिकांश सामाजिक दायित्वों को पूरा करने का काम स्त्रियों को हस्तांतरित होने लगा है।

7. राजनीतिक सहभागिता पर प्रभाव

के0एम0 पणिक्कर ने लिखा है कि ''जब स्वतंत्रता ने पहली अंगड़ाई ली, तब भारत के राजनीतिक जीवन में स्त्रियों की बढ़ती हुई सहभागिता को देखकर बाहर की दुनिया चौंक पड़ी क्योंकि वह तो हिन्दू स्त्रियों को बहुत पिछडी हुई, अशिक्षित और एक प्रतिक्रियावादी सामाजिक व्यवस्था से जकड़ी हुई समझने की अभ्यस्त थी।'' नगरीकरण ने महिलाओं की राजनीतिक सहभागिता को बढ़ाया है। आज नगरीय समुदायों में, महिलाओं का राजनीति में विशेष महत्व है। आज महिलाओं को मत देने से लेकर चुनाव में खडे होने तक का अधिकार है। अनेक राजनीतिक दलों के शीर्ष नेताओं के रूप में भी महिलाओं ने महत्वपूर्ण योगदान किया है। महिलाओं की राजनीतिक सहभागिता से स्पष्ट होता है कि उनमें स्वतंत्र रूप से समुदाय का नेतृत्व करने की क्षमता विकसित हुई है।[6]

8. शिक्षा पर प्रभाव

नगरीकरण द्वारा लोगों के विचारों में परिवर्तन आया, परिणामस्वरूप स्त्री–पुरूष समानता पर विचार किया जाने लगा है। आज लडकियों की शिक्षा को भी उतना ही महत्व दिया जाने लगा है जितना पहले लड़कों की शिक्षा पर किया जाता था। नगर चूंकि शिक्षा के क्षेत्र होते हैं इसलिए लडकियां आसानी से उच्च स्तर तक की शिक्षा ग्रहण कर सकती हैं। आवागमन की सुविधा उपलब्ध होने से विद्यालय आने – जाने में कोई परेशानी नहीं होती है जिससे लडकियों की शिक्षा निर्बाध गति से चलती रहती है।

9. आर्थिक क्षेत्र पर प्रभाव

नगरीकरण औद्योगीकरण को बढ़ावा देता है जिससे व्यवसाय के नये मार्ग प्रशस्त होते हैं। आज महिलाएं आर्थिक क्षेत्र में अपनी पूर्ण सहभागिता रखती है। व्यवसाय का कोई भी ऐसा क्षेत्र नहीं

है जहाँ महिलाएं न हों। आज महिलाएं पुरूषों के साथ कंधे से कंधा मिलाकर चल रही है। आज जैसे –जैसे स्त्रियां विभिन्न सेवाओं और व्यवसायों में प्रवेश कर रही हैं उनकी सामाजिक और आर्थिक स्थिति तेजी से मजबूत हुई है। इस दशा ने महिलाओं को एक आत्म निर्भर आर्थिक जीवन व्यतीत करने की प्रेरणा दी है।

नकारात्मक प्रभाव

1 संयुक्त परिवारों के विघटन से महिलाओं में स्वछन्दता बढ़ी है। एकाकी परिवार में पति – पत्नी और उनके अविवाहित बच्चे रहते हैं। ऐसी परिस्थिति में महिलाओं की स्वतंत्रता स्वछदता में परिवर्तित हो जाती है।

2. नगरीकरण के कारण व्यक्तिवादिता को बढ़ावा मिला है। आज महिलाओं में सामूहिक भावना के बजाय व्यक्तिवादिता बढ़ गई है।

3. नगरीकरण ने तलाक की दर में वृद्धि की है। आज विवाह जन्म – जनमांतर का बंधन न होकर मात्र एक समझौता रह गया है। महिलाएं भी स्वयं आगे आकर तलाक लेने में पीछे नहीं है।

4. नगरीकरण ने वेश्यावृत्ति को बढ़ावा दिया है। जिसका सीधा संबंध महिलाओं से है।

5. नगरीकरण ने महिला अपराधों में वृद्धि की है जिसमें महिलाएं अपराध करने में पुरूषों से पीछे नहीं है। आज महिलाएं अपराध के क्षेत्र में शिकार और शिकारी दोनों की भूमिका में है।

6. नगरीकरण के कारण महिलाओं में पश्चिमी सभ्यता का नशा चढ गया है परिणाम स्वरूप आज वे भारतीय संस्कृति व मूल्यों को भूल कर भौतिकवादी बन गई है।

7. नगरीकरण के कारण महिलाएं अब भ्रष्टाचार में भी लिप्त हो गई है। पहले ऐसा माना जाता था कि भ्रष्टाचार केवल पुरूषों द्वारा होता है परन्तु आज महिलाएं भी भ्रष्टाचार करने में पीछे नहीं है।

8. नगरों में महिलाएं ज्यादा शिक्षित एवं जागरूक होती है इसलिए वे कानूनों से परिचित होती है। महिलाएं कभी – कभी जागरूकता का गलत फायदा उठाती है। घरेलू हिंसा अधिनियम, दहेज निरोधक अधिनियम आदि का ये महिलाएं नाजायज फायदा उठाकर पति तथा ससुराल वालों को झूठे केस में फंसा देती है।

9. नगरों की संस्कृति ने महिलाओं को मादक द्रव्यों का व्यवसनी बना दिया है।

10. नगरीकरण द्वारा महिलाओं में नैतिक मूल्यों का पतन देखा गया है।

निष्कर्ष

उपर्युक्त विवेचन से स्पष्ट है कि नगरीकरण वह प्रक्रिया है जिसमें कोई ग्रामीण समाज धीरे – धीरे नगरीय विशेषताओं को अपना ले और नगरों में जाकर बस जायें जिससे नगरों का विस्तार एवं विकास होता है। नगरीकरण ने महिलाओं के जीवन को बहुत अधिक प्रभावित किया है। जिस प्रकार प्रत्येक सिक्के के दो पहलू होते है उसी प्रकार नगरीकरण के भी दो पहलू है अर्थात् महिलाओं पर

नगरीकरण का यह प्रभाव सकारात्मक एवं नकारात्मक दोनों ही रूपों में पड़ा है जहाँ सकारात्मक प्रभावों ने महिलाओं की सामाजिक स्थिति को ऊँचा उठाने में सहायता पहुँचाई है वहीं इसके नकारात्मक प्रभावों ने महिलाओं के समक्ष अनेक परेशानियां लाकर खड़ी कर दी हैं। महिलाओं को चाहिए कि वे नगरीकरण के सकारात्मक प्रभावों का अपने जीवन में अमल करें और नकारात्मक प्रभावों से बचने का प्रयास करें।

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संगीता तिवारी
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भारत में प्राचीन काल से चली आ रही खेती में लागत बहुत कम आती थी लेकिन जैसे – जैसे हरित क्रांति के नाम पर अन्धाधुन्ध रासायनिक उर्वरकों हानिकारक कीटनाशकों, हाईब्रिड बीजों और अधिकाधिक भूजल के प्रयोग से भूमि की उर्वरा शक्ति, उत्पादन, भूजल स्तर और मानव स्वास्थ्य में निरन्तर कमी आयी है। किसान बढ़ती लागत एवं बाजार पर निर्भरता के कारण खेती छोड़ रहे हैं और आत्महत्या करने पर मजबूर हो रहे हैं। बाद में आयी विदेशी तकनीक जैविक खेती, जिसमें वर्मी कम्पोस्ट, कम्पोस्ट, बायोडायनामिक आदि विधियाँ जटिल होने के कारण अन्ततः किसान को बाजार पर ही निर्भर बनाती हैं। अतः आवश्यकता है एक ऐसी कृषि पद्धति कि जिसमें किसान को बार–बार बाजार न जाना पड़े, उत्पादन न घटे, खेत उपजाऊ बने रहें और मानव रोगी न बने ऐसी कृषि पद्धति है' **शून्य लागत प्राकृतिक खेती'** जिसमें, देशी गाय से 10–30 एकड़ तक खेती संभव है।

हिमाचल के राज्यपाल आचार्य देवव्रत ने कहा कि हरियाणा सरकार के सहयोग से शून्य लागत प्राकृतिक कृषि प्रणाली को मानव, जमीन, स्वास्थ्य, पानी व किसान के लिये सुरक्षित बताया है। यह भी बताया है कि यही कृषि प्रणाली रसायनिक व जैविक खेती का एक मात्र विकल्प है। उन्होंने यह भी कहा कि कुरूक्षेत्र में एक स्थायी प्रशिक्षण केन्द्र स्थापित किया जायेगा जिसमें रोजाना किसानो को शून्य लागत प्राकृतिक कृषि प्रणाली की ट्रेनिंग दी जायेगी। इसके साथ ही उन्होंने यह भी कहा कि वर्ष 2022 तक हिमाचल प्रदेश को जहरीली रसायनिक खेती से मुक्त कर दिया जाएगा। राज्यपाल ने कहा कि हिमाचल सरकार ने 25 करोड़ रूपये की लागत से प्राकृतिक खेती को खुशहाल किसान नामक योजना लागू की हैं। इस योजना के तहत प्रदेश के किसानों को प्रशिक्षण तथा आवश्यक उपकरण प्रदान किये जायेंगे। प्राकृतिक खेती को पूर्ण रूप से सुरक्षित बताते हुए उन्होंने कहा कि यह खेती किसानों की आय को दोगुनी करने की क्षमता रखती है। राज्यपाल ने कहा कि प्रधानमंत्री श्री नरेन्द्र मोदी भी किसानों की आय को दोगुना करने के लक्ष्य को लेकर काम कर रहे हैं और प्राकृतिक खेती इस लक्ष्य की प्राप्ति में महत्वपूर्ण भूमिका निभा सकती है। उन्होंने कहा कि सूखे को मात देने में शून्य लागत प्राकृतिक खेती

कारगर है। दरअसल इस विधि में अपेक्षाकृत मात्र दस फीसद पानी की जरूरत पड़ती है। कीट रोगों का भय एकदम समाप्त हो जाता है। इस प्रणाली के अंर्तगत उत्पादन लागत शून्य रहती है और कृषि उत्पाद भी विशुद्ध होते हैं। इसमें भूमि की उत्पादन शक्ति बढ़ने के साथ ही सिंचाई के लिये कम पानी की जरूरत होती है।

शून्य लागत प्राकृतिक खेती का अर्थ

प्राकृतिक खेती का अर्थ प्रकृति प्रदत्त खेती से है। जिसमें अंडी की खाद, सनई की खाद, ढ़ेचा की खाद, खली की खाद और गोबर की खाद खेतों में डालकर केचुएं उत्पन्न करवा कर खेती करी जाती है। जिसमें लागत (मूल्य) बहुत कम आती है लगभग शून्य के बराबर और लाभ अधिकतम होता है। इस खेती में रासायनिक खादों का प्रयोग बिलकुल नहीं होता, फसलों की शुद्धता बनी रहती है और जन जीवन प्रभावित नहीं होता।

इस खेती की शुरूआत महाराष्ट्र के विदर्भ क्षेत्र के अमरावती जिले के रहने वाले **''सुभाष पालेकर''** ने की। इन्होंने कृषि स्नातक की पढ़ायी पूरी करने के बाद, अपने गाँव में किसान के रूप में 1973 से लेकर 1985 तक खेती की है। जब खेत में पर्याप्त उत्पादन नहीं बढ़ा तो उन्होंने अपने आप से पूछा, बिना मानवीय सहायता के हरे–भरे पेड़ कैसे खड़े है ? क्या इनके लिये रासायनिक खाद की जरूरत नहीं है? इसी को आधार बना कर बिना लागत की खेती करने का अनुसंधान शुरू किया गया। पालेकर ने बताया कि 15 सालों के गहन अनुसंधानों बाद शून्य लागत प्राकृतिक खेती को जन्म दिया। वह पिछले 20 सालों से लगातार शून्य लागत प्राकृतिक खेती का प्रशिक्षण देने सिर्फ देश में ही नहीं बल्की विदेशों में भी जाते हैं। आज भी इस पद्धति को अपना कर लाखो किसान बिना लागत के आय बढ़ा रहे हैं और मुनाफा कमा रहे हैं। पालेकर के इस योगदान को वर्ष 2016 में भारत सरकार ने पद्म श्री सम्मान से अलंकृत किया।

शून्य लागत खेती के उद्देश्य :– इस खेती के उद्देश्य तो बहुत हैं लेकिन कुछ उद्देश्य निम्नवत हैं –

1. मुख्य सफल लागत मूल्य कम होना।
2. सह उत्पादित फसलों का भी विक्रय करना।
3. कृषि की आय को दो गुनी करना।
4. खेती के लिये कोई भी संसाधन जैसे खाद, बीज, कीटनाशक आदि को बाजारों से न लाकर अपने घर पर ही इनका निर्माण करना ।
5. पशुधन को बढ़ावा देना।
6. पेड़–पौधों को बचाकर रखना और नये पेड़ – पौधे लगाना।
7. मानव जाति को जैविक व रासायनिक से होने वाले नुकसान से बचाना।
8. सूखे को खत्म करना।

प्राकृतिक व्यवस्था क्या है ?

पौधों के पोषण के लिये आवश्यक सभी 16 तत्व प्रकृति में उपलब्ध रहते हैं, जिन्हें पौधों के भोजन के रूप में बदलने का कार्य मिट्टी में पाये जाने वाले करोड़ों सूक्ष्म जीवाणु करते हैं। यदि यह सूक्ष्म जीवाणु पर्याप्त संख्या में मिट्टी में उपलब्ध रहें तो अच्छी उपज के लिये किसी बाहरी पदार्थ की जरूरत नहीं पड़ेगी। इस पद्धति में पौधों को भोजन न देकर भोजन बनाने वाले सूक्ष्म जीवाणुओं की उपलब्धता पर जोर दिया जाता है। प्रकृति में इन सूक्ष्म जीवाणुओं की भी उपलब्धता की एक विशिष्ट व्यवस्था है। पौधा अपने पोषण के लिए मिट्टी से सभी तत्व लेता है। फसल के पकने के बाद उसका काष्ठ पदार्थ कूड़ा – करकट के रूप में मिट्टी के साथ अपघटित होकर, मिट्टी को उर्वरा–शक्ति लौटाता है।

गाय और भैंस के गोबर का कृषि में महत्व

एक ग्राम देशी गाय के गोबर में 300–500 करोड़ सूक्ष्म जीवाणु पाये जाते हैं। गाय व भैंस के गोबर में गुड़ व अन्य पदार्थ डालकर किण्वन से सूक्ष्म जीवाणु बढ़ाने की क्रिया तेज कराके तैयार जीवामृत व धनजीवामृत जब खेत में पड़ता है तो करोड़ो सूक्ष्म जीवाणु भूमि में पहुँचते हैं, जो पौधों को भोजन निर्माण कराते हैं। किसी बाहरी पदार्थ की आवश्यकता नहीं पड़ती।

देशी केचुओं का कृषि में महत्व

केचुआ मिट्टी, बालू, पत्थर (कच्चा चूना) खाता हुआ धरती के नीचे 15 फुट गहराई तक भूमि के नीचे जाता है। धरती के नीचे से पोषक तत्वों को ऊपर लाता है तथा पौधे की जड़ के पास धरती के ऊपर अपनी विष्टा छोड़ता है जिसके फसल के लिए सभी आवश्यक तत्वों का भण्डार होता है। केचुआ जिस छेद से नीचे जाता है कभी उससे ऊपर नही आता है। भूमि में दिन रात करोड़ो छिद्र कर भूमि की जुताई करता रहता है। भूमि को मुलायम बनाता है और जब बारिश होती है तो इन्ही छिंद्रो से पूरा, वर्षो का जल भूमि में संग्रहित होता जाता है।

शून्य लागत प्राकृतिक कृषि के चरण

1. **बीजामृत (बीज शोधन)** – 5 किलो देशी गाय का गोबर, 5 ली0 गोमूत्र, 50 ग्राम चूना, एक मुट्ठी खेती की मिट्टी को 20 ली0 पानी में मिलाकर 24 घंटे रखे दिन में दो बार लकड़ी से घोलें। तैयार बीजामृत को 100 किलो बीजों पर छिड़क कर उपचार करें। बीज को छांव में सुखायें एवं बोयें।
2. **जीवामृत** – जीवामृत सूक्ष्म जीवाणुओं का महासागर है जो पेड़ पौधों के लिए कच्चे पोषक तत्वों को पकाकर उनके लिये भोजन तैयार करते हैं। इसे बनाने के लिए, गौमूत्र 5–10 लीटर, गोबर 10 किलो, गुड़ 1–2 किलो, दलहन आटा 1–2 किलो, एक मुट्ठी जीवाणुयुक्त मिट्टी (100 ग्राम) तथा पानी 200 लीटर इन सभी सामग्री को एक साथ मिलाकर ड्रम में जूट की बोरी से ढककर छाया मे रखें। सुबह व शाम डंडे से घड़ी की सुई की दिशा में घोलें। 48 घंटे बाद छानकर निम्न प्रकार से दें। इसका प्रयोग सात दिन के अन्दर ही करें।

(क) **सिंचाई पानी के साथः**– 1 एकड़ में 200 लीटर जीवामृत सिंचाई करते समय पानी के साथ टपक विधि से या धीमे–धीमे बहा दें।

(ख) **छिड़काव द्वाराः**– पहला छिड़काव बुवाई के 1 माह बाद 1 एकड़ में 100 लीटर पानी, 5 लीटर जीवामृत मिलाकर दें। दूसरा छिड़काव 21 दिन बाद 1 एकड़ में 150 लीटर पानी व 10 लीटर जीवामृत मिलाकर दे। तीसरा व चौथा छिड़काव 21–21 दिन बाद 1 एकड़ में 200 लीटर पानी व 20 लीटर जीवामृत मिलाकर दें। आखिरी छिड़काव दाने की दूध की अवस्था में प्रति एकड़ में 200 लीटर पानी, 5–10 लीटर खट्टी छाँछ (मठ्ठा) मिलाकर छिड़काव करें।

3. **घन जीवनमृत** – घन जीवनमृत, जीवाणुयुक्त सूखी खाद है जिसे बुवाई के समय या पानी के तीन दिन बाद भी दे सकते हैं। बनाने की विधि इस प्रकार है – गोबर 100 किलो, गुड़ 1 किलो, आटा दलहन 1 किलो, मिट्टी जीवाणुयुक्त 100 ग्राम उपर्युक्त सामग्री में इतना गौमूत्र (लगभग 5 ली0) मिलायें जिससे हलवा/पेस्ट जैसा बन जायें, इसे 48 घंटे छाया में बोरी से ढककर रखें। इसके बाद छाया में ही फैलाकर सुखा ले फिर बारीक करके बोरी में भरें। इसका 6 माह तक प्रयोग कर सकते हैं। एक एकड़ खेत में 1 कुन्तल तैयार घन जीवनमृत देना चाहिए।

4. **आच्छादान** – देशी केचुओं एवं सूक्ष्म जीवाणुओं के कार्य करने के लिये आवश्यक ''सूक्ष्म पर्यावरण'' उपलब्ध कराने हेतु एवं भूमि की नमी को सुरक्षित करने हेतु भूमि को ढ़कना (आच्छादान) करना पड़ता है। सूक्ष्म पर्यावरण का आशय है पौधों के बीच हवा का तापमान 25–32 डिग्री, नमी 65–72 प्रतिशत व भूमि सतह पर अंधेरा। जब हम भूमि का काष्ठ पदार्थो से या अन्य प्रकार से आच्छादान करते हैं तो सूक्ष्म पर्यावरण का निर्माण होता है जिसमें देशी केचुओं व सूक्ष्म जीवाणु को उपयुक्त वातावरण मिलता है एवं भूमि की नमी का वाष्पन नहीं हो पाता। बाद में काष्ठाच्छादन भूमि में अपघठित होकर उर्वरा शक्ति का निर्माण करता है। सहफसलों द्वारा भी भूमि को सजीव आच्छादन के द्वारा ढका जा सकता है।

5. **मेड़ व नाली व्यवस्था द्वारा जल की बचत** – पौधों की जड़े सीधे पानी नहीं लेती, बल्कि मिट्टी कणों के बीच 50 प्रतिशत हवा व 50 प्रतिशत वाष्प के मिश्रण (वाफसा) होते हैं, जिन्हें पौधे लेते हैं। अतः सतह से ऊँचे तैयार मेड़ पर फसलों को नालियों द्वारा पौधों की आवश्यक सिंचाई वाफसा के रूप में उपलब्ध कराने से पानी की आवश्यकता बहुत कम पड़ती है। नालियों को भी आच्छादान से ढ़क दिया जाता है, जिससे नमी का वाष्पन कम से कम हो।

बहुफसली पद्धति

उचित मिश्रित फसलों को लेने पर फसलो की जड़ें अलग–अलग स्तर से उचित खुराक ले लेती हैं एवं सहअस्तित्व के आधार पर रोगों एवं कीटों से बचाव तथा नाइट्रोजन का बंटवारा कर लेती हैं। उचित फसल चक्र अपनाने से भूमि को नाइट्रोजन स्वतः ही प्राप्त हो जायेगा, ऊपर से यूरिया देने की आवश्यकता नहीं होगी।

फसल सुरक्षा

इस पद्धति में कीट नियंत्रकों की आवश्यकता ही नहीं पड़ती क्योंकि कीट आते ही नहीं, फिर

भी आवश्यकता पड़ने पर गोबर, गौमूत्र, छाछ एवं वनस्पतियों द्वारा तैयार नीमास्त्र, ब्रहयास्त्र, अग्नियास्त्र, फफूंदनाशक दशपर्णी अर्क आदि बनायी जाती है। इस प्रकार स्वयं तैयार कीट नियंत्रकों का प्रयोग कर फसल सुरक्षा कर सकते हैं।

ध्यान देने योग्य बातें

- प्राकृतिक कृषि में देशी बीज ही प्रयोग करें।
- प्राकृतिक कृषि में किसी भी भारतीय नस्ल का देशी गोवंश ही प्रयोग करें। जर्सी या होलस्टीन का प्रयोग हानिकारक है।
- जीवाणुयुक्त मिट्टी हेतु वट वृक्ष, पीपल के नीचे या मेंड़ की मिट्टी लें।
- पेड़ पौधों व फसल की पंक्तियों की दिशा उत्तर दक्षिण होगी।
- दलहन फसलों की सहफसली खेती करना अच्छा रहता है।
- वर्मी कम्पोस्ट बनाने में जो आयसेनिया फीटिड़ा नामक जन्तु प्रयोग होता है, जो केचुआ नहीं है। यह जन्तु कैडमीयम, आरसेनिक, पारा, सीसा आदि विषैले तत्व छोड़ता है, जो कि भूमि के लिये अत्यन्त हानिकारक है।

निष्कर्ष

देश के प्रख्यात शोध कृषक व शून्य लागत खेती के जनक **''सुभाष पालेकर''** जी ने कहा कि जैविक व रासायनिक खेती मानव व प्राकृतिक संसाधनों के लिये खतरा है। इनसे अधिक लागत पर जहरीला अनाज पैदा होता है। जिसे खाकर मानव बीमार और धरती बंजर हो रही है। हरित क्रांति का विरोध करते हुये उन्होंने कहा था कि ''फसल ज्यादा उत्पन्न करने के लिये किसान उर्वरकों का उपयोग भी अधिक करते हैं जो धरती को बंजर बनाती जा रही है।'' जीव, जमीन, पानी और पर्यावरण को बचाने के लिए तथा सुस्वास्थ्य के लिए एक मात्र उपाय शून्य बजट खेती ही है। इसके लिए तीस एकड़ पर सिर्फ एक पशु (गाय या भैंस) पालने की जरूरत है। एक गाय से ही प्रत्येक किसान हजारों की बचत के साथ देश व समाज की भलाई भी कर सकता है।

सन्दर्भः–

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HABITAT LOSS AND ITS EFFECT ON NATIVE SPECIES

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ABSTRACT

In order to get better life we humans run after advanced technologies in machines, medicines, industries and mining, etc. This of course assured betterment for our life but only for a short span. Because increased human activities decreased our environment quality which becomes a cause of great disadvantageous effect in the form of habitat loss. The problem of habitat loss is not local but global as it directly affects food web and in a chain reaction one effects the other. Ultimately it is a threat to the entire biodiversity.Present study is an effort to find out the reasons of habitat loss, its process and detrimental effects on richness of native species in the light of recent research.

Key words: Habitat Loss, biodiversity conservation, habitat fragmentation

INTRODUCTION

We all know that each and every species is adapted to its environment where they can live and breed freely in the place which provides them food, shelter and possibilities to grow and propagate. Such places are known as habitat. Most of the species of plants and animals like endemic species are capable for fertilization in their restricted habitats only, which in fact is a small part of land or aquatic ecosystem. Ecosystems which are rich in biodiversity are known as hotspots (Mittermeier et.al, 1998). Many species share common abiotic (physical) environment in similar habitat (Corenblit et.al 2010; D'Alpaos, 2011). Different components of biodiversity are

interdependent in the form of food web, so if there any specific species loss happens it affects others also.

We are living in the scientific era, where research and their results in industrialization, medicines etc. give humans an opportunity for better and long life. But in turn it has caused disbalance in nature. Increased human activities like deforestation, urbanisation, roads, railways, industries, mining etc. increase the threat to habitat loss. Anthropomorphic alternations in the climate also play an important role in habitat degradation and its loss (Scanes, 2018).

Habitat loss is not only the loss of any area but it is the greatest threat and could be the reason for the loss of variety of life forms on earth.

TYPES OF HABITAT LOSS AND ITS CAUSES:

Habitat is a natural environment which provides food, shelter, protection and optimum conditions for reproduction for particular species. But now-a-days habitat is shrinking which is also termed as habitat loss. It can be categories as follows to study its causes.

Habitat Destruction:

Clearing land for agriculture practice leads to habitat destruction. Mining and Urban sprawl (i.e. unrestricted growth of urban areas) for housing and commercial development leads to the excessive cutting down of trees. Habitat destruction compelled native species to migrate or become extinct in absence of optimum growth conditions (Tilman et.al, 1994).

Habitat Fragmentation:

It is the consequence of the construction of roads, railways in land ecosystem. Construction of dams, canals, water diversions cause habitat fragmentation in aquatic ecosystem, which is not only harmful for aquatic flora and fauna but amphibians too.

Habitat Degradation:

Ecosystems are dramatically changed by excessive human interference which leads to the sudden or prolonged climatic change, pollution, sewage, pesticides, mining wastes, acid rains etc. Invasive species and forest fire are also responsible for habitat degradation (Schleuning et.al, 2009).

IMPACT OF HABITAT LOSS:

- Due to anthropogenic activities the quality and quantity of any habitat reduces which makes it unfit for dwelling of native species. It may no longer be able for food, shelter and reproduction.

- Habitat fragmentation decreases dispersal of species (deMaynadier and Hunter, 2000), increases the rate of mortatily (Carr and Fahrig, 2001) and reduces genetic diversity (Reh and Seitz, 1990).
- Habitat area gets reduced in small patches by fragmentation. Patch isolation occurs which increases risk of demographic and genetic insufficiency (Cushman, 2006). Complete patch isolation prevents mating and effects genetic pool.
- Endemic species are more likely to become endangered or extent due to habitat destruction, as they belong to very small and confined area.
- Habitat destruction adversely affects the biodiversity of hotspots leading to increased extinction crisis (Brooks et. al, 2002).

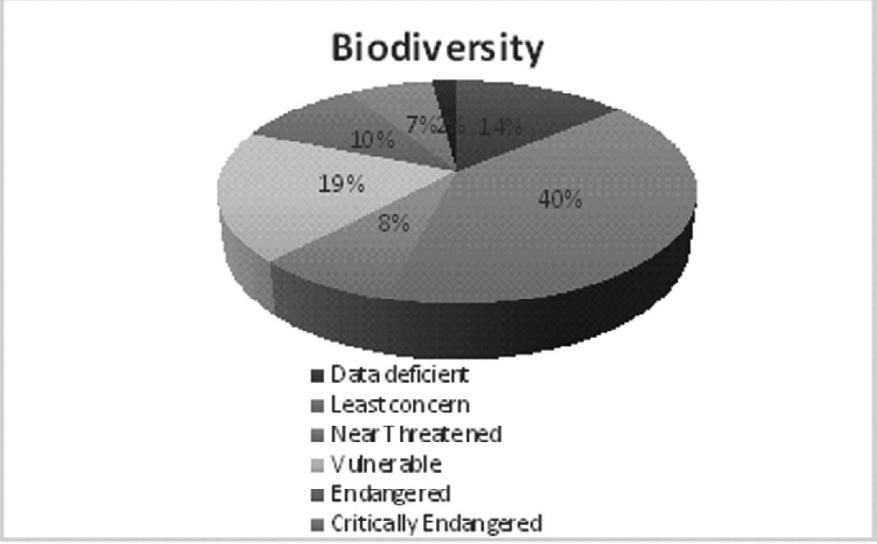

Figure: Showing impact of habitat loss on total biodiversity (taken from internet).

CONCLUSION

Habitat loss is one of the biggest problems among the biodiversity conservationists because high urban sprawl has already taken over many natural habitats by destruction, fragmentation, degradation and deforestation. It also swallowed and is ready to be swallowed many rare and endemic species of flora and fauna worldwide. Several biodiversity conversation methods proved insufficient and there is a need of strict action to stop excessive human activities in rich biome area. There is a need of a check on industrial expansion.

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पर्यावरण संरक्षण के लिये सरकार की नीतियां

शशांक कुमार

समाज शास्त्र विभाग

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पूरे विश्व में पर्यावरण विविध कारणों से दबाव की स्थिति में हैं। भारत के मामले में कतिपय क्षेत्रों में अधिक जनसंख्या घनत्व, प्राकृतिक संसाधनों पर दबाव डाल रहा है जो प्रमुख कारण है। गरीबी और आर्थिक वृद्धि दर में कमी भी इनके प्रमुख कारण में हैं। तथापि अधिकांश व्यवस्थायें 1970 के दशक और 1980 की शरुआत में स्थापित की गयी, जब प्रणालियाँ इतनी विकसित नहीं थीं तथा ज्ञान का स्तर इतना विकसित नहीं था। परिणामस्वरुप अनेक क्षेत्रों में यह एक धारणा थी कि पर्यावरणीय कानूनों की संरचना आर्थिक वृद्धि में बाधक हैं। यह संरचना पर्यावरण के संरक्षण के अभीष्ट उद्देश्यों को भी नहीं प्राप्त कर पा रही है। पर्यावरण के नवीन एवं क्रान्तिकारी रुझान मानव पर्यावरण संरक्षण के वैश्विक चिंता के स्टॉकहोम घोषणा 1972 के उद्गार के साथ भारत में पर्यावरण सोच मे चहुमुखी विकास हुआ है। संविधान का 42वां संशोधन अधिनियम इस विकसित सोच का स्पष्ट उदाहरण है। 1976 में संविधान में संशोधन कर दो महत्वपूर्ण अनुच्छेद 48 ए तथा 51 ए (जी) जोड़े। 48 ए राज्य सरकार को निर्देश देता है कि वह पर्यावरण की सुरक्षा एवं सुधार सुनिश्चित करें तथा देश के वनों तथा वन्य जीवन की रक्षा करें। अनुच्छेद 51 ए (जी) नागरिकों को कतर्व्य प्रदान करता है कि वे प्राकृतिक पर्यावरण की रक्षा करें तथा सभी जीवधारियों के प्रति दयालु रहें। स्वतत्रंता पश्चात् बढ़ते आद्योगीकरण, शहरीकरण तथा जनसंख्या वृद्धि से पर्यावरण गुणवत्ता में निरंतर कमी आती गयी। पर्यावरण की गुणवत्ता की इस कमी में प्रभावी नियंत्रण व प्रदूषण के परिप्रेक्ष्य में सरकार ने समय–समय पर अनेक नियम और कानून बनाये इसमें से अधिकांश का मुख्य आधार प्रदूषण नियंत्रण और निवारण था।

पर्यावरण की नीतियां भारत सरकार द्वारा इस प्रकार जारी की गई हैं जो निम्न प्रकार हैं–

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भारत मे पर्यावरण सम्बन्धित उपरोक्त कानूनों का निर्माण उस समय किया गया जब पर्यावरण प्रदूषण देश में इतना व्यापक नहीं था। 21वीं सदी में जल के महत्व को स्वीकारते हुये जल संसाधनों के नियोजन विकास और प्रबंधन के साथ ही इसके सद्प्रयोग का मार्ग प्रस्वस्थ्य करने के लिये राष्ट्रीय जल संसाधन परिषद ने 1 अप्रैल 2002 को राष्ट्रीय जल नीति पारित की। इसमें जल के प्रति स्पष्ट व व्यवहारिक बात अपनाने की बात कही गयी। मानव जीवन के लिये जल के अति महत्व को देखते हुये पारिस्थितिक संतुलन बनाये रखने और सभी प्रकार की आर्थिक एवं विकासशील गतिविधियों के लिये और इसकी बढ़ती कमी को ध्यान में रखते हुये उचित प्रबंधन तथा न्याय संगत उपयोग करना अनिवार्य हो गया है राष्ट्रीय जलनीति की सफलता पूर्णतः इसमें निहित सिद्धान्तों एवं उद्देश्यों पर राष्ट्रीय सर्वसम्मति तथा वचन बद्धता बनाये रखने पर निर्भर करेगी।

पर्यावरण तथा वन मंत्रालय ने दिसंबर 2004 को राष्ट्रीय पर्यावरण नीति 2004 का ड्राफ्ट जारी किया है। इसकी प्रस्तावना में कहा गया है कि समस्याओं को देखते हुये एक व्यापक पर्यावरण नीति की आवश्यकता है साथ ही वर्तमान पर्यावरणीय नियमों तथा कानूनों को वर्तमान समस्याओं के सन्दर्भ में संशोधन की आवश्यकता को दर्शाया है।

भारत संसार के उन देशों में से एक है जिनके संविधानों में पर्यावरण का विशेष उद्देश्य है। भारत ने पर्यावरणीय कानूनों का व्यापक निर्माण किया है तथा हमारी नीतियां पर्यावरण संरक्षण में भारत की पहल दर्शाती हैं। पर्यावरण संबधित सभी विधेयक होने पर भी भारत में पर्यावरण की स्थिति काफी गंभीर बनी हुई है। भारत में जिस प्रकार से पर्यावरण कानूनों को लागू किया जा रहा है। उसे देखते

हुये लगता है कि इन कानूनों के महत्व को समझा ही नही गया है। इस दिशा में पर्यावरण नीति 2004 को गम्भीरता से लागू करने की आवश्यकता है। पर्यावरण संरक्षण में न्याय पालिका ने भी एक महत्वपूर्ण भूमिका निभायी है इसके प्रयासों से स्वच्छ पर्यावरण मौलिक अधिकार का एक महत्वपूर्ण अंग बन गया है। समाज तथा आम आदमी की भागीदारियों को भी प्रोत्साहित किया गया है। यह इसके प्रयासों का ही फल है कि आज सरकार तथा नीति निर्माताओं की सूची में पर्यावरण प्रथम मुद्दा है तथा वे पर्यावरण संरक्षण के प्रति गम्भीर हो गये हैं।

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AIR PURIFIER ADOPTION WITH MODULARITY AND BIG DATA

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ABSTRACT

The problem of air pollution in India is not restricted to Delhi-NCR or other metros but is a nationwide problem. This leads to a loss of 3% GDP every year. The greater loss is the death of 1.2 Million Indians every year due to this national problem. Virtually no states in India, except for a few, comply with the WHO standards.

The major tackling has to be done at the legislative level by the Government. However, an immediate solution is required to purify the air around us. Currently there exists several stand-alone air purifiers and built in air purifiers in Air Conditioners but the Indian consumers have still not adopted them. More than 50 percent of the purchases are still by institutional buyers.

The primary reason for this slow adoption is cost and portability. The process of stripping down some functional components of air purifiers, scaling their size down and encapsulating them in every day objects will lead to better adoption. Similarly, Big Data can be used to attain better efficiency in the process and reducing working cost of the system by prediction.

Keywords— *air pollution, legislative level, immediate solution, air purifiers, slow adoption, Big Data, prediction.*

I. INTRODUCTION

In March 2019, a study by WHO revealed that 15 out of the top 20 most polluted cities across the globe were from India. More than 1.2 Million deaths happened in India 2018 due to air pollution itself. Air pollution has lead to a number of respiratory diseases like acute respiratory infections and chronic obstructive pulmonary diseases. However, recent data from WHO has suggested stronger link between, indoor and outdoor air pollution and cardiovascular diseases, such as strokes and heart diseases, as well as between air pollution and cancer. Even though the Indian market is aware of the severity of the problem but they are still sceptical towards air purifiers. India's per capita income was recorded to be approx. Rs. 9500 per month in year

2017-2018 and they cannot afford the expenses of air purifiers. Even though the cost of air purifiers have fallen down to as low as Rs. 8000, but it is way too high for the Indian market, where 1/5th of the population is below the poverty line. Apart from this an air purifiers keeps running and consuming electricity continuously which adds to the cost. The clear solution to this problem is reducing the cost of manufacturing and the cost of running the system. The prior can be achieved by stripping, scaling down and encapsulating. The later can be achieved with the help of Big Data and prediction.

II. CURRENT LANDSCAPE

The air purifier market is estimated to be about Rs 200-250 crore and though it's growing at 30-40% this year, the industry experts said that the growth is impressive in percentage terms because of the low base and should not be read as a sign that Indians are adapting quickly. More than half of the purchases are still by institutional buyers such as the foreign embassies, luxury hotels and CXO chambers in large corporates with only some affluent consumers or people with respiratory problems buying it for households, senior executives at Blue Star, Eureka Forbes, Kent and Hicare said. "Air purifier is still hyped up in India and the industry as a whole is expected to make a loss this year considering the huge expenses on marketing and promotion without any commensurate sales ", said Blue Star joint MD Mr.B.Thiagaranjan. Indoor air quality in the buildings depends on few factors. These factors include outdoor air quality, construction of the ventilation system and effects of indoor pollutants. Growing sources of harmful substances can be external and internal. External sources include

air pollution from combustion processes, road traffics, factories, allocation pollution from soils such as radon, leakages from the tanks with fuel, pollution around intake ducts through which air flows to the building etc. Outdoor air always contains the pollution associated with various natural processes in our planet (soil erosion, volcanic pollution, etc.). Internal sources include all pollutants associated with air handling systems. There are materials which are used in this

systems such as air filters, ducts, fittings and air or fire dampers. Materials which are used during the building process or building occupants also can be sources. More specific substances are tobacco smoke, sources of laboratories, kitchens, cafeterias, bathrooms, offices, parking garages etc. All these places should be equipped with ventilation systems. Air cleaners are the equipments which purify and make air free from particles, gases and different compounds. There are two types of air cleaners which are used in buildings -

- Household air cleaners (purifiers)
- Dust air cleaners.

The following filters are used in air cleaners-

A. Mechanical filters

This method arrests large particles of dust, fabric fibres and animal dander. Particles grow through the filter grid and settle on it.

B. Ionizers

This type of filter arrests much smaller particles than mechanical (until 0,01 micron).

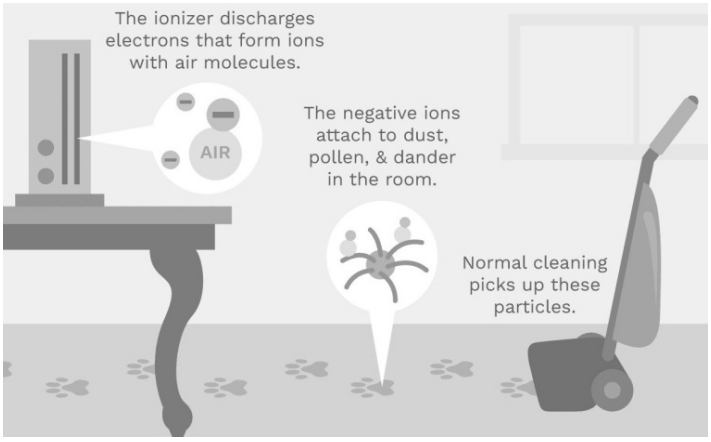


Figure 1 - Working of Ionizers]

C. Electrostatic filters

The air goes through an ionization chamber. In this chamber particles become positively charged. Then air goes over two negative charged plates, on which positively charged particles are deposited. But electrostatic filters can't arrest molecules of gases. And on the other hand, this filter can produce ozone and nitrogen oxides in the process.

D. HEPA filters

Developed in the 1940s, High Efficiency Particulate Air (HEPA) technology was made popular by use in medical cleanrooms, and it is still the most reliable and effective technology used. Air purifiers equipped with a HEPA air filter absorb up to 99.97% of all particles, like allergens, pollen, dust, dander, and others that are 0.03 microns and larger in size; harmful indoor air particles that cause allergy and asthma symptoms are measured to be about 0.03 microns or larger. This is implemented through a number of different technologies like -

- Activated Carbon
- Pre-filters
- UV Light

E. Photocatalytic filters

This type of filters in contrast with other filters does not arrest pollutants. Photocatalytic filters fully destroy them. The method of air purification is the decomposition and oxidation of toxic contaminants under ultraviolet light. The size of particles is less than 0.001 micron. In this case, filters are not contaminated and cannot cause air pollution as other filters.

Present day air purifiers hold a combination of these different types of technologies to ensure superior air quality. However, stripping down on some of these for reducing cost and size of air purifiers can lead to better adoption in the Indian market. Apart from this creating the various technologies as Ad-on parts can help reduce cost.

III. MINIMISING COST

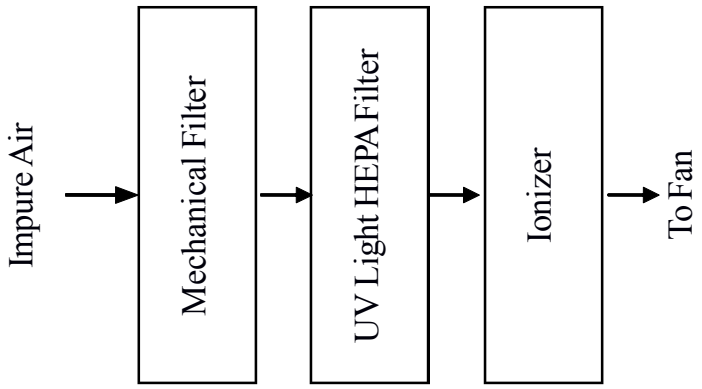
We can perform some of these activities to minimise the manufacturing cost of the system -

A. *Stripping down some features* which require more resources and cost.

B. *Dividing the system into swappable components* will give consumers an affordable entry level product which they can upgrade with time.

C. *Addition in pre-existing products* like ceiling fans and table fans instead of being built as a separate product.

The most feasible would be to add them in table fans for its portability. In this case, the filtering process that can be effective would be mechanical filters, ionizers and UV light HEPA filters. These can also be sold as separate component which can be added to any table fan.



[**Figure 2-** Purification Process]

Adopting only these would be enough since the larger impurities will be removed by the Mechanical Filter, the bacteria and germs will be killed by the UV Light and the Ionizers will ionise the air. The air coming out through this would contain smaller particles and ionised air molecules which will in attach to these remains particles later and remove them as well.

Building them as swappable equipment can also be easily achieved through this. Consumers can start with just the Ionizer module and later additional components can be added. This will reduce the initial cost for consumer to bare minimum which will be of the desired startup module.

IV. MINIMISING SIZE

Size is not an important factor when we talk about implementing the suggested mechanism in table fan, but when we address ceiling fan, size becomes a key factor. Because structural integrity and stability become more bigger concerns. Hence, the aim here is to not provide much functionality or upgradeability. The goal is to provide some degree of air purification to replace conventional ceiling fans which provide none.

The best option here is to use Ionizers which will remove small sized particles which are often left out after usual household cleaning. The addition of these Ionizers will simply add an additional cost of Rs.400- Rs.500 over the existing cost of the ceiling fan which is affordable for the consumers.

V. MINIMISING RUNNING COST

The air purifiers have to be running continuously and thus consume electricity. The following techniques can be adopted to tackle this -

A. *Ambient Conditions Analysis* - Analysing attributes like moisture, temperature, particle count, etc. However, this approach requires addition of more components and sensors which increase the cost exponentially.

B. *Prediction using Big Data and Data Science* - Large amounts of data about trends in air population with time, date, location and other attributes is available. This Big Data can be used to generate Data Science Models the can predict the time when the purifier should be running. For Example-

- An air purifier in Delhi should be running more than a purifier in Shillong.
- The air purifier should run more during day than night since vehicular pollution is more during day.
- During rainfall the air purifier can turn off since moisture in air causes dust particles to settle down.
- During Diwali the purifier should run continuously.

This can be easily achieved by creating a module that can be added to the pre-existing system suggested above which controls the functioning of the other modules using IoT. By applying cognitive techniques, unstructured data can be analyzed and together with real-time ongoing insights give in lot of relevant insights that will lead to precise predictions and effective management models. In the case of air pollution, once when the key insights on the contributing factors of pollution are identified, the management and prediction become far easier.

VI. CONCLUSION

Decreasing the cost of air purifiers and adding them to pre-existing appliances like table fans and ceiling fans

will increase the adoption rate of the air purifiers. Air Conditioners have already started adding air purification modules. But since the majority of the people in India cannot afford Air Conditioners, adding them to fans is more apt. Minimising cost, minimising size and minimising running cost is the solution. As the Indian market

starts adopting air purifiers, the focus can then shift to efficiency. Big Data, Data Science, Artificial Learning, and Machine Learning will help improve this efficiency in future.

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KNOWLEDGE MANAGEMENT PROCESS IN INDIAN NATIONALISED BANKS

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ABSTRACT

K*nowledge management is emerging discipline and has potential to innovate and serve society at large scale. The present study attempts to explore the component of knowledge management process with empirical data. The study is based on both primary and secondary data. Bank employee in Lucknow is taken as sample unit and they were selected through multistage sampling method. 240 questionnaires were distributed however only 216 samples were completed in all respect. The finding of the study with the help of exploratory factor analysis explores and endorsed by respondent i.e. knowledge acquisition, knowledge transfer, knowledge integration and knowledge application.*

Key words: *knowledge acquisition, knowledge transfer, knowledge integration and knowledge application*

INTRODUCTION

Knowledge management process leads to the application and development of firm's knowledge and create value and competitive advantage.It coordinates the generation, acquisition, transfer and application of individual or organizational knowledge in value creation processes.Success becomes a function of the quality of knowledge content to create and conveyadequate products and services*(Wiig, K.M., 1997)*.Knowledge is information combined with context, interpretation, experience, and reflection*(Davenport, T.H., et al., 1998)*. Moststudies have focused on aspects

of knowledge management, such as knowledge creation, retention or adoption, sharing*(Singh, R.M. & Gupta, M., 2014)*. Successful organization is those that create new knowledge, disseminate it widely across the organization and quickly embody it into products*(Metaxiotis,K.,et. al., 2005)*. In India, the banking system is going through crisis and it is essential to assess that to what extent nationalised banks implement the knowledge management.

LITERATURE REVIEW

Knowledge processes include effective collaboration to extract the best fromexisting knowledge*(Armistead, C., 1999)*. Knowledge transfer processes are also important in supporting organisational effectiveness (*Armistead, C., 1999)***.** It may help to solve problem easier and faster*(Shaghaei, N. &Turgay, T., 2013)***.** Knowledge processes enable organizations to generate and acquire new knowledge, drive their application, support the storing, sharing and transferring of knowledge*(Schiuma, G., 2012)*.Knowledge acquisition includes storing knowledge in a convenient format for future retrieval*(Koh, S.C.L.,et. al., 2005)***.** External knowledge acquisition affects the firm's ability to earn economic rents in dynamic scenario*(Lopez-Saez, P., et. al., 2010)*.Motivations to transfer knowledge are present in all organizational settings and affect people's behavior, intentions, and interests in such a manner that may promote their willingness to engage in knowledge transfer*(Strach, P. & Everett, A.M., 2006)*.Knowledge transfer performed by innovating organization during or after the adoption of the innovation*(Daghfous, A. & Ahmad, N., 2015)***.** Knowledge Integration is the resultant knowledge will solve problems *(Rodzi, M.Z.M, et al., 2015)*.Integration is the process of combining several types of explicit knowledge into new patterns and new relations *(Herschel, R.T. & Jones, N.E., 2005)***.** Knowledge application capability can be defined as the ability of employees to use knowledge for the purpose of solving problems and dealing with challenges in the firm*(Kim, S. & Lee, H., 2010)*.To assess the component of knowledge management process; research methodology is specified in next section.

OBJECTIVE OF THE STUDY

The objective of the study is to explore the component of knowledge managementa process with special reference to Canara Bank, Bank of India and Union Bank of India in Lucknow.

RESEARCH METHODOLOGY

Scope of the study

a. The study is confined to the Lucknow district of Uttar Pradesh.

b. The scope of the study is to explore the component of knowledge management process.

Research design

The examination is exploratory, descriptive and cross-sectional study. It utilized the data gathering instrument and, explicitly intended to explore the component of Knowledge management process. The statistical software SPSS 23.0 was utilized. The statistical method is exploratory factor analysis.

Sample size and sampling technique

240 questionnaires were distributed however only 216 samples have been completed in all regard. Multistage sampling method has been employed in order to collect the data.

Data gathering instrument

Data gathering instrument is based on five-point Likert scales. The respondent needs to simply tick against one parameter of each variable relying upon whether he or she strongly agree, agree, neutral, disagree and strongly disagree. This instrument for knowledge management process was taken from Wu, I. & Hu, Y., 2018.

Collection of data

Data was collected from both primary and secondary source. Primary data was collected with the help of questionnaire. Secondary details collected from various sources such as, published research paper, article and so on.

DEMOGRAPHIC PROFILE OF RESPONDENT

In this table A; responses from respondents related to demographics were analyzed using percentage and frequency distribution. The researcher depicts respondent profile as gender, age group, education qualification and position of employee. As we can analyze in the ' gender classification' the participation of male is relatively more to that of females. Male respondent is 142 (65.7 %) where female are 74 (34.3 %) which uncovers that there is higher level of male respondents. The majority of the respondents are in the age beginning from 30 to 40 years of age are 70 (32.4 %), followed by those of 20-30 years are 59 (27.3%) respondent, and other age group. In case of education qualification of respondent, 107 (49.5%) of respondents have qualified graduation, 65 (30.1%) respondents had completed Post Graduation, 44 (20.4%) respondents have other qualification.

TABLE - A

DEMOGRAPHIC PROFILE OF RESPONDENT

Particular	Frequency	Percent
Gender		
Male	142	65.7 %
Female	74	34.3 %
Age Group		
20-30 years	59	27.3 %
30-40 years	70	32.4 %
40-50 years	43	19.9 %
50 years and above	44	20.4 %
Educational Qualification		
Graduation	107	49.5 %
PG	65	30.1 %
Other	44	20.4 %
Position		
Clerk	90	41.7 %
Officer	126	58.3 %

ANALYSIS AND RESULTS

A principal component analysis (PCA) was conducted on the 12 items with orthogonal rotation (varimax). The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, KMO = .726, and all KMO values for individual items were > .533, which is well above the acceptable limit of .5 (Field, 2009). Bartlett's test of sphericity $\div^2$ (66) = 745.366, p < .001, indicated that correlations between items were sufficiently large for PCA. An initial analysis was run to obtain eigenvalues for each component in the data. Four components had eigenvalues over Kaiser's criterion of 1 and in combination explained 67.530 % of the variance. Given the large sample size and Kaiser's criterion on four components, this is the number of components that were retained in the final analysis. Table C shows the factor loadings after rotation. The items that cluster on the same components suggest that component 1 represents knowledge transfer, component 2 knowledge application, component 3 knowledge integration and component 4 knowledge acquisition.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.726
Bartlett's Test of Sphericity	Approx. Chi-Square	745.366
	Df	66
	Sig.	.000

Table – B
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.120	25.998	25.998	3.120	25.998	25.998	2.207	18.394	18.394
2	2.143	17.860	43.858	2.143	17.860	43.858	2.098	17.483	35.877
3	1.699	14.155	58.013	1.699	14.155	58.013	2.086	17.383	53.260
4	1.142	9.517	67.530	1.142	9.517	67.530	1.712	14.270	67.530
5	.779	6.490	74.020						
6	.592	4.937	78.958						
7	.521	4.343	83.301						
8	.499	4.157	87.458						
9	.487	4.062	91.520						
10	.387	3.221	94.741						
11	.351	2.924	97.665						
12	.280	2.335	100.000						
Extraction Method: Principal Component Analysis.									

TABLE –C

ROTATED COMPONENT MATRIX

Coding	Component			
	1	2	3	4
B2	.874			
B1	.874			
B3	.808			
D1		.819		
D2		.818		
D3		.799		
C1			.835	
C2			.813	
C3			.768	
A2				.804
A3				.785
A1				.660
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 5 iterations.				

FINDINGS AND CONCLUSION

In current scenario, the knowledge management is one of the important topic across the globe. In banking industry, they deal with huge amount of data and information on daily basis. Data and information is not to be considers knowledge until it is contextualized. Finding based on empirical data were endorsed by respondent and confirm the literature. Four component were identified i.e. knowledge acquisition, knowledge transfer, knowledge integration and knowledge application. The Knowledge management processes includes knowledge creation, organizing, storage, sharing and utilization*(Nawab, S., et. al., 2015)***.** It will facilitate the ability to capture all related knowledge, then deployed or modified by the firm in a useful manner*(Alhawari, S. & Al-Jarrah, M.,2012).*Knowledge management process is implemented in effective way to address the emerging issues in context of Indian nationalised bank.

LIMITATIONS AND FUTURE RESEARCH

The study is cross sectional and it requires longitudinal study for more conclusive finding. Study is confined to Lucknow district only. The study can be implemented in other part of India. The sample size for future research could be larger to generalize the finding.

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15

BIODIVERSITY LOSS

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Biodiversity is the variety of different forms of life on earth, including the differentplants, animals, microorganism, the genes they contain and the ecosystem they form. It refers to genetic variation, ecosystem variation, species variation within the area.It is the life support system in which the organism depends on air, food, water.

The ecosystem services of biodiversity is maintained through protection and formation of the soil, conservation and purification of water, maintaining hydrological cycles, regulation of biochemical cycles, absorption and breakdown of pollutants and waste materials through decomposition, determination and regulation of the natural world climate.

Despite the benefits from biodiversity, today's threats to species and ecosystem are increasing day by day with alarming rate and virtually all of them are caused by human mismanagement of biological resources. With the ever increasing amount of environmental degradation there arises the cause of sudden extinction of species in the worldwide and also the local reduction or the loss of the species in a certain habitat. To ensure intra and intergenerational equity, it is important to conserve biodiversity. Some of the existing measures of biodiversity conservation include; reforestation, zoological gardens, biosphere reserves, social forestry to minimize stress on the exploitation of forest resources.

Introduction

The ecological consequences of biodiversity loss have aroused considerable interest and controversy during the past decade. Major advances have been made in

describing the relationship between species diversity and ecosystem processes, in identifying functionally important species, and in revealing underlying mechanisms. There is, however, uncertainty as to how results obtained in recent experiments scale up to landscape and regional levels and generalize across ecosystem types and processes. Larger numbers of species are probably needed to reduce temporal variability in ecosystem processes in changing environments. A major future challenge is to determine how biodiversity dynamics, ecosystem processes, and abiotic factors interact.

Causes for the Loss of Biodiversity

Causes for the loss of biodiversity can be classified into natural causes and man- made causes.

A. Natural Causes:

Natural causes for the loss of biodiversity mainly include floods,

Earthquakes and soil erosion. Let us understand them one by one.

- Floods:For instance, take an example of recent news. On 6th December, 2019, Matthew Littlewood and Joanne Holden published an article in which they mentioned about flooded Rangita River which washed away almost all the eggs and small chicks of birds living over there.
- Earthquakes: Earthquakes destroy the habitats of animals. As a result they migrate to different places to find food and shelter. This sudden migration affects not only their food chain but also their health which results in the loss of biodiversity.
- Soil Erosion:Soil erosion can also cause significant losses in biodiversity. When the highly fertile soil is wiped away, productivity of soil is affected. Many flora species need fertile soil to grow.

B. **Man- Made Causes:** Man is also responsible for degrading the condition of biodiversity. Few man- made causes are listed below:

- Deforestation:The biodiversity of an area decreases when animals or plants die as a result of deforestation.
- Pollution:Dumping of waste into the ocean results in the loss of the lives of aquatic animals. Many animals die due to heavy air pollution by inhaling polluted air. Polluted soil also causes many diseases in plants, animals and microorganisms.
- Mining Activity:Mine-extracted material causes poisoning which affects the living species and results in the loss of biodiversity.

The Human Impact on Biodiversity Loss

As much as we like to try to keep ourselves apart from it, by building roads and houses to protect us from the elements, humans are intrinsically linked to the world around us. Biodiversity loss will affect us, too.

Maria Neira, director of WHO's Department for the Protection of the Human Environment, summed it up as "Human health is strongly linked to the health of the ecosystems, which meet many of our most critical needs."

We harvest plants from around the world for both modern and alternative medicine. Many of these medicines save lives, and we could lose half of these plants by 2050.We harvest 200 billion pounds of food from the oceans every single year. Meat from wild animals also helps to sustain people around the world.

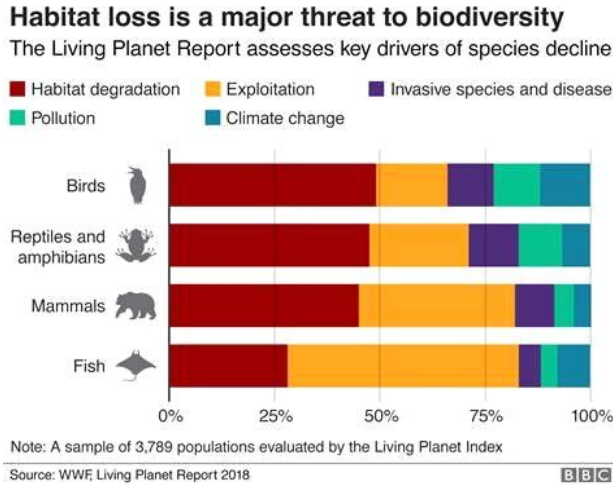

Fig 1 : Habital Loss

Conclusion: Reverse the Biodiversity Loss

Trying to save the whole planet is a lofty goal unless it is done with the initiative of everyone. It will take everyone making small changes in the way they live to create large, cumulative changes.

Followings points can be considered for the preservation of the biodiversity:

A. Recycle:

Purchase products that are made with recycled materials. Plastic,paper,wood and metal can all be recycled, so start there to make a difference.

B. Buy Sustainable:

We all love sea food but before we start stocking up on seafood, we should make sure you're buying fish that has been sustainably harvested. Avoid fish that are endangered.

C. Drive Green:

Everyone talks about reducing their carbon footprint, and the easiest way we can do this is to give up our gas guzzler in favor of an electric car. These low no-emission vehicles have much less of an impact on the environment. We can also try carpooling, public transportation, riding a bike or walking where we can initiate our effort.

D. Protect Local Habitats and Make Wildlife Welcome:

We might not be able to save the world, but we can help improve our local areas by taking the time to clean up animal habitats, like beaches, forests and other undeveloped areas. And hence making our area welcoming for wildlife. Bird houses, bat houses and other housing can be great, as can planting local flora and turning your backyard into our own personal wildlife sanctuary.

E. Go Package-Free:

Plastic packaging is one of the biggest wastes we experience on a daily basis. Hence the shops at grocery store can allow bringing our own bags, jars and other reusable packaging to buy dry ingredients in bulk.

F. Compost:

The average person generates a lot of garbage in a single day, much of it organic. Instead of tossing our vegetable peelings or coffee grounds, we can try setting up a compost pile for our organic waste. Not only does it keep your trash out of landfills, but it also makes killer natural fertilizer for flowers and plants.

G. Volunteer:

There are probably plenty of organizations in our area that are working toward a greener tomorrow. We can volunteer our time and help improve the area where we live.

H. Stand Up:

Big companies are starting to get the picture, but there are still plenty that will exploit natural resources. If we got a big development company that will result in cutting down forests or drain local wetlands, we can take our stand to prevent this.

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DEPLETION OF NATURAL RESOURCES

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ABSTRACT

With the ever increasing technological innovations today, natural resources have been depleting. Resource depletion occurs when the renewable and non-renewable natural resources become scarce because they are consumed faster than they can recover. The natural resources contribute at large to the economic development of the nation. Current patterns of energy and natural resource use, agricultural practices, and urbanization appear to be largely unsustainable and require urgent remediation. The consumption pattern of natural resources did not seem to be justifiable which can have economic downfalls for the nation. Population explosion is acting as a catalyst for resources depletion. If the consumption scenario is not checked it will lead to irreversible climate change and declined economic growth, as a result of increased social, economic, and environmental costs and decreased productivity.

Current economic models fail to incorporate the effects of high-carbon growth on climate change and environmental degradation. A new generation of economic models is needed that account for the risk of catastrophic impacts, do not overestimate the costs of climate change action, and use a discount rate that does not treat future generations as less important than the current one. This is the time, we have to hear nature's call, we should save our natural resources by adopting various measures like – control deforestation, recycle more and improve recycling systems, protect coastal ecosystems, reduce dependency on fossil fuels and spread awareness.

Introduction

Homo Sapiens are using natural resources endlessly day by day. Three kinds of reserves of natural resources can be identified: continuous resources such as sunlight and wind, the use of which does not lead to a reduction in their size; renewable resources, such as wood and crops that can be harvested – but not faster than their rate of replenishment; and the third category, non-renewable resources such as fossil fuels and minerals, that has been traditionally considered as depletable and exhaustible. The last are created by very slow geological processes, so slow in human terms that their use diminishes the available stocks. Resources such as clean water, fertile soils and biodiversity, given the time required for their recovery, can also be considered to be non-renewable.

Depletable resources are those that cannot be renewed or regenerated, including fossil fuels, other minerals, unreplenishable aquifers, and the like. Such resources are essentially exhaustible even if some recycling is possible so that a certain reversibility of their depletion is feasible. Living resources, such as, forests, clean water, fertile soils and biodiversity, though capable of being regenerated, can still be depleted, either inadvertently or deliberately when mined by their owners to extinction or near extinction.

The focus in this paper, however, will be on that class of marketable resources conventionally viewed as depletable or exhaustible, with minerals representing a prime example of such resources.

Causes of Depletion of Resources

A. Overpopulation

So far, the world population has increased from 1 billion to 7.7 billion today. Still, there is a consistent increase in the overall earth populace and this has been a critical factor in accelerating the depletion of natural resources. In addition, it contributes to increased ecological contamination. Many of the world's small island or isolated states have large populations for their size. Macao, Monaco, Singapore, Hong Kong and Gibraltar are the five most densely populated. Singapore has nearly 8,000 people per km^2 – more than 200 times as dense as the US, and 2000 times that of Australia.

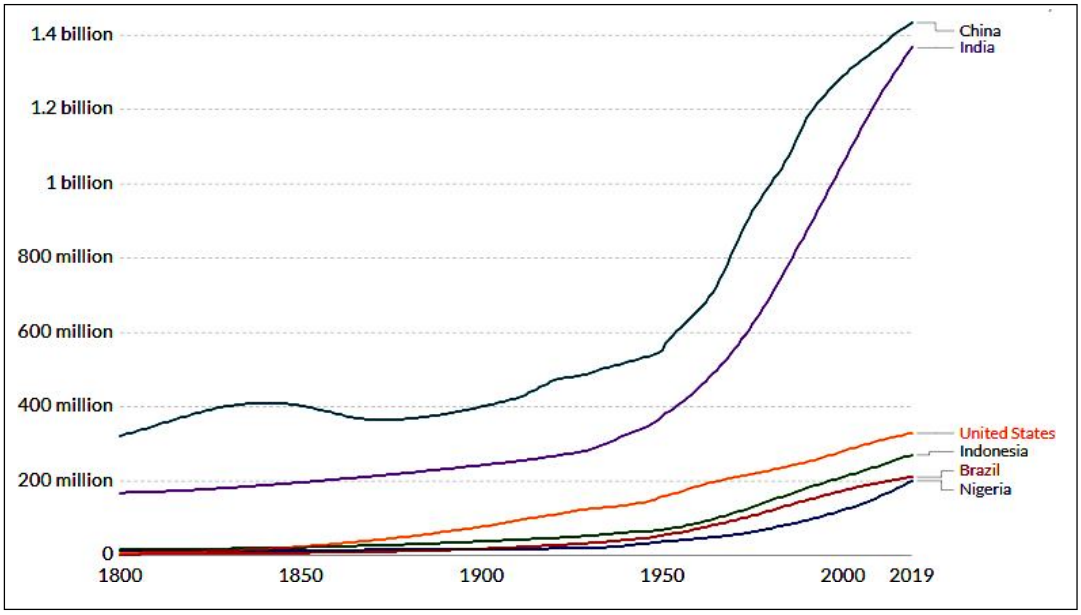

Fig : 1 (Graph showing the rise in population in top 5 world's most populated countries)

Research further indicates that developing countries are using more and more resources to industrialize and support their ever-increasing population. Hence, the depletion of natural resources will continue as long as the world population increases.

B. Deforestation

Forests cover more than 30% of the Earth's land surface, according to the World Wildlife Fund. These forested areas can provide food, medicine and fuel for more than a billion people.

Worldwide, forests provide 13.4 million people with jobs in the forest sector, and another 41 million people have jobs related to forests.

Deforestation is the permanent removal of trees to make room for something besides forest. Poverty is an important underlying cause of deforestation, of which about two-thirds is carried out by small farmers clearing land for cultivation and to obtain wood for fuel.

Commercial logging for timber is responsible for most of the rest. Moreover, increased logging activities lead to soil erosion that degrades natural soil minerals.

The World Bank reported that the net loss of global forest between 1990 and 2016 was 1.3 million square kilometers. On the same note, tropical deforestation is estimated to occur at a rate of one percent annually, especially in Latin America regions.

C. Poor Farming Practices

Humans are causing a lot of stress to land resources due to the over-reliance on food production for daily nutritional requirements. Poor irrigation practices, for example, is a key contributing factor to salinization and alkalization of the soil that sustains plants growth.

Poor soil management practices and the use of heavy machinery and farming equipment also destroy the soil structure making it unsuitable for plant growth.

Some farming practices such as excessive use of pesticides, fungicides, and herbicides equally kill important soil micro-organisms that are essential in replenishing nutrients in the soil.

D. Over consumption

The 1760 industrial revolution saw large-scale mineral and oil exploration and the practice has been gradually growing, leading to more and more natural oil and mineral depletion. And together with the advancements in technology, development and research in the contemporary era; exploitation of minerals has become easier and humans are digging deeper to access different ore. The increased exploitation of different minerals has led to some of them entering into a production decline.

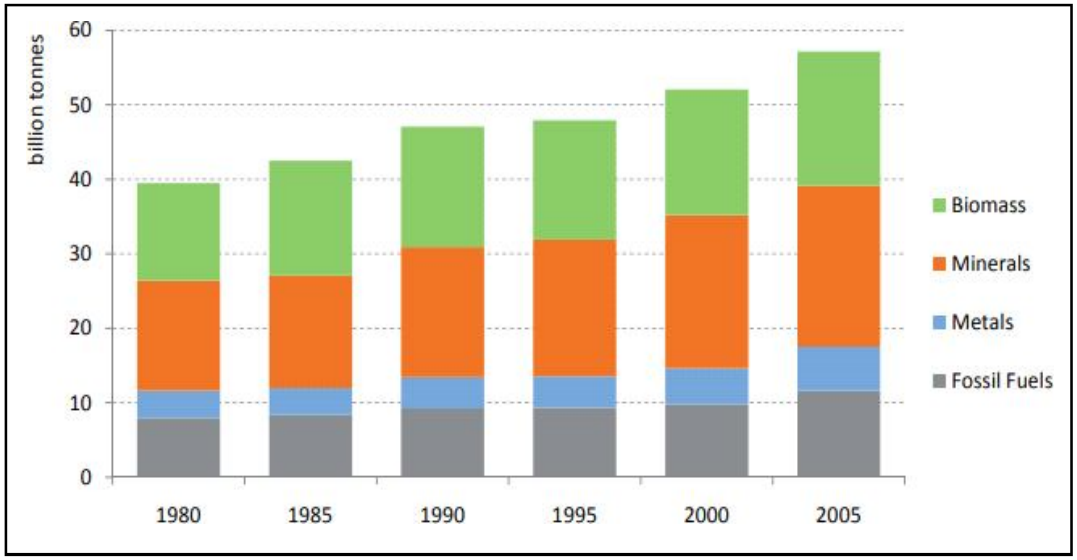

Fig : 2 Global extraction of natural resources (1980-2005)

E. Industrial and Technological Development

The present-day world is incessantly becoming industrialized as more and more countries make major technological breakthroughs. But as technological

advancements continue, there is similarly a considerable growth in industries that release toxins and chemical by-products which are eventually deposited in lakes, soils, and lands. As a result, the by-products and toxic materials alter natural habits such as aquatic systems and wildlife.

According to National Policy on the Environment (2016), urbanization, excessive consumption of fossil fuels by industrial and automobile sectors, and degradation of natural resources have increased carbon dioxide resulting in global warming causing extreme weather events that are responsible for a number of natural hazards (e.g., the 2012 Nigeria witnessed major flood disasters) and massive erosion of land. Such kind of natural hazards is a wake-up call for coherent and integrated management of environment within the policy environmental regulatory framework.

F. Pollution

The present-day world is incessantly becoming industrialized as more and more countries make major technological breakthroughs. But as technological advancements continue, there is similarly a considerable growth in industries that release toxins and chemical by-products which are eventually deposited in lakes, soils, and lands. As a result, the by-products and toxic materials alter natural habits such as aquatic systems and wildlife.

Examples of the impacts include acidic lakes, dead zones, and the death of wildlife as well as aquatic life. Industrial and technological advancements have also driven the demand for virgin materials for research, development, and production. More resources are hence being used to satisfy the industrial demands, increasing the rate of natural resource depletion.

Impact of depletion of natural resources

A. Depletion of minerals

As minerals are needed in every phase of life, from housing to business, they are being used up rapidly. A United States Geological Survey (USGS) study found a significant long-term trend over the 20th century for non-renewable resources such as minerals to supply a greater proportion of the raw material inputs to the non-fuel, non-food sector of the economy; an example is the greater consumption of crushed stone, sand, and gravel used in construction. Studies by Global Phosphorus Research Institute, for example, shows that the earth could run out of phosphorus – an essential element for plant growth, in the next 50 to 100 years.

B. Extinction of species

Due to the changes in the living conditions of animals as a result of resource overexploitation and habitat degradation, some species are extinct. One of the largest

fish in the world, the Chinese Paddlefish could grow upto 23 feet in length, found in China was driven to extinction by the mid-2000s. Catarina Pupfish went extinct in the wild in 2014. Its habitat was destroyed by the extraction of groundwater for industry and farming. Not only these, but there has been a drastic reduction in the number of marine species due to water pollution.

C. Oil depletion

Oil is a non-renewable resource that accounts for approximately 40 percent of the total energy used globally. Research by EIA's International Energy Outlook in the year 2013 had shown that due to the high rate of oil exploitation, the amount of oil remaining would last for only 25 years.

D. Water shortage

There's nothing more essential to life on Earth than water. People are struggling to access the quantity and quality of water they need for drinking, cooking, bathing, and growing their food.

Globally, 844 million people lack access to clean water. Without clean, easily accessible water, families and communities are locked in poverty for generations. In India, water scarcity is expected to worsen as the overall population is expected to increase to 1.6 billion by year 2050.

Water scarcity affects every continent and was listed in 2019 by the World Economic Forum as one of the largest global risks in terms of potential impact over the next decade.

E. Climate change

Climate change is among the greatest and most difficult challenge facing the world today. Climate change is also highly significant in that successfully addressing it will go a very long way toward addressing other environmental problems. Dealing with the problems of air pollution; water risks; the loss of forest, natural habitats, and biodiversity; and soil degradation will benefit greatly from actions to address climate change. These spillover effects provide another reason for focusing attention on climate.

Climate change can affect economic activity through four principal paths:

- increases in temperature and the associated impacts on agriculture, energy demand, disease, and so forth
- rises in sea level and the associated threat to infrastructure and production capacity, especially in urban areas

- increased intensity of extreme weather events and the associated destruction of infrastructure and agriculture
- shifts in the hydrological cycle and the associated impacts on agriculture, power and industrial systems, and drinking water.

Solutions to slow down the rate of depletion

A. Control deforestation

As we know, deforestation is the major cause of environmental changes and leads to depletion of resources. Programs aimed at checking against deforestation such as REDD (Reducing Emissions from Deforestation and Forest Degradation) created by the World Bank, the New York Declaration on Forests, and the United Nations are initiatives that could help reduce the depletion of natural resources.

B. Recycle more and Improve recycling systems

In 2016, global plastics production was approximately 335 million metric tons, and about half of that was used to make single-use products, according to the Earth Day Network.

Reducing the plastic use helps avoid the use of the resources needed to make plastic and prevents plastic waste from harming the natural environment. Substituting single-use plastics like plastic grocery bags, utensils and straws with durable items can help.

C. Protect coastal ecosystems

Coastal ecosystems aren't just important for maintaining biodiversity, they are also extremely valuable to the fishing and tourism industries. Whether living near a coastal reef or not, seafood consumers should be aware of how the purchasing decisions they make affect the environment.

D. Reduce dependency on fossil fuels

Preventing the depletion of fossil fuels is usually discussed in terms of using less gasoline and electricity, which is typically produced through the burning of fossil fuels. Although driving less and carpooling more are obvious ways to conserve gasoline, purchasing locally grown or locally raised food products supports farms and companies that don't burn fossil fuels in shipping their products over long distances.

E. Spread awareness

People need to be educated on how their daily practices put a strain on the scarce natural resources and their individual contributions to the depletion of natural resources. The main purpose of creating awareness would be to encourage people to

preserve and restore the natural environment by getting involved in conservation efforts.

Conclusion

The purpose of natural resource exploitation is generally to trigger economic growth and development. But, we cannot overlook this issue as our life is at stake. The measures that are given to save natural resources from depletion will play an important role in transforming economic processes toward a more sustainable footing. Sadly, they will not be sufficient unless they succeed in demonstrating that the benefits of climate action are greater than have been widely understood and the language of burden-sharing and costs is replaced with that of opportunity and greater well-being for citizens everywhere. This area will be a big battlefield in the coming years. The stakes are high, and time is running out.

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IMPACT OF ELECTROMAGNETIC RADIATION

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ABSTRACT

Current technologies have become a source of omnipresent electromagnetic pollution from generated electromagnetic fields and resulting electromagnetic radiation. In many cases this pollution is much stronger than any natural sources of electromagnetic fields or radiation. The harm caused by this pollution is still open to question since there is no clear and definitive evidence of its negative influence on humans. This is despite the fact that extremely low frequency electromagnetic fields were classified as potentially carcinogenic.

In many cases this pollution is much stronger than any natural sources of electromagnetic fields or radiation. Wireless and radio communication, power transmission, or devices in daily use such as smartphones, tablets, and portable computers every day expose people to electromagnetic pollution. The harm caused by this pollution is still open to question since there is no clear and definitive evidence of its negative influence on human beings. This is despite the fact that extremely low frequency electromagnetic fields were classified as potentially carcinogenic. For these reasons, in recent decades a significant growth can be observed in the scientific research on the influence of electromagnetic fields and/or electromagnetic radiation on living organisms.

Introduction

People rely on these technological tools for work, communicating with friends and family, school, and personal enjoyment. What most people don't seem to realize,

however, is that **all of these electronic devices are known to emit waves of Electromagnetic Radiation (EMF).** Electromagnetic fields and/or electromagnetic radiation, as electromagnetic pollution, affect various elements of the environment. Among the elements of that environment all living organisms should be placed at the first position. Therefore it becomes very important to appropriately determine the nature and related side effects of electromagnetic pollution and its impact on living organisms. Every day living organisms are exposed to different types of electromagnetic pollution. However, all of them can be well characterised by their physical parameters such as type (electric, magnetic, electromagnetic), frequency, and intensity/power. Electronic devices such as smartphones, tablets, microwave ovens, radio, and television sets emit low intensity electromagnetic radiation at frequencies from 300 MHz to 300 GHz that can be associated with microwaves. On the other hand power transmission lines and electric devices are strong sources of electromagnetic fields (primarily electric for power transmission lines, primarily magnetic for transformers, or electromagnetic for antennas) and radiation of much lower frequencies but much higher intensities.

Electromagnetic Waves

Electromagnetic Waves are produced by motion of electrically charged particles. These waves are also called electromagnetic radiation because they radiate from the electrically charged particles. They travel through empty space as well as through air and other substances. Electromagnetic waves at low frequencies are referred to as electromagnetic fields and those at very high frequencies are called electromagnetic radiations.

Sources of electromagnetic fields and radiation influencing living organisms

Type	Frequency	Source
Static*	—	Natural, video screens, magnetic resonance imaging, and other diagnostic/scientific equipment, electrolysis, and welding devices
ELF	Below 300 Hz	Power transmission lines, home wiring, car electric engines, electric trains and trams, and welding devices
IM	300 Hz ÷	Video screens, antitheft devices used in cars, homes, and shops, card readers,
	100 kHz ÷	metal detectors, magnetic resonance imaging, and welding devices

RF	100 kHz ÷	GHz Radio, television, smartphones, tablets, microwave ovens, radar and radio.
	300GHz	transmitters, and magnetic resonance imaging.

We should be realised that different types of electromagnetic fields and/or electromagnetic radiation are responsible for different types of phenomena that can be observed as a result of radiation exposure.

Impact of Electromagnetic Radiation

The American Academy of Environmental Medicine (AAEM) believes we need to do a better job at understanding the **negative health effects from EMF exposure**. They have documented significant harmful effects occur from EMF exposure such as genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system dysfunction, and many others.

- **Impact On Birds**

There has been research done abroad which says there is some kind of impact on birds due to cell phone towers. As the human population decreases, bird population increases. So the number of cell phone towers with 4G technology might certainly impact the lives of birds, and of humans. This needs a greater amount of investigation, research and mapping in the country.

- **Impacts On Human Beings**

Biological effects of radiation are generally common to man and animals. Higher animals are more susceptible to genetic damages due to radiation. Exposure is high in higher animals than the lower animals such as flies and insects. Studies on Drosophila have shown that mutation rates were increased enormously on radiation exposure.

- **Impacts On Plants**

Ultraviolet radiation affects plant growth and sprouting and the amount of damage is proportional to the radiation received. Due to radiation exposure soil can become compact and lose the nutrients needed for plants to grow. Prolonged radiation exposure can completely destroy the fertility of plant and the plant gradually dies. Plant cells, contain chromosomes i.e. the genetic material responsible for plant reproduction if the ceil is much damaged by radiation then reproduction is hindered. As UV radiations destroy cells, the chances of mutation are increased. Affected plants are often small and weak with altered leaf patterns.

➢ **Impacts On Human Beings**

The American Academy of Environmental Medicine (AAEM) believes we need to do a better job at understanding the **negative health effects from EMF exposure**. They have documented significant harmful effects occur from EMF exposure such as genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system dysfunction, and many others.

1. Nervous system and brain: widespread neurological/neuropsychiatric effects like sleep disturbance/insomnia; fatigue/tiredness; headache; depression/ depressive symptoms; lack of concentration/attention/cognitive dysfunction; dizziness/vertigo; memory changes; restlessness/tension/anxiety/stress/ agitation; irritability.
2. Endocrine/hormonal systems: The steroid hormone levels drop with EMF exposure, whereas other hormone levels increase with initial exposure. The neuroendocrine hormones and insulin levels often drop with prolonged EMF exposure
3. Oxidative stress and free radical damage: central roles in essentially all chronic diseases, as well as other body effects.
4. Cellular DNA attacks: These are related to cancer causation and produce the most important mutational changes in humans and diverse animals, as well as in future generations.
5. Apoptosis (programmed cell death): This can cause both neurodegenerative diseases and infertility.
6. Fertility Problems: This can lead to lower sex hormones, lower libido and increased levels of spontaneous abortion and, as already stated, attack the DNA in sperm cells.
7. Cancer: 15 different mechanisms of EMF radiation's effect on the cell can cause cancer. Brain cancer, salivary cancer, acoustic neuromas and two other types of cancer go up with cell phone use. People living near cell phone towers have increased cancer rates.

How can we reduce these impacts ?

- ***Decrease Sources***

Taking away the number of sources of EMF in your vicinity or your home is a great way to start. A swarm of bees can hurt you, but **one bee can't do much**. Eliminate

as many sources as EMF as possible, by **turning them off** or **removing them** from your room or house.

- ***Increase Your Distance***

EMF protection should include keeping devices **as far away from our bodies as possible**. A safe distance from the radiation source ensures that we won't be affected. This is why sources such as power lines, cell towers, and appliances that are far away are not much of a threat. With smaller EMF-emitting devices though, these cause **more of a risk** as the source is often pressed near, if not, right **against our bodies**. Even if the device is not pressed to directly our skin, radiation is still absorbed by our bodies. This is why proper EMF protection is advised.

- ***Limit Your Time***

Naturally, this isn't possible when a device is designed to be used near the body. A much more effective form of EMF protection can be simply **using these devices over shorter periods of time**. Limiting the amount of time you use mobile devices can greatly reduce your exposure to EMFs and the negative health effects they may produce. On Apple products, you can set **time limits on apps**, and you can put a timer on your WiFi router to turn off at night!

- ***Use Wired Devices***

By wiring your mouse, keyboard,speakers, headphones, and by using an Ethernet cable over wireless Internet, you can significantly **reduce the amount of Radio Frequency radiation** you are exposed to.

- ***Use Shielding***

One of the most effective forms of EMF protection recommended are **shields designed to protect one from EMF radiation**. This shielding should be made specifically for EMF protection, and not just against heat or discomfort. You want an EMF shield that will stay between you and your electronic device to **conduct, absorb, and dissipate** the radiation away from your body.

5G the future Problem

The new 5G technology utilizes higher-frequency MMW bands, which give off the same dose of radiation as airport scanners. **The effects of this radiation on public health have yet to undergo the rigours of long-term testing.** Adoption of 5G will mean more signals carrying more energy through the high-frequency spectrum, with more transmitters located closer to people's homes and workplaces–basically a lot more (and more potent) RFR flying around us.

- DNA single and double-strand breaks (which leads to cancer)
- oxidative damage (which leads to tissue deterioration and premature ageing)
- disruption of cell metabolism
- increased blood-brain barrier permeability
- melatonin reduction (leading to insomnia and increasing cancer risks)
- disruption of brain glucose metabolism
- generation of stress proteins (leading to myriad diseases)

Conclusion

You have no choice but to think of your health, when you are sick. Disease is the body's way of shouting so loud you are forced to listen. Caring for your health on a daily basis can prevent chronic issues and speed up recovery when a problem does occur. If EMF protection is not a priority for you, consider that exposure to **EMF radiation** can **cause fertility problems, cellular damage or DNA mutation, as well as create skin problems**. EMF radiation is a **major source of study in the scientific community** and with good reason. As we continue to evaluate the long term effects of being surrounded by all of these devices, it is recommended to **approach their use with reason and care.**

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सतत् कृषि विकास पर भूमण्डलीय ऊष्मन का प्रभाव

सुनील दत्त

शोध छात्र, सी0एस0जे0एम0 यूनिवर्सिटी कानपुर

(सम्प्रति–प्रवक्ता भूगोल, शि0ना0सिं0 वि0मा0इ0का0 गौरा–रायबरेली)

प्रस्तावना

भारत एक विशाल जनसंख्या वाला देश है। यहाँ की जनसंख्या की उदरपूर्ति का मुख्य आधार कृषि है। जनसंख्या की तीव्र वृद्धि से कृषि क्षेत्र सिकुड़ते जा रहे हैं। पर्यावरणीय तत्व– ओला, पाला, अतिवृष्टि एवं अनावृष्टि एक ओर जहाँ अपना कुप्रभाव छोड़ते हैं, रसायनिक उर्वरक मृदा की उर्वरता को कम करते हैं, अनियन्त्रित सिंचाई, अशोधित बीज, पुरातन कृषि यन्त्र एवं पुरातन कृषि प्रौद्योगिकी कृषि उत्पादकता को बाधित करते हैं, कृषि विकास में रोड़ा अटकाते हैं, वहीं मनुष्य की भौतिकतावादी और अतिविकास की लालसा ने पृथ्वी के पर्यावरण में हस्तक्षेप करके अपने लिए एक नयी समस्या उत्पन्न कर ली है। पृथ्वी के पर्यावरण में औसत से अधिक तापवृद्धि ही भूमण्डलीय ऊष्मन है।

मानवीय गतिविधियों ने वन विनाश, औद्योगीकरण नगरीकरण, झूमिंग कृषि, खनन और परिवहन आदि कार्यों में वृद्धि पृथ्वी के सामान्य वायुमण्डलीय तापमान में वृद्धि करती है। इस भूमण्डलीय ऊष्मन (तापाधिक्य) ने पर्यावरण सन्तुलन को बिगाड़ दिया है। पर्यावरण असन्तुलन से कृषि के सतत् विकास पर लगाम लग रही है। भूमण्डलीय ऊष्मन के लिए उत्तरदायी ग्रीन हाउस गैसें पार्थिक विकिरण के रूप में उत्सर्जित ऊष्मा को अनन्त वायुमण्डल में जाने से रोक लेती है, जिससे वायुमण्डल के औसत ताप में वृद्धि हो जाती है। एक रिपार्ट के अनुसार भूमण्डलीय ऊष्मन के लिए जिम्मेदार प्रमुख गैस CO_2 की 19वीं सदी में वायुमण्डलीय मात्रा 280 PPM थी, जो 21वीं सदी में बढ़कर 379PPM हो गयी है। इस प्रकार विश्व के औसत तापमान में 1.4°C से 5.8°C के मध्य वृद्धि संभावित है। इसके फलस्वरूप समुद्र तल में लगभग 88 सेमी0 की वृद्धि संभावित है। इस तरह पृथ्वी के पर्यावरण में औसत तापमान वृद्धि से मानव जीवन पर विशेष रूप से कृषि पर विनाशकारी प्रभाव परिलक्षित होने वाला है। अतः सतत् कृषि विकास के लिए भूमण्डलीय ऊष्मन पर लगाम लगाना अति आवश्यक है।

मूल शब्दः– भूमण्डलीय ऊष्मन, सतत् कृषि विकास, ग्रीन हाउस गैस, झूमिंग कृषि।

उद्देश्य

1. भूमण्डलीय ऊष्मन के प्रभावों का विश्लेषण करना।
2. कृषि विकास के सहायक तत्वों का अध्ययन करना।
3. भूमण्डलीय ऊष्मन के उत्तरदायी कारकों का वर्णन करना।
4. भूमण्डलीय ऊष्मन के प्रभाव को कम करने के उपाय खोजना।
5. कृषि विकास एवं भूमण्डलीय ऊष्मन के मध्य सम्बंधों की व्याख्या करना।

विधि तन्त्र

प्रस्तुत शोध पत्र के अध्ययन में द्वितीयक स्त्रोतों से प्राप्त आंकडों की तालिका बनायी गयी है। तालिका में दिये गये आंकडों का वर्गीकरण एवं विश्लेषण करके निष्कर्ष निकाला गया है। मानचित्रों एवं आलेखों के माध्यम से भूमण्डलीय ऊष्मन के प्रभावों को दर्शाया गया है। सोशल मीडिया, कम्प्यूटर, इण्टरनेट का भी प्रयोग किया गया है। किसानों से कृषि विकास के लिए आवश्यक दशाओं को समझने का प्रयास किया गया है।

विश्लेषण एवं व्याख्या

भूमण्डलीय ऊष्मन का अर्थ है– पृथ्वी के औसत तापमान में वृद्धि होना, जिसके कारण पृथ्वी के वायुमण्डल में असन्तुलन और परिवर्तन होता है। पृथ्वी के तापमान में औसत से अधिक वृद्धि करने वाली प्रमुख गैसे–कार्बन डाई आक्साइड, क्लोरो फ्लोरो कार्बन, मिथेन, नाइट्रस ऑक्साइड आदि मुख्य हैं। इन गैसों को हरित गृह प्रभाव की गैसें कहा जाता है। इन गैसों के उत्सर्जन में मानवीय क्रिया कलाप अधिक उत्तरदायी हैं। पृथ्वी की सतह का औसत तापमान 15°C है। पृथ्वी तक आने वाली सौर ऊर्जा का 75 प्रतिशत भाग पृथ्वी की सतह सोख लेती है, जिससे उसका तापमान बढ़ता है। शेष ऊष्मा वायुमण्डल में वापस लौट जाती है। कुछ ऊष्मा हरित गृह प्रभाव की गैसों द्वारा सोख ली जाती है। कार्बन डाई आक्साइड ग्रीन हाउस प्रभाव की प्रमुख गैस है। यह मानव की अनेकानेक क्रियाओं द्वारा वायुमण्डल में छोड़ी जाती है। वायुमण्डल में इसका सान्द्रण दिन–प्रतिदिन बढ़ता जा रहा है। CO_2 सहित ग्रीन हाउस गैसों के अत्यधिक सान्द्रण से वैश्विक ऊष्मन की स्थिति पैदा हो रही है। ग्रीन हाउस गैसों के प्रभाव से पृथ्वी का औसत तापमान 33°C अधिक है। इन गैसों के बिना पृथ्वी तल का अधिकांश भाग –18°C के औसत तापमान पर जमा होता।

जलवायु वैज्ञानिकों के अनुसार वैश्विक ऊष्मन तेजी से बढ़ रहा है। 1995 में आईपीसीसी ने एक अनुमान व्यक्त किया है कि यदि इसी प्रकार भूमण्डलीय ऊष्मन होता रहा तो 21वीं सदी में तापमान में 3.5°C से 10°C तक की वृद्धि हो सकती है। इससे न केवल तापमान में परिवर्तन होगा अपितु वर्षा की मात्रा में भी परिवर्तन होगा। भारत में वार्षिक वर्षा में भारी उतार चढ़ाव आयेंगे। कहीं बाढें आयेंगी तो कहीं सूखा पडेगा। बाढ़ और सूखा के हालातों मे कृषि पर बुरा प्रभाव पडेगा। कृषि के प्रभावित होते ही मानव अस्त–व्यस्त हो जायेगा। इस प्रकार भूमण्डलीय ऊष्मन का मानव जीवन पर गहरा प्रभाव परिलक्षित होगा।

भूमण्डलीय ऊष्मन के कारण, क्षेत्र एवं प्रभाव

मानव की विभिन्न क्रियाकलापों द्वारा भारत के विशिष्ट स्थानों पर ताप वृद्धि हो रही है। जिसका विवरण निम्न है–

क्र0सं0	कारण	क्षेत्र	प्रभाव
1.	वन नाशन	छोटा नागपुर का पठार, पश्चिमी घाट पर्वत	स्थानीय ताप वृद्धि
2.	झूमिंग कृषि	उत्तरी पूर्वी भारत, उडीसा, मध्य प्रदेश, केरल	स्थानीय तापवृद्धि एवं पारिस्थितिकीय असन्तुलन
3.	खनन एवं बीहड़ीकरण	रानीगंज, झरिया, बोकारो, तालचेर, सिंह भूमि, बेलाडीला, कुद्रेमुख।	स्थानीय तापवृद्धि
4.	औद्योगीकरण	कलकत्ता, मुम्बई, दिल्ली, चेन्नई एवं अन्य औद्योगिक नगर	ऊष्माद्वीप, प्रदूषण गुम्बद, वायु प्रदूषण, अम्ल वर्षा
5.	परिवहन	रेल, सड़क एवं जलमार्गों के रेखा जाल जैसे कानपुर, कलकत्ता, मुम्बई, दिल्ली	ऊष्माद्वीप, वायु प्रदूषण, अम्ल वर्षा
6.	नगरीकरण	विभिन्न महानगर, दसलाखी नगर जैसे–दिल्ली, मुम्बई, कोलकाता, इलाहाबाद, बैंगलोर, चेन्नई	ऊष्माद्वीप, प्रदूषण गुम्बद

स्रोत–भारत का भूगोल, लेखक डा0 शिवसागर ओझा

उपरोक्त तालिका में दिये गये तापाधिक्य के कारक एवं प्रभाव यद्यपि स्थानीय स्तर के हैं किन्तु यही वायुमण्डीय संचरण द्वारा विसरित होकर प्रादेशिक, राष्ट्रीय एवं वैश्विक ऊष्मन के कारण बनते हैं।

वायुमण्डलीय गैसें

वायुमण्डल में अनेक गैसें एक निश्चित मात्रा में पायी जाती हैं। इनकी मात्रा में थोड़ा सा भी परिवर्तन वायु की गुणवत्ता में परिवर्तन पैदा कर देता है। यह परिवर्तन वायु प्रदूषण और भूमण्डलीय ऊष्मन के रूप में दिखायी पड़ता है। वायुमण्डल की प्रमुख गैसों का आयतानुसार विवरण निम्न है।

तालिका–1

क्र0सं0	गैस का नाम	आयतन की % मात्रा		भार की % मात्रा
1.	नाइट्रोजन	78.088		75.527
2.	आक्सीजन	20.949		23.143
3.	आर्गन	0.93	भारी गैसें	1.282
4.	कार्बन डाई आक्साइड	0.03		0.0456
5.	हाईड्रोजन	0.01		–––
6.	नियान	0.0018		–––
7.	हीलियम	0.0005		–––
8.	क्रिपटान	0.0001	हल्की गैसें	–––
9.	ओजोन	0.00006		–––
10.	जेनान	0.000005		–––

स्रोत–जलवायु विज्ञान, लेखक–डी0एस0 लाल

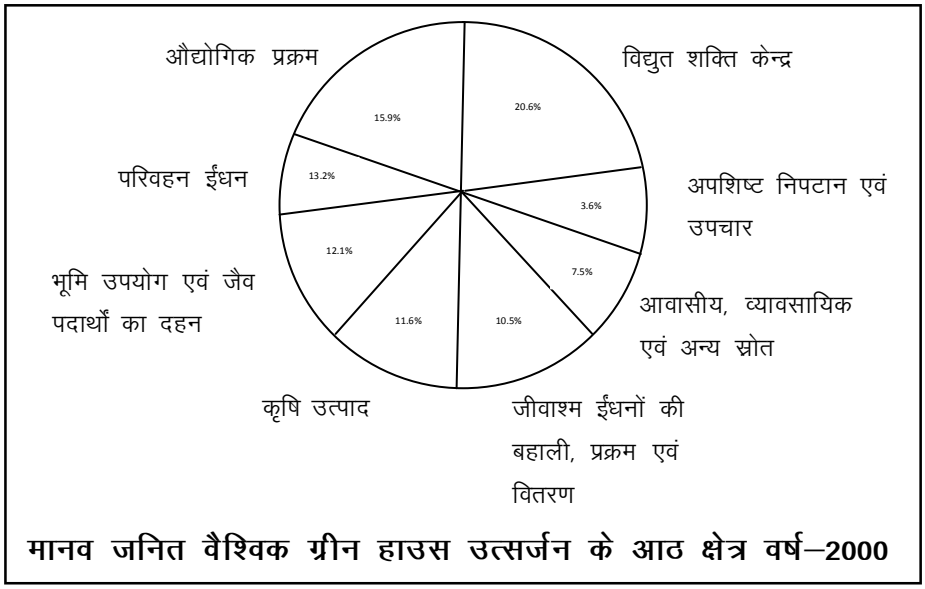
हमारा वायुमण्डल अनके, गैसों, जलवाष्प एवं धूलकणों से बना है। यह अनेक गैसों का यान्त्रिक सम्मिश्रण है। पृथ्वी के वायुमण्डल में भारी एवं हल्की गैसें पायी जाती हैं। भारी गैसें पृथ्वी के निचले मण्डल एवं हल्की गैसे ऊपरी मण्डल में पायी जाती हैं। भारी गैसों में नाइट्रोजन–78.08% सबसे अधिक मात्रा में पायी जाती है। नाइट्रोजन, आक्सीजन, आर्गन, Co_2 एवं हाइड्रोजन जैसी भारी गैसों में आर्गन एक मात्र अक्रिय गैस है। शेष सक्रिय गैसें हैं। अन्य हल्की गैसें– नियान, हीलियम, क्रिपटान और ओजोन अक्रिय गैसें हैं। इन अक्रिय गैसों में ओजोन एक विषैली गैस है। यह पृथ्वी की सतह से 15 से 50 कि0मी0 की ऊँचाई के मध्य पायी जाती है। यह सुपर सोनिक जेट विमानों से निकलने वाली नाइट्रस ऑक्साइड, एअर कण्डीशनर एवं रेफ्रिजरेटरों से निःसश्त क्लोरो फ्लोरो कार्बन से काफी प्रभावित हो रही है। ओजोन गैस से बनी ओजोन परत सूर्य से आने वाली हानिकारक अल्ट्रा वायलेट किरणों को अवशोषित करके पृथ्वी के जीव जन्तुओं की रक्षा करती है। वायुमण्डल की भारी गैसों में कार्बन डाई ऑक्साइड ऐसी गैस है जो सौर विकिरण के पारदर्शी तथा पार्थिव विकिरण के लिए अपारदर्शी मानी जाती है। जब वायुमण्डल में इसका सान्द्रण बढ़ जाता है तो अनेक समस्यायें उत्पन्न हो जाती हैं। हरित गृह प्रभाव में वृद्धि होती है, जिसके कारण पृथ्वी के निचले वायुमण्डल एवं धरातलीय सतह के तापमान में वृद्धि होती है। माण्ट्रियल प्रोटोकाल 1987 एवं क्योटो प्रोटोकाल 1997 के द्वारा वैश्विक स्तर पर Co_2 एवं CFC के उत्सर्जन में कमी किये जाने पर सहमति बनी है।

भूमण्डलीय ऊष्मन के उत्तरदायी तत्व

हरित गृह प्रभाव

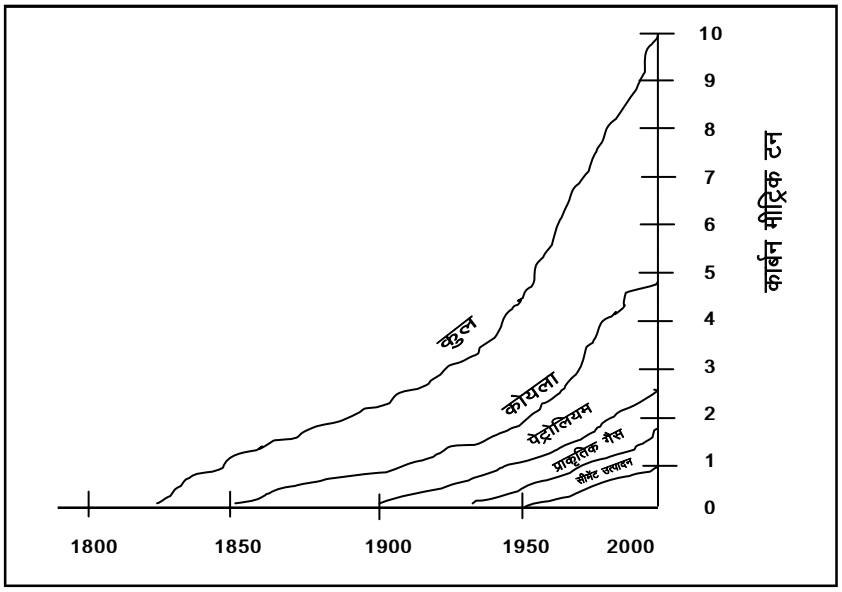
भूमण्डलीय ऊष्मन में हरित गृह प्रभाव को महत्वपूर्ण कारक माना जाता है। हरित गृह प्रभाव के लिए कार्बन डाई आक्साइड (Co_2), नाइट्रस ऑक्साइड (N_2O), मिथैन, (CH_4), ओजोन (O_3) क्लोरो फ्लोरो कार्बन (CFC_S) एवं जलवाष्प को मुख्य माना जाता है। कार्बन डाई ऑक्साइड का उत्सर्जन पिछले 15 वर्षों में 40 गुना बढ़ गया है।

विभिन्न क्षेत्रों से ग्रीन हाउस गैसों का उत्सर्जन

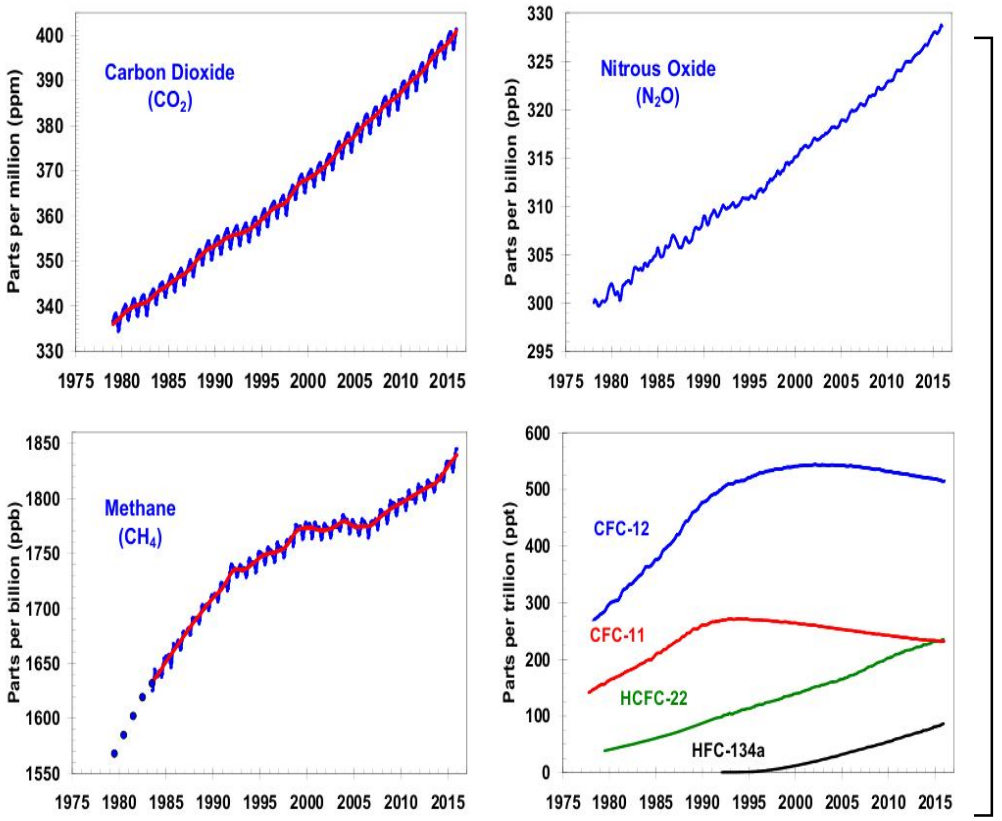


मानव जनित वैश्विक ग्रीन हाउस उत्सर्जन के आठ क्षेत्र वर्ष–2000

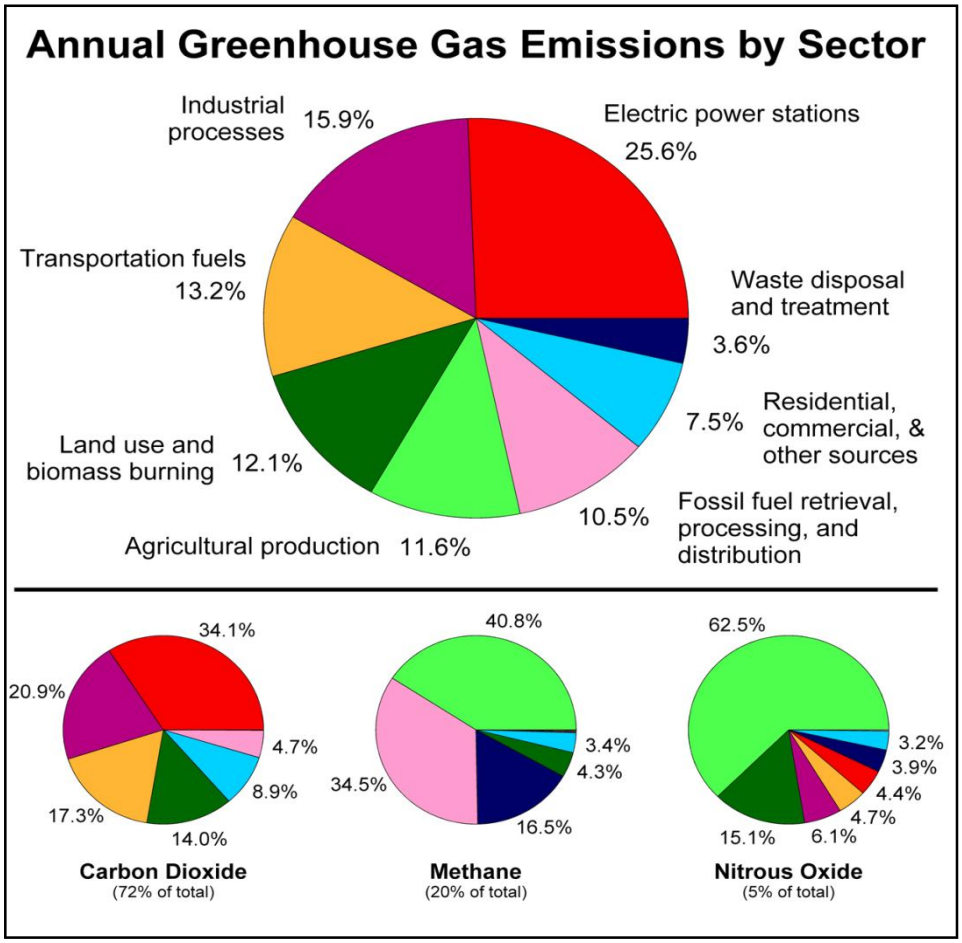
मानव जनित वैश्विक कार्बन उत्सर्जन



प्रधान ग्रीन हाउस गैसों का ट्रेंडस



ग्रीन हाउस गैसें ही भूमण्डलीय ऊष्मन के लिए उत्तरदायी हैं। विश्व बैंक ने 15 सितम्बर, 2009 को विश्व विकास रिपोर्ट में विकसित देशों को ग्रीन हाउस गैंसों के उत्सर्जन को घटाने एवं विकासशील देशों को इससे सम्बन्धित आर्थिक सहयोग एवं तकनीकी सहायता प्रदान करने को कहा है। रिपोर्ट में चेतावनी दी गयी है कि वर्तमान जलवायु परिवर्तन संकट की उपेक्षा नहीं होनी चाहिए।



भूमण्डलीय ऊष्मन सम्बंधी पर्यावरण सम्मेलन

क्र0 सं0	पर्यावरण सम्मेलन	सम्मेलन वर्ष	मुख्य लक्ष्य
1	जेनेवा प्रोटोकाल	1925	जैविक एवं रासायनिक हथियारों का निषेध
2	स्टॉकहोम समझौता	5 जून 1972	पर्यावरण सुरक्षा हेतु विश्वव्यापी स्तर पर प्रथम प्रयास सं0रा0 पर्यावरण कार्यक्रम (UNEP) का आरम्भ, 5 जून पर्यावरण दिवस घोषित
3	साइट्स(C.I.T.E.S) वाशिगंटन सम्मेलन	1973	विश्व का सबसे बड़ा वन्य जीव संरक्षण समझौता
4	आधारी समझौता	1989	खतरनाक निर्गमी कचरों के सीमा पार आवागमन और उनके निपटान का समझौता
5	वियना सभा	1985	ओजोन परत के सरक्षण हेतु आस्ट्रिया में वियना कन्वेशन हुई जिसमें ODS, CFC, HCFC, CH_4 की कटौती पर शर्ते तय हुई
6	माण्ट्रियल समझौता	16 सितम्बर 1987	ओजोन संरक्षण का प्रथम अन्तर्राष्ट्रीय समझौता था। 16 सितम्बर को अन्तर्राष्ट्रीय ओजोन संरक्षण दिवस घोषित किया गया। CFC के उत्पादन एवं प्रयोग पर दिशा–निर्देश तय किये गये।
7	टोरण्टो विश्व सम्मेलन	1988	ग्रीन हाउस प्रभाव को कम करने के लिए विश्व के देशों से 2005 तक उत्सर्जन में 29% की कटौती का प्रस्ताव
8	पृथ्वी शिखर सम्मेलन	1992	रियो डी जेनरो में पर्यावरण और विकास पर आयोजित सम्मेलन, जिसे 'अर्थ समिट' या पृथ्वी शिखर सम्मेलन कहा गया। टिकाऊ विकास के लिए 'एजेण्डा–21' स्वीकृत किया गया।
9	क्योटो प्राटोकाल	11 दि0 1997	जपानी शहर क्योटो में यू एन एफ सी सी सी के तीसरे सम्मेलन में क्योटो प्राटोकाल स्वीकार किया गया। इसमें 55 देशों में 37 विकसित देश सम्मिलित रहे। स0रा0 अमेरिका को छोड़कर सबने ग्रीन हाउस उत्सर्जन में कटौती पर हस्ताक्षर किये।
10	बॉन सहमति	23 जुलाई 2001	जर्मनी के वान में सम्पन्न सातवें विश्व मौसम परिवर्तन सम्मेलन में ग्रीन हाउस गैंसो के उत्सर्जन में अमेरिकी रवैये के कारण यूरोपीय देशों ने अमेरिका को अलग रखते हुए क्योटो प्रोटोकाल का संकल्प व्यक्त किया।
11	जोहान्सबर्ग पृथ्वी सम्मेलन	सितम्बर 2002	दक्षिणी अफ्रीका के जोहान्सवर्ग में दूसरे पृथ्वी सम्मेलन में सतत् विकास पर संयुक्त राष्ट्र सम्मेलन सम्पन्न हुआ। सम्मेलन का मुख्य उद्देश्य ''टिकाऊ विकास'' हासिल करना था।
12	कोप सम्मेलन	अक्टूबर 2002	नई दिल्ली में जलवायु परिवर्तन पर संयुक्त राष्ट्र देशों का आठवां सम्मेलन सम्पन्न हुआ। इसमें जलवायु परिवर्तन एवं सतत् विकास सम्बंधी घोषणा पत्र को स्वीकार किया गया।
13	बेलाजियों घोषणा पत्र	2002	इटली के बेलाजियों में ग्रीनहाउस गैसों के उत्सर्जन एवं शहरी वायुगुणवत्ता आदि के लक्ष्य को ध्यान में रखकर 43 सिद्धातों का घोषाण पत्र तैयार किया गया।
14	बर्टलैण्ड रिपोर्ट	1987	इसे 'हमारा साक्षा भविष्य' के नाम से जाना जाता है। इसमें टिकाऊ विकास की अवधारणा को प्रवर्तित किया गया।
15	पेंटागन पर्यावरणीय रिपोर्ट	2007	इस रिपोर्ट में चेतावनी दी गयी है कि वर्ष 2020 तक यूरोप के तापमान में भारी गिरावट आ सकती है।

भूमण्डलीय ऊष्मन सम्बंधी IPCC रिपोर्टः–

संयुक्त राष्ट्र संघ के अन्तर्सरकारी दल– (आई0पी0सी0सी0)– Intergovernment Penal on climate change ने 17 नवम्बर–2007 को स्पेन के वैलेंसिया में अपनी चौथी रिपोर्ट में भूमण्डलीय ऊष्मन के दुष्प्रभावों पर चेतावनी दी है कि सन् 2100 तक विश्व की सतह का औसत तापमान 1980–99 के दौरान रहे औसत तापमान की तुलना में 1.1^0C से 6.4^0C तक बढ़ जायेगा, जबकि समुद्र तल 18 सेमी0 से 59 सेमी0 तक ऊँचा हो जायेगा। रिपोर्ट में कहा गया है कि राष्ट्रों को CO_2 के उत्सर्जन को कम करना होगा। तापमान को स्थिर करने के लिए राष्ट्रों को अपने GDP के 5.5% का त्याग करना होगा। वर्ष 2020 तक विभिन्न महाद्वीपों पर इस जलवायु परिवर्तन सम्बंधी भूमण्डलीय ऊष्मन का निम्न असर परिलक्षित होगा।

- वर्ष 2080 तक यूरोप के पहाड़ी इलाकों में ग्लेशियर पिघलेंगे, बर्फ कम होगी, कई प्रजातियां विलुप्त हो जायेंगी। हद से ज्यादा गर्मी होगी और सूखा पड़ेगा। पानी की कमी होगी मानव स्वास्थ्य एवं कृषि पर प्रतिकूल प्रभाव पड़ेगा।
- उत्तरी अमेरिका में बर्फ पिघलने से बाढ़ का खतरा बना रहेगा। गर्म हवाओं से परेशानियां बढ़ेंगी। कृषि विकास एवं मानव स्वास्थ्य प्रभावित होगा।
- लैटिन अमेरिका में भूमण्डलीय ऊष्मन से मिट्टी में नमी कम हो जायेगी और जंगलों पर खतरा बढ़ जायेगा। भूमि बंजर हो जायेगी। गम्भीर जल संकट पैदा हो जायेगा।
- वर्ष 2060 तक अफ्रीका में 10–25 करोड़ तक लोग प्रभावित होंगे। यहाँ के कई देशों में कृषि क्षेत्र घटकर आधा रह जायेगा। पैदावार घटने से खाद्यान्न संकट पैदा हो सकता है। G.D.P. पर 5 से 10% तक असर पड़ेगा। वर्ष 2080 तक बंजर भूमि में से 5 से 8% तक और वृद्धि हो जायेगी।
- वर्ष 2050 तक एशिया में साफ पीने के पानी की भयंकर समस्या होने वाली है। तटीय इलाकों में समुद्र का जल स्तर बढ़ने से बाढ़ का खतरा और बढ़ जायेगा। बाढ़, सूखा एवं महामारियों से मरने वालों की संख्या बहुत बढ़ जायेगी।
- वर्ष 2060 तक ऑस्ट्रेलिया में जैवविविधता को भारी नुकसान होगा। 2030 तक द0पू0 ऑस्ट्रेलिया एवं न्यूजीलैण्ड में पीने के पानी की भारी कमी हो जायेगी। सूखे एवं वनाग्नि के कारण खेती को नुकसान पहुँचेगा। तटीय इलाकों के जलमग्न होने के कारण ग्रेट बैरियर रीफ को भारी क्षति पहुँचने की संभावना है।

आई0पी0सी0सी0 की रिपोर्टों में बताया गया है कि औद्योगीकरण (1880) से पूर्व CO_2 की मात्रा 280PPM थी, जो 2005 के अंत तक बढ़कर 379PPM हो गयी। औद्योगीकरण से पूर्व मीथेन (CH_4) की मात्रा 715PPB थी, जो 2005 में बढ़कर 1734PPB हो गयी। उपरोक्त वर्षों में नाइट्रस आक्साइड की

सान्द्रता 270PPB से बढ़कर 339PPB हो गयी। पिछले 100 वर्षों में अण्टार्कटिका के तापमान में दुगुना वृद्धि हुई है और बर्फीले क्षेत्रों में कमी आयी है। रिपोर्ट में साफ तौर पर कहा गया है कि समस्त विश्व के पास ग्रीन हाउस गैसों के उत्सर्जन को कम करने के लिए केवल 10 वर्षों का समय है। यदि ऐसा नहीं होता है तो सम्पूर्ण विश्व को इसके परिणाम भुगतने पड़ेंगे।

कृषि विकास

1 अप्रैल, 1951 को प्रथम पंचवर्षीय योजना प्रारम्भ हुई थी। इस योजना में कृषि विकास को सर्वोच्च प्राथमिकता प्रदान की गयी थी। इसमें कृषि वृद्धि दर का लक्ष्य 2.1% था किन्तु वृद्धि लक्ष्य से अधिक 3.6% प्राप्त हुई थी। द्वितीय में 3.5, तृतीय में 0.73, चतुर्थ में 14.7, पंचम में 12.3, छठवीं में 6. 1, सातवीं में 5.8, आठवीं में 4.7, नौवी में–2.5 दशवीं में 2.4, ग्यारहवीं में 3.6 एवं 12वीं में 4.0% वृद्धि दर प्राप्त हुई। कृषि एवं सम्बद्ध क्षेत्रों मं वर्ष 2010–11 में सर्वाधिक विकास दर 7.5% तक पहुंच गयी थी।

तालिका–3

अवधि	कुल जी0डी0पी0 वृद्धि दर (%)	कृषि एवं सम्बद्ध क्षेत्र (%)
2007–08	9.3	5.8
2008–09	6.7	0.1
2009–10	8.4	2.9
2010–11	8.4	7.5
2011–12	6.9	1.7
2012–13	4.5	1.4
2013–14	4.7	1.4
2015–16	8.2	
2016–17	7.1	
2017–18	6.7	3.4
2018–19	7.2	3.8

भारत मे कृषिगत उत्पादन

इण्डिया विजन 2020 के महत्वपूर्ण लक्ष्यानुसार जी0डी0जी0 में कृषि क्षेत्र का योगदान 6.0% निर्धारित किया गया है।

निष्कर्षः– निष्कर्ष रूप में कहा जा सकता है कि भूमण्डलीय ऊष्मन का प्रभाव आगामी वर्षों में न केवल मानव स्वास्थ पर पड़ने वाला है अपितु पर्यावरण एवं कृषि स्वास्थ्य पर भी पड़ने वाला है। भू–मण्डलीय ऊष्मन एक वैश्विक समस्या है। इससे विकसित एवं विकासशील सभी देश प्रभावित होंगे। भू–मण्डलीय ऊष्मन के लिए उत्तरदायी ग्रीन हाउस गैसों का जिस गति से वायुमण्डल में सांद्रण बढ़ता जा रहा है, यह विश्व के लिए बहुत बड़ा संकट है। भू–मण्डलीय ऊष्मन को बढ़ावा देने वाली गैसों में यदि कमी या कटौती नही की गयी तो सतत कृषि निकास को सपना धरा का धरा रह जायेगा। कृषि विकास के लिए एक अनुकूल जलवायुविक दशाओं की आवश्यकता होती है। यदि कृषि विकास एवं भावी पीढ़ी के जीवन को खुशहाल बनाना है तो भू–मण्डलीय ऊष्मन को रोकना होगा। ग्रीन हाउस गैसों के उत्सर्जन में कटौती करनी होगी। हमें Think Globally But Act Locally के मूल मन्त्र के साथ पोषणीय विकास की ओर उन्मुख होना होगा।

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19

ROLE OF POLICE IN PREVENTION OF ILLEGAL CUTTING OF TREES IN INDIA

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ABSTRACT

The Indian Forest Act 1927, Preservation of Trees Act 1984 and the Forest Conservation Act 1980 are some laws at the central level to govern and monitor the illegal cutting of trees. Whenever any illegal activity regarding the cutting of tree takes place then the role of police at the local level becomes prominent. It often comes to the general notice of all that police gets involved in illegal activity of cutting trees and promotes it instead. So, it is very important that police must perform its duties in accordance with the laws as it is immoral as well as unethical in the context of their duties and the environment.

Police must take proper legal actions against the culprits and ensure the fair trial in the criminal justice system because giving a helping hand to the perpetrators will lead to prospective threat to the environment in the long run. There is provision of imprisonment and fine against felling of trees but legal machinery usually compromises on its part by accepting undue favors. This kind of behavior leads to impart a not so good message in the society and the nexus of these criminals gets strong at the ground level. So, there is a need of better surveillance system over the activities of criminals as well as preventive authorities as it is rightly said that with power comes corruption and with absolute power comes absolute corruption.

Legal framework regarding the implementation of Indian Forest Act 1927, Preservation of Trees Act 1984 and the Forest Conservation Act 1980 must be scrutinized again and if, the concerned authority fails to deliver on its duty then it should be handled in the same manner as the criminals are being dealt.

Keywords: Indian Forest Act 1927, Forest Police, Civil Police, Preservation of Trees Act 1984, Forest Conservation Act 1980

Following the National Green Tribunal (NGT)'s ban on illegal felling of trees in the national Capital, the Delhi Police has authorized its officers to directly register a case in such activity. Earlier police station could not entertain any complaint in this regard without the prior intimation to the tree officer or forest officer. A sub-inspector rank officer will investigate such cases.

The order has been issued in the wake of several complaints about the deforestation and illegal trees felling from various parts of Delhi. A case under the Delhi Prevention of Trees Act, 1994 can be lodged at the concerned police station on any complaint without the prior intimation to the tree officer or forest officer.

The police had received several complaints regarding cutting of trees. The NGT has also been intimating the police about such activities in various parts especially jungles in south and southwest Delhi. Delhi Police Commissioner BS Bassi has authorized the officers to register the case under the Prevention of Trees Act and the culprit will be liable to one-year punishment or a fine up to Rs1,000, or both.

As of now, there was no such precedent of registration of an FIR directly by a police officer posted at a police station. The complaints were first forwarded to the tree officer or forest officer of the concerned area, and only then the police would be informed. This leads to delay in the investigation process and the culprit easily escapes.

Environmental activist Aruna Vashisht, who works against deforestation in the Capital, welcomed the Delhi Police's initiative. "This should have been done long-long time back. But it is a good step and this should be widely published so that people become aware of it. This will help us in preventing such activity in the Capital," Vashisht, who works with Society for Protection of Environment and Biodiversity, said while talking to The Pioneer.

Delhi Preservation of Trees Act, 1994 was passed in order to save the trees planted in the national Capital from being getting depleted due to human activities. The Act aimed at keeping a check on cutting of trees by the owners of the trees on their land. The Act gave birth to Tree Authority in the National Capital Region for the preservation of trees.

The South Delhi police have registered this year's first case against an owner of a house, situated in JorBagh, for allegedly cutting a tree inside his house. According to the police, a case under Section 24 of Delhi Preservation of Trees Act has been registered in Lodi Colony police station and intimation has been sent to the Delhi government's forest department in this regard.

"One of our senior officials received a call on Sunday from a Cabinet minister whose relative resides near the accused's house. She told us that the owner of the house had cut a tree and asked us to verify the same. Later, the Officer on Special Duty (OSD) of the minister also informed another official regarding the same issue," a senior NDMC official told Mail Today.

According to the official, when a team consisting senior officials reached the spot, they found leaves lying on ground. On questioning, a resident informed that while pruning the tree they cut it by two feet. A call was made to the PCR and also to local police. When cops reached the spot, NDMC officials informed them that the owner cut the tree without following the mandatory rule of informing the forest department. A case was later registered against the accused.

During investigation it was revealed that the Cabinet Minister's relative resides just next to the occupant's house and during a visit, the minister observed the illegal act. "NDMC staff told us that a minister called and asked them to lodge a complaint with the police. The minister also ensured that the NDMC officials visited the spot as her staff were present at the spot," a Delhi Police officer said.

NDMC official also added that accused has planted eleven plants in NDMC's parks. He may be fined by forest department soon.

Section 24 of the Delhi Preservation of Trees Act says that any person who contravenes any of the provisions of this Act or rules or orders made there under shall, on conviction, be punished with imprisonment which may extend to one year or with fine which may extend to one thousand rupees or with both.

Today after the Bombay High Court dismissed all petitions against the proposed axing of over 2,500 trees in Mumbai's Aarey Colony, the officials cut down nearly 1,500 trees on Saturday, leading to a string of protests in the city. As the protests against felling of trees intensified, the police arrested 29 protesters and imposed section 144 of the Criminal Procedure Code in Aarey Colony and surrounding areas, restricting movements and gathering of groups, and cordoned off the area.

"We have imposed section 144 of the CrPC in Aarey Colony, Goregaon check post and surrounding areas," the Mumbai Police said.

As the felling of trees began, a high political drama erupted with the opposition in Maharashtra blaming the ruling BharatiyaJanata Party (BJP) and Shiv Sena for the "slaughter" of trees. Congress also slammed the Shiv Sena of adopting double standards by condemning the BMC tree authority's decision to cut 2,600 trees but continuing to support the BJP-led government.

Police have also booked 38 protesters under various sections of the IPC since late Friday night after they entered the metro rail site as the Mumbai Metro Rail Corporation Ltd (MMRCL) began felling of trees. Several people, including NCP MLA JitendraAwhad, Shiv Sena leaders PriyankaChaturvedi and former Mayor Shubha Raul, were detained while protesting against the felling of trees.

AAREY FOREST PROTESTS: 10 POINTS

1. Clashes were reported in Aarey Colony between the Mumbai Police and protesters who tried to stop the felling of trees for the construction of Mumbai metro.
2. As the cutting of the trees continued despite massive protests, the activists tried to get relief from the Bombay High Court, seeking a stay so that they could approach the Supreme Court against BMC tree authority's decision. The activists argued that an appeal would be filed in the apex court on Monday but by then the MMRCL would have completed cutting all trees in Aarey Colony.
3. The application by the activists was taken up for urgent hearing by Justices SC Dharmadhikari and AK Menon. However, the green activists suffered a second jolt after the high court bench refused to stay ongoing felling of trees at Aarey Colony.
4. Advocate AkshayShinde, appearing for the MMRCL, told the judges that they initiated the action of cutting trees only after the HC on Friday dismissed the petitions challenging the approval granted by the BMC Tree Authority. The bench, after hearing brief arguments, said it would not interfere with Friday's order and refused to grant a stay on the MMRCL action.
5. Shiv Sena president Uddhav Thackeray's son Aaditya Thackeray slammed the Mumbai metro for axing the trees in Aarey Colony just hours after the Bombay HC's decision to not quash the BMC tree authority's decision, allowing felling of over 2,600 trees.
6. Aaditya Thackeray also condemned the detention of protesters outside Aarey Colony and cutting down of trees during the enforcement of model code of

conduct before the assembly elections. Requesting Chief Minister DevendraFadnavis to look into the matter, Aaditya Thackeray said it was a matter of "shame" if protesters were being arrested and filed cases against.

7. The issue has taken a political hue in the run-up to assembly polls, with the Opposition parties blaming ruling BharatiyaJanata Party (BJP) and the Shiv Sena for their "failure" in saving trees.

8. Senior Congress leader and former Mumbai Congress chief Sanjay Nirupam, who went to protest against the felling of trees in Aarey Colony, condemned the BMC tree authority's decision to cut trees at night. He also protested the arrest of activists.

Sanjay Nirupam said the Shiv Sena was adopting "double standards", as it condemned tree felling but continues to support the BJP-led government.

9. Congress's MilindDeora called the tree cutting decision akin to "stabbing yourself in the lungs" and said the "brutal" felling of trees was a setback for Mumbai. Taking to Twitter, MilindDeora said, "It's like repeatedly stabbing yourself in the lungs. When cities destroy coastlines and green cover, they are advancing the doomsday clock."

10. Amid strong opposition from green activists, Union Environment Minister PrakashJavadekar cited a Bombay High Court order to defend the Mumbai Metro Corporation's move to fell trees in Aarey Colony, saying it was "not a forest".

"Basically the high court has decided and ruled yesterday that it is not a forest," Javadekar told reporters here. "You can't fell anything that is a forest," he said.

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VISUALIZING POLLUTION THROUGH AUGMENTED REALITY APPLICATION

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ABSTRACT

Awareness is the best weapon and defence against fighting this disaster of current age where we are in a fight to survival against a monster of our own creation. Now there are already many ways to study (only theoretically) the levels of pollution, however, there are none to actually **show** something to a common person who just doesn't have enough time to study the statistics of the complex **Air Quality Index** applications. How good it would be if we could actually see and feel the pollution around us. This is where the **Augmented Reality** comes in. Now based on Augmented Reality, we have planned an application called **Critical Air 3D** that will analyse the heavily complex data and do the interpretation job for you, and will show you the critical situation of the environment on the screens of your smartphones and public displays. Some features of CriticalAir 3D are that it will alert the people as they enter highly polluted areas, and can show them the condition of the surrounding air through an immersive display on their smartphones or any other displays. The app will help the user with finding out ways to avoid passing through the area with increasingly dangerous levels of pollution. The app will access the routes where the pollution is less. It will highlight the potential and the already existing sources of particulates released in the atmosphere. It will detect any activity that will have any effect on the Air Quality and alert the user the consequences of that activity. The app will help the user take safety measures and precautions that he/she needs to take before entering such an area. We hope that this app helps in safeguarding the user and family members that might have little children, aged people and pregnant women.

Introduction

As the saying goes," Picture can tell a thousand words". Although we are made aware of television reports and various applications on our smartphones of the current levels of the air pollutants in the air, and the Quality of air around us. But, this just limits to the textual level and for those only who took the time and have the knowledge to interpret the statistical data and the severity of the interpretation. On the other hand, the common masses have really no idea on how to judge the quality from that data. Here's where Augmented Reality (AR) can help us. The use of augmented reality will increase the chances of the underlying information to reach the common masses. This would be very similar to the techniques of teaching kids at school, where nowadays, audio-visual techniques are being used to teach kids. In the same way, common masses can be easily shown through immersive and interesting graphics and interfaces the impact of the pollution on our surroundings.

The App that will change things

Now based on Augmented Reality, we have planned an Application called **Critical Air 3D** that will analyse the heavily complex data and do the interpretation job for you, and will show you the actual meaning behind those data and the critical situation of the environment in a virtual reality built on the screens of your smartphones and even displays on various public displays if we really want to scale up this project.

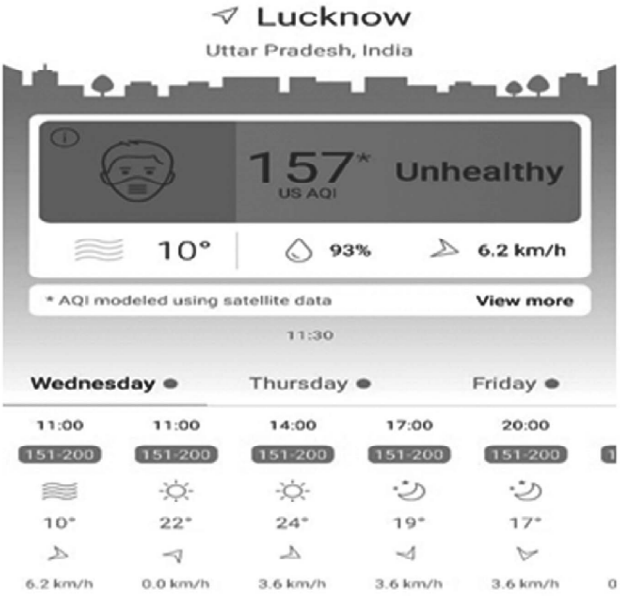

Fig. 1. Image courtesy: Air Visual application

Here we will analyse the statistical data and all the tough work and will present the audiences with a three dimensional model, rather an Augmented Reality model of the space around us with all the objects representing the particulates present in the air around us.

The features we will offer

The features that we're planning to integrate are as follows-

- The app will display in an augmented reality screen, the present condition of the air around us
- It will highlight the potential and the already existing sources of particulates released in the atmosphere.
- It will alert the people as they enter highly polluted areas, and can show them the condition of the surrounding air through an immersive display on their smartphones or any other displays.
- It will detect any activity that will have any effect on the Air Quality and alert the user the consequences of that activity.

Technology used

Information on pollution level and air quality index like NO2, O3, PM 2.5, SO2, CO, Humidity level, Barometric Pressure, Wind speed and Wind direction [1] will be taken from airpollutionapi.com through **API (Application Programming Interface)** which will pass the real time information in JSON format to our application. The user will pass the current location as Latitude and Longitude to the Airpollution API which in turn returns real time air pollution data of the location through RESTful web interface.

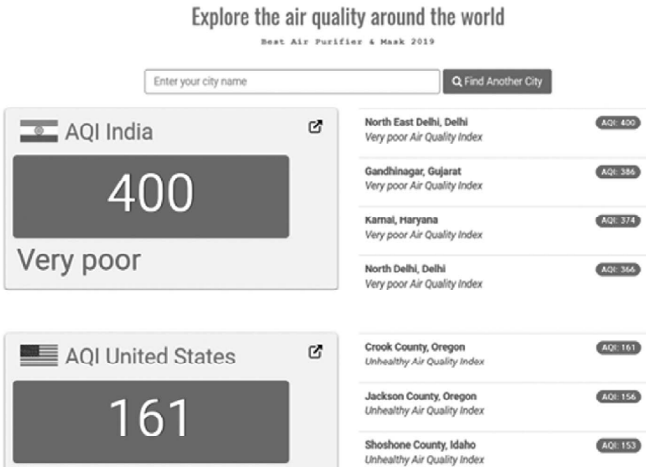

Fig. 2. AQI's of top most polluted areas in India

The visualization will be done through the Augmented Reality Technology which will provide a visual description of the pollution data based on the current location of the user. The application will render the environment in real time and show the pollutant particles around the space of the user which the user cannot see with naked eyes. Thus the user will be aware of the adverse effects of pollution on our environment. The application will alert and notify the user, the necessary steps that can be taken to reduce the pollution. The application will be developed using Google ARCode toolkit, ARToolKit and other tools [2] which will provide all the technical support required.

Fig. 3. Smoke simulation from a car using AR
Image courtesy: http://www.CarTreatments.com/

Benefits

The benefits that were planning to provide are basically focussed on creating awareness among the common masses where the people can be made aware of the dangerously increasing toxicants in the atmosphere and be connected to the factual situation and in-depth analysis of the data on the quality of air, without actually having the knowledge and inferences to actually interpret it themselves. This is an app more to educate the people of the threateningly increasing levels of pollutants in the atmosphere and to create a feeling of conservation and responsibility in the minds of citizens towards protecting their environment. The main idea behind our efforts is even with all the information technology around us and all this information available to the people, people only concern themselves with the practical aspects to this

information rather than studying data in the forms of graphs. They know the numerical values to various factors but how to put it into the picture is still something only experts can do. The solution to the problem of pollution is not something few experts sitting in large conference rooms can find effectively. The solution rather lies in educating the masses and making them aware of how simple little things in their daily lives can impact their lives in such a large variety of ways. The simple awareness of what to do and what will be right for the environment will cause people to change their normal habits to suit the benefits of the environment. Only then can the situation change.

How will it work

The app will focus on presentation alongside implementation. As we already know, the process of displaying moderately complex models and relationships can be made quite easy through technologies and concepts like Augmented Reality and virtual reality. The simple integration of this technology makes things on a different scale than how it would be without it.

The application will use the data from various sources like https://www.airpollutionapi.com/ and various other applications that provide free information about the pollutants in the air. The app also can make use of Air quality monitors offered by various suppliers and can use real time monitoring to the air quality at a particular place. The app will then put that data in the real time 3D image of the place using Augmented Reality API's and will render the graphics into the picture. This will make it a child's play to get the real picture behind the data and numbers for anyone with general understanding.

Not only this the app will be designed to inform the users of when the Air Quality is beyond the average threat levels and alert him to perform the safety measures and precautions that he needs to take before entering such an area. The user can then either chose not to enter such an area. In that case too, the app will help the user with finding out ways to avoid passing through the area with increasingly dangerous levels of pollution. The app will access the routes where the pollution is less and will combine it with the data relating to GPS and traffic routing applications and will find out the most optimal route the user should take in optimal time. This will be very effective in safeguarding the user and his family that might have little children, aged people, and pregnant women who might have adverse health effects because of prolonged exposure to toxic air. The app can use data from google maps to find routes with less traffic congestion, routes with less sources like factories, and the user can just pick the path indicated by the path without worrying for the health of the family. The app can have a

mask which can be synced to the app and will itself indicate when it is important to put it on. The app will be connected to the mask, an advantage of InternetOfThings (IOT), which will use mask to indicate the time when it will really be necessary to wear it, the app will work synchronously with the mask, the data calculation will be done by the app only.

The app will also use data on emissions and tests conducted on various sources of pollutants and indicate potential sources of pollution and display in simulation the emission of pollutants and type of pollution source emits.

The application will rate each source according to pollution levels of that area and use prediction according to statistical data the severity of the source. This would create awareness among the common masses the existing sources of pollution to a highly accurate level.

Conclusion

The app will help the people in a number of ways. This will not only create awareness in the common masses but will also help the user to affect his daily life in a way that will be most suitable for the health of himself and his family in the current time where people are exposed to the threatening levels of harmful chemicals.

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WASTE MANAGEMENT- THE CHALLENGING ISSUE

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ABSTRACT

This paper presents an overview of Toxic waste and E-waste, their impacts, its present situation and some effective waste management strategies.The key to success in means of these waste management is to design eco-friendly machines, suitable materials which is to be used for recycle by using safe methods, dispose of toxic and e-waste by making well developed techniques and to create awareness to the people of society about the impact of toxic and e-waste.

Only single action is not enough to control its impacts but together they can complement each other to solve this major situation. Proper Container should be used in order to accumulate waste from residential, commercial and industrial sites which should be covered by the Daily Cover. Waste Management is a broad field which comprises proper management, reducing, recycling and reusing of waste material. As these wastes are causingcatastrophic effect on mankind. The present scenario is very sad which can only be remedied if appropriate steps will be taken.

The responsibility of waste management is divided into three parts: The first one is the Government, who will make policies, rules, regulations and keep track if it is implemented or not. The second one is Manufacturer, who makes the material which causes waste. They should use those material which minimises waste produced or at least the effect. The last one is we the society who needs to be aware of waste we are creating, dumping and throwing here and there. There needs to be social and individual awareness.

Introduction

"Reduce, Reuse and Recycle" has been tagline of recycling for decades but now, there is a fourth "R" called Reclaim which means to use some of the properties of waste through conversion or transformation.

Toxic or Hazardous Wastes are generated from household products such as Computer equipment, batteries, televisions, mobile phones and leftover paints or pesticides.

These wastes may be in solid or liquid that contain chemicals, radiation and heavy metals which badly causes water treatment systems, laboratories, hospitals, farming and many other industries.The Government of India defines toxic waste as any waste which because of its physical, chemical or biological composition is likely to harm health or environment. It occurs when toxic waste is openly dumped into the groundwater which causes contamination of the aquifers and region's water supply which directly make an impact on the production of the agriculture and public water supply.

These toxic waste contains heavy metals, pathogens which badly affects the genes and therefore causing the various health hazards such as reproductive issues, development problems and damage to immune system and sometimes permanent disorder.

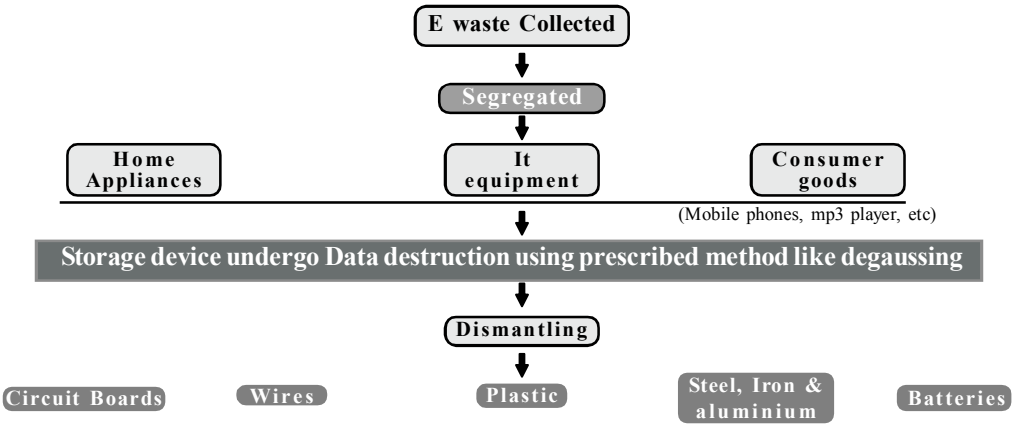
E-Waste is a collection of electronic waste which comprised of electronic tools and machines. It consists of waste from TVs, CDs, Computer, Mobiles, Tablets, etc. In India as technology is growing, thus the voluminous amount of waste is generated. E-Waste when combined with land may infects human and animal life, pollutes soil and destroy nutrients of the soil. It when combined with water may infect aquatic life and if that water is consumed without any treatment then it may cause serious health issues. The main health issues caused by E-waste are: Bronchitis, Asthma, Lung Cancer, Skin Disease, Damage Immune System, etc.

E-Waste

E-Waste is present in India in such a bulk amount that it won't take much time for India to become top country in the world which produces highest amount of E-waste. The main reason for this is an illegal trafficking and unlicensed recycling of e-waste, lack of technological, financial, and technically skilled human resources, inadequate organizational structure and an inadequate description of the roles and responsibilities of stakeholders and institutions involved in e-waste management. India is also treated as dumping ground of E-Waste from developed countries. E-Waste

Management Rules 2016 says that the manufacturer of the e-waste will take up the responsibility task of recycling and decomposing the waste but it is only implemented on paper. Only few percent is implemented at ground level. The Global E-Waste Monitor 2017 published by the United Nations University states that India generates over 2 million tons of E-Waste annually making it at the 5th position followed by US, China, Japan and Germany.

Process of E-Waste Management (The Process)



E- Waste Management Strategies

For the proper management of waste: Collection, Disposal and Treatment is the key factor.Below is the comparison of treatment of e-waste between developed and developing countries:

Developing countries	Developed countries
"Informal" sector	Formal sector
Manual dismantling	Manual dismantling
Manual separation	Semi-automation separation
Recovery of metals by heating, burning and acid leaching of e-waste scrap in small workshops	Recovery of metals by the state of the art methods in smelter and refineries

Steps to be followed for proper waste management:

- Collection of e-waste from different sources like buildings, fields, river, etc. using different techniques.
- Disposal of e-waste as it will minimize thedisastrous health issues and other effects.

- It can be treated as reusable material because it may contain gold or silver.

There are many ways by which the waste produced can be stored and recycled by using various techniques. The old method of disposing old electronics to sell it to rag man must be stopped. Instead spread the awareness about the dangers of selling their obsolete electronics to rag man. For instance, we can add RFID-enabled "smart bins" to the various cities'streetscapes where it is mostly required. RFID (radio-frequency identification) is mostly used for several things like from library books, to Canadian passports, to medical equipment. By implementing that technique into recycling bins, cities can track pick-up times, participation rates and material data.

Toxic Waste:

Main Reasons for raising of Toxic Waste:The main reason for the raising of toxic waste are the inefficient services provided by the government, incomplete knowledge of scientific techniques in terms of taking measuresof disposal , rules and regulations are not followed regularly, and limitation of trained employees.

Inefficiency of the management of toxic waste in our country is the main factor, which makes India struggle with the growing challenge of managing and implementing the toxic waste.

Indian Scenario of Toxic Waste Management

The toxic waste generated in the country per annum is estimated to be around 4.4 million tons while as per the estimates of Organization for Economic Cooperation and Development (OECD) derived from correlating toxic waste generation and economic activities, nearly five million tons of toxic waste are being produced in the country annually.

The research shows that the Toxic Waste generation is maximum in Maharashtra (45.47%) followed by Gujarat (9.73%). Minimum Toxic Waste is recorded in Chandigarh (0.00689%).

Sources and its Serious Impact of Toxic Waste

Sources	Impacts
College and University laboratories, Offices, Hospitals etc.	Air Pollution, Fire Explosion etc.
Chemical units, Pesticides etc.	Loss of crop, Water Pollution.
Radioactive and Nuclear Units.	Loss of Productivity of land, Cancer.
Bio-Tech laboratories.	Loss of fertility of land.

Research and Development Organization.	Contagious land.
Plastic and Rubber Industries.	Water Pollution.
Fertilizer Units	Soil contamination.

Measure Steps for Storage or Disposal of Toxic Waste

There are many options available for toxic waste management. The most important step is to reduce the quantity of waste or to recycle the waste material for other productive use. Toxic waste can be treated by chemical, thermal, biological, and physical methods.

One important technique is used to treat toxic waste biologically is called landfarming. In this technique, the waste is carefully mixed with surface soil on a suitable tract of land. Toxic waste are not destroyed by any chemical processes but it need to be disposed properly. For these types of waste, land disposal is the only option but it is not safe for environment. There are two methods involved in land disposal that is landfilling and underground injection.

Methods adopted for Disposal of Toxic Waste : The disposal of waste is the crucial element to ensure that it should not have adverse effect on human, animal and environment.

Following are the methods that are used for the dispose of Toxic Waste.

- **Underground Disposal :** This method is the most economical choice for radioactive waste. These wastes are generated from the lab experiments, medical treatments and from the production of nuclear fuel. Underground Disposal method should be done in that place where it meets the technical and geological criteria. Local people may get affected if these wastes are not handled properly.
- **Landfill Disposal :** This method involves storing of toxic solid waste into the ground.

For these disposal, Landfills are designed for toxic wastes in which lined with a double layered using some non-porous material like clay are used in order to avert the leaching of waste into the ground. To prevent insects from entering Landfill Disposal, rodents are used to cover the ground.

- **Incineration :** This process consists of burning of the toxic waste into an incombustible residue. It is generally used in that place where there is a limited space for the Landfills. In this technique, firstly the waste is detoxified to reduce the release of toxic gases into the environment. Incineration method also helps in reducing the cost of waste disposal and energy production. Heavy metals and all waste materials or substances are burnt in Incineration by using several devices to control pollution.

- **Green Plastic :** Burning Green Plastics gives off toxic chemicals. They take approx. 500 years to decompose in landfills. As far as "environmentally-friendly" plastics go, they mostly comes under one of these categories and they are bio-plastics, biodegradable plastics and recycled plastics.

Biodegradable plastics made from petrochemicals but in the presence of oxygen and moisture, they break down more quickly if compared with traditional plastics but sometimes they don't break down harmlessly. To use the biodegradable process harmlessly, the plastic needs to be decompose into carbon dioxide, methane, water or biomass for some period of time.

Conclusion

About 90% of the E-Waste generated in India is being consumed by the informal sector as rag men are dealing with hi-tech trash. The mobile phones, Desktops, Laptops, Mp3 Players or any other electronic item from a household or an office is mined unscrupulously for metals. The use of scientific techniques and safe disposal method of Toxic and E-Waste Management is an important concept which should be taken properly. The lack of scientific, technical and financial resources creates the serious impact on the Environment and lives.

Therefore it is mandatory to make an efficient actions in order to take proper storage and disposal methods to recycle the waste materials for further use.

Nowadays, Government has taken a serious step under Swach Bharat Abhiyan in which the serious action is taken against the use of plastic and e-waste which is considered to more dangerous than any other waste which is no doubt causes the more threat to an environment.The future of waste management is a conglomeration of technology, governance and city ordinances. For instance, Toronto does a good job in waste management, due to strict municipal policies and expensive fees for high volumes of garbage which works in Canada.The increase in the Industries reflects the main reason behind the increasing of Toxic Waste and E-Waste materials.

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IMPACT OF GLOBAL WARMING

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Global warming is the cause, climate change is the effect. Scientists often prefer to Speak about climate change instead of global warming, because higher global temperatures don't necessarily mean that it will be warmer at any given time at every location on Earth. Warming is strongest at the Earth's Poles, the Arctic and the Antarctic, and will continue tobe so. Changing wind patterns could mean that a warming Arctic, for example, leads to colder winters in continental Europe. Regional climates will change as well, but in very different ways. Some regions like parts of Northern Europe or West Africa will probably get wetter, while other regions like the Mediterranean or Central Africa will most likely receive less rainfall. Melting ice is the most visible impact of a warming climate. The UN Panel on Climate Change finds that average Arctic temperatures have increased at almost twice the global average rate in the past 100 years.

These greenhouse gases act like a mirror and reflect back to the Earth some of the heat energy which would otherwise be lost to space. The reflecting back of heat energy by the atmosphere is called the "greenhouse effect". The major natural greenhouse gases are water vapor, which causes about 36-70% of the greenhouse effect on Earth (not including clouds);carbon dioxide CO2, which causes 9-26%; methane, which causes 4-9%, and ozone, which causes 3-7%. It is not possible to state that a certain gas causes a certain percentage of the greenhouse effect, because the influences of the various gases are not additive. Other greenhouse gases include,

but are not limited to, nitrous oxide, sulfur hexafluoride, hydro fluorocarbons, per fluorocarbons and chlorofluorocarbons. Almost 100% of the observed temperature increase over the last 50 years has been due to the increase in theatmosphere of greenhouse gas concentrations like water vapor, carbon dioxide (CO_2), methane and ozone.

Causes of global warming: The buildup of carbon dioxide in the atmosphere, mainly from your fossil fuel emissions, is the most significant human cause of global warming. Carbon dioxide is released every you burn something, be it a car, airplane or coal plant. This means you must burn less fossil fuel if you want the Earth's climate to remain stable! And unfortunately, we are currently destroying some of the best known mechanisms for storing that carbon—plants. Deforestation increases the severity of global warming as well. Carbon dioxide is released from the human conversion of forests and grasslands into farmland and cities. All living plants store carbon. When those plants die and decay, carbon dioxide is released back into the atmosphere. As forests and grasslands are cleared for your use, enormous amounts of stored carbon enter the atmosphere. An unstoppable feedback loop may happen if you let this continue. If the activities mentioned above warm the Earth just enough, it could cause natural carbon sinks to fail. A "carbon sink" is a natural system that stores carbon over thousands of years. Such sinks include peat bogs and the arctic tundra. But if these sinks destabilize, that carbon will be released, possibly causing an unstoppable and catastrophic warming of the Earth. The oceans are no longer able to store carbon as they have in the past. The ocean is a huge carbon sink, holding about 50 times as much carbon as the atmosphere. But now scientists are realizing that the increased thermal stratification of the Oceans have caused substantial reductions in levels of phytoplankton, which store CO_2.

Increasing global temperatures are causing a broad range of changes. Sea levels are rising due to thermal expansion of the ocean, in addition to melting of land ice. Amounts and patterns of precipitation are changing. The total annual power of hurricanes has alreadyincreased markedly since 1975 because their average intensity and average duration have increased (in addition, there has been a high correlation of hurricane power with tropical sea-surface temperature). Changes in temperature and precipitation patterns increase thefrequency, duration, and intensity of other extreme weather events, such as floods, droughts, heat waves, and tornadoes. Other effects of global warming include higher or lower agricultural yields, further glacial retreat, reduced summer stream flows, species extinctions. As a further effect of global warming, diseases like malaria are returning into areas where they have been extinguished earlier. Although global warming is affecting the number and magnitude

of these events, it is difficult to connect specific events to global warming. Although most studies focus on the period up to 2100, warming is expected to continue past then because carbon dioxide (chemical symbol CO2) has an estimated atmospheric lifetime of 50 to 200 years. Increasing temperature is likely to lead to increasing precipitation but the effects on storms are less clear. Extra tropical storms partly depend on the temperature gradient, which is predicted to weaken in the northernhemisphere as the polar region warms more than the rest of the hemisphere. Regional effects of global warming vary in nature. Some are the result of a generalized global change, such as rising temperature, resulting in local effects, such as melting ice. In other cases, a change may be related to a change in a particular ocean current or weather system. In such cases, the regional effect may be disproportionate and will not necessarily follow the global trend. There are three major ways in which global warming will make changes to regional climate: melting or forming ice, changing the hydrological cycle (of evaporation) and changing currents in the oceans and air flows in the atmosphere. The coast can also be considered a region, and will suffer severe impacts from sea level rise. Glacier retreat and disappearance: Mountain glaciers and snow cover had decreased in both the northern and southern hemispheres. This widespread decrease in glaciers and ice caps has contributed to observed sea level rise. In Polar regions, there will be reductions in glacierextent and the thickness of glaciers. Oceans:The role of the oceans in global warming is acomplex one. The oceans serve as a sink for carbondioxide, taking up much that would otherwise remain inthe atmosphere, but increased levels of CO2 have led toocean acidification. Furthermore, as the temperature ofthe oceans increases, they become less able to absorbexcess CO2. Global warming is projected to have anumber of effects on the oceans. Ongoing effectsinclude rising sea levels due to thermal expansion andmelting of glaciers and ice sheets, and warming of theocean surface, leading to increased temperaturestratification. Other possible effects include large-scalechanges in ocean circulation.Health:Human beings are exposed to climate changethrough changing weather patterns (temperature,precipitation, sea-level rise and more frequent extremeevents) and indirectly through changes in water, air andfood quality and changes in ecosystems, agriculture,industry and settlements and the economy. The effectsof climate change to date have been small, but are projected to progressively increase in all countries and regions. It is concluded that climate change had altered the seasonal distribution of some allergenic pollenspecies. With medium confidence, they concluded thatclimate change had altered the distribution of someinfectious disease vectors and increased heat wave related deaths.

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FUTURE OF RENEWABLE ENERGY IN INDIA

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ABSTRACT

The necessity of crude oil has been expanding at a quick year after year which has made India need imports of petroleum products.Due to excessive import of crude oil and petroleum products the fiscal deficit increases in every budget year. If it is continously increases so our Indian government have to face the petroleum crises and also have to face more budgetary loss. Indian government have to increase the production level of petroleum and crude oil because it is the main energy source. We can not imagin our lives without energy. If these type of conditions not to be removes so a huge crises is stands near by future. This paper given an insight into the present state of crude oil and petroleum products imports as well as consumption aand also discribes the renewable energy technologies for sustainable future of energy.

Key words: Crude oil, Petroleum Products, Renewable Energy

Introduction:

Petroleum products plays a vital role in every mode of our lives. They are easily recognized in the gasoline, we use the fuel our cars and the heating oil use to warm our homes. Less obvious are the uses of petroleum products base components of plastic, medicines, food items and a host of other products. Petroleum products fall into three major category fuels such as motor gasoline and distillate fuel oil (diesel oil), finished non-fuel productssuch as solvents and lubricating oils, and feedstock for the petrochemical industry such as naptha and various refinery gases. Demand is greatest for products in the fuel category, especially motor gasoline.

The modern era of oil production begun on August 27,1859, when Edwin L. Drake drilled the first successfull oil well 69 feet deep near Titusville in

Northweatern 'pennsylvania. Just five years earlier, the invention of the kerosene lamp had ignited intense demand for oil. By drilled an oil well, Drake had hoped to meet the growing demand for oil lighting industrial lubrication. Drake's success inspired hundreds of small companies to explore for oil. In 1860, world oil production reached 500,000 barrels, by the 1870's production soared to 20 million barrels annully. In 1879, the first oil well was drilled in California, and in 1887 in Texas.

The Indian petroleum industry is one of the oldest in the world, when oil being struck at Makum near Margherita In Assam in 1867, nine year after Drake's discovery in Titusville. Oil exploration and production activities were largely confined to the northeast until the 1970's when the most prolific and important Indian producing Basin, Bombay High, was discovered. India's first refinery was built at Digboi in 1901. Therefore more refineries were setup in the late 1950's and early 1960's with the assistance of internatonal oil companies such as Shell, Caltex and Esso to meet India's growing petroleum products need. The industry has come a long way since then for nearly fifty year independence, the oil sector in India, has seen the growth of giant national oil companies in a sheltered environment. A process of transition of the sector has begun since the mid nineties, from a state of complete protection. The move was inevitable if the India had to attract funds and technology from abroad in to our petroleum sector. The sector in recent years has been characterized by rising consumption of oil products, declining crude production and low reserve accretion India remains one of the least explored countries in the world, with a well density among the lowest in the world. With demand for 100 million tonnes, India is the fourth largest consumption zone in Asia, even though on a per capita basis the consumption is a mere 0.1 tonnes, the lowest in the region. This makes the prospects of the Indian oil industry even more exciting.

The years since independence have however seen the rapid growth of the upstream and downstream oil sectors. There has been optimal use of resourses for exploration activities and increasing refining capacity as well as the creation of a vast marketing infrastructure and a pool of highly trained and skilled manpower. Indigenous crude production has risen to 35 million tonnes per year, an addition of 18 refineries, an installes capacity of 156.1 million tonnes per year and a network of 500 km pf pipelines, but with the consumption of hydrocarbons said to increase manifold in the coming decades, the liberalization, deregulation and reforms in the petroleum sector is the essential for the health and overall growth of our economy.

Import / Consumption of Petroleum Products In India:

India is the world's third largest energy consumer and the nation faces

substantial challenges in meeting both present and expected demand for energy. India has growing nuclear power industry and abundant hydroelectricpower (particularly in North India) and it is the world's third largest producer of coal (which provide more than half of domestic energy needs) . But India is also a growing consumer and importer of petroleum and natural gas and consumption of these products is expected to increase substantially. The government appears to be addressing petroleum demand by limiting imports and by expanding domestic exploration and production butbseveral factors provide a little optimum that such measures will be sufficiant for future demand.

India is a large and rapidly growing economy. Being a developing country, the energy technology stock in India is relatively inefficient and has slow turnover, consequently, the energy system is highly energy intensive. So it has to be said that the fiscal deficit increases in every budget year. If it is continously increases so our Indian government have to face the petroleum crises and also have to face more budgetary loss. Indian government have to increase the production level of petroleum and crude oil because it is the main energy source. We can not imagin our lives without energy. If these type of conditions not to be removes so a huge crises is stands near by future.

Table :1

Import of Crude Oil and Petroleum Products (in rs. crore)

Import	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Crude Oil	**672220**	**784652**	**864875**	**687416**	**416579**	**470159**	**565951**
LPG	27019	31674	37213	36571	25778	32124	37861
Petrol	3311	891	1481	2301	4207	1617	581
Naphtha	9827	9272	6044	4592	9581	8374	7797
ATF	0	0	0	706	889	1109	1103
Kerosene	2710	0	0	172	158	0	0
Diesel	5039	2771	452	670	605	2959	4224
Lubes	8314	11139	12985	12702	9478	8625	11051
Fuel Oil	4392	4218	5759	3659	2380	1848	3468
Bitumen	197	272	801	1623	1832	1638	1672
Petcoke	2616	3414	4082	5883	5633	7929	11135
Others	4666	5001	7080	6266	4821	5342	8053
Total Import	**68091**	**68852**	**75896**	**74644**	**65361**	**71566**	**86946**

Source: Petroleum Planning & Analysis Cell

Table : 2

Product Wise Consumption Of Petroleum Products (in tonnes)

Product	2011	2012	2013	2014	2015	2016	2017	% of Total	% Growth
1	2	3	4	5	6	7	8	9	10
Light Distillates	43243	45581	47059	49735	55996	61182	63929	31.8	4.5
LGP	15209	15645	15855	17671	19040	21231	22841	11.4	8.1
Motor Sprit	14736	15535	16891	18384	21089	23660	25393	12.6	7.3
Naptha	11069	11898	11433	10965	12910	13493	12385	6.2	-8.2
Others	2229	2504	2879	2716	2958	2798	3209	1.6	14.7
Middle Distillates	78062	82461	82125	82550	86399	90166	91681	45.6	1.7
SKO	8434	7655	7249	7127	6887	5931	4086	2.0	-31.1
ATF	5465	5318	5449	5678	6095	6805	7432	3.7	9.2
HSDO	63231	68623	68641	69021	72665	76740	79303	39.5	3.3
LDO	442	392	384	354	403	458	476	0.2	4.1
Others	490	473	401	370	349	233	383	0.2	64.3
Heavy Ends	24835	27187	28604	31025	35094	45045	45244	22.5	0.4
Furnace Oil	7942	6548	5853	5464	6031	7382	6619	3.3	-10.3
FSHS	1849	1541	582	415	196	113	64	0.0	-43.0
Lubes/Greases	2579	3087	3180	3421	3366	3664	3639	1.8	-0.7
Bitumen/Asphalts	4657	4585	4986	5128	5570	6108	5839	2.9	-4.4
Petroleum Coke	5811	9127	11285	13842	17006	24414	25637	12.8	5.0
Wax	255	219	180	168	166	174	230	0.1	32.1
Others	1741	2080	2538	2587	2759	3195	3216	1.6	0.7
Total Consumption	146139	155229	157788	163310	177489	196398	200853	100.0	2.3
Refinery Boiler Fuel ans Losses	17072	18168	17557	17536	18349	20197	20910	-	3.53
Grand Total	163211	173397	175345	180846	195838	216595	221764	-	2.39

Source: Petroleum Planning & Analysis Cell

After analysing the obove table 1and 2 it has to be said that the fiscal deficit increases in every budget year and demand of crude oil and petroleum products increasing year after year. If it is continously increases so our Indian government have to face the petroleum crises and also have to face more budgetary loss. Indian government have to increase the production level of petroleum and crude oil because it is the main energy source. We can not imagin our lives without energy. If these type of conditions not to be removes so a huge crises is stands near by future.

Different Renewable Energy Sources:

1. Solar Power: Solar vitality is a spotless vitality as it delivers no destructive strong, fluid or gas squanders and doesn't make contamination. Sun powered power can be delivered through PV cell which is made of semiconductor and Energy Collectors characterized into illustrative trough, allegorical, tower and explanatory circle framework and so forth. With 300 clear radiant days, India gets around 5,000 trillion KWh/year, which is unquestionably more than the all out vitality utilization of the nation today.

On 30 November 2015, Indian Prime Minister and the Prime Minister of France propelled the International Solar Alliance. The ISA is a partnership of 121 sunlight based rich nations and ISA plans to advance and create sun based influence among its individuals and has the target of assembling $1 Trillion (Euros 883 billion) of venture by 2030. Some huge ventures have been proposed by Indian government, and a 35,000 km2 (14,000 sq mi) region of the Thar Desert has been saved for sunlight based power ventures, adequate to produce 700 to 2,100 gigawatts. India is likewise the home to the world's solitary 100% sun based fueled air terminal, situated at Cochin, Kerala. India likewise has a completely 100% sun oriented controlled railroad station in Guwahati, Assam.

2. Wind Power: Wind vitality is ending up being a promising elective vitality innovation of things to come. Throughout the years, there has been impressive increment measure of vitality created by wind-driven turbines because of ongoing progression in the turbine advancements. Despite the fact that India is a relative newcomer to the breeze business contrasted and Denmark or the US, local strategy support for wind power has driven India to turn into the nation with the fourth biggest introduced wind control limit on the planet. Starting at 30 June 2018, the introduced limit of wind control in India was 34,293 MW. Wind power represents 10% of India's complete introduced control limit. India has set an aggressive objective to produce 60,000 MW of power from wind control by 2022. MNRE reported another breeze sun based mixture strategy in May 2018 which implies that a similar real estate parcel will be utilized to house both breeze ranches and sun oriented boards.

3. Bio Energy: Biomass is an asset of sustainable power source that is gotten from carbonaceous misuse of different human and normal exercises. Bio vitality incorporates biomass control, bagasse cogeneration, waste to vitality, biomass gasifier, bio ethanol, bio diesel and so forth. Biomass removes carbon from the environment while it is developing, and returns it as it is scorched. Given its tropical area and plenteous daylight and downpours, India is a perfect domain for Biomass creation. It

is evaluated that the potential for biomass vitality in India incorporates 16,000 MW from biomass vitality and a further 3,500 MW from bagasse cogeneration.

4. Little Hydro Power (SHP): India is the seventh largest maker of hydroelectric power on the planet. Hydro extends in India under 25MW limit are named 'Little Hydro Power' and is considered as a 'sustainable power source'. SHP units with an all out limit of 4,380 MW have been introduced up till now.

5. Tidel Power: The tides that are created along certain pieces of the Indian coastline can possibly remove vitality from the turbines. The tidal rise in India is as high as 8.5 m at Bhavnagar, Gujarat and as low as 0.5 m at the Southern piece of India. Overview of India predicts tide levels at somelocations along the Indian coastline and Tide Tables are distributed for consistently (Sanil Kumar V. et al, 2006). According to the examinations completed by Central Water and Power Commission (CWPC) in 1975, the Gulf of Kutch and Gulf of khambhatin Gujarat and Sunderbans zone in West Bengal are the main appropriate locales in India for the creation of Tidal Energy. In 1980s, Central Electricity Authority (CEA) took up a study for the evaluation of tidal vitality potential in India. CEA recorded couple of spots of Potential Tidal Vitality extraction in India shown(Table). No tidal power age plant has been introduced in India because of its significant expense of age of power and absence of techno-monetary practicality. Be that as it may, there are recommendations for setting up of tidal power stations at Gujarat.

Table:3

Tidel Energy Potential In India

Region	State	Tidel Potential(MW)
Gulf of Khambhat	Gujarat	7000
Gulf of Kutch	Gujarat	1200
Gangatic Delta Sundarbans	West Bengal	100

Source:Renewable and sustainable energy review.

Government Initiatives:

1. Another Hydropower approach for 2018-28 has been drafted for the development of hydro extends in the nation.
2. The Government of India has reported designs to actualize a US$ 238 million National Mission on cutting edge ultra-supercritical innovations for cleaner coal use.
3. The Ministry of New and Renewable Energy (MNRE) has chosen to give custom

and extract obligation advantages to the sun oriented housetop division, which thusly will bring down the expense of setting up just as create control, in this way boosting development.

4. Around 4.96 million family size biogas plants were introduced in the nation under the National Biogas and Manure Management Program (NBMMP) by 2016-17.

5. The Indian Railways is taking expanded endeavors through supported vitality proficient measures and most extreme utilization of clean fuel to chop down outflow level by 33 percent by 2030.

Current Scenario:

Throughout the years, sustainable power source segment has risen as a critical player in India particularly influencing the power age limit. This backings the administration's plan of maintainable advancement while turning into an essential part in meeting the country's vitality needs. For recent years, the Indian Government has taken a few activities, for example, presentation of the idea of sun based parks, sorting out RE-Invest 2015, a worldwide financial specialists' meet, propelling of a huge framework associated housetop sun oriented program, reserving of Rs.38,000 crore for a Green Energy Corridor, eight-crease increment in clean condition cess from Rs.50 per ton to Rs.400 per ton5 for, sunlight based siphon plot with an objective of introducing 100,000 sun based siphons and program to prepare 50,000 individuals for sun based establishments under the Surya Mitra conspire, no between state transmission charges and misfortunes to be collected for sun powered and wind influence, obligatory acquirement of 100 percent influence from waste to vitality plants, and Renewable Generation Obligations on new warm and lignite plants, and so on.

Advantage of India:

1. Strong Demand: With the developing Indian economy, the power utilization is anticipated to arrive at 15,280 TWh by 2040.

2. Expanding Investments: With Indian government's goal-oriented focuses on, the area has turned out to be very alluring to remote and Indian speculators. It is required to pull in ventures upto USD 80 billion (Euros 70 billion) in next four years.

3. Upper hand: Indian has daylight accessible consistently and has a huge hydropower potential.

The Indian Government has expanded the objective of sustainable power source ability to 175 GW constantly 2022 which incorporates 100 GW from sun oriented, 60 GW from wind, 10 GW from bio-power and 5 GW from little hydro-control.

Table:4

Source	Total Installed Capacity(MW)
Wind Power	34,046
Solar Power	21,651
Biomass Power	8,701
Waste to Power	138
Small Hydro Power	4,486
Total	69,022

Soure- Source:Renewable and sustainable energy review.

Future Prospectes:

With right interests in green advances, we can say that India is all around situated to accomplish the driven sustainable power source targets. The interest towards cleaner vitality will assume a key job in supporting nation's progress to a full manageable vitality framework. It's anything but a concealed reality that India is the world's fourth-biggest carbon producer with its all out populace of 1.3 billion individuals with control segment contributing significantly to the equivalent. Nonetheless, in the ongoing years, India has gained huge ground in field of sustainable power source. Worldwide environmental change concerns have pushed the Government to build up a point by point plan for perfect and economical power for all. Sustainable power source's advancement in India looks splendid as around 293 worldwide and local organizations have resolved to create 266 GW of sunlight based, wind, small scale hydel and biomass-based power in India throughout the following decade. This would involve a speculation of $310 billion - $350 billion (Euros 27 billion to Euros 30 billion). The International Finance Corporation, the venture arm of the World Bank Group, is intending to contribute about $6 billion (Euros 5 billion) by 2022 out of a few practical and sustainable power source projects in India. With the venture capability of INR 15 trillion (Euros 187 billion) throughout the following four to five years in Indian power area demonstrates gigantic open doors in control age, dispersion, transmission and gear. Further, sustainable power source stockpiling market in India is likewise expected to observe vigorous development, throughout the following decade, when the expense of capacity decreases, which is probably going to happen in light of sheer volume development through the electric vehicle course.

To finish up, we can say that India has a lot of sustainable power source to cross over any barrier among request and supply so we should industriously place in endeavors to saddle different types of sustainable power sources with the utilization of more up to date advancements to shape a perfect and safe spot for our coming ages.

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जनसंख्या वृद्धि और पर्यावरण

मो0 शमीम

हिन्दी विभाग, अ0इ0 डिग्री कालेज, लालबाग, लखनऊ

भारत अनेक धर्मों व सम्प्रदायों का देश है। कुछ लोग कहते हैं कि भारत किसानों का देश है। ध्यानपूर्वक देखा जाये आज हमारा देश समस्याओं का देश बन गया है। बेरोज़गारी भुखमरी, भ्रष्टाचार, साम्प्रदायिकता की समस्या, सांस्कृतिक समस्या व देश में पर्यावरण प्रदूषण व जनसंख्या वृद्धि की समस्या सबसे बड़ी है। आजीविका के साथ जनसंख्या वृद्धि की समस्या भी जुड़ी है। जिस समस्या का समाधान किसी के पास नहीं है।

अतः यहाँ कृषि के लिए भूमि का अभाव हो गया है। इसके परिणामस्वरूप भारत की सुख–समृद्धि में योगदान करने वाले अमूल्य जंगलों को काटकर उस भूमि को खेती करने योग बना दिया। इस प्रकार अमूल्य वन सम्पदा नष्ट होती गई पर्यावरण प्रदूषण की समस्या धीरे–धीरे बढ़ती गई, वर्षा पर कुप्रभाव एवं अमूल्य जंगली जानवरों के वंश धीरे–धीरे समाप्त होते गये। हस्त–शिल्प और कुटीर उद्योग नष्ट हो जाने से लोग आजीविका की खोज में ग्रामों से भागकर शहरों में बसने लगे। जिससे पर्यावरण–प्रदूषण आदि समस्याएँ जन्म लेने लगी।

जनसंख्या वृद्धि का सबसे बड़ा अभिशाप है कि वह देश विकास को रोकती है। बढ़ती हुई जनसंख्या के लिए खाद्यान्न और रोजगार जुटाने में देश की समस्त शक्तियाँ लग जाती हैं अन्य किसी दिशा में सोचने का समय नहीं रहता। अतः यह समस्या भी सुलझाना आसान नहीं क्योंकि कृषि भूमि सीमित है, और औद्योगिक विकास भी एक सीमा तक ही सीमित है।

आज हर देश औद्योगिक क्षेत्र में उन्नति कर रहा है। अपने देश का बना माल दूसरे देश में खपाया जा रहा है। औद्योगिक क्षेत्र में भयंकर स्पर्द्धा चल रही है।

जनसंख्या वृद्धि के कारण हमारी पर्यावरण प्रदूषण के प्रति जागरूकता आज सोचनीय हो गई है। प्रदूषण की समस्या प्राचीन एवं मध्यकालीन भारत के लिए अज्ञात थी। परन्तु यह वर्तमान युग में

औद्योगिक प्रगति एवं शस्त्रास्त्रों के निर्माण के फलस्वरूप प्रारम्भ हुई है। आज इसने इतना विकराल रूप धारण हुआ है कि इससे मानवता का भयावाह संकट उत्पन्न हो गया।

मानव जीवन मुख्यतः स्वच्छ वायु और जल पर निर्भर है। यदि दोनों ही चीजें दूषित हो जाए तो मानव के अस्तित्व में भय पैदा हो जाता है। ध्वनि–प्रदूषण पर अपने विचार व्याप्त करते हुए नोबल पुरस्कार विजेता रॉबटकोच ने कहा था "एक दिन ऐसा आयेगा जब मनुष्य को स्वास्थ्य के सबसे बड़े शत्रु के रूप में निर्दयी शोर से संघर्ष करना पड़ेगा"।

पर्यावरण का निर्माण प्रकृति के द्वारा किया गया है प्रकृति के द्वारा प्रदत्त पर्यावरण जीवधारियों के अनुकूल होता जा रहा है। पर्यावरण के प्रदूषित होने के कारण अनेक प्रकार के प्रभाव जीवधारियों पर दिख रहे हैं।

जब जनसंख्या के भरण–पोषण के साधनों की अपेक्षा जनसंख्या में अत्यधिक वृद्धि हो जाती है तो इसको "जनसंख्या विस्फोट" कहा जाता है। इंग्लैण्ड के अर्थशास्त्र के विद्वान टामसमाल्थस ने अठारहवीं शताब्दी के अन्त में ही इस ओर संकेत किया था। उनका विचार था एक निश्चित समय में किसी स्थान की खाद्य–सामग्री के उत्पादन में जितनी वृद्धि होती है, उससे कई गुना अधिक जनसंख्या में वृद्धि हो जाती है।"

वर्ष 1901 से अब तक जनसंख्या में तीव्र गति से वृद्धि दर्ज की गई है। 70 वर्षों में भारत की जनसंख्या तीन गुना से भी अधिक हो गई है। मुख्य कारण है– कम आयु में विवाह, निरक्षरता, मृत्यु दर में कमी तथा और आयु में वृद्धि।

यह कहा जा सकता है, कि कृषि प्रधान देश होने के उपरान्त भी भारत का कृषि उत्पादन तीव्र गति से बढ़ती हुई जनसंख्या को खाद्यान्न उपलब्ध कराने में सक्षम नहीं है इसलिये प्रकृति भी कभी–कभी अपने प्रकोप से जनसंख्या में कमी करती है। कभी बाढ़ बहा ले जाती है तो कभी सूखा अथवा ओलावृष्टि भी। आचार्य विनोबा भावे जी ने कहा था– जो बच्चा एक मुँह लेकर पैदा होता है, वह दो हाथ लेकर आता है।

आशय यह है कि दो हाथों से पुरूषार्थ करके व्यक्ति अपना एक मुँह तो भर ही सकता है। परन्तु देश की उत्तरोत्तर प्रगति में अपना योगदान नहीं दे सकता है। लघु उद्योगों से करोड़ों लोगों का पेट भरता है। अब बड़ी–बड़ी मशीनों व शक्तिशाली कम्प्यूटरों के कारण करोड़ों लोग बेरोज़गार हो गये। और धीरे–धीरे यह समस्या विकराल होती गई। जिन लोगों ने गाँवों को छोड़कर शहरों की ओर पलायन किया उन्हें भारत के बड़े शहर जैसे दिल्ली, मुम्बई, कोलकाता, कानपुर आदि शहरों में अपना आशियाना बनाना पड़ा। इसके कारण शहरों में जनसंख्या वृद्धि हुई जिससे शहरों में पर्यावरण प्रदूषण की समस्या अत्यधिक बढ़ गई। जिसको बचाना अब एक चुनौती है।

आज आवश्यकता इस बात की है कि वनों की अंधाधुंध कटाई पर रोक लगाई जाए। काटे गये वृक्षों के बदले वृक्षारोपण करके इसकी क्षतिपूर्ति की जाय। वनों की कटाई के स्थान पर उद्योग धंधे ऐसे स्थानों पर स्थापित किए जा सकते हैं जहाँ बंजर भूमि है तथा कृषि योग्य भूमि नहीं है। हर्ष का विषय यह है कि सरकार ने वृक्षारोपण को बढ़ावा दिया है। जन–मानस भी इस ओर जाग्रत हुआ है तथा अनेक समाज सेवी संस्थाओं ने वन–संरक्षण महत्व को जन–जन तक पहुँचाया है। यदि आज हम लोग साफ–सफाई, सुरक्षा, यातायात आदि–आदि की समुचित व्यवस्था कौशल पूर्ण तरीके से कर लें तो काफी हद तक हम पर्यावरण को अच्छा बनाकर अपने जीवन को सुरक्षित और सुंदर बना सकते हैं।

सन्दर्भः–

1. हिन्दी गौरव–आर.डी. अग्रवाल
2. सरस्वती हिन्दी रचना– डॉ0 कमल सत्यार्थी, डॉ0 आर.पी. गुप्ता
3. राजहंस हिन्दी निबंध –डॉ0 आर.एन. गौड़
4. हिन्दी नवनीत– डॉ0 आर.एस. त्रिपाठी व एम.सी.एस. शास्त्री

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POPULATION GROWTH AND ITS IMPACT ON THE ENVIRONMENT

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ABSTRACT

Population growth can be defined as an increase or decrease in the population size of living species including human beings. Human populations are also subject to natural process of birth and death. There has been a rapid increase in the world human population over the last few decades (UNFPA, 2011). Unless urgent steps are taken to control population, serious problems may arise like environment damage and limited availability of food resources. Continuous population growth can be problem and therefore it is important to understand, what are the effects of population growth on the environment and how we can manage population growth for the benefit of all.

The interactions between human population dynamics and the environment have often been viewed mechanistically. It explores the ways in which demographers and other social scientists have sought to understand the relationships among a full range of population dynamics (e.g., population size, growth, density, age and sex composition, migration, urbanization, vital rates) and environmental changes. Therefore this paper discusses theories of population growth and their effect on the resources and environment of the earth..

Introduction

Here in this paper we are going to discuss the two main terms- i.population growth and their effect on environment.

Population:- Population is a dynamic field. There have been significant changes in birth rates and the population trajectories of countries and continents in recent years. Global population is still growing by more than 80 million a year, however, and is most likely to continue growing for the rest of this century unless we take action.

CURRENT WORLD POPULATION
7,751,847,720

For most of our existence the human population has grown very slowly, kept in check by disease, climate fluctuations and other social factors. It took until 1804 for us to reach 1 billion people. Since then, continuing improvements in nutrition, medicine and technology have seen our population increase rapidly.

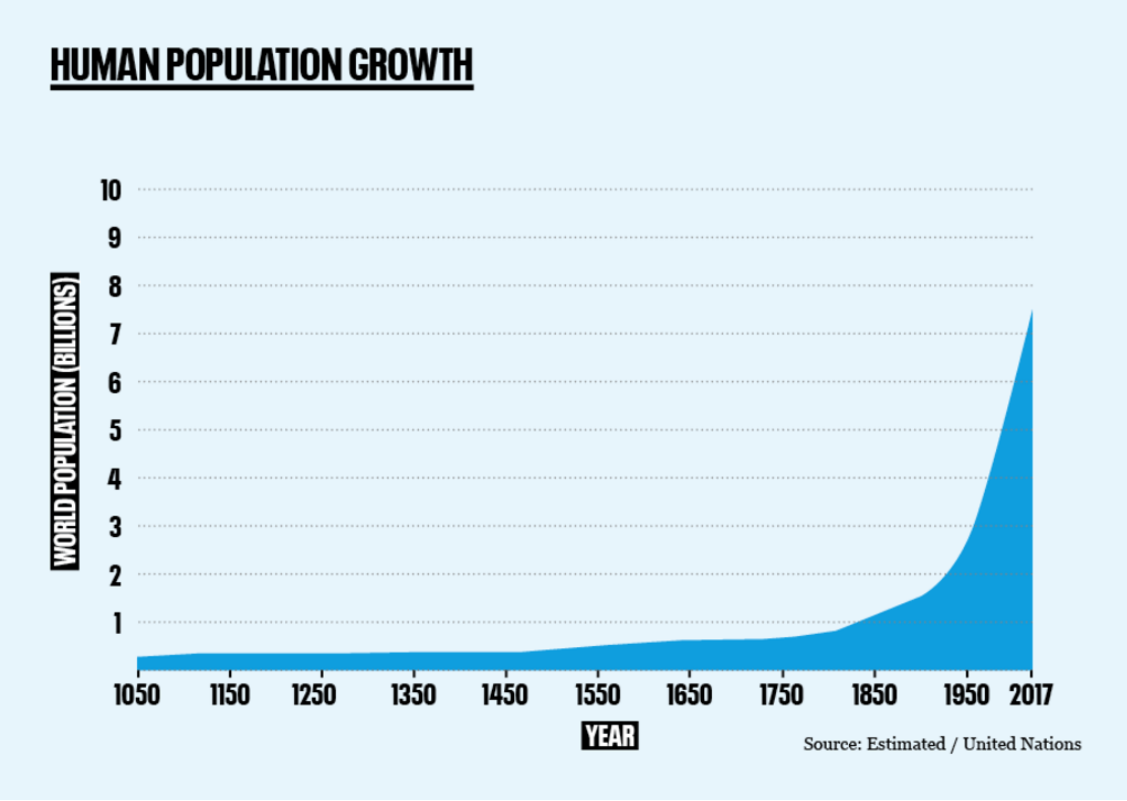


Fig : Growth in population

Human population has witnessed exponential growth over the past few hundred years.

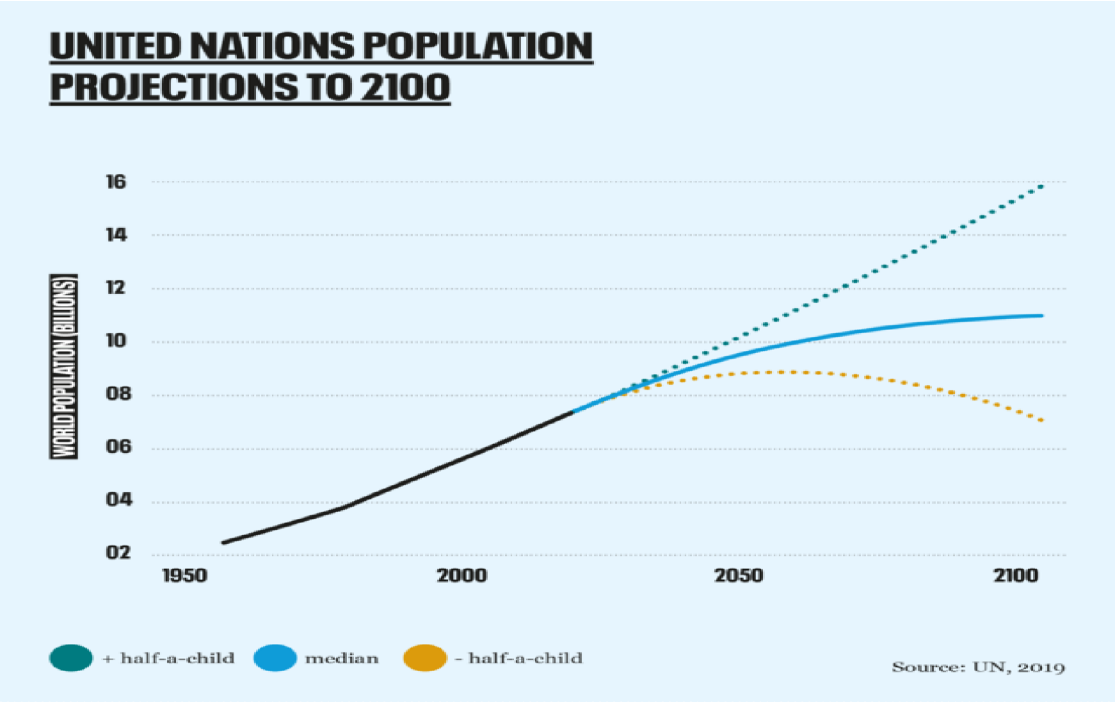
The impact of so many humans on the environment takes two major forms:

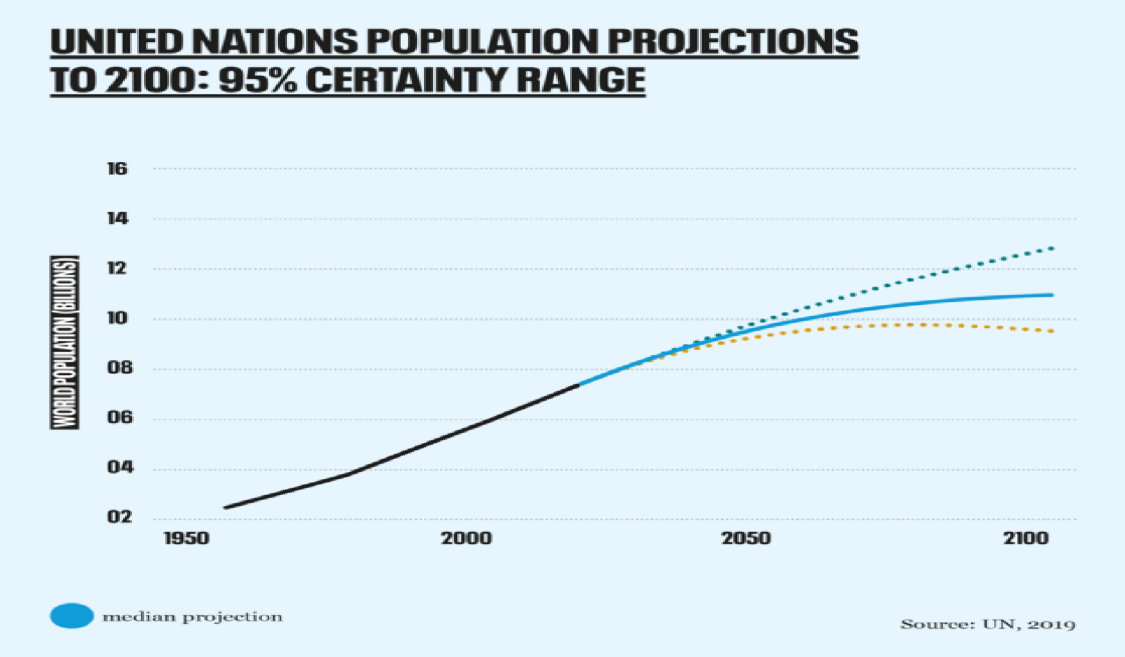
- consumption of resources such as land, food, water, air, fossil fuels and minerals
- waste products as a result of consumption such as air and water pollutants, toxic materials and greenhouse gases.

It is very important to manage and control the the population growth for the betterment and long existence of humans on the earth .

Every two years, the United Nations makes projections for future population growth. Its latest median projection is a population of **9.7bn in 2050** and **10.9bn in 2100**. Because many factors affect population growth, it makes a range of projections depending on different assumptions. Within its 95% certainty range, the difference in population in 2100 from the highest to lowest projection is almost 4bn people - more than half the population we have today.

The second graph above shows the UN's projected population if, on average, every other family had one fewer child or one more child than in the median projection ('minus half a child' or 'plus half a child' per family).





If we can achieve that modest reduction in number of children born, we will have more than 3bn people fewer by 2100 - a lower population than we have today.

(Source: United Nations World Population Prospects 2019)

Increase of this much of people on earth will create a big problem of consumption of resources that are non-Renewable. Resources are few and population being increased day by day that create the problem for human to provide the food, land, water and other neccessry products the that are present on earth in limited quantity.

The main impact of overpopulation on environment are-

1. Loss of Biodiversity.
2. Land, Water and Air pollution.
3. Global Warming.
4. Ozone Depletion.

Now we have to understand the reasons of overpopulation..

At present there are two school of thought for the theories on population growth. The first is the pessimistic view developed by Reverend Robert Malthus, a British scholar who believed that the resources available will not be sufficient for

human beings if human population is not controlled. The other theory is the optimistic view developed by Julian Simon who believed that humans can manage the issue of population because of their knowledge and skills.

I. Factors affecting population growth

The population growth is determined mainly by birth rate, death rate, and migration patterns (immigration and emigration). For instance, the population in the developed countries like Europe and America is growing at rate of only 0.1% per year while in developing countries the growth rate is over 1.5% per year. (Wright and Boorse, 2011) (UNDP).

In developing countries where manual labour is still considered main source of labour, children form part of the labour force and therefore families tend to have more children. Similarly when the pension system is not good, people tend to raise more children to look after during old age. Wherever women are more educated and take lead role in household income activities, there tend to be less number of children raised. In areas where traditions, culture and customs exist respected population tend to be higher due to less use of contraceptives.

Neo-Malthusian or pessimistic views on population growth

Malthusian theories or pessimistic theories on population growth was derived from the ideas of Reverend Thomas Robert Malthus, a British scholar who wrote series of essays on the principles of population. There were six editions of his An Essay on the Principle of Population (published from 1798 to 1826) in which he said that if the human population growth is left unchecked the food supply will not be sufficient to meet the needs of humans. He proposed the idea that while human population grew exponentially, the food resources grew only arithmetically. He also believed that population will be controlled naturally by disease, famine and mortality. This was called as the pessimistic model of population growth. Malthus believed in using preventive checks such as abstinence, delayed marriage and restricting marriages in order to control population growth. Some people criticized Malthusian theory based on the fact that there has been an enhanced agricultural production and reduced human fertility over the past few decades since the publication of his theories. However, many still believe in his theory that if left unchecked, population growth can pose serious problems for resource availability (Cristina, 2010).

Neo-Malthusianism

These are groups who also believe in the theories of Malthus and encourage population control programs for the present and future benefit of human beings. The

Neo-Malthusians view however differ from Malthus in their belief on the use of contraceptive techniques for the birth control measures. The neo-Malthusians or the pessimistic view had more concerns about the effect that population growth have on environmental degradation. While they supported the theories put forward by Malthus, this group of people strongly supported the idea of actively controlling population growth in order to prevent adverse impact on the environment. This pessimistic group are concerned about the effect of overpopulation on resource depletion and environmental degradation. There has been a general revival in neo-Malthusian ideologies from the 1950s onwards especially after the publication of series of books by some Malthusian supporters such as Fairfield Osborn (Our Plundered Planet), William Vogt (Road to Survival) and Paul Ehrlich (The Population Bomb). Although many critics of neo-Malthusianism criticize the revival of this theory based on fact that the green revolution has led to sufficient food production. Pessimists such as Paul Ehrlich believe that unchecked population will ultimately lead to serious problems in the future (Ehrlich, 2009). Neo-Malthusian or the pessimistic view is more about the positive checks but Malthusian said that there is balance between both positive and negative checks.

Technological or Optimistic views on population growth

The optimistic model of population growth was proposed by Julian Simon who in his book 'The Ultimate Resource (1981)' argued that as resources become scarce the price goes up which in turn creates incentives for people to discover new source or find alternatives for the resource. Simon also claims in his book that the natural resources are infinite based on the justification that innovative methods can be used to make natural resources available. Increasing population growth and reduced resources make people to create innovations and inventions to produce more food and all basic needs. The optimistic view said that science and technology can overcome scarcity problems. Esther Boserup (1910-1999)-Danish economist said necessity is the mother of invention. So, humanity will always find a way to overcome its problems. The optimistic view also said that more people means more alternatives to find new materials and discover ways to do things.

Relationship between environment and population growth

Humans are an integral part of the eco-system of nature and there is close interconnection between human beings and environment. Ever since life existed humans have been depending on their environment for food, shelter, and other necessities. There is an inverse relationship existing between population growth and environment as overpopulation will lead to adverse effect on the environment. As human population

increase, there is also increase in the demand for food and other energy sources. It is essential that the population is maintained at a level so that the natural resources are sufficient to meet the requirement for survival of all living beings.

Factors affecting environment

Environment means our surroundings in which all the things, living or non living, which includes atmosphere (air), hydrosphere (water), lithosphere (solid earth), biosphere (all living organisms), and geosphere (rocks and regoliths). Numerous factors affect our environment which includes anthropogenic activities such as urbanization, industrialization, deforestation, overpopulation, and use of fossil fuels. Natural disasters such as earthquakes, volcanoes, cyclones, landslide and floods can also negatively affect the environment.

The ***physical environment*** includes land, air, water, plants and animals, buildings and other infrastructure, and all of the natural resources that provide our basic needs and opportunities for social and economic development.

A clean, healthy environment is important for people's physical and emotional wellbeing. At a fundamental level, factors such as clean air and good quality drinking water are vital for people's physical health. Other environmental factors such as noise pollution can cause both physical harm and psychological stress.

Overpopulation can have a number of effects, most of which are negative as examined below.

Lack of water

Over population creates greater demand on the world's freshwater supplies. As only roughly 1% of the world's water is fresh and accessible, this creates a major issue.

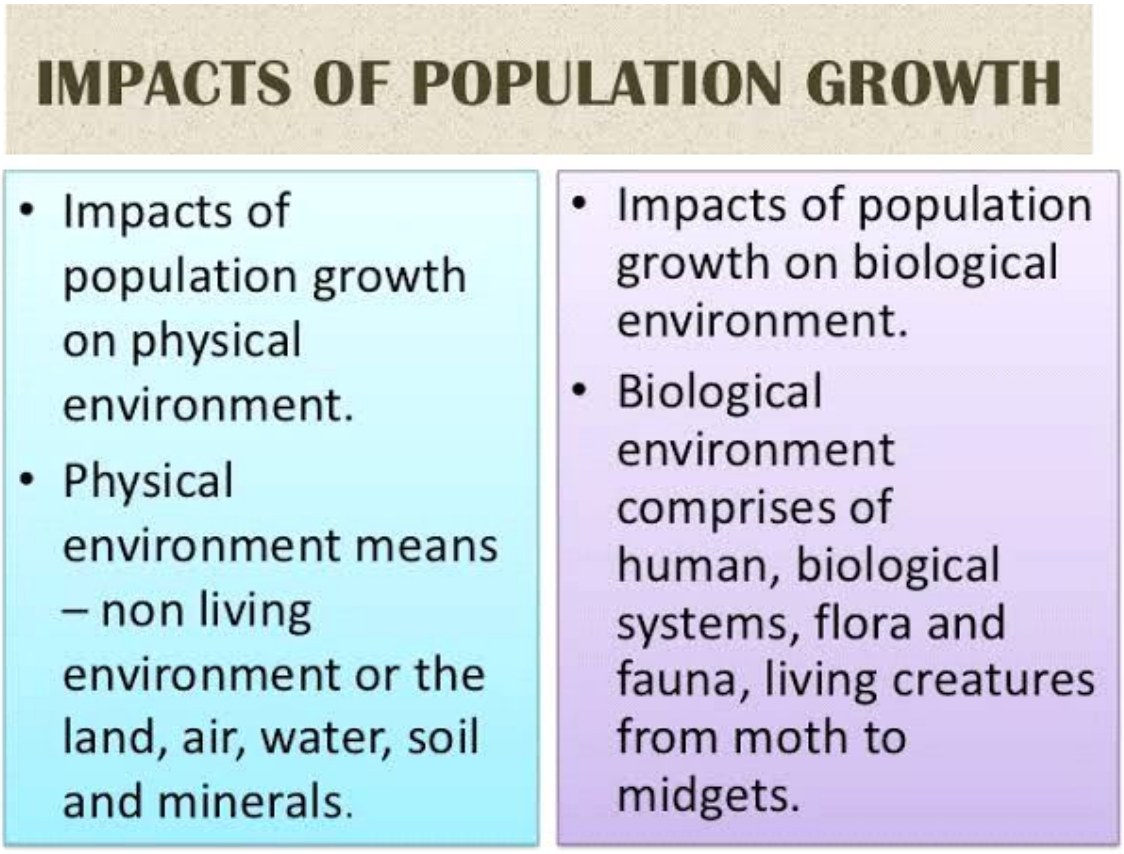
Some estimates state that human demand for fresh water will stand at approximately 70% of what is available on the planet by 2025. This will place those living in impoverished areas that already have limited access to such water at great risk.

Lower Life expectancy

While higher life expectancy is leading to increase in population in developed countries, lower life expectancy may be caused by the booms in population that less developed nations are experiencing.

A large proportion of the world's population growth occurs in less developed countries. This stretches the resources of these countries be thinner resulting in less

Table



access to medical care, fresh water, food and jobs, all resulting in a fall in life expectancy.

Extinction

The effect of overpopulation on the world's wildlife is also a major issue. As demand for land grows, so too does the destruction of natural habitats, such as forests.

Some scientists warn that if present trends continue, as many as 50% of the world's wildlife species will be at risk of extinction. Data has also been collected to show that there is a direct link between increase in human population and decrease in the number of species on the planet.

Resource Consumption

As the population grows, so too does the amount of resources needed to keep so many people alive. Food, water and fossil fuels are all being consumed at record rates, placing greater demands on producers and the planet itself.

Ironically, it is the discovery of many of these natural resources – particularly fossil fuels – that have contributed to conditions that are favorable to population growth. A study has shown that the world's ecosystem changed more rapidly in the latter-half of the twentieth century than at any other point in history because of increased use of these resources.

Increased Intensive Farming

As population has grown over the years, farming practices have evolved to produce enough food to feed larger numbers of people. However, intensive farming methods also cause damage to local ecosystems and the land, which may pose problems in the future.

Furthermore, intensive farming is also considered a major contributor to climate change due to the machinery required. This effect will likely intensify if the population continues to grow at its current rate.

Faster Climate change

Overpopulation directly correlates to climate change, particularly as larger nations, like China and India, continue to develop their industrial capacities. They now rank as two of the three largest contributors to emissions in the world, alongside the United States.

97% of the scientific community agrees that human activities are changing global temperatures. Larger populations may up these changes up, especially if more is not done to reduce individual carbon footprints on a wide scale.

Other environmental effects overpopulation:—

Ozone depletion

Ozone layer depletion increases the amount of UVB that reaches the Earth's surface. Laboratory and epidemiological studies demonstrate that UVB causes non-melanoma skin cancer and plays a major role in malignant melanoma development. In addition, UVB has been linked to the development of cataracts, a clouding of the eye's lens.

Global warming

Human population growth and climate change have grown hand in hand as the use of fossil fuels has exploded to support industrialized societies. "More people means more demand for oil, gas, coal and other fuels mined or drilled from below the Earth's surface that, when burned, spew enough carbon dioxide (CO2) into the atmosphere to trap warm air inside like a greenhouse," notes. Most fossil fuel

consumption comes from developed countries. It is a sobering thought that most developing nations aspire to similar industrial economies as they experience economic growth, which further escalates CO2 emissions into the atmosphere.

Deforestation is another important component of greenhouse gas emissions. Globally, forests store more than twice the amount of carbon dioxide than is found in the atmosphere. As forests are cleared and burned, that CO2 is released into the atmosphere, accounting for an estimated 25 % of total greenhouse gas production.

Solutions

We have to take some potential steps to control and mange the population to overcome the effects on the environment to live long healthy life.and for saving our non-renewable resources. Some steps that are needed to be taken for managing the population are —

1. Better sex Education

A lack of sex education – or poorly-implemented education – has led to overpopulation issues in many countries. The issue is so pronounced that the United Nations Population Fund (UNFPA) is calling for improvements to be made, particularly in poorer areas of the world.

Better education will help people understand more about the potential consequences of having sex as they relate to child birth. It will also do away with many of the myths that surround the sexual act and introduce scientifically-proven methods of birth control.

2. Access to the Contraceptive

Access to birth control must go hand-in-hand with better sex education. After all, without it people cannot put what they have learned into practice.

The World Health Organization (WHO) states that 225 million women who are living in the developing countries would prefer to postpone giving birth but are not using any form of contraception. Many organizations, such as the American Congress of Obstetricians and Gynecologists (ACOG), also support improving access to contraceptives

3. Education on the subject

While a number of organizations exist to provide schools with curriculam and teaching materials to cover the subject of overpopulation, it is still a subject that is not covered in schools as well as it should be.

This education should extend beyond talking about sex and into the global

consequences of overpopulation. Dialogue about the subject needs to be more open, with sites like debate.org offering useful resources that allow the issue to be confronted rationally.

Conclusion

In conclusion overpopulation can lead to problems in the form of depleting natural resources, environmental pollution and degradation, and loss of habitat. Therefore, urgent steps need to be taken to manage human population growth to a level that can be managed well. The theories founded by Reverend Malthus can be still followed because the natural resources available now may not be sufficient in the future if we do not control human population growth.

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जैव विविधता का विघटन

इन्द्रा शुक्ला
अर्थशास्त्र विभाग
महिला पी0जी0 कालेज, लखनऊ

वैश्विक स्तर पर हम जैव विविधता की दृष्टि से बेहद सम्पन्न हैं। चैपमैन के आंकलन के आधार पर पृथ्वी पर जीव जंतुओं एवं वनस्पतियों की लगभग 15–19 लाख (1.5–1.9 मिलियन) ज्ञात/वर्णित प्रजातियां हैं जबकि इनकी अनुमानित संख्या लगभग 5.3 मिलियन आंकलित की गई है। वैश्विक स्तर पर जैव विविधता में व्यापक विभिन्नता भी विद्यमान है और इसी विभिन्नता के आधार पर ही वैश्विक स्तर पर यह निर्धारित किया जाता है कि किन क्षेत्रों में जैव–विविधता अधिक है और किन क्षेत्रों में यह कम है।

वैश्विक स्तर पर जहाँ ऊष्ण कटिबंधों के स्थानीय एवं जलीय भाग, प्रवाह भित्ति क्षेत्र में आई भूमियां जैव– विविधता की दृष्टि से बेहद संपन्न मानी जाती हैं, वहीं पश्चिमी विश्व के मानसूनी क्षेत्र व घास के मैदान भी जैव–विविधता की दृष्टि से अच्छे माने जाते हैं। इन क्षेत्रों की जलवायु जैव–विविधता की दृष्टि से अनुकूल है। यही कारण है कि ये क्षेत्र समृद्ध जैव– विविधता वाले हैं।

भारत में जैव विविधता का विघटन

भारत की जलवायु जैव–विविधता की दृष्टि से अत्यन्त अनुकूल है। यही कारण है कि भारत को जैव विविधता की दृष्टि से एक समृद्ध देश माना जाता है। भारत में जहाँ सघन वन खूब हैं वहीं आर्द्र भूमि के भी विस्तृत क्षेत्र है। यहाँ समुद्रीय क्षेत्र का भी अच्छा विस्तार है। यह विशिष्टताएं यहाँ जैव विविधता को अच्छा आधार प्रदान करती है। भारत के पर्यावरण एवं वन मंत्रालय के आंकड़ों के अनुसार भारत विश्व के कुल प्राणी जगत का 7.31 प्रतिशत तथा वनस्पति का 10.88 प्रतिशत भाग आच्छादित किये हुए है। भारत में जहाँ 25 जैविक प्रांत है। वहीं हाथी, गैंडा, शेर व बाघ जैसे बड़े जानवरों के पर्यावास भी यहाँ है। यहाँ 14 जैव भौगोलिक क्षेत्र है। भारत के कुल वन क्षेत्र 750 लाख 400 हजार हेक्टेअर में से 400 लाख 61 हजार हेक्टेयर भूमि को संरक्षित तथा 210 लाख 51 हजार हेक्टेयर भूमि को सुरक्षित क्षेत्र के रूप में वर्गीकृत किया गया है। इसमें 500 से अधिक वन्यजीव अभयारण्य तथा 100 से अधिक राष्ट्रीय उद्यान, जिनका फैलाव एक लाख 61 हजार वर्ग किमी0 से अधिक क्षेत्र में है, भी सम्मिलित है।

समुद्री सुरक्षित क्षेत्र का फैलाव एक लाख 6.1 हजार वर्ग किमी0 से अधिक क्षेत्र में है, भी सम्मिलित है। समुद्री सुरक्षित क्षेत्र का फैलाव 2,67,042 हेक्टेयर भूमि पर है, जो कि प्रवाल भित्तियाँ, ज्वारनदमुख तथा मैग्रोव आदि आर्थिक दृष्टि से महत्वपूर्ण पारिस्थितिकी तंत्र को मजबूत आधार प्रदान करता है।

भारत के केन्द्रीय पर्यावरण व वन मंत्रालय द्वारा अखिल भारतीय स्तर पर 'मानव जाति जीव विज्ञान (Ethnobiology) परियोजना के अर्न्तगत किये गये एक सर्वेक्षण के अनुसार देश के आदिवासी समुदायों के लोग जंगली पौधों की 9000 से भी अधिक प्रजातियों का इस्तेमाल करते हैं जिनमें से 7500 प्रजातियों का इस्तेमाल औषधि के रूप में होता है। 3900 प्रजातियाँ ऐसी हैं, जिनका प्रयोग खाद्य पदार्थ के रूप में तथा 700 प्रजातियों का प्रयोग विभिन्न पारंपिक एवं भौतिक जरूरतों को पूरा करने के लिए किया जाता है ।

जैव–विविधता विघटन के कारण

जैव–विविधता मानव जीवन का आधार है। आदिम अवस्था से ही मनुष्य की निर्भरता प्रकृति पर रही है। चूंकि मानव सभ्यता की शुरूआत जंगलों से ही हुई, अतः मनुष्य ने बड़ी संख्या में वन्य जीवों एवं वनस्पतियों को अपने जीवन का आधार बनाया। बढ़ती आबादी और विकास की अंधी दौड़ के कारण हमारे पारिस्थितिकीय तंत्र पर जैविक और अजैविक दबाव निरंतर बढ़ रहे हैं। फलतः जैव विविधता का ह्रास हो रहा है और भोजन तथा अन्य आवश्यक वस्तुओं की बढ़ती मांग की पूर्ति में बाधाएं सामने आ रही है। हमारे जैव प्रौद्योगिकी उद्योगों के लिए भी जैव–विविधता कच्चे माल के रूप में उपयोगी है। ऐसी परिस्थिति में प्रत्येक प्रजाति या जीन की कमी हमारे भावी विकास को सीमित करती है। पारिस्थितिकीय तंत्र को संतुलित रखने के लिए तथा पर्यावरण संरक्षण हेतु जैव–विविधता का अपना अलग महत्व है कितने ही ऐसे सूक्ष्म जीव हैं, जो भूमि की उर्वरता बनाए रखते हैं तथा फसल उत्पादन में वृद्धि करते हैं। समुद्र में पाया जाने वाला शैवाल ऑक्सीजन उत्पन्न करता है तथा हमारे पर्यावरण का प्रदूषण साफ करता है कहने का आशय यह है कि प्रकृति तो हमें वह सब कुछ देती है, जो हमारे जीवन का आधार है, किन्तु हमने प्रकृति को संरक्षित किये बगैर उसका इतना अधिक दोहन कर डाला कि उसकी देने की क्षमता अब निरंतर क्षीण पड़ती जा रही है। यह स्थिति जैव–विविधता के ह्रास की परिचायक हैं जैव विविधता के ह्रास का सबसे गंभीर रूप प्रजातियों का विलोपन है। जैव– विविधता के ह्रास के मुख्य कारण निम्नलिखित हैं :–

1. **वनों का विनाश** :– आबादी का दबाव बढ़ने के कारण शहर ही नहीं, गांव भी बढ़े हैं। इस वजह से जंगल सिकुड़े हैं, जो कि जैव– विविधता के प्राकृतिक केन्द्र होते हैं। हमारे नये वन क्षेत्र तो पैदा नहीं किए, उल्टे वनों की अंधाधुंध कटाई कर डाली। अपनी आवश्यकताओं की पूर्ति हेतु इनका अधिकाधिक दोहन किया। यह स्थिति जैव–विविधता के लिए घातक सिद्ध हुई है और जैव–विविधता के ह्रास का कारण बनी है।
2. **वन्य जीवों का शिकार** :– वन्य जीवों के अवैध शिकार से भी स्थिति बिगड़ी है। वन्य जीवों की खाल, सींग, हड्डी, खुर, दांत आदि का औषधीय महत्व होने के कारण वन्य जीवों का शिकार किया जाता है। शिकार की वजह से जहाँ अनेक जीव लुप्त होते जा रहे हैं, वहीं पारिस्थितिकीय तंत्र भी क्षतिग्रस्त हो रहा है।

3. **प्राकृतिक आवासों का नष्ट होना** :– प्राकृतिक आवासों का जीवधारियों के लिए विशेष महत्व होता है, क्योंकि यहाँ उन्हें भोजन और शरण दोनों मिलती हैं, जो कि जीवन और अस्तित्व के लिए आवश्यक है। सुरक्षित प्रजनन भी प्राकृतिक आवासों में ही संभव हो पाता है। प्राकृतिक आवासों के तेजी से नष्ट होने व क्षतिग्रस्त होने के कारण जैव–विविधता से जुड़े संकट बढ़े हैं। प्राकृतिक आवासों के नष्ट होने के कई कारण हैं जैसे– प्राकृतिक संसाधनों का अंधाधुंध दोहन, वनों की कटाई, प्रदूषण की मार, कृषि के लिए वन क्षेत्रों की कटाई (झूम खेती), जलवायु परिवर्तन तथा जंगलों की आग, बाढ़ तथा तूफान जैसी प्राकृतिक आपदाएं। आवास छिन जाने से खाद्य प्रजातियों और जंगली जीव–जंतुओं में कमी आना स्वाभाविक है। यह स्थिति बड़े पैमाने पर जैव–विविधता के ह्रास का कारण बन रही है। यहाँ अंतर्राष्ट्रीय प्रकृति संरक्षण संघ (IUCN) के अध्ययन के उन रूझानों का उल्लेख आवश्यक है, जो उसने वर्ष 2000 में पेश किए थे। इन रूझानों के अनुसार विलोप के कगार पर पक्षियों का 89 प्रतिशत, स्तनपायी जीवों का 83 प्रतिशत तथा संकटापत्र पौधों का 91 प्रतिशत पहले ही आवासों के नष्ट होने अथवा क्षतिग्रस्त होने के कारण प्रभावित हो चुका है।

4. **जीनांतरित बीजों का विस्तार**:– आजकल जीन में हेराफेरी करके तैयार किये गये बीजों यानि जीनांतरित बीजों का प्रचलन बढ़ रहा है ये बीज मिट्टी में मिलकर रासायनिक प्रक्रिया करते हैं, जो स्थानीय पादप प्रजातियों के लिए हानिकारक होता है। पक्षी तथा वन्य जीव इन बीजों को खाकर अपनी प्रजनन क्षमता खो रहे हैं। इन बीजों के प्रयोग से भू–गर्भीय जल भी प्रदूषित होता है।

5. **अनियंत्रित पशु चराई** :– अनियंत्रित पशु चराई से वन नष्ट होते हैं। फलतः जैव–विविधता प्रतिकूल रूप से प्रभावित होती है। भारत में विश्व की लगभग 15 प्रतिशत पशु सम्पदा है और पशु चराई का प्रतिशत अच्छा–खासा है। अनियंत्रित पशु चराई से मिट्टी के कटाव को बल मिलता है।

6. **बढ़ता हुआ प्रदूषण** :– निरंतर बढ़ता प्रदूषण भी जैव– विविधता को नुकसान पहुँचा रहा है। यह अलग–अलग तरीकों से जैव–विविधता को क्षति पहुँचाता है, जिससे प्रजातियों के विलोपन का खतरा बढ़ जाता है। अब कृषि कार्यो से प्रयोग में लाए जाने वाले कीटनाशकों को ही लें, इनका प्रयोग फसलों को कीटों से बचाने के लिये किया जाता है, किन्तु ये कीटनाशक जैव–विविधता की दृष्टि से महत्वपूर्ण पक्षियों जैसे–मोर, बाज, चील, गौरैया आदि की मौत का कारण बनते हैं। खेती की मिट्टी, स्थानीय वनस्पतियों तथा भू–गर्भीय जल को भी ये प्रतिकूल रूप से प्रभावित करते हैं। अपशिष्ट बढ़ते प्रदूषण की ही देन है। इनके एक बड़े हिस्से को न तो हम नष्ट कर पाते हैं और न ही रीसाइकल (Recycle) कर पाते हैं। ये जहरीले होते हैं तथा कुछ ऐसे होते हैं, जिनका जहरीलापन समय के साथ बढ़ता जाता है। ये जहरीले तत्व भोजन श्रृंखला (Food Chain) में प्रवेश कर जीवित प्रजातियों के ऊतकों में पहुँचकर व्यापक हानि पहुँचाते हैं।

7. **पर्यावरण के परिवर्तन** : पर्यावरण में परिवर्तन का प्रतिकूल प्रभाव जैव विधि पर पड़ता है। पर्यावरण अनुपालन के कारण पर्यावरण में बदलाव देखे जा रहे हैं, जिनके मूल में जहाँ कुछ मानवजनित कारण हैं वहीं कुछ प्राकृतिक भी है। भूमण्डलीय पर्यावरण में बदलाव अक्सर प्रजातियों के अस्तित्व के लिए संकट का कारण बनते हैं जो प्रजातियाँ पर्यावरण में होते बदलावों के अनुरूप स्वयं को ढाल लेती हैं, वे तो बनी रहती है और जो ऐसा नहीं कर पाती हैं, उनका अस्तित्व या तो समाप्त हो जाता है, अथवा संकटग्रस्त हो जाता है।

8. **रोग**: अक्सर मानवीय गतिविधियों के कारण वन्य जीव व प्रजातियां रोगग्रस्त हो जाती हैं। वे संक्रमण का शिकार होने लगती है। इसमें भी जैव–विविधता के प्रति खतरा बढ़ा है। विदेशी प्रजातियों के आने से भी रोग बढ़ते हैं और स्थानीय प्रजातियाँ विलुप्त हो जाती हैं।

9. **आक्रमणकारी विदेशी प्रजातियाँ**: कभी–कभी ऐसा भी होता है कि आक्रमणकारी विदेशी प्रजातियाँ कमजोर स्थानीय प्रजातियों को निगल लेती है। द्वीपीय क्षेत्रों में यह प्रभाव अधिक देखने को मिलता है। कभी इनका आकस्मिक अभिगमन होता है, तो कभी उद्यान और कृषि कार्यों के लिए इन्हें आयातित किया जाता है। यूरोपियन उपनिवेशन के तहत भी कई विदेशी प्रजातियों ने विभिन्न मुल्कों में प्रवेश किया। कुछ विदेशी प्रजातियाँ नई जगहों पर कामयाब नहीं रहती, तो कुछ इस हद तक फूलती–फलती हैं कि देशज प्रजातियों को या तो नष्ट कर देती है, अथवा उन्हें खा जाती है। कभी–कभी ये विदेशी प्रजातियाँ आवासीय परिवर्तनों को इस प्रकार जन्म देती हैं कि स्थानीय प्रजातियाँ उसमें खप नहीं पाती हैं। इस तरह धीरे–धीरे उनका विलोपन हो जाता है।

जैव विविधता का संरक्षण मानव जीवन व सह अस्तित्व के लिये आवश्यक है। मनुष्य परिस्थितिकीय तंत्र का प्रमुख हिस्सा है। जिस प्रकार पारिस्थितिकी के लिये जीवन जन्तु, वनस्पतियों व कीट पतंगे आवश्यक हैं, ठीक उसी प्रकार मनुष्य भी एक आवश्यक प्राणी है इस शृंखला में किसी भी पक्ष का नकारा नहीं जा सकता।

वैश्विक स्तर पर इन्टरनेशनल यूनियन फॉर कनजर्वेशन ऑफ नेचर एवं नेचुरल रिसोर्सेस International Union for conservation of Nature and Natural Resources (IUCN) संगठन जैव विविधता संरक्षण की दिशा में काम कर रहा है दुर्लभ प्रजातियों के संरक्षण तथा प्राकृतिक संसाधनों की सुरक्षा की दिशा में यह संगठन महत्वपूर्ण भूमिका निभा रहा है।

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BIG DATA ANALYTICS FOR E-COMMERCE

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ABSTRACT

In retail and ecommerce Big data is proving to be a game-changer. Businesses can reap the rewards of better customer experiences and bigger profits if it can successfully implemented. Overall, the findings of the study synthesize diverse Big Data Analytics concepts such as definition of big data, types, nature, business value and relevant theories providing deeper insights along the cross-cutting analytics applications in e-commerce**.** Predicting trends, optimising pricing and forecasting demand, are just some of the ways that ecommerce businesses are using data to gain a competitive advantage. The guesswork has been removed, and now ecommerce businesses can accurately make strategic decisions on how to operate their online empires. In order to remain competitive and defend market share, E- Commerce firms formulates online marketing strategies based on real time data. E-Commerce firms are finding ways to extract meaningful information from larger datasets where data gets generated at greater velocity, different variety and at high volumes that are often referred to Big Data. E-Commerce firms are investing huge on Big Data Analytics to empower them to take accurate and timely decisions. This paper investigates how the use of big data analytics is perceived as value creator that can guide E-Commerce companies to attain competitive advantage. This has led to a paradigm shift in the E-commerce sector; as data is no longer seen as the byproduct of their business activities, but as their biggest asset providing: key insights to the needs of their customers, predicting trends in customer's behavior, democratizing of advertisement

to suit consumers' varied taste, as well as providing a performance metric to assess the effectiveness in meeting customers' needs. This paper presents an interpretive framework based on exploration of the definitional aspects, distinctive characteristics, types, business values and challenges of Big Data Analytics in the e-commerce landscape.

Keyword : Big Data, E-Commerce, Analytics, Personalization, Dynamic Pricing.

INTRODUCTION :

Presently, there is no unified definition for the term "Big Data", however, the most widely accepted definition of Big data is in terms of 3 characteristics, **volume**, **velocity** and **variety** also referred to as 3 V's –**V**ariety refers to the heterogeneous nature (made up of structured and unstructured datasets), **V**elocity depicts the speed at which data is captured, and **V**olume refers to the size of data (usually in Petabytes, Exabyte and Terabytes) (Russom, 2011) (Edosio, 2014).

The creation and consumption of data continues to rapidly grow around the globe with large investment in big data analytics hardware, software, and services. The availability of large data sets is one of the core reasons that Deep Learning, a sub-set of artificial intelligence (AI), has recently emerged as the hottest tech trend. Huge giants such Google, Facebook, Amazon, IBM, Intel, and Microsoft are heavily investing in big data, with the acquisition of talent hot on their agenda.

Big data is continuously creating new challenges and opportunities, all of which have been forged by the information revolution. Big data is changing the way e Commerce stores operate. With big data ,online retailers have the opportunity to create better shopping experiences, boost customer satisfaction and generate more sales .Big data is big deal to sales and marketing given the game-changing value buried within the mountains of data .The recent exponential growth stems from the explosion of social and mobile .According to e Marketer, retail e Commerce sales reached a staggering $1.915 trillion in 2016,accounting for 8.7% of total retail spending worldwide, That's a lot of transactional data. Sales are expected to increase to $4.058 trillion in 2020 making up 14.6% of total retail spending that year. Retailers are wasting no time in investing into big data. Sales of big data products and services are expected to increase at a compound annual growth rate of 23.1% through 2019, with annual spending reaching $ 48.9 billion in 2019.

PROBLEMS EMERGING

Over one third of retailers remain in the dark over their available data and most admit that silos are the primary hurdle for using such imformation.

THE CHALLENGES FOR RETAILERS:

- 51% are unable to access data, which creates an obstacle to measuring marketing ROI.
- 45% do not use data effectively to personalize marketing communications.
- 42% do not have the technology or resources to link individual customer data together.
- 39% rarely collect and store data.
- 29% have tiny amounts of customer data.

1) PREDICT TRENDS

Every online retailer wants to know the next bestselling product before their competitors, and there are few better strategies than using employing big data to predict trends. By introducing trend forecasting algorithms, retailers can remove the guesswork when predicting trends of what's causing a buzz online.Ad-buying data is analysed to see what marketing departments are currently pushing.Sentiment analysis determines the context in which a product is discussed online.are the conversations positive or negative. The data can be used to accurately predict the next top selling products in a specific category.

2) OPTIMISE PRICING

Before the explosion of big data and innovative pricing systems, many businesses would rely on comparative pricing with competitors, and benchmark the value of their own product or service to come up with the best pricing strategy. The issue with this manual approach is that it becomes unmanageable for larger eCommerce businesses that stock thousands of items. The perfect scenario would be for each product to have its own strategy, and big data makes this possible.Walmart has invested in freal-time merchandising to track millions of purchases each day to identify patterns that point the way to higher profits.For example, one product may not sell efficiently on its own, btut when paired with a complementary product,overall sales increase.With data and analytics, retailers can map the rise and fall of demand and match pricing accordingly, Action can be taken on insights in a matter of minutes.

3) FORECAST DEMAND

Almost every business performs demand forecasting in some capacity. For example, if you're a restaurant owner, you will need to forecast how many customers you'll have in tomorrow and what meals they'll order so you know which ingredients to purchase and how many chefs to have in the kitchen. If you sell shirts online, then

you'll need to predict in advance how many shirts of each colour you'll need to order from your manufacturer.

Typically, business owners will forecast demand through their gut-feeling ("people will order pancakes than waffles") or a rule of thumb ("stock more snowman t-shirts around Christmas time"). The issue with gut-feel or rules of thumb is that they're not quantitative. If you have enough historical data, you can make accurate forecasts.

Accurate demand forecasts are valued because inventory is expensive to keep on shelves.Amazon's forecasting tools use historical data and have the provision for assessing fluctuations in demand during festivals and holidays.Analytics enable Amazon to predict the traffic on the website along with the possible conversion rate.Through the Amazon Web Services(AWS) cloud,the business has the flexibility to scale up in real-time.Amazon uses brand and SKU data along with the number of visits to various product pages to determine if the assortment will attract customers.This data is then shared with the listed sellers.

4) CREATE PERSONALISED STORES

It has been well documented that personalisation increases conversions and few would argue with the data. For many years, Amazon has blown the e-Commerce industry away with its customer-centric, and many businesses are now turning to big data to replicate such tailored experiences.With big data and fast web server technologies, business can generate dynamic websites that are filled with relevant product based on the historic behavior of a consumer and their personal preferences.Automated recommendations have a huge impact on sales conversion.Many retailers are striving to rival Amazon's progress in a personaised eCommerce experience,given the lucrative rewards in sales.

5) OPTIMISE CUSTOMER SERVICE

Exceptional customer service is vital for both customer satisfaction and retention in the retail industry. Successfully implementing a well-defined customer service strategy can no longer be an afterthought. Big data allows businesses to optimise their customer service and provide an enhanced customer service experience.

6) GENERATE MORE SALES

Big data can play a pivotal role in generating more sales for any **e-commerce** business. With literally trillions of dollars forfeited to cart abandonment, big data analytics can be used to deliver a customer experience that cannot be ignored.Cart abandonment is a widely-discussed pain point for e-commerce retailers and the figures

speak for themselves. Retailers can use big data to offer a personalized experience and prevent potential abandonment. Ecommerce analytics reveal that large volumes of customers fail to convert at the last minute even though an item is in their basket.

CONCLUSION

Big data analytics (BDA) has appeared as the new frontline of innovation and competition in the wide spectrum of the e-commerce landscape due to the challenges and opportunities generated by the information revolution. Big data analytics (BDA) gradually provides value to e-commerce firms by using the dynamics of people, processes, and technologies to transform data into insights for robust decision making and solutions to business problems. This has become a holistic process dealing with data, sources, skills, and systems in order to create a competitive advantage. Prominent e-commerce companies such as Google, Amazon, eBay, ASOS, Netflix and Facebook have already embraced Big Data Analytics and experienced enormous growth.

Through its systematic review and creation of taxonomy of the key aspects of Big Data Analytics, this study helps in presenting a useful starting point for the application of Big Data Analytics in emerging e-commerce research. The study represents an approach for encapsulating all the best practices that build and shape Big Data Analytics capabilities. In addition, the study reflects that once Big Data Analytics and its scope are well defined; distinctive characteristics and types of big data are well understood; and challenges are properly addressed, the Big Data Analytics application.

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IMPERILMENT OF INDUSTRIALIZATION:DUE TO THE RAPID GROWTH OF FACTORIES AND INDUSTRIAL REVOLUTION

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ABSTRACT

Industrialization is complete transformation of economic and social status. It involves transformation in the living standard. Industrialization gimmick mainly emphasises on income i.e., economic growth, improves one's living standard and people tends toward technology.Now if we talk about who have been pursuing industrialization, so different countries have been adopting the characteristics of industralization to achieve success at different and various levels. Industrialization corresponds to change in circumstances taking everything into account this change had been witnessed in different part of the world.

Industrial change is the result of many conditions that have been occurred over the time. People no more have depandancy on human for their work. They can settle their work using energy as a source. The farmers have been transferred from agricultural ground to the factories which was a count on the development factor.As the people are migrating from agricultural ground to industries there is rapid increase in the production of goods and services and so are demands. So to fulfill the demand there is tremendous growth in the employment as more number of labourers are required to accelerate the work.

Talking about hazards of industrialization, industrialization is the root cause of the environmental quandary. Ozone depletion, acid rain, smog etc. Industrialization

causes many health related problems such as cancer, grasping disabilities, asthma,and other related issues.

This paper presents an introduction to Industrializationand its advancement, and its Hazards.

Keywords: Industrialization, gimmick, migrating, quandary, hazards.

Introduction

There were many effects through the industrial revolution. This actually spread worldwide and was the key turning point and it completely changed the world. The big change that came out was the use of factory system in the mass production. The inventions of the industrialization isfirst used by the textile industry. Before the industrialization people used to wove the clothes with the help of thread at the home. But later on machineries have been used for this purpose.The factories used to produce large amount of goods at very low cost and very rapidly without compromising with the quality they produce.

Hazards of Industrialization

Industrialization had come up with many negative impact as well. It was the coal which changed the way. Beside increase in the growth of production, and in the economic growth , there was many hazards caused by this revolution.industialization led to various kinds of pollution such as air pollution,soilpollution,water pollution and many more which was soul reason behind the rising health problems. Burning of fossil fuels caused the huge amount of smoke in the air which was the major contributor for the air pollution. Pollen, dust,mold spores from the industries was also the reason for the air pollution. Some emission released from the industries was poisonous, they can even led to death.

Water pollution was also the problem because of industrialization. Water pollution is mainly caused in the region which is next to the water resources. The human activities led to the contamination of the water. The water bodies have been drowned in the chemicals. Toxics are mixed with drinking water sources which is injurious to the health. People demand for fresh water have been increased with the industrialization. They are running for safe and clean water.

Problems associated with the industrial revolution

The rapid growth and increase in the industrilization led to dramatic destruction.The next hand in hand problem that goes with the industrialization is the soil pollution. Many chemicals and toxic materials strain into the soil destroying the

crops that were grown. The contamination of soil is mainly caused due to the heavy metals. One of the most popular contaminated soil is lead.

A lot of destruction has been caused due to the industialization. Since there was the requirement of lumber so deforestation was seen all around. For the creation of fine roads, gravel pits and strip mines ecosystem was heavily disturbed and damaged. Since the surrounding was new to the animals and other species they extinct as they were unable to grab their new surroundings and adapt the change. The presumption of the industries was on the product that were causing heavy annihilation. Dependency on the lead used in gasoline was harming our surronding. Another thing was the industrial waste which was not disposed safely causing many injurious health problems.

Conclusion

Industrial revolution had changed the world a lot but in the name of progress it has caused many big problem to our environment and surrounding as well. People are lacking many natural resources due to the growing industrial revolution. There are many ways to control these side effects. Now its us who have to decide whether we want our home ,ourland,our planet to be the safe place for us to live. We need to change the way ,the sight to reduce the upcoming problems in the near future which could become deadly and dangerous beyond our thoughts.

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BANK CREDIT BY COMMERCIAL BANKS IN INDIA WITH SPECIAL REFERENCE TO BIHAR SINCE 2001

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ABSTRACT

The banking structure in India evolved over several decades and has been serving the credit and banking services needs of the economy. There are numerous layers in banking structure to cater to the varied and specific requirements of different borrowers and customers. The banking structure in india played a major role in the promoting economic development and mobilisation of savings.

In the past several years, India's banking system has earned several outstanding achievements to its credit. The most striking is its extensive reach. It is no longer confined to metropolises in India. Indian banking system has reached to the remote corners of the country. This is one of the main aspects of India's economy growth.

In 1969, Regulation policy of the Government for banks has paid rich dividends with the nationalization of 14 major private banks. Today Banking has become instant and convenient, with the account holder not having to wait for hours at the bank counter for withdrawing money from his account or getting a draft.

This paper deals with land development bank limited time exercises, and additionally unmistakably demonstrate the utilitarian project, limbs advance requisition methodology and generally speaking exercises about the area advancement bank. The credit –deposit ratio is an Indicator of progress of any financial institution like commercial banks. It indicates the level of credit deployment of banks in relation to deposits mobilized by them. A high credit-deposit ratio indicates that larger portion of deposits is used to earn maximum interests.

The study has carried out with a purpose to present the performance of public sector banks through the c-d ratio in last decadesby classifying credits and deposits along with the percentage. The current study is an attempt to find out the various factors thatjustify the performance of commercial banking in Bihar. In this study secondary data was used and the samplesize of the study was from 2010 to 2015.

Key word- Bank Credit, CD Ratio, Commercial Bank, Bihar

INTRODUCTION

Formal financial sectors in most developing economies serve only a minority, often no more than 20 – 30 percent of the population. Most households do not have access to even basic financial services. A majority of those who do not have access are concentrated in low-income categories. Even those low-income households who have access to finance are underserved both in terms of quantity and quality of products and services. Access to finance is not a magic bullet capable of lifting poor people out of poverty. However, there is consensus that better access can play a potentially key role in inclusive growth and development.[1]

Access to financial services has received more attention lately and has become a more important part of the overall development agenda. This is likely for a number of reasons. For one, show that "finance" as in financial development determines for growth has been accumulating over the last decade. Second, based on changes in economies and economic production, finance may have moved up in the ranking of barriers to growth. Third one, there is an increasing perception that provide to finance has been altered for households and enterprises.[2]

Insufficiency in rural entrance to formal finance and the evidently exaction terms of informal finance for the poor provide a strong need and ample space for innovative approaches to serve the financial needs of India's rural poor. The past decade has witnessed the emergence of many microfinance approaches, most notably, a nationwide attempt, pioneered by nongovernmental organizations, and now supported by the state, to create links between NGOs, commercial banks and informal local groups ("self-help groups," or SHGs). also called as "Self -help groups Bank Linkage," evidence revealed that the model has progressively targeted poorer segments of the rural population and helped reduce the vulnerability of its clients. Surveys indicate that nearly 54 percent of SHG members are from the poorest groups, the landless and marginal farmers.

Recent analyses show that access for poor households to loans under SHG bank Linkage has improved asset position, increased savings, shifted borrowing patterns and activities financed, increased employment and consumption expenditure and had a positive impact on income, decreased poverty and had a beneficial social impact.[3]

Considering the importance of access to credit, especially by the poor, an attempt was made in this chapter to analyses, how far the beneficiaries have access to credit by priority sector. Before analyzing the access to credit, it is imperative to know the profile of beneficiaries availing credit from priority sectors.

Literature Review

Jules F. Bogen, The Changing Cornposition of Bank Assets New York University, New York, 1961, and in George R.Morrison and Richard T.Titled "Developments in the Commercial Bank Loan-Deposit Ratio" in which they find the Bankattitudes toward their individual loan-deposit ratios have obviously undergone considerable change in the postwar period.it is clear that many banks are now willing to operate with higher loan-deposit ratios than they would have thoughtappropriate even at the close of the 1950's. Nevertheless, although the loan-deposit ratio has been a highly flexibleelement in the portfolio decisions of many banks, the ratio remains a significant criterion in determining over-all lendingand investing policies for a large number of banks. To the extent that banks are again giving careful attention to theirloan-deposit ratios, loan accommodations are becoming more closely geared to the over-all growth of bank deposits,which in turn is heavily influenced by Federal Reserve policy. Such a development might be expected to be accompaniedby more selective credit policies on the part of banks in choosing among their many applicants for credit.

Reserve Bank of India Mumbai – Banking Statistics - Basic Statistical Returns March, *1996*and priority sector advances" in which it is emphasized on deposits and advances have gown' enormously in India.

Roshan Singh *et al.* (1978) studied the pattern of flow of credit in development block of Patna & all district in Bihar. They found that the pattern of financing agriculture was similar both at the national and district level.

Ramappa and Sivasankaraiah (2007) studied that the share of agriculture loan in the total priority sector advances was considerably large and fluctuated from 73.02 per cent in 1993-94 to 76.79 per cent in 2004-05. It was also evident that of the total agriculture loan in 2004-05, crop loan alone accounted for 93.31 percent.

Research Methodology

The study has been conducted with reference to the data related to Public Sector Banks (SBI and Nationalized Banks)operating in India. The public sector banks have been studied with the belief that they hold largest market share ofbanking business in India. In this study secondary data was used and the sample size of the study was from 2010 to 2015.The data for the study purpose has been taken mainly from 'Economic Survey published byState government.

Deposits and CreditsPer Capita Deposits and Credits of Scheduled Commercial Banks

Shows the deposits and credits of scheduled commercial banks in Bihar vis-à-vis other states and their shares inthe total deposits and credits in the country. it is seen that there has been significant growth in totaldeposits in Bihar over the previous year by Rs. 14,800 crore. Simultaneously, the expansion of credit in 2009-10 has alsoremarkably Improved the credit had expanded by Rs 5400 crore compared to only Rs 2751 crore in 2008-09.In 2008-09,the expansion of credit was only by 15 percent of the additional deposits collected during that year. In 2009-10, theexpansion of credit was as much as 36 percent over the previous year. But while Bihar's share in the total deposits ofscheduled commercial banks remained the same in these two years at 2.2 percent, its share of credit has improvedmarginally from 0.83 percent to 0.87 percent.The population served by a bank office in Bihar also remains the highest in the country. While the per capita deposit ofBihar has increased significantly in 2009-10 by Rs. 1406, compared to an increase of Rs. 1437 the year before, theincrease in per capita credit was only one-fourth of this, i.e. by Rs 103 compared to an increase of Rs 63 one year back.The credit flowing into any economy depends on its absorption capacity which in turn is determined by the physicalinfrastructure, but banks still need to take much more pro-active measures in increasing the credit flow by opening morebranches in the unbanked areas, and relaxing some of their stringent credit norms. It has been noted earlier that theexpansion of bank branches in Bihar in 2009-10 has been skewed in favour of urban and semi-urban areas, which alreadyhad relatively better banking facilities.

CONCLUSION

The term of priority sectors has evolved over a period of time and at present, priority sectors are broadly considered as those sectors of the economy which in the

absence of inclusion in the priority sector categories would not get on time and suitable finance. Typically, these are small loans to small and marginal farmers for agriculture and allied activities, loans to Micro and Small Enterprises, loans for small housing projects, education loans and other loans to persons with low income levels.

Presently, the target for aggregate advances to the priority sector is 40 per cent of the Adjusted Net Bank Credit (ANBC) or the credit equivalent of Off Balance sheet Exposure (OBE), whichever is higher for domestic banks. Foreign banks have 20 or more than 20 branches in the country are being brought on par with domestic banks for priority sector targets in a stage manner over a period of five year starting from April 1, 2013. 32% target is fixed For foreign banks with less than 20 branches.

The domestic banks, i.e, public and private sector, could not achieve the target of 40 percent for the year 2012.

The narrated four factors explain the direct impact of priority sector lending to the extent of 48.04 percent. The most important factor was 'improvement in social conditions' which consist of seven variables with a reliability coefficient of 0.807, eigen value of 3.014 and explains 14.74 percent of variation. The second important factor was 'Increase in Savings and investment' which consists of six variables with a reliability coefficient of 0.837, eigen value of 2.882 and explains 12.190 percent of variation.

The third factor 'Generated income and employment' which consists of six variables has a reliability coefficient of 0.815, eigen value of 2.878 and explains 10.850 percent of variation. The fourth factor 'Asset creation' which consists of four variables has a reliability coefficient of 0.648, eigen value of 1.198 and explains 10.250 percent of variation. The KMO Measure of sampling adequacy was 0.815 and the Bartlett's Test of Sphericity was significant.

The impact of priority sector lending by commercial banks on rural development has been determined by several independent variables. There have been 23 variables identified that have a vast influence on the priority sector beneficiaries. A part of the variables have positive influence and certain variable have negative influence on priority sector lending. Out of the said variables, a certain group of variables had a significant influence on the priority sector lending.

The factor analysis (principal axis method) helped in reducing the variables in to broader factors, so that the understanding of the impact of the lending was visible

and the latent variables provided more insight in the determination of the benefits. The determinants were further understood through multiple regressions which provided the model that connects the entire scheme of things. Under the model, the impact factors played the vital role and thus it can be concluded that the priority sector lending benefited the beneficiaries in a major way and the broader areas of improvement were in social conditions, savings and investment, employment generation and asset creation. Thus it can be established that the priority sector credit has a direct bearing on the livelihood of the beneficiaries and more targeted credit will uplift the bottom of the pyramid to a higher income strata.

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USING TECHNOLOGICAL ADVANCEMENTS AND ANALYZING THEIR POTENTIAL FOR EFFECTIVE WASTE MANAGEMENT AND POLLUTION REDUCTION

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ABSTRACT

This paper focuses on using and analyzing the potential of technology for effective waste management and pollution reduction. Saving environment is the need of the hour; various steps are to minimize the effect of the climate change, which is prevailing as an impending doom over our heads. One key aspect, to save environment is the innovations in the field of technology. The industry 4.0 revolution is all set to barge in with a ton of technological advancements, in the fields of AI, IoT, Machine Learning, etc. If these techniques can save the environment or at least help in sustainable development then it is something that is worth pondering. Minimal usage of fossil fuels, creating alternative and renewable sources of energy, minimizing the waste generation and getting a pollution free environment to live are some of the prime goals for environment conservation.

A device that could harness the true potential of *Carbon Capture and Storage* (CCS) technology and make it efficient enough for everyday usage. Using Smart Grids and better battery technology can effectively help in developing devices that harness the renewable energy to its true potential. A device that could classify the waste as biodegradable and non-biodegradable or suggest ways to reduce the waste generated. A device that is capable of scanning the pollution sources of the city or one that can inhibit the working of the machines if they generate hazardous amount of wastes into

the environment is the need of the hour. A device that can monitor the pollution levels of an automobile and issue warnings.

With the fast growing pace of technological advancements, it is possible to create such devices easily and use them daily with minimum efforts to our benefit.

Keywords—*Environment, Waste, Pollution, Technology*

I. Introduction

Technology has always helped to simplify the lives of humans. With the advancements in technology, the things that people only dreamt off once are now becoming a reality. However, the faster the pace of the humanity is travelling on the path of technological advancement, the faster is the peril of the planet Earth. Effects of climate change are now visible everywhere. Problems like escalating temperatures, frequent natural calamities, rising sea levels and decreasing air quality are becoming frequent today.

Every year during the winter season, the northern parts of our country face smog and poor air quality index, the glaciers and icebergs all over the world are melting, causing a worldwide crisis. According to a recent report, if we minimize the amount of carbon generation to a *negative*, then also it will take years to balance the amount of greenhouse gasses to an acceptable and safe level in the environment. The forest fire that plagued the 'lungs of the world', the *Amazon Rainforest,* resulted in an adverse effect on the environment and gave rise to a worldwide concern, leading to public outrage and various social media campaigns.

Humans have made substantial progress in the fields of Artificial Intelligence, Machine Learning and Internet of Things, especially in the past decade. However, all these advancements are worthless if there is no planet to live on. We have developed technologies that can easily help us to communicate throughout the world, the technologies that have helped to harness the wind and solar power, which is available in abundance. Making visible progress in the technological advancements have called out for the measures to improve the condition of the planet, Earth.

II. Technological Advancements

A. Biofuels

Biodegradable alternatives of fossil fuels like wind and solar energy plants are widely used as these resources are available in abundance. This not only reduces the amount of harmful gases like SO_2 and CO_2 in the atmosphere and helps in preserving the earth's fossils. At the national level, around 30 nations around the world already have renewable energy contributing more than 20 percent of energy supply, where

Denmark and *Germany*'s contributions are substantial.

Other alternatives like, *Green Cars* are also gaining popularity today. With various leaders of the automobile industries like, *Tesla, Ford,* etc. already contributing in the development of Green Cars, the concern of a worldwide contribution towards a cleaner environment is gaining momentum.

B. Carbon Capture and Storage (CCS) Technology

Carbon dioxide (CO_2) is one of the most harmful greenhouse gas in the environment. The amount of CO_2 is increasing at an alarming rate in the environment; trees can make use of this gas for photosynthesis. However, still the concentration of the CO_2 in the environment is at an alarming level, this is where *Carbon Capture and Storage (CCS),* comes to play.

Through this technique, the CO_2 gas is separated from the other gases in the atmosphere. It is then stored in the rock formations below the ground, after the carbon extracted from it is then transported through the pipelines. Thus, *CCS* can effectively help in improving the air quality for over decades.According to the CCS Association, this technology allow the separation of carbon dioxide from gases through these methods: ***pre-combustion capture, post-combustion capture*, and *oxyfuel combustion***.

Countries like Switzerland, USA and Canada are already working on this technology and in 2017; a CCS plant was setup in Switzerland. Apart from this, many startups also focus on this technology. Thus, the most harmful greenhouse gas, CO_2 is now developed into one of the widely used organic compound, Carbon.

C. Nuclear Fusion

The experience of the humans with nuclear reactors and the nuclear technology has not been a positive one. With the incidents of Hiroshima and Nagasaki, still haunting many, the accidents of Chernobyl are also horrifying. However, in shadow of these one cannot overlook the immense possibilities of the nuclear fusion and one of the most important aspect that it emits zero carbon. The same procedure that powers the Sun can be used as a cleaner alternative of fuel, thus reducing the pollution in the environment.

Unlike, nuclear fission, the process of nuclear fusion, does not generate harmful radioactive wastes. Thus, it is not only a cleaner but also a safer alternative fuel.

D. Sensors

With the advent of IoT, the devices are now becoming advanced and thus help

in generating data in a form that was never known before. Using various sensors, one could test for smoke, gas emission, identify pollutants, etc. There are various devices that could be made out of these sensors and thus help in effective waste management and pollution reduction as well.

Using IoT and various sensors one can easily develop devices that can easily monitor the wastes generated by the buildings or the automobiles and suggest preventive actions if necessary.

If these sensors are used effectively and efficiently then they can easily change our day to day lifestyle. Wearable sensors are already used track vitals of a body, if these sensors are used to monitor the quality of resources of our surroundings like air, water, etc. then it can be used for mass improvement.

E. Solar Glass

Solar Glass is an emerging technology that works upon the concept of Solar Panel and makes use of *Photovoltaic Cells.* However, instead of using separate solar panels, and placing them on the rooftops. The Solar Glass technology, aims at developing glass panels. These glass panels are transparent and can be used to harness the sun's energy and convert it into Solar Power.

With this, our cities, which are turning into concrete jungles full of skyscrapers, can easily use Solar Energy, when the glass panels are replaced with Solar Glass.

However, one of the biggest hurdles in the path of production of Solar Glass is its efficiency. The Solar Panels are only able to reach 25% efficiency level, and introducing transparency will further decrease the efficiency of solar panels.

Studies conducted at *Michigan University*, show that even with such low efficiency values, the Solar Glass can generate enough energy to satisfy 40% of the electricity need of US alone.

III. CONCLUSION

Although, there are various technological advancements to improve the waste management and reduce pollution levels in the environment. However, all the efforts are worthless without proper implementation. The devices, so developed must be available at the individual level; they must be affordable by everyone. This call up for not only an individual but for the world leaders to take up responsibility and make substantial efforts. The government policies must be favoring not only research and development of the environment friendly products, but it should make individuals aware on how to use them to their advantage. Individuals must themselves take up

responsibility and try to minimize the waste generation and pollution discharge in the environment.

The crisis that Earth is facing today requires a combined effort of all the inhabitants irrespective of the regional and cultural differences. It is the time, that we come together for the betterment of our planet and make it a better place for our future generations.

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FOREST FIRE DETECTION AND PREVENTION SYSTEM USING INTERNET OF THINGS

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ABSTRACT

To lead a healthy life, we need a healthy environment, but our current environmental condition is not so good resulting in so many severe diseases. Major environmental issues being climate change, pollution, environmental degradation, and resource depletion etc. Many factors and reasons can be blamed for the same but one of the major reasonsbehind this is fire. Fire in resident area can be controlled within a time but becomes a challenging one when caught in distant and out areas like forest. It has been found in a survey that 80 percent loss in forest is caused by fire. This could be avoided if fire gets detected in early stages. The objective of this work is to propose a system which can be used to detect fire as soon as possible using Internet of Things (IoT). In order to implement this system, we need a microcontroller, sensors and a communication network. This system includes components called sensors which continuously sense the environment and if any abnormal data is being captured, it transmits the signal to the centralized center where analysis can be done. Fire causes smoke, massive increase in temperature which can be easily measured against a threshold value. IoT sensors consume very low power, so they can operate on solar energy, eliminating the problem of power supply in outdoors. Since IoT devices are

provided with Unique Identifiers (UIDs), whenever any sensor sends data, its location and nearby devices can be easily detected. Several algorithms and logics can be implemented to compare the factors recorded with the threshold value and conclude the possible reason.

Keywords : IOT, Arduino, Sensors, UID, PIR.

INTRODUCTION

Less than 3 percent of the earth is occupied by Rainforest, with Amazon rainforest being world's largest rainforest, which contributes almost 20 percent of earth's oxygen. Fire burning across the Brazilian Amazon at last official count was about 76,000 and according to Brazil's National Institute for Space Research (INPE) data, it is an increase of over 80 percent over the same period last year. The impact of recent massive fire in Amazon rainforest was seen in Sao Paulo, Brazil's largest city, when city got plunged into sudden darkness around 3 pm and rain that poured down smelled like smoke. NASA satellite confirmed that Amazon Rainforest was burning at a record rate. But satellite based detection of forest fire suffers from severe limitations restricting the speedy and effective fire control system. In recent years, the prevention and detection of Forest fires has been a global concern which is being trying to be solved for several years.

In this project, we have come up with an idea which could be effective enough to detect fire over a large geographical area as soon as possible using Internet of Things (IoT). Internet of Things is a system of interrelated things having ability to collect and transmit or receive data over a network without human to computer interaction. The market of Internet of Things is expected to reach 9 billion Dollar by 2020. By the end of 2020 it is being expected than more than 1.9 billion IoT devices would be connected in India which will lead to the growth of 31 times of current Indian market. One of the major barriers to mass deployment of wireless IoT sensors is power supply or battery lifetime. Effective solution to this problem is the integration of solar panels into the system. Solar panel harvests light energy and increases battery lifetime as well as decreases the overall cost of the system.

Proposed fire detection project will consist of several sensors to collect the data from the surroundings.This will include temperature, gas and humidity of the surrounding environment. The collected data from devices is sent to the centralized centers where data can be analyzed and depending on the constitution of gases and abnormal change in temperature or humidity a decision can be taken.

SYSTEM ARCHITECTURE

The given architectural view defines the flow of control and the subjected hardware requirements for the proposed system. The hardware specification requires sensors, microcontroller, server connectivity source and power supply system.

The architectural view shows the beginner working and devices usage. As the sensors would act as input devices to the microcontroller "Arduino" that process the data collected through algorithms and transmit the data to the server through cloud connectivity, if the calculated result would be as for the fire presence - the buzzer would act as a local area alert and the action from the server station would be taken by the centered fire stations. The power source for the device would be best to have form natural resources (primarily from the solar panels).

In the depicted model there are a number of electronic and computing devices are being used. There are a number of sensors placed which involves the PIR sensor, Gas sensor and Flame sensor. Every connected sensor has their specific role in the detection of fire. The role of the sensors in this model is most important they provide data in real time accurately and if fire is detected the action can be taken without any delay as the real time data transmission is done through the cloud computing to the nearest fire department.

PIR SENSOR : It stands for Passive Infrared Sensor that is used to measure the infrared light being emitted from the particular object that is focused to it. Here it used to detect fire as every object has a temperature value above which it has gets heat, this detection is done using the infrared rays emitted from the object. This can be used to fine out the region having the maximum heat emission.

PIR SENSOR :

GAS SENSOR : The gas sensors are used to detect the presence of concentration of the gas. Here as fire detector the sensor can detect the presence of some specified gas such as carbon monoxide and nitrogen oxide, to identifies the presence of fire at an early stage.

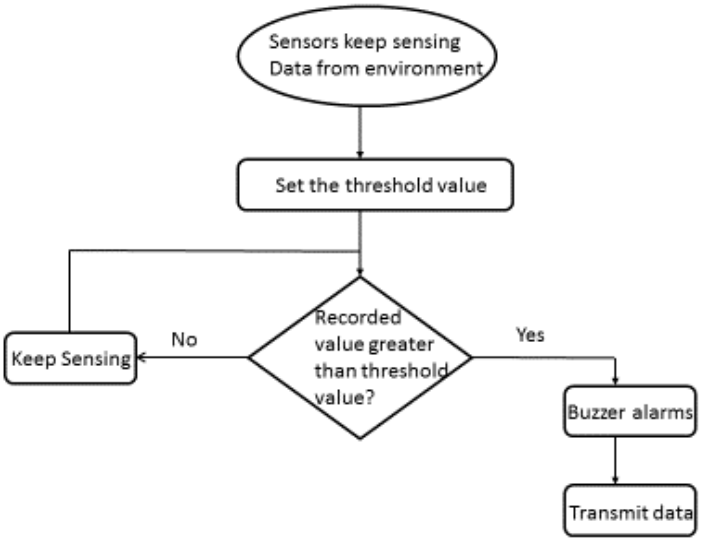
FLAME SENSOR : This sensor is used to detect and respond to the presence of fire. This sensor can detect the presence of fire from a specified range i.e. upto 10m of distance. As this sensor responds as detects fire so it would activate the buzzer.

ARDUINO UNO: The Arduino Uno is a microcontroller board subject to the ATmega328P, which we are using. It has 14 induced data pins in which 6can be used as PWM data, 6 fundamental data sources, a 16 MegaHz quartz gainful stone, a USA affiliation, a power jack, an ICSP header and a reset catch which is used for resetting input data. It includes everything a microcontroller should have. It requires a power supply that is here provided by the solar power sources.

BUZZER : It is used as an alert sign to indicate the emergence of fire in the particular area. This alert system would work when the sensors predict the data and the microcontroller processor predicts the presence of fire.

SOLAR POWER RESOURCE : The of power is must for any device to work but in forest, the installation of power supply cables can somehow damage the trees so here to provide power supply solar power panels can be integrated in the system making it nature friendly and effective.

SYSTEM FLOWCHART



The Sensors are the key component that acts as an input device to the microcontroller. The sensors that can work for fire detection are PIR sensor, temperature sensor, heat sensor, and gas sensor. Most of the working of the system is self-explanatory from the flowchart. The sensors integrated with the system to record real time data and send signals to the Arduino Uno microcontroller as input via the input pins. The microcontroller processes the data in real time with the algorithms stored for processing, to detect the presence of fire. All the real time data is send to server in real time with the help of cloud computing. The processed output value is checked and if depicts the emergence of fire the process moves towards the alert process i.e. the buzzer gets activated and an alert signal would be send onto the server and to the nearest fire station so that action can be taken immediately.

FUTURE SCOPE

The cost and the reliability of the devices needs to be more effective and several natural factors like rain, wind and so may harm the devices which are needed to be considered and worked on. A sub-server unit can be used in between the transmitting

unit and receiving unit to make the process faster. The real time transmission of data constitutes a voluminous amount of data which requires large storage and heavy processing capability. Large volume of data needs high speed processor to process data on time and efficiently. The system can also be upgraded with higher version of Zigbee to make it run for longer period of time.

Conclusion

The paper depicts the requirements of our environment and the possible and effective solutions for fire safety. The main concept and technology being used is Internet of Things. The proposed system can overcome the limitations of existing system of fire detection using satellite. In this way, this system reduces the catastrophic events caused due to fire. The major problem of power supply in outer regions is solved using solar energy cells and using low powered IoT devices (sensors). Cost effectiveness of overall project is maintained by using low cost and maintainable devices. But still there is a scope of more efficient working model.

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पर्यावरण संरक्षण में बौद्ध धर्म का योगदान

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शोध सार

गौतम बुद्ध ने भारतीय भूमि से सम्पूर्ण विश्व को बौद्ध सिद्धांतों से परिचित कराया। गौतम बुद्ध का जीवन करुणा और त्याग को परिलक्षित करता है। वे इस बात पर दृढ़ थे कि भौतिक सम्पदा जीवन का उद्देश्य नहीं होती। उन्होंने ऐसे समाज की रचना की जहाँ अलौकिकता बाहरी दुनिया से नहीं बल्कि मनुष्य के अंतर्मन में निहित है। अपने सिद्धांत के तीन शब्द– "अत्त दीपो भव" अर्थात "अपना दीप स्वयं बनो" के आधार पर गौतम बुद्ध ने मानवता को महान प्रबंधनीय सीख प्रदान की।

यह बौद्ध परंपरा, विहारों, महाविहारों के माध्यम से भारतवर्ष को लंबे समय तक सुसंस्कृत बनाती रही। विनय–पिटक में मानवीय तत्वों का निर्धारण और उसका अनुपम जीवन–संचालन इसी श्रमण परंपरा की देन रही है। विनय पिटक में सदैव यही परिलक्षित होता है कि मानवीय गुण सुकर्मों के माध्यम से ही प्रखर हो सकते हैं। समस्त विनय पिटक तथा उससे संबंधित अवधारणाएं, विचार आदि इसी पक्ष को उजागर करती हैं कि मानवीय गुण स्वस्थ्य पारिस्थितिकी एवं पर्यावरण में ही प्रस्फुटित हो सकते हैं।[1]

कुंजी शब्दः– पारिस्थितिकी, पर्यावरण संरक्षण, जलवायु परिवर्तन, बौद्ध, विहार, प्राणी, करुणा, मध्यम मार्ग

परिचयः–

जलवायु परिवर्तन आज मानव के लिए गम्भीर मुद्दा है। यह सम्पूर्ण विश्व की अर्थव्यवस्था एवं पारिस्थितिक प्रणाली के माध्यम से मानव को प्रभावित कर रहा है। अफ्रीका, यूरोप, एशिया, कनाडा और अमेरिका के धर्म शिक्षकों के एक समूह ने जलवायु संकट पर एवं इसके सम्भावित दुःखद परिणामों को कम करने के तरीकों में बौद्ध अंतदृष्टि का सहारा लिया है।[2]

आज मानव जलवायु परिवर्तन के अभूतपूर्व संकट से गुजर रहा है। मानव हित के लिए पृथ्वी पर ग्रीन हाउस गैसों में कटौती आवश्यक है। इसके लिए हम बुद्ध की शिक्षाओं एवं बौद्ध भिक्षुओं की जीवन परिचर्या से मार्गदर्शन कर सकते हैं। हमें बौद्ध धर्म की "दुःखों की सच्चाई" को स्वीकार करना चाहिए, जो कि प्रत्येक समस्या का सार्थक समाधान बताता है। जलवायु परिवर्तन दुःख का मूल कारण है। दुनिया भर में जीवाश्म ईधनों का भारी मात्रा में दोहन एवं लगातार हो रहे जंगलों के विनाश ने प्रकृति की क्षमता को कम किया है।

बौद्ध धर्म का पर्यावरण और उसके संरक्षण में बहुत बड़ा योगदान रहा है क्योंकि गौतम बुद्ध को बोधि वृक्ष (पीपल) के नीचे ज्ञान प्राप्त हुआ था, जो कि पर्यावरण का संरक्षक माना जाता है।[3] भगवान बुद्ध ने खुद सन्यासी जीवन बिताकर पर्यावण के संरक्षित करने में अपना महान योगदान दिया है। बौद्ध धर्म हमारे अर्थात् मानव मन के भीतर तृष्णा, घृणा, भ्रम, इच्छा एवं विशाल दुःखों का निराकरण बताता है। बौद्ध धर्म के अनुसार प्रकृति और मनुष्य के मध्य कोई विशेष अंतर नहीं है, जिस प्रकार जल चक्र, कार्बन चक्र और खाद्य चक्र होता है। ठीक उसी प्रकार कर्म और पुनर्जन्मों का चक्र भी होता है।[4] नश्वरता का सिद्धांत कहता है कि प्रकृति के संसाधनों का एक असीम सागर नहीं है। कर्म का सिद्धांत रूप हमें प्रकृति के संसाधनों से अलग रखता है।

प्राचीन भारत में यज्ञों का काफी प्रचलन था, जिसमें स्वर्ग प्राप्ति के लिए तथा राजा चक्रवर्ती बनने के लिए विभिन्न प्रकार के यज्ञों का सम्पादन करते थे। इन यज्ञों में जानवरों की बलि दी जाती थी। तत्कालीन समय के कूटदंत नामक ब्राह्मण का उल्लेख है कि उसने यज्ञ की तैयारी की जिसमें पाँच सौ बैल, पाँच सौ बछिया, पाँच सौ बछड़े, पाँच सौ गाय और पाँच सौ मेढ़ों की बलि देने का प्रबंध किया। यज्ञ के लिए हजारों वृक्षों को भी काटा गया। बुद्ध ने देखा कि इस तरह तो पर्यावरण संतुलन ही बिगड़ जाएगा, इसलिए उन्होंने इस प्रकार के यज्ञों का विरोध किया। उन्होंने कहा कि इस तरह के हिंसायुक्त खर्चीले यज्ञ महाफलदायक नहीं होते हैं और इस प्रकार के यज्ञों में सदाचारी व्यक्ति नहीं जाते हैं। बुद्ध इस बात को भली–भाँति जानते थे कि पशु–पक्षियों की हत्या से पर्यावरण पर बुरा प्रभाव पड़ता है, इसलिए पंचशील के पहले ही शील में किसी भी प्राणी की हिंसा न करने का प्रावधान किया है। बुद्ध ने कहा– 'जैसा मैं हूँ वैसे ही अन्य प्राणी हैं। अतः न जीव हत्या करो न किसी को ऐसा करने की अनुमति दो।' बुद्ध ने पशु–पक्षियों की योनि में बोधिसत्व की कल्पना इसलिए की, ताकि अनजाने में भी उनकी हत्या न हो। गौतम बुद्ध ने भिक्षुओं की जो जीवन परिचर्या बनाई[6] वह पर्यावरण अनुकूल थी। भिक्षुओं को बौद्ध विहार गांव एवं नगरों के कोलाहल पूर्ण वातावरण से दूर जंगलों में बनाने का निर्देश दिया और एक बात ध्यान देने योग्य है कि विहार ऐसी जगह हो जहाँ आसानी से आवागमन हो सके।[5]

बौद्ध धर्म समस्त पेड़ों की रक्षा नहीं कर सकता लेकिन पेड़ों के प्रचण्ड विनाश का विरोध करता है। बुद्ध ने प्राकृतिक संसाधनों का अत्यधिक दोहन और प्रदूषण पर संवेदना व्यक्त की थी। लालच का प्रमुख कारण तृष्णा को माना गया है, जिस प्रकार एक बौद्ध भिक्षु एक साधारण जीवन जीता है। अगर मनुष्य बौद्ध धर्म की शिक्षाओं का अनुसरण करे, तो सीमित संसाधनों का प्रयोग करके पर्यावरण को प्रदूषित करने से रोक सकता है। सरल जीवन जीने के लिए लालच की कम सम्भावना है और संतोष

की अधिक अगर हम कम संसाधनों का प्रयोग करते हैं, तो इससे बीच का रास्ता (मध्यम मार्ग) निकाला जा सकता है। मध्यम मार्ग संतुलित और यथार्थवादी तरीके प्रदान करने में मदद करता है।

यज्ञीय कर्मकाण्ड तथा पशुबलि जैसी कुप्रथाओं का बुद्ध ने जमकर विरोध किया।[6] वैदिक कर्मकाण्डों, पशुबलि एवं यज्ञ का भी उन्होंने विरोध किया। वे मानव जाति की समानता के अनन्य पोषक थे। उनका मानना था– मनुष्य–मनुष्य में भेद जन्म के आधार पर नहीं, अपितु गुण, बुद्धि एवं कर्म के आधार पर होता है। अतः उन्होंने ब्राह्मणों की जन्मना श्रेष्ठता के दावे का खण्डन किया। जाति–पाति, छुआ–छूत जैसा कोई भेदभाव उनकी दृष्टि में नहीं था, यही कारण था कि उन्होंने संघ का द्वार सभी जातियों के लिए खोल दिया था। एक सच्चे समाज सुधारक के रूप में वे अपने समकालीन समाज को जाति तथा धर्म के दोषों से मुक्त करना चाहते थे। बुद्ध जटिल दार्शनिक समस्याओं में कभी नहीं उलझे तथा नैतिक दार्शनिक के रूप में उन्होंने मनुष्य के नैतिक तथा सामाजिक गुणों के विकास पर ही बल दिया।[7] इनकी धार्मिक दृष्टि इतनी बड़ी उदार थी कि उनकी दृष्टि में ज्ञान तथा नैतिकता दोनों ही महत्वपूर्ण थे, किंतु ज्ञान को नैतिकता से ऊपर रखने के लिए कदापि प्रस्तुत नहीं थे। ज्ञान की अपेक्षा शील (नैतिकता) को उन्होंने अधिक महत्वपूर्ण बताया क्योंकि यही ज्ञान की प्राप्ति का माध्यम है। उन्होंने तत्कालीन समाज में प्रचलित अनेक मान्यताओं तथा अंधविश्वासों जैसे– नदियों के जल की पवित्रता, शकुन, भविष्यवाणियों, स्वप्न विचार, जादूटोना तथा चमत्कार पूर्ण प्रदर्शनों आदि की निंदा करते हुए उन्हें त्याज्य बताया। काया–क्लेश, घोर तपस्या, संसार त्याग के भी वे पक्ष में नही थे, किंतु अपने कुछ उत्साही अनुयायियों को उन्होंने संसार त्यागकर भिक्षु जीवन व्यतीत करने को प्रोत्साहित किया क्योंकि सांसारिक सुखों को वे निर्वाण प्राप्ति के मार्ग में बाधक मानते थे।[8] सामान्य मनुष्यों के लिए बुद्ध ने जिस धर्म का उपदेश दिया वह भिक्षु धर्म से भिन्न था और उसे उपासक धर्म कहा जाता है। दीर्घनिकाय के सिंगालोवादसुत्त से इस धर्म का वर्णन प्राप्त होता है। बुद्धघोष ने इसे 'गिहिविनय' अर्थात 'गृहस्थों के लिए आचरण' की संज्ञा प्रदान की है। इसमें इस धर्म के प्रमुख लक्षण अहिंसा, प्राणियों पर दया, सत्य, माता–पिता की सेवा, गुरुजनों का सम्मान, ब्राह्मणों तथा श्रमणों को दान, मित्रों, परिचितों, सम्बंधियों आदि के साथ अच्छा व्यवहार करना बताया गया है। यह बातें मानव कल्याण के लिए उत्तम मानी जाती हैं। बुद्ध के उपदेशों का मूल लक्ष्य ही मानव जाति को उसके दुःखों से त्राण दिलाना था और इस रूप में उनका नाम मानवता के महान पुजारियों में सदैव अग्रणी रहेगा। उनके उपदेशों तथा शिक्षाओं में अध्योपांत सरलता एवं व्याहारिकता दिखाई देती है। बौद्धधर्म मूलतः अनीश्वरवादी है। सृष्टि का कारण ईश्वर को नहीं माना गया है। तर्क यह है कि यदि संसार को ईश्वर का रचयिता माना जाए, तो उसे दुःखों को भी उत्पन्न करने वाला भी मानना होगा। इसीलिए बुद्ध ने ईश्वर की जगह मानव प्रतिष्ठा पर ही बल दिया। बौद्धधर्म में आत्मा की भी परिकल्पना नहीं की गई है अर्थात अनात्मवाद के सिद्धांत के अंतर्गत यह मान्यता है, कि व्यक्ति में जो आत्मा है, वह उसके अवसान के साथ समाप्त हो जाती है। आत्मा शाश्वत व चिरस्थाई वस्तु नहीं है, जो अगले जन्म में भी विद्यमान रहे। किंतु बौद्ध धर्म में पुनर्जन्म की मान्यता है। इसी कारण कर्मफल का सिद्धांत भी तर्कसंगत होता है। इस कर्मफल को अगले जन्म में ले जाने वाली आत्मा नहीं है। कर्मफल का, अगले जन्म में पहुँचने के बारे में मिलिंद प्रश्न में कहा गया है, कि जिस प्रकार पानी में एक लहर उठकर दूसरे को जन्म देकर स्वयं समाप्त हो जाती है, उसी प्रकार कर्मफल चेतना के रूप में पुनर्जन्म का कारण होता है।

निर्वाण प्राप्ति के लिए सदाचार तथा नैतिक जीवन पर बुद्ध ने आध्यात्मिक बल दिया है। दस शीलों का अनुशीलन नैतिक जीवन का आधार है।

बौद्ध धर्म संसार का अकेला और अब तक का ऐसा धर्म है जो प्रारम्भ से अंत तक वृक्ष एवं वृक्ष श्रृंखलाओं से बंधा है।[9] यह बात ऐसे ही नहीं कह दी गई अपितु इस प्रकार के कथन का बहुत युक्ति–युक्त एवं ऐतिहासिक आधार उपलब्ध है। बौद्ध साहित्य का गम्भीर अध्ययन न भी कर पायें तो भी हम पायेंगे कि तथागत बुद्ध का सिद्धार्थ कुमार के रूप में जन्म लुम्बिनी वन में शाल वृक्ष की शीतल व सुखद छाया में हुआ था। अपनी जिज्ञासाओं का समाधान करने के उद्देश्य से गृहत्याग करने के पश्चात पीपल के वृक्ष की छाया में साधनारत होकर तपस्या करते हैं। पीपल का वृक्ष प्रत्येक समय रात हो या दिन ऑक्सीजन छोड़ता है, जिसके नीचे बैठने से मन को सुखद अनुभूति प्राप्ति होती है। पीपल के वृक्ष की शीतल छाया में उन्हें ज्ञान प्राप्त हुआ और इसी पीपल के वृक्ष के नीचे बुद्धत्व प्राप्त हुआ। इसी कारण इसे बोधिवृक्ष के नाम से जानते हैं। बौद्धधर्म में जितना महत्व पीपल वृक्ष को दिया गया है, उतना महत्व अन्य किसी भी वृक्ष को नहीं दिया गया है।

बुद्ध के समय लोग वैश्विक पर्यावरण के प्रति चिंतित नहीं थे। इसलिए उन्होंने इस विषय पर कोई अलग से विशेष शिक्षा नहीं दी फिर भी उन्होंने भिक्षुओं के लिए संघ में कुछ नियम प्रतिपादित किए जो पर्यावरण संरक्षण की दृष्टि से महत्वपूर्ण हैं। भिक्षुओं को चारिका करते समय प्राकृतिक जल स्रोतों तथा नदी के पानी में मल–मूत्र तथा गंदगी डालने एवं स्नान न करने का निर्देश दिया था।[10]

अहिंसा का अभ्यास केवल मनुष्यों पर ही लागू नहीं होता परन्तु सभी सत्त्वों पर लागू होता है, हर वह प्राणी जिसमें चित्त हो। जहाँ चित्त है वहाँ पीड़ा, आनन्द, और सुख जैसे भाव भी होते हैं। कोई भी सत्त्व दुःख नहीं चाहता, सभी सुख चाहते हैं। मेरा विश्वास है कि एक आधारभूत स्तर पर सभी सत्त्वों में यह भाव होता है।

बौद्ध धर्म के अभ्यास के दौरान हम इस अहिंसा के विचार और हर प्रकार के दुःख को समाप्त करने के इतने अभ्यस्त हो जाते हैं कि हम किसी को भी बिना सोंचे समझे हानि नहीं पहुँचाते। यद्यपि हम यह नहीं मानते कि वृक्षों और पुष्पों का भी चित्त होता है, पर फिर भी हम उनके साथ सम्मान जनक व्यवहार करते हैं। इस तरह हम मनुष्यों और प्रकृति के प्रति एक ही प्रकार की वैश्विक उत्तरदायित्व की भावना रखते हैं।

पुनर्जन्म में हमारा विश्वास हमारी भविष्य की चिंताओं का एक उदाहरण है। यदि आप यह सोचें कि आपका पुनर्जन्म होगा, तो संभव है कि आप स्वयं से कहें, कि मुझे किन–किन चीजों का संरक्षण करना चाहिए क्योंकि मेरे भविष्य का रूप इन सब बातों को बनाए रखेगा। भले ही इस बात की संभावना हो कि हम किसी अन्य जीव के तौर पर या किसी अन्य ग्रह पर जन्म लें, पुनर्जन्म की सोच ही आपको इस ग्रह और भावी पीढ़ियों के प्रति चिंतित बना देती है। पश्चिम में जब 'मानवता' की बात होती है, तो इसका अर्थ आमतौर पर केवल वर्तमान पीढ़ी के मनुष्यों से होता है। बीती हुई मानवता तो जा चुकी है। पाश्चात्य विचार साधारणतया वस्तुओं के व्यावहारिक पक्ष से जुड़े होते हैं। यह आवश्यक नहीं कि पर्यावरण के प्रति चिंता धार्मिक हो और न ही इसके लिए सदा करुणा भाव आवश्यक है। बौद्ध हर सत्व

के प्रति करुणा की भावना अभिव्यक्त करते हैं, पर यह करुणा हर एक पत्थर, पेड़ या मकान की ओर निर्देशित नहीं होती, जिसमें से अधिकांश अपने घरों को लेकर कुछ चिंतित रहते हैं, परन्तु उसके प्रति कोई करुणा की भावना नहीं होती। हम इसे व्यवस्थित रखते हैं, ताकि इसमें रह सकें और खुश रहें। हम जानते हैं, कि अपने घर में सुखी रहने के लिए हमें उसके रख–रखाव पर ध्यान देना होगा। इसलिए हमारी भावनाएँ करुणा के स्थान पर चिंता की हो सकती हैं। इसी तरह से यह ग्रह भी हमारा घर है, जिसे हमें व्यवस्थित रखना होगा। अगर हम अपने ग्रह को अपना घर या अपनी 'धरती माँ' मानते हैं, तो हम स्वाभाविक रूप से अपने पर्यावरण के विषय में सोचते हैं। आज हम इस बात को समझते हैं कि मानवता का भविष्य बहुत सीमा तक हमारे ग्रह पर निर्भर करता है और ग्रह का भविष्य बहुत कुछ मानवता पर निर्भर करता है। परन्तु यह हमेशा से हमारे लिए इतनी स्पष्ट नहीं रही है। अब तक हमने देखा कि धरती माँ ने हमारे घर की अव्यवस्थित आदतों को किसी प्रकार सहन किया है।[11] पर अब मनुष्य द्वारा इसका उपयोग, जनसंख्या और प्रौद्योगिकी के स्तर तक पहुँच चुका है, जिससे अनेकों पर्यावरणीय समस्यायें उत्पन्न हो रही हैं। वह हमें अब चेतावनी दे रही है, कि हमारे कार्यों की सीमाएँ हैं। भारतीय बौद्धों के व्यवहार में पर्यावरणीय संरक्षण के प्रति सहभागी दृष्टिकोण पाया जाता है। बौद्ध किसी वस्तु का विवेकहीन होकर उपभोग नहीं करते। वह उपयोग की एक सीमा निर्धारित करते हैं, जो एक सरल जीवन और वैयक्तिक उत्तरदायित्व के प्रशंसक हैं। बुद्ध सदैव स्वयं को पर्यावरण का ही एक अंग मानते थे। दलाईलामा ने पांच सूत्रीय शांति योजना में एक प्रस्ताव रखा था, कि समूचा भारत अभयारण्य बने, जिसमें लोगों के बीच समन्वय, मनुष्यों और पशुओं के बीच समन्वय, सत्वों और पर्यावरण के बीच समन्वय हो। समूचे विश्व से लोग शांति और समरसता का अनुभव करने हेतु भारत आएंगे। बड़े–बड़े बहुमंजिली और अनेक कमरों वाले होटल बनाने के स्थान पर हम छोटी इमारतें बनाए, निजी घरों की तरह जिनकी पर्यावरण के साथ अधिक सामंजस्यता होगी।

धरती पर जीवन का अस्तित्व जैसा हम जानते हैं, मानवीय गतिविधियों, जिनमें मानवीय जीवन मूल्यों के प्रति प्रतिबद्धता का अभाव है, के कारण खतरे में पड़ गया है। प्रकृति और प्राकृतिक संसाधनों का विनाश अज्ञान, लालच और पृथ्वी के जीवों के प्रति सम्मान के अभाव के परिणामस्वरूप होता है। सम्मान का यह अभाव धरती के मनुष्यों की भावी पीढ़ियों तक पहुँचता है, अगर विश्व शांति यथार्थ नहीं बनती और प्राकृतिक पर्यावरण का विनाश वर्तमान गति से चलता रहा तो भावी पीढ़ी को जघन्य पर्यावरणीय समस्याओं का सामना करना पड़ेगा, जिसमें पीने के पानी से लेकर शुद्ध वायु तक पाना दूभर हो जाएगा।

हमारे पूर्वजों ने धरती को समृद्ध और सम्पन्न दृष्टि से देखा था, जो वह है। अतीत में भी कुछ लोगों ने प्रकृति को कभी समाप्त न होने वाला और सदा बने रहने वाला माना था, जो अब हम जानते हैं कि ऐसा तभी हो सकता है जब हम इसकी देख–रेख करें। अज्ञानता के कारण अतीत में हुए विनाश को भुला पाना कठिन है, जिसकी पूर्ति हम सघन वृक्षारोपण एवं अन्य प्रकृति सहभागी कार्यकलाप करके कर सकते हैं। यह आवश्यक है कि हम नैतिक रूप से पुनर्परीक्षण करें कि हमने विरासत में क्या पाया है, हम किसके लिए उत्तरदायी हैं और हम भावी पीढ़ियों को क्या देकर जाएँगे।[12]

बौद्धधर्म और उसकी सांस्कृतिक एवं कलात्मक उपलब्धिओं में भारतीय ब्रिटिश शासकों ने महानता की झलक देखी थी, जो कालांतर में मध्यकालीन हिंदू धर्म से सम्बद्ध मूर्तिपूजा की भृष्टता और गिरावट से होते हुए भारत के तथाकथित पतन की कहानी कहती है।[13] सन् 1900 ई० में एशियाटिक सोसायटी को संबोधित करते हुए **लार्ड कार्जन** ने कहा था, "भारत की महान कलात्मक उपलब्धियां सब की सब वाह्य और आयातित हैं, जो इस देश में विजेताओं की उन लहरों के साथ आईं जो फारस, मध्य एशिया, अरब और अफगानिस्तान से वास्तुकला के पाठ पढ़कर आए थे। इसी तरह की लहर बाद में अपने शिखर पर आरूढ़ ब्रिटिश विजेताओं को भी लाई।" ब्रिटिश इतिहास लेखन की इस विधा में बौद्ध धर्म और उसकी उपलब्धियां भारतीय संस्कृति की महानता की प्रतीक थीं क्योंकि वे मौलिक, तर्कपूर्ण जीवन्त और प्रसारणशील थीं। कम से कम मध्य एशिया, अफगानिस्तान, चीन, दक्षिण पूर्व एशिया और श्रीलंका, जैसे देशों ने बौद्ध धर्म से कुछ सीखकर अपनी कलात्मक और सांस्कृतिक धरोहर को समृद्ध बनाया था। बौद्धधर्म में पर्यावरण का व्यापक अवलोकन एवं वर्णन किया गया है, जिसमें प्राकृतिक और सांस्कृतिक (सामाजिक, आर्थिक, राजनैतिक) पर्यावरण के संदर्भ में उल्लेख है।

बौद्ध धर्म निवृत्तिमार्गी होते हुए भी भौतिक जीवन में आस्था और विश्वास रखने वाला एक धर्म था। उसने न तो मानव पुरुषार्थ को निरस्त किया और न ही समाज, राजनीति और अर्थव्यवस्था के औचित्य को। सामाजिकता का तो इतना कायल था कि भिक्खुसंघ के निर्माण का एक नया प्रयोग करके उसने एक ओर यदि भिक्खुसंघ के भरण–पोषण की जिम्मेदारी भौतिक लक्ष्यों एवं उद्देश्यों से लिप्त समाज पर डाली तो दूसरी ओर भिक्खुसंघ को स्वयं आदर्श मानसिकता की एक मिसाल प्रस्तुत करते हुए भिक्खुओं के उपदेशों एवं चरित्र से लिप्त एवं होड़ की अवस्था मानसिकता को यथासंभव स्वस्थ्य, निरपेक्ष और वस्तुनिष्ठ बनाने की चेष्टा की। हिंसा से अहिंसा की ओर, तृष्णा से तृप्ति की ओर, मनोजचित्त से स्थिर–चित्तता व प्रज्ञा की ओर, क्रोध से करुणा की ओर ले जाने वाला मार्ग उसने प्रशस्त किया। इससे व्यक्ति, समाज और राजनीति का कल्याण सम्भव था। संस्थाएं और व्यवस्थाएं वही होती हैं अंतर केवल इससे पड़ता है कि उन्हें चलाने वालों का और उन पर चलने वालों का रुख क्या है? व्यवस्थाओं और संस्थाओं के बल से मजबूर करके व्यक्ति और समुदायों के रुख को सतही तौर पर क्षण भर के लिए नियंत्रित तो किया जा सकता है लेकिन उन्हें अंदर से बदला नहीं जा सकता। अंदर से बदलने का काम तो आत्म–निर्णय और आत्म–संयम से ही होता है जिसकी कोशिश बौद्ध धर्म ने अपनी शिक्षा के माध्यम से की थी। 'अत्तदीपो भव' की शिक्षा बौद्ध धर्म का सार एवं उसकी उपलब्धियां मानी जाती हैं।

बौद्धधर्म के माध्यम से प्रवर्तित यह सकारात्मक रूख ही प्रवृत्ति और निवृत्ति दोनों ही मार्गों पर चलने वाले लोगों एवं समुदायों के प्राकृतिक, सामाजिक, आर्थिक, सांस्कृतिक और राजनीतिक पर्यावरण के अनुकूलन का कार्य करता है और उसमें आवश्यक सकारात्मक परिवर्तन भी करता है। भिक्खुसंघ, गणतंत्र संगठन, धम्म शासन तथा (वर्षावास के चार महीनों को छोड़कर) निरंतर संचरणशील भिक्खुचर्या वर्ण, जाति विखण्डित समाज और सैन्य–प्रधान राजतंत्रीय राजनीति के विभेदक शक्ति संबंधों का भागीदार बनने से रोकने के लिए बौद्ध धर्म में कारगर उपाय थे। इसीलिए सामाजिक, राजनीतिक, आर्थिक और सांस्कृतिक पर्यावरण के प्रति बौद्ध धर्म की दृष्टि अन्य धर्मों से भिन्न थी।

सांस्कृतिक पर्यावरण के प्रति इस धर्म का रुख अलग था। राजतंत्रीय निरंकुशता एवं सैनिक–कूटनीतिक सत्ता विस्तार के स्थान पर शांतिपूर्ण सह–अस्तित्व की अहिंसक राजनीति, समाज को विखण्डित करने वाली जाति व्यवस्था का सैद्धांतिक विरोध, हिंसक यज्ञविधि के तिरस्कार के माध्यम से राजनीति और धर्म की अनर्थकारी युक्ति में अनास्था और स्वायत्त औद्योगिक एवं व्यापारिक श्रेणियों में संगठित लाभपरक नगरीय अर्थव्यवस्था का, खेतिहर और आवश्यकतापूर्ति–परक ग्राम्य अर्थव्यवस्था के ऊपर अपेक्षाकृत अधिक समर्थन बौद्ध धर्म की भिन्न पर्यावरणीय दृष्टि के कतिपय उदाहरण हैं।

प्राकृतिक पर्यावरण के साथ मनुष्य और उसके सांस्कृतिक संभार के संबंधों के प्रति बौद्ध धर्म की दृष्टि का मूल मंत्र **'बहुजन हिताय बहुजन सुखाय'**[15] का आदर्श तथा अहिंसा एवं करुणा की व्यापक व्याख्या में निहित है। **'बहुजन हिताय बहुजन सुखाय'** के आदर्श को यदि केवल वर्तमान तक ही सीमित कर दिया जाए तो इससे क्षमता का नयाधारित (Expedience based) सिद्धांत निकलता है और यदि इसे भविष्य में आने वाली पीढ़ियों तक विस्तृत कर दिया जाए तो इससे प्राकृतिक पर्यावरण के परिपालनीय विकास (sustainable development) का मूलतत्व निकलता है। प्राकृतिक पर्यावरण से प्राप्त होने वाले लाभों का उपयोग अपरिग्रह पूर्वक होना चाहिए, लिप्सात्मक संग्रह की प्रवृत्ति से नहीं। बौद्ध धर्म की इस दृष्टि का आधार न तो एक ही परमपिता की संतान होने के तर्क से मानवमात्र की बंधुता के मिथक पर आधारित है और न ही आज की तरह पर्यावरण के नष्ट होने के डर पर। वह तो अहिंसा और करुणा के उस भाव से अनुप्राणित है जिसमें मानवमात्र ही नहीं प्राणिमात्र भी समा जाते हैं। पर्यावरण से प्राप्त होने वाले लाभ प्रकृति से छीने गए उपादान नहीं, अपितु उसकी करुणा के प्रसाद हैं जो बतौर दान के मिलने के कारण अपरिग्रह का आचरण करने वालों के लिए भी ग्राह्य हैं। उनका लिप्सापूर्ण संग्रह अधर्म है, पाप है। इसलिए नहीं कि इससे कोई देवता या परम पिता नाराज हो जाएगा, अपितु इसलिए कि इससे **'बहुजन हिताय बहुजन सुखाय'** के महामूल्य का ह्रास होगा, कमजोर के मुख का निवाला छिनेगा। यह शोषण नहीं, सहयोग और एक दूसरे के लिए उत्सर्ग पर आधारित है। प्राणियों की विभिन्न प्रजातियों के आपसी रिश्ते और वानस्पतिक और पारिस्थितिकी, पर्यावरण के साथ प्राणियों के रिश्ते तथा इसी प्रकार वर्तमान पीढ़ी के उत्सर्ग पर निर्भर करती है आगामी पीढ़ी। यदि वर्तमान पीढ़ी ही समस्त प्राकृतिक पर्यावरण को अपनी अनंत लिप्सा का ग्रास बना लेगी, तो आगामी पीढ़ी का क्या होगा? तृष्णा अनंत है और अनर्थकारी है। शक्ति संचय का उद्देश्य और अधिक शक्ति संचय नहीं, अपितु उस शक्ति का प्रयोग **'बहुजन हिताय और बहुजन सुखाय'** के लिए होना चाहिए। मनोरथ पूर्ति के लिए हिंसात्मक पशुबलियों, साम्राज्य विस्तार के लिए निर्दोषों का सैनिक संहार, पशुसत्ता के लिए समाज का जन्मना आधारित जातियों का विखंडन, व्यवसायों का पवित्र और अपवित्र में विभाजन तथा स्त्रियों पर पुरुषों की दासता का सहज आरोपण, ये सब अनर्थकारी हैं प्राकृतिक एवं सांस्कृतिक दोनों ही प्रकार के पर्यावरणों के लिए। ये पर्यावरण के लिए तो तात्कालिक प्रभाव से विनाशकारी हैं और मानवमात्र के लिए भी अन्ततोगत्वा आत्मघाती हैं।[14]

बौद्ध भिक्खुओं के संघाराम अथवा विहार की व्यवस्था में विहारों के निर्माता के लिए प्राकृतिक पर्यावरण (वन) और सांस्कृतिक पर्यावरण (नगर, ग्राम) के संधि स्थल को वरीयता दी गई है और विभिन्न वास्तु प्रकारों जैसे– प्रासाद, विहार, हर्म्य, गुहा, कुटी आदि को मान्यता दी गई है, लेकिन विहार अथवा संघाराम भिक्खुओं के सक्रिय प्रयास के परिणाम न होकर गृहस्थ उपासकों के माध्यम से दिए गए दान

होते थे, जिसकी मरम्मत तथा रखरखाव की जिम्मेदारी भी दान दाता की होती थी। ये विहार नगर अथवा ग्रामों की उपत्यकता में स्थित होते थे और इनकी योजना में आवासीय प्रदूषण से पर्यावरण की क्षति न हो इसका पूरा–पूरा ध्यान रखा जाता था, जैसे, मलमूत्र विसर्जन हेतु वच्चकुटी और पस्साबकुटी का निर्माण जिसमें अपिधान से ढंके वच्चकूप तथा अपिधान युक्त पस्साबकुम्भि आदि होती थी। आवासीय प्रदूषण योजनाबद्ध तरीके से नियंत्रित करके पर्यावरण की नैसर्गिक शुद्धता बनाए रखने के लिए ये उदाहरण जो गाँवों एवं नगरों की उपत्यका में स्थित थे निश्चित रूप से गाँवों एवं शहरों के परम्परागत रहन–सहन के लिए प्रेरणादायक और अनुकरणीय रहे होंगे। विशेषकर उस स्थिति में जब इस प्रकार के उपक्रम स्वयं उनके अपने श्रम और संसाधनों के उद्योग से बनाकर उदारतापूर्वक भिक्खुसंघ को दान दिए गए हों। इस प्रकार पर्यावरणीय शुद्धता को अक्षुण्ण बनाए रखने की चेतना जन–मानस में जगाने का सराहनीय कार्य बौद्ध धर्म ने बहुत बड़े पैमाने पर किया होगा।

बौद्ध भिक्खुओं के औषधीय ज्ञान और उनके माध्यम से किए जाने वाले औषधि निर्माण, रोगी परिचर्चा एवं चिकित्सा आदि से प्रारम्भ होने वाले ऐसे प्रयास थे जो पर्यावरणीय संसाधनों के भिक्खुओं के हित में प्रयोग से प्रारंभ होकर **'बहुजन हिताय और बहुजन सुखाय'** के महामूल्य से प्रेरित होकर जन साधारण के लिए भी उपलब्ध कराए जाते रहे होंगे। भिक्षा के लिए गली–मोहल्लों में संचरणशील भिक्खु और बस्तियों की उपत्यका में स्थित बौद्ध विहार जन स्वास्थ्य और स्वच्छता के प्रबल प्रेरकों के रूप में प्रस्तुत हुए होंगे।

साक्षरता और शिक्षा के द्विजत्व, पुरुषत्व और अध्ययन–अध्यापन के परंपरागत तंग घेरों से बाहर निकल कर स्त्रियों और द्विजेतर लोगों के बीच से आने वाले भिक्षुओं को भी उपलब्ध कराकर संचरणशील भिक्षुओं के माध्यम से हर आम और खास के बीच अनुभव, ज्ञान और धम्म के सारगर्भित मौखिक उपदेशों की अलख जगाकर बौद्ध धर्म ने सांस्कृतिक पर्यावरण को भी परिष्कृत करने का क्रांतिकारी कार्य किया था।

महामानव बुद्ध का धर्मचक्र प्रवर्तन किसी राजचक्र प्रवर्तन से कम महत्वपूर्ण नहीं था। वे अपने समय के धर्मचक्रवर्ती थे इसमें कोई दो राय नहीं हो सकतीं। सैनिक शक्ति के बल पर अर्जित सम्प्रभुतायुक्त राज्यों की तुलना में सद्भावना और सच्चरित्रता के बल पर अर्जित अंतःकरण की सम्प्रभुता पर प्रतिष्ठित गौतम बुद्ध का धर्म चक्र कहीं अधिक व्यापक और दीर्घस्थाई सिद्ध हुआ। भारतीय उपमहाद्वीप की भौगोलिक सीमाओं को लांघकर यदि यह अफगानिस्तान, मध्य एशिया, चीन, जापान, दक्षिण पूर्व एशिया और श्रीलंका तक पहुँच गया तो भगवान बुद्ध के महापरिनिर्वाण के लगभग 2550 वर्ष बीत जाने पर भी यह आज भी जीवंत है। इस धर्मचक्र का यह विस्तार और दीर्घजीविता दुनिया के किसी भी प्राचीन साम्राज्य के विस्तार तथा उसकी दीर्घजीविता से अधिक है। यह बुद्ध के माध्यम से प्रवर्तित गणतंत्रीय भिक्षुसंघ का तथा धम्म का शासन है जिसके माध्यम से प्रवर्तक की वैयक्तिक सीमा देश और काल का अतिक्रमण करके अपरिमित हो गई है।[15]

प्राकृतिक और सांस्कृतिक पर्यावरण को **'बहुजन सुखाय और बहुजन हिताय'** उपयोग में लाने का इसका रास्ता प्राचीन एवं आधुनिक राजनीतिक तंत्रों की तरह भौतिक स्वार्थों एवं हितों की गणित के आधार पर किए गए संसाधनों के न्याय, अन्यायपूर्ण वितरण से होकर नहीं, अपितु बहुजन का निर्माण करने वाले व्यक्तियों के अंतःकरण को जगाकर उनमें पर्यावरण के समुचित उपयोग का संस्कार डालने

के प्रयास से होकर जाता है। जन कल्याण अथवा विकास जिसे बहुजन स्वयं करता है और पर्यावरण की रक्षा करते हुए करता है, राजनीतिक तंत्रों का मुखापेक्षी बनकर नहीं।

पर्यावरण तथा पारिस्थितिकी के प्रति भारतीय संस्कृति का असीम अनुराग प्राचीनकाल से ही रहा है। भारतीय मनीषियों ने प्रकृति के संरक्षण तथा पेड़–पौधों एवं जीव–जंतुओं में सामंजस्य हेतु विभिन्न प्रकार के नियमों तथा वर्जनाओं को धार्मिक वाङ्मय में दैनिक आदेशों के रूप में जोड़कर पारिस्थितिकी में अपना अमूल्य योगदान दिया है।

छठवीं शताब्दी ईसा पूर्व में तथागत गौतम बुद्ध के माध्यम से उद्घोषित नवीन बौद्धिक क्रांति में जहाँ एक ओर मूलभूत सामाजिक तथा सांस्कृतिक संशोधन और परिवर्तन हुए, वहीं पर्यावरण तथा पारिस्थितिकी के क्षेत्र में भी नवीन दृष्टिकोण अपनाया गया। बुद्ध ने तो पर्यावरण और पारिस्थितिकी से अपना अभिन्न संबंध ही स्थापित कर लिया था।

मानव जीवन का पर्यावरण से बहुत ही गहरा रिश्ता रहा है। स्वस्थ्य मानव जीवन के लिए स्वच्छ पर्यावरण का होना जरूरी है। वर्तमान समय में पर्यावरण इतना ज्यादा प्रदूषित हो गया है, कि मानव का सांस लेना भी मुश्किल हो गया है। आज जरूरत है, कि हम लोग अपनी जीवन शैली में परिवर्तन करके पर्यावरण को संरक्षित करने का संकल्प लें।

जलवायु परिवर्तन आज मानव के लिए सबसे गम्भीर मुद्दा है। यह सम्पूर्ण विश्व की अर्थव्यवस्था एवं पारिस्थितिक प्रणाली के माध्यम से मानव को प्रभावित कर रहा है। अफ्रीका, यूरोप, एशिया, कनाडा और अमेरिका से धर्म शिक्षकों के एक समूह ने जलवायु संकट पर एवं इससे सम्भावित दुःखद परिणामों को कम करने के तरीकों में बौद्ध अंतरदृष्टि का सहारा लिया है।[16]

निष्कर्ष:–

आज मानव जलवायु परिवर्तन के अभूतपूर्ण संकटों से गुजर रहा है। मानव हित के लिए पृथ्वी पर ग्रीन हाउस गैसों में कटौती आवश्यक है। इसके लिए बुद्ध की शिक्षाओं, बौद्ध विहारों एवं बौद्ध धर्म के संसाधनों से मार्गदर्शन कर सकते हैं। हमें बौद्ध धर्म की "दुखों की सच्चाई" को स्वीकार करना चाहिए, जो कि प्रत्येक समस्या का सार्थक समाधान बताता है। जलवायु परिवर्तन दुःख का मूल कारण है। सम्पूर्ण विश्व में जीवाश्म ईंधनों का भारी मात्रा में दोहन, जंगलों का विनाश, जो कि प्रकृति की क्षमता को कम कर रहा है।

बौद्ध धर्म का पर्यावरण के संरक्षण में बहुत बड़ा योगदान रहा है, क्योंकि गौतम बुद्ध को बोधिवृक्ष (पीपल) के नीचे ज्ञान प्राप्त हुआ था। पीपल का वृक्ष पर्यावरण की दृष्टि से अत्यन्त उपयोगी माना जाता है। गौतम बुद्ध ने खुद सन्यासी जीवन बिताकर पर्यावरण को संरक्षित करने में अपना महान योगदान दिया है। बौद्ध धर्म हमारे अर्थात् मानव मन के भीतर तृष्णा, घृणा, भ्रम, इच्छा एवं विशाल दुखों का निराकरण बताता है। बौद्ध धर्म के अनुसार प्रकृति और मनुष्य के मध्य कोई विशेष अंतर नहीं है। जिस प्रकार जलचक्र, कार्बनचक्र और खाद्य चक्र होता है, ठीक उसी प्रकार कर्म और पुनर्जन्मों का चक्र भी होता है। नश्वरता का सिद्धांत कहता है, कि प्रकृति के संसाधनों का एक असीम सागर नहीं है। कर्म का सिद्धांत रूप हमें प्रकृति के संसाधनों से अलग रखता है।

बौद्ध धर्म समस्त पेड़ों की रक्षा नहीं कर सकता लेकिन पेड़ों के प्रचण्ड विनाश का विरोध करता है। बुद्ध ने प्राकृतिक संसाधनों के अत्यधिक दोहन और प्रदूषण पर संवेदना व्यक्त की थी। लालच का प्रमुख कारण तृष्णा को माना गया है। जिस प्रकार एक बौद्ध सन्यासी साधारण जीवन जीता है, अगर मनुष्य बौद्ध धर्म की शिक्षाओं का अनुसरण करे, तो सीमित संसाधनों का प्रयोग करके पर्यावरण को प्रदूषित होने से रोक सकता है।

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16. पालि साहित्य

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पर्यावरणीय और वैकल्पिक ऊर्जा स्रोत

तबस्सुम ख़ान
डिपार्टमेन्ट ऑफ हिस्ट्री
अमीरूद्दौला इस्लामिया डिग्री कालेज, लालबाग़, लखनऊ

ये सच है कि पर्यावरण संरक्षण में वैकल्पिक स्त्रोत महत्वपूर्ण भूमिका निभाते हैं, क्योंकि वैकल्पिक स्त्रोत से ही हम विकास की गति को तेज कर सकते हैं और पर्यावरण की रक्षा भी। यह तथ्य किसी से छिपा नहीं है कि जब भी ग्रीनहाउस गैस के उत्सर्जन में कटौती की बात आती है तब से विकसित और विकासशील देशों के दो खेमे बन जाते हैं। अमरीका और चीन कार्बन उत्सर्जन के मामले में दुनिया में सबसे आगे है। इसके लिए ऊर्जा उत्पादन की वैकल्पिक तकनीक की पहल आवश्यक हो सकती है। जहाँ तक भारत की बात है कि अब इन वैकल्पिक स्त्रोतों को विकसित करने से हमारा देश तरक्की की राह की अग्रसर होगा और साथ ही पर्यावरण रक्षा में महत्वपूर्ण भूमिका निभा सकता है। भारत में पर्यावरण स्थिरता सूचकांक का अध्ययन विभिन्न राज्यों में **इंस्टीटयूट ऑफ फाइनेंशियल मैनेजमेंट एंड रिसर्च** द्वारा कराया गया है। जिसमें मणिपुर पर्यावरण स्थिरता सूचकांक के मानकों को पूरा करता हुआ सबसे आगे है। इसके बाद क्रमशः सिकिक्म, त्रिपुरा, नागालैंड और मिजोरम प्रथम पाँच राज्यों में शामिल है। जबकि पंजाब, गुजरात, उत्तर प्रदेश, हरियाणा और राजस्थान सबसे नीचे की पायदानों पर है। निम्नांकित पर विचार करना आवश्यक है–

- ई– कचरा
- अंतरिक्ष कचरा
- प्लस्टिक कचरा
- घटते पेड़, बढ़ता प्रदूषण, कृषि क्षेत्र में वैकल्पिक स्त्रोत
- खनिज तत्वों को बचाना जरूरी
- पर्यावरण प्रदूषण रहित विभिन्न ऊर्जा स्त्रोत विकल्प बनेगा भी तापीय ऊर्जा
- पवन ऊर्जा को विकसित करने की भी जरूरत
- बायोगैस
- सौर ऊर्जा

ई–कचरा

सूचना तकनीक के मौजूदा दौर में दुनिया ई–कचरे का ढेर होता जा रहा है, जो प्रदूषण को लंबे समय तक और गहरे तक प्रदूषित करने वाला है। यह ई–कचरा अक्षरणीय प्रदूषक है, ये चुनौतियाँ ऐसी है जो मौजूदा व्यवस्था के साथ जुड़ी हैं।

अंतरिक्ष कचरा

अंतरिक्ष कचरा पृथ्वी के चारों ओर उसकी कक्षा में एकत्रित मानव निर्मित उपग्रहों, उसके टुकड़ों आदि पदार्थो का संग्रह है, जो अब किसी काम के नहीं रहे। इन कचरों में अंतरिक्ष में भेजे गये भागों के कलपुर्जे भी शामिल हैं। उपग्रहों के नष्ट हुए हिस्से आदि भी अंतरिक्ष कचरा हैं। सबसे बड़ा खतरा अंतरिक्ष कचरे के आपस में टकराने का है। अंतरिक्ष कचरे से विकिरण की समस्या का भी खतरा रहता है।

प्लास्टिक कचरा

प्लास्टिक कचरा पर्यावरण का सबसे बड़ा दुश्मन बन चुका है, लेकिन सवाल यह भी उठता है कि प्लास्टिक का चलन शुरू होने के पीछे क्या कारण है। जिस तरह से वनों की कटाई हुई और लकड़ी की उपयोगिता कम हुई, उसी गति से प्लास्टिक ने पाँव पसारा और आज यह हमारे लिए खतरा बन चुका है। प्लास्टिक का आविष्कार 1862 में इंग्लैड में हुआ, लेकिन अब इसकी सबसे ज्यादा खपत भारत में हो रही है। प्लास्टिक एक कार्बन पदार्थ है। इसमें पाए जाने वाले नाइलोन के संश्लेषण के लिए बैंजीन कच्चे माल के तौर पर उपयोग होती है। यह भी कैंसर का वाहक है। इसके दुष्प्रभावों को देखते हुए पर्यावरण मंत्रालय ने 40 माइक्रोन से कम की प्लास्टिक पर रोक लगा रखी है।

भू–तापीय ऊर्जा

जियोथर्मल यानी भू–तापीय ऊर्जा पृथ्वी से प्राप्त की जाती है। यह प्रदूषणरहित ऊर्जा का प्रमुख स्त्रोत है। पृथ्वी के गर्भ से मैगमा, यूरेनियम और थोरियम जैसे पदार्थ भारी मात्रा में पाए जाते हैं, जिनका उपयोग नहीं होता है और ये निरर्थक रहते हैं। ऐसे में इनका उपयोग करने से किसी तरह का नुकसान भी नहीं है। अतः इसका उपयोग बिजली उत्पादन में किया जा सकता है। विश्व के करीब 20 देश भू–तापीय ऊर्जा के जरिये एक तरफ जहाँ बिजली प्राप्त कर रहे हैं, वहीं पर्यावरण को भी बचा रहे हैं। आइसलैंड जैसा छोटा देश अपनी पूरी ऊर्जा का करीब 17 फीसदी हिस्सा इसी प्रणाली से हसिल कर रहा है। वैज्ञानिकों की मानें तो भू– तापीय प्रवणता के उपयोग से तापीय ऊर्जा का सतत् प्रवाह होता रहता हैं। भारतीय भूगर्भ सर्वेक्षण ने देश में करीब तीन सौ स्थानों के बारे में पता लगाया है। इन क्षेत्रों में भू–तापीय ऊर्जा के दोहन की अपार संभावनाएं है। वैज्ञानिकों की ओर से जिन स्थानों का सर्वेक्षण किया गया है– उसमें प्रमुख रूप से हिमालयी भू–तापीय क्षेत्र, नगा– लुसाई, भू–तापीय क्षेत्र, अंडमान निकोबार द्वीप समूह भू–तापीय क्षेत्र, सोन–नर्मदा तापी गार्डन, पश्चिमी तट, दामोदर घाटी, महानंदा घाटी, गोदावरी घाटी आदि क्षेत्र हैं।

भू–तापीय ऊर्जा की ओर अपार सम्भावना को देखते हुए भारत सरकार ने नीति भी लागू कर ही है जो भू तापीय ऊर्जा दोहन की तकनीक के विकास को बढ़ावा देगी। इस ऊर्जा तकनीक को अपनाकर भारत पर्यावरण प्रदूषण रोकेगा साथ ही 2 हजार मेगावाट तक बिजली उत्पादित कर सकेगा। इसका सबसे ज्यादा फायदा किसानों को मिलेगा। कृषि कार्य में बिजली संकट दूर होगा। अमेरिका के ओरेगन शहर में भू–तापीय ऊर्जा के जरिये ही तमाम कल कारखाने चल रहे हैं जिन स्थानों पर पानी की मात्रा पर्याप्त है वहाँ के लिए यह प्रदूषण रहित सबसे कारगर विकल्प हो सकता है।

कृषि क्षेत्र में वैकल्पिक स्त्रोत

इसमें कोई संदेह नहीं कि हरितक्रान्ति के बाद कृषि उत्पादन क्षमता में करीब तीन से चार गुना बढ़ोत्तरी हुई हैं। इसमें प्रमुख कारण थे– उन्नत किस्म के बीच का चावल, उर्वरक, कीटनाशक, सिंचाई का सामयिक और पर्याप्त उपयोग आदि। लेकिन इसका एक दुष्परिणाम भी सामने आया, किसानों ने अन्धाधुंध रासयनिक खादों का प्रयोग करना शुरू कर दिया, जिसमें उत्पादन तो बढ़ा लेकिन मिट्टी की उर्वरा शक्ति कमज़ोर हुई और पर्यावरण प्रदूषण बढ़ा जो भविष्य के लिए गंभीर चुनौती है। भविष्य में उत्पादन पर बुरा प्रभाव पड़ेगा क्योंकि जब मिट्टी में पोषक तत्व जैसे– नाइट्रोजन, फास्फोरस, पोटाश, कैल्शियम, गंधक, मैग्नीश्यिम एवं सूक्ष्म तत्वों में तांबा, लोहा, जस्ता, आदि नहीं होंगे तो पौधे का पूर्ण रूप से विकास नहीं होगा। इसके तहत पोषण प्रबंधन पद्धति, एकीकृत जल प्रबंधन, एकीकृत बीज प्रंबधन, एकीकृत कीट प्रंबधन आदि पर विशेष रूप से ध्यान देने की जरूरत है।

पवन ऊर्जा को विकसित करने की जरूरत

पर्यावरण प्रदूषण को देखते हुए एक बार फिर पवन ऊर्जा तकनीक अपनाने की जरूरत महसूस की जा रही हैं। तेज वायु के दबाव से पवन चक्की को चलाते हैं तो पवन चक्की से बिजली उत्पादित होती है। इस से दूसरे साधनों पर निर्भरता कम होती है, साथ ही कोयले की खपत कम होगी जिससे वायु प्रदूषण रुकता है।

आमतौर पर पवन ऊर्जा का प्रयोग रेगिस्तानी तटीय एवं पर्वतीय क्षेत्रों में किया जाता हैं। पवन ऊर्जा जेनरेटर पर महाराष्ट्र में मई 2007 में प्रयोग किया गया। यहाँ से वायु टरबाइन जेनरेटर तकरीब 4.45 मेगावाट बिजली उत्पादन कर रहा है। इसी तरह राजस्थान के जैसलमेर जिले में लगी पवन ऊर्जा टरबाइन से 21.25 मेगावाट बिजली का उत्पादन किया जा रहा है। यहाँ से पैदा होने वाली बिजली से विभिन्न जिलों में बिजली आपूर्ति की जा रही है। पर्यावरण प्रदूषण बचाने में पवन ऊर्जा को सबसे कारगर उपाय माना जाता है। यही वजह है कि पवन ऊर्जा के मामले में ब्रिटेन दुनिया में सबसे आगे है। चीन, स्पेन, अमेरिका में भी पवन ऊर्जा के क्षेत्र में तेजी से विकास हो रहा है। भारत में भी इसकी गति बढ़ाने की जरूरत है। इसी प्रकार सतत् विकास लक्ष्यों में पवन ऊर्जा का लक्ष्य 2022 तक 60 गीगावाट अपेक्षित है।

बायोगैस

विभिन्न तरह की मृतप्रायः वनस्पतियों एवं हमारे आसपास मौजूद कचरे को भी हम ऊर्जा के

रूप में इस्तेमाल कर सकते हैं। इससे प्रदूषण कम होगा साथ ही हमारी जरूरतें भी पूरी होगी। ग्रामीण इलाकों में पशुओं के गोबर, रसोई के अपशिष्ट आदि से बायोगैस को तैयार किया जाता है इसका इस्तेमाल भोजन पकाने, तापन, रोशनी और कुछ इंजनों में मोटिव पावर पैदा करने में किया जाता है। भारत बायोगैस उत्पादन के मामले में दुनिया में दूसरे स्थान पर है। फिर भी बढ़ते पर्यावरण प्रदूषण और विकास की दौड़ में कम होते दूसरे संसाधनों को देखते हुए इसे और विकसित किये जाने की जरूरत है।

गोबर गैस अथवा बायोमास गैसीकरण द्वारा तापीय और विद्युत अनुप्रयोग किया जा सकता है। भारत में हर साल करीब नौ करोड़ यूनिट से ज्यादा बिजली गोबर गैस से पैदा की जा रही है। शहरी और औद्योगिक अपशिष्टों से करीब 3500 मेगावाट ऊर्जा उत्पादन हो रहा है।

सौर ऊर्जा

विकास की दौड़ में अन्य तकनीकों पर बढ़ते खर्च और प्रदूषण को देखते हुए इन दिनों सौर ऊर्जा पर विशेष जोर दिया जा रहा है। सूर्य से मिलने वाली ऊर्जा को संरक्षित करके हम उसका सदुपयोग कर सकते है। सौर ऊर्जा सौर विकिरण के माध्यम से संचयित की जाती है। भारत में सूर्य की रोशनी पर्याप्त मात्रा में मिलती है। इसका औसत प्रतिवर्ष करीब तीन सौ दिन है। ऐसे में यह सबसे उपयुक्त माध्यम है। खासतौर में रेगिस्तानी इलाके में यह काफी कारगर साबित हो रहा है। भारत के अलावा अमेरिका, अल्जीरिया और मोरक्को में बड़े पैमाने पर सौर ऊर्जा का प्रयोग किया जा रहा है। भारतीय सरकार को सतत् विकास लक्ष्यों में सौर ऊर्जा का लक्ष्य 100 गीगावाट रखा गया है।

निष्कर्ष

आज दुनिया खासकर हमारे देश को विकास के साथ–साथ पर्यावरण हितैशी वैकल्पिक ऊर्जा स्त्रोतों को अपना कर ही सतत् विकास के लक्ष्यों को पूरा किया जा सकता है।

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