

Environmental Pollution and Biodiversity: An Overview

P.K. Paul^{1*}, Princy Matlani², Rajendra Singh Kushram³ and Manju Sahu⁴

¹Executive Director (MCIS), Department of CIS, & Information Scientist (Offg.), Raiganj University, West Bengal, India

²Assistant Professor, School of Studies (Engineering & Technology) GGV, Chhattisgarh, India

³Assistant Professor, Govt. Aranya Bharti PG College Baihar, Balaghat, Madhya Pradesh, India

⁴Assistant Professor (Hindi), Dr. CV Raman University Bilaspur, Chhattisgarh, India

*Corresponding author: prantoshkpa@gmail.com

Received: 21 Sept., 2021

Revised: 29 Nov., 2021

Accepted: 02 Dec., 2021

Abstract

The Environmental Pollution is one of the biggest problem which we are facing each and every time. The problem of environment related pollution is leading various crisis to the humanity. Today developed and developing both kind of countries are worried about the environmental and ecology related problems and issues. The human activities such as urbanization, mining, industrializations, non following environmental aspects and activities lead Environmental Problem and Pollutions viz. water pollutions, air pollutions, soil pollutions, noise pollutions, and emerging pollutions viz. radiation, composting, electronic waste, ocean dumping etc. Countries are even acted different environmental laws to reduce environmental pollutions. It is worthy to note that pollutions doesn't mean caused by the chemical substances and furthermore the substances that responsible in pollutions are treated as pollutants. As far as this assignment is concerned it is noted with various kind of pollutions including its causes, effects including possible solutions, proper environmental management etc.

Keywords: Environmental Pollutions, Global Warming, Environmental Management, Major Pollutions, Bio Diversity, Ecology

Environmental Pollutions is simply the damages, destructions of the environmental concerns, matters and simply harm to the living species. It is moreover can be noted as environment can accommodate it by dispersion, breakdown, recycling, or storage in some harmless form. Today environmental pollutions are greatest issues and challenges worldwide (Alloway, 1996; Spehn *et al.* 2005). According to the experts environmental pollutions issued emerged after the industrial revolutions. And according to the experts pollution consists of six basic types of pollution, i.e. air, water, land, soil, noise, and light (as depicted in Fig. 1). It is important to note that environmental pollutions not only concern with the fossil fuels and carbon emissions and here lot of other issues

and factors are also there viz. chemical pollutions, electromagnetic pollutions, e-waste etc. (Brix, 1994; Ehrenfeld, 2003). Government and organizations, institutions, scientific societies, NGOs etc. are responsible in developing and playing a great role environmental management and minimizing environmental pollutions by different means. It is important to note that there are many reasons for global reasons but prime one is environmental pollutions. Due to the environmental pollutions

How to cite this article: Paul, P.K., Matlani, P., Kushram, R.S. and Sahu, M. (2021). Environmental Pollution and Biodiversity: An Overview. *Int. J. of Inclusive Develop.*, 7(02): 49-59.

Source of Support: None; Conflict of Interest: None



it is reflecting not only natural or environmental health but also human health directly and indirectly. There are numerous reasons in environmental pollutions such as—Pollution from different kind of vehicles like cars, trucks, Fossil fuel emissions from power plants, industrial causes in developing water pollution and even latest Radiation comes into play as well. Therefore the huge and growing environmental pollutions lead the effect on climate change, global temperature and warming, radiations, human hazards, etc. (Cardinale et al. 2006; Kumar et al. 2017).



Fig. 1: Different types of pollutions at a glance

issues and problems in food chain. Among the populations one of the important is Air pollutions that is simply the harmful contaminants viz. chemicals, toxic gases etc. in the atmosphere of the earth (Chapin Iii et al. 2000; Spehn et al. 2005). Such air pollutions results huge problems of the health of human and vegetables. Among the reasons burning fossils fuels, mining operations, gases which are harmful from the industries and factories are treated as important. Water pollution results when various toxic objects come into the water portion/ bodies such as in lakes, rivers, seas etc. Many of such water pollutions are artificial and man-made. Similar to other pollutions soil pollutions also considered as important and caused by presence of chemicals, fertilizers, artificial substances etc. As far as Noise pollutions are concerned, it is the excessive noise generation and development normally and mostly by humans (such as industries, transportations, unnecessary music) except some of the natural things viz. volcanoes etc.

OBJECTIVE OF THE STUDY

This Assignment entitled 'Environmental Populations and Biodiversity' is deals with different agenda and objective mainly following as prime—

- To learn about the basics about the Environmental pollutions and hazards in brief.
- To know about the water pollutions, air pollutions, soil pollutions, noise pollutions in brief manner.
- To learn about the effects in respect of basic pollutions in contemporary context.
- To learn about the Biodiversity including its features, nature and characteristics with special reference to the effects of environmental pollutions into biodiversity.
- To find out some of the solutions in respect of basic environmental pollutions concisely.

Types of Environmental Pollutions

Environmental Pollutions can impact the basic ecological balancing and ultimately apart from direct human and environment effects it also results

Air Pollutions: Causes, Effects and Solutions

There are many reasons of pollutions of the air and that can be naturally or artificially by human being. Among the natural pollutants important are volcanic eruptions, forest fires, marshes, radioactive materials etc. However as far as artificial activities important are thermal power plants, industrial activities, vehicles related emissions, burning of fossil fuels etc. Air pollutants can be classified into three viz.

- Based on source of the origin
- Based on method of origin
- Based on chemical composition
- Based on state of matter

As far as problems/ effects are concerned there are numerous reasons of air pollutions such as health issues and problems like respiratory, heart and lung disorders, heart stroke & liver cancer, bone problems, anemia. Some of the air pollutions components like toxic is the reason for tissues and bones, ammonia effects burning of eyes, nose, throat, lung damage.

Regarding possible solutions there are many air atmosphere cleaning process such as dispersion, absorption, rain-washout etc.

- Minimizing the uses of petrol and fossil fuels.
- Use of fuels having less sulphur and ash content.
- Public awareness regarding the pollutions
- The establishments like hospitals, schools, playground etc. better to located other than busy places.
- Proper and good amount of vegetation can be done for better air quality and minimizing air pollutions.
- Industries and waste disposal should be established accordingly.

Water Pollutions: Causes, Effects and Solutions

Water pollution is another major kind of pollution within environmental pollutions, which is occur when toxic materials and come into the water bodies like lakes, ponds, rivers and seas etc. (Weinrach, 2002) such pollutions can be by human or artificially (refer Fig. 2). As far as some of the important causes are concerned few important are—

- Dumping solid waste in the water bodies.
- Human and also animal wastes.
- Disposing untreated industrial swage.
- Agricultural waste like pesticides, fertilizers.



Fig. 2: Various objects in water pollutions in the eco systems

There are many effects of water pollutions into the water pollutions such as health issues of the humans, animals, environmental concerns like that. Factories, refineries, industries etc. are the

major sources of water pollutions. Atmospheric contaminants are also derived from human practices (such as gaseous emissions from automobiles, factories and even bakeries) (Parparov *et al.* 2006).

Water pollution is effecting human, animals, and plants by various means of the human healths, environmental and ecosystems, fauna systems, economic loss. Water pollution can be controlled by various ways such as—

- Sewage pollutions are need to identified treatment of the sewage plants before its move into the water systems/ bodies (Brix, 1994; Owa, 2013).
- Uses of less organic insecticides, pesticides are harmful for the environment and therefore it is essential to reduce such chemicals. Here bio-fertilizers can be enhanced and promoted.
- Oxidation ponds can be useful in removing low level of radioactive waste, hot water should be removed, thermal pollutions etc.
- Domestic and industrial waste into the water must be checked and think-of before discharge into the water bodies, dead bodies of animals or human should not be moved into the water bodies.

Therefore there are many reasons in water pollutions and it effects a lot to the society, environment and humans & animal directly (Ehrenfeld, 2003; Gaidajis *et al.* 2010).

Soil Pollutions: Causes, Effects and Solutions

The presence of harmful substances like pollutants and contaminants in soil in such a concentration so that it poses a risk to human health and our ecosystem is called soil pollution (Refer Fig. 3).

There are many causes for soil pollutions such as—

Deforestation and soil erosion—Deforestation is one of the major cause for soil pollution as it makes the land dry. So, we need to observe that initially if a land becomes dry and barren, it cannot be regained or reuse because of its tortured fertility.

Mining activities—In the duration of mining activities or extraction activities soil pollution takes place.

Agriculture—As the human population is increasing day by day, the need of food in the planet is also increasing. And for the survival purpose, farmers

are using various insecticides and pesticides to get rid of insects and thus making the soil polluted.

Landfills—Every house produce garbage every day. This if not recycled as compost goes straight to landfills and make it overcrowded. Thus results in inland pollution (Brix, 1994; Spehn *et al.* 2005)



Fig. 3: Some of the common types of Soil Pollutions

Industrialization—As with the increase in population, there is also need of food, shelter and other household things. This gave rise to high peak rise in industrialization. They also produce lots of waste and also require deforestation thus leading to soil pollution.

Nuclear waste—Huge amount of nuclear waste is dumped beneath the earth surface to avoid any casualties thus making the soil polluted.

Sewage—In the modern era, , urban lifestyle as well as rural lifestyle, produces huge amount of waste which ultimately goes to landfills and make it toxic and this adds to the problem of soil pollution.

Effect of Soil Pollutions

Climatic change—Due to polluted land, the ecosystem suffers and it becomes very hazardous that it effect the climate change.

Impact on Environment—Soil pollution directly leads to effect the biodiversity of environment. It raises various concerns like global warming, green house effect, etc.

Impact on human health—Crops grown on land which has pesticides and insecticides in it get contaminated in small quantity in our food too. So, it makes our immune system suffers and various health issues like cancer, respiratory problems etc.

Effect on wildlife—The forest and animal life has suffered most in the past decades. They face a serious threat with regards to the loss of habitat and natural environment.

Control of Soil Pollutions

There are 3Rs principles can be used such as Reduce, Reuse and Recycle:

- Reducing the use of pesticides and insecticides.
- Reusing of certain materials such as glass, paper, plastic, cloth.
- Recycling use of materials like paper, plastic and glass.
- Reforesting i.e. restoring forest and plants, grasses (Bardakhanova *et al.* 2017).

Noise Pollutions: Causes, Effects and Solutions

What is a Sound?

Sound is a vibration that propagates as a mechanical wave of pressure and displacement, through some medium (i.e. air or water). Sound refers to only those vibrations, with frequencies that are within the range of hearing for human.

Then what is Noise?

Unwanted Sound is termed as Noise.

Unwanted sound which is annoying and distracting or damaging people's hearing is termed as Noise. When there is lot of noise in the environment it is termed as noise pollution. Sources of noise pollutions are include (and also refer Fig. 4 & 5)—

- Road or Traffic noise
- Aircraft Noise
- Noise from Rail Roads
- Constructional noise
- Noise from industry
- Loud Speaker/Public Address System
- Firecrackers (Ehrenfeld, 2003; Spehn *et al.* 2005).

Types of Noise Pollution

Environmental Noise or Community Noise—Noise which is emitted from all sources, except at the industrial workplace is known as Community noise (also called environmental noise, residential noise

or domestic noise). Main sources of community noise include road, rail and air traffic, construction and public work, and the neighborhood. Typical neighborhood noise comes from live or recorded music; from sporting events including motor sports; from playgrounds and car parks; and from domestic animals such as barking dogs.

- Aircraft noise
- Roadway noise
- Underwater noise



Fig. 4: Some of the common types of Noise Pollutants

Industrial Noise—Various process in industrial machinery such as drilling, blasting, gear, turbulent flow, compressors, pumps etc. produces noise which falls under this category.

Effects of Noise Pollution

Primary Effects

- Hearing Impairment
- It Decreases the Efficiency of A Man
- Lack of concentration
- Pupil Dilation
- Mental Illness
- Temporary or permanent Deafness

Secondary effects

- It Causes Heart Attack
- Digestive problems
- Aggressive Behavior

- Effect on Vegetation Poor Quality of Crops
- Effect on Animal
- Sleep interference
- Speech interference

Noise Pollution		
Causes	Effects	Solutions
<ul style="list-style-type: none"> • Urban planning • Industrialization • Public transportation • Noise pollution from cars • Construction • Clusters • Events • Domestic appliances • Agriculture • Marine activities • Military • Sports • Airports • Thunder 	<ul style="list-style-type: none"> • Psychological disorders • Tinnitus • Stress • Anemia • Brain damage • Hearing problems • Cardiovascular disease • Communication issues • Sleeping issues • Effects on animals and plants 	<ul style="list-style-type: none"> • Reduce sound in your space • Turn off electronics • Mask noise • Close windows • Move to another house with the level of noise pollution • Build a fence • Plant trees • Install quiet zones • Electric cars • Landscaping • Healthiness • Government regulations • No road • Education • Construction

Fig. 5: Noise Pollutions at a glance with causes, effects and solutions

Solution to Noise Pollution

- **Awareness of noise pollution:** exposure of noise pollution to public.
- **Control at source:-** Reducing the levels of noise from domestic perspective, low voicespeaking.
- **Control at transmission path:-**installation of barriers.
- **Usage of protective equipment:-**Hearing protection (Owa, 2013).

Radioactive Pollutions & Aspects

Involving Radiation in environment by using radioactive elements. Due to release of radioactive substances into the environment during nuclear explosions and testing of nuclear weapons, nuclear weapon production and decommissioning, mining of radioactive ores, handling and disposal of radioactive waste, and accidents at nuclear power plants, the environment gets polluted. This is called as radioactive pollution. Sources of Radioactive Pollution

1. Natural sources
 - Cosmic rays
 - Terrestrial radiation
2. Man-Made sources
 - Medical sources
 - Industrial sources
 - Nuclear Explorations

- Nuclear Power
- Nuclear & Radiation accidents

Effect of Radiation

- On Human Being

Effect on humans can vary from mild to fatal. A mild symptom is skin irritation. Long term exposure to radiation will cause adverse effect.

- On Environment

Radiation exposure to the environment means that it is present even in the soil. The radioactive contaminants in the soil react together with the various nutrients that cause the nutrients to be lost, making the soil highly toxic and infertile.

Prevention

- Proper method of disposing of radioactive waste
- Use of high chimney and ventilation where radioactive contamination is very high.
- Banning of nuclear tests
- Alternative energy sources
- Proper storage
- Reusing
- Precautions at personal level

Light Pollutions & Aspects

As far as major pollutions are concerned light pollution is considered as most important and valuable. Normally artificial presence of light considered as most valuable in light pollutions. The light pollutions can have different and various effects on the humanity and animals. Among the common light pollutions important are—

- Over-illumination and Light trespass
- Light clutter
- Glare and Skyglow

Moreover there are many reasons and areas in which we can see the uses of light pollutions such as infrastructure place lights, garage lights, additional lights, nighttime lights, streetlights, different motor vehicles lights etc. There are many direct and indirect effects of light pollutions like—

- Health related effects.

- Sleeping Problems
- Air and atmosphere pollutions
- Issues and effects in astronomy
- Waste of resources
- Animals and plants related issues.

There are certain solutions in order to manage light pollutions such as preparing of light shields wherever required, warm and cool light, use of proper motion sensors, turn off the lights wherever required, proper awareness schemes etc.

E Waste and its Management

Electronic waste or E Waste is the pollutions that comes from the electronic products and such electronic products can be considered as non-working, old or obsolete or even such products may reached their end of the life cycle. E Waste normally contains different types of harmful chemicals and materials such as mercury, lead, chromium, cadmium, chemical flames retardants etc. which effects environmental health and human health as a whole (Peralta et al. 2006; Perkins et al. 2014). Different kind of institutions, organizations including government bodies is dedicated in managing such Electronic waste management in order to protect environmental and human health. The amount of the items are include copper, aluminum etc are about sixty percent whereas plastic is about thirty percent and core of hazards material are about three percent with heavy toxic metals, lead etc. It is important to note that lead effects the biological systems by the air, water, food, soil etc. Therefore it may caused serious health issue majorly to the children including adults like skin diseases, nausea, gastritis, duodenal ulcer etc. (Robinson, 2009).

E Waste Management: The Opportunities

The issue of E-Waste can be managed by proper management principles and strategies. As far Indian government is concerned The Ministry of Environment, Forest, Climate Change is playing leading role in enforcing new rules, norms and regulations i.e. E Waste Management Rules 2016 (Seigneur, 1992). E-waste can be managed by preparing material again or recycling the matters with the following steps to be followed—

- Step 1: Collecting and Transporting
- Step 2: Shredding and Sorting
- Step 3: Dust Extraction
- Step 4: Magnetic Separation
- Step 5: Water Separation
- Step 6: Purification of Waste Stream
- Step 7: Preparing Recycled Materials for Sale (Gaidajis *et al.* 2010; Kahhat *et al.* 2008).

Initiatives and best practices in E-Waste management

There should be proper way in managing E Waste Management and in this regard role from the consumer part is important, proper designing, reduce, reusing, recycling are important. Technology transfer including consumer behaviors need to address using proper awareness initiatives (Realf *et al.* 2004; Nnorom and Osibanjo, 2008; Zhang *et al.* 2012).

Challenges

In managing E Waste there are many technological, human and managerial issues and some of them are include—

- The growing toxic substances are important and very hazardous and it leads proper and huge risk to humans, animals, and the environment.
- Lack of availability in proper and skilled human resources also emerging issue.
- Lack of legislations and regulations regarding E-waste really important to note.

Inadequate stakeholders and institutions support in E-waste is an important issue and here Government needs proper encouragement to the new entrepreneurs with proper financial support and technological guidance (Odermatt, 1995; Widmer *et al.* 2005). Here e-waste recycling and disposal need to establish with proper initiative incentives to ensure compliance across the electronics industry. The materials collected from the unorganized sector are need to send to the organized sector in order to do proper E Waste Management.

Land Filling and Composting

Landfills are considered as the site for the disposal of waste materials by burial. This method is one of

the oldest in disposing solid waste. The landfills are increasing day by day due to creation of large amount of solid waste. The generators of the items are normally from the industries, markets, hospitals, offices and educational premises. Integrated waste management is the solutions for such kind of Landfills (Refer-Fig. 7). There are many reasons (as depicted in Fig. 6) of Landfills but major are as follows—

Solid Waste— Solid waste materials are generated from different sources as mentioned before and some of the wastes are include wood, paper, plastic, broken furniture, glass, grounded cars, obsolete electronic products, and hospital and market waste. Since most of the waste are non- biodegradable therefore their disposal are important to look into.



Fig. 6: Landfills solutions

Agricultural Waste

Such waste are include animal manure, crop, and farm remains, and most of the collected waste dumped in the landfills. Most of such waste are highly toxic and can be contaminate land and allied environmental aspects.

Industry, manufacturing, construction related Waste



Fig. 7: Landfills and different kind of effects and solutions

There are lots of wastes generated every time from the oil refineries, power plants, construction works, pharmaceuticals etc. Here industrial process and activities including construction related works are major waste generators. Here oil refinery processes generates petroleum hydrocarbon byproducts; however construction works generate various kind of wood, plastics, and metal wastes etc. and all such responsible in pollutions by dumping them into landfills.

Urbanization and Populations

The growing urbanization also causes environmental pollutions as from the growing and rapid urbanization numerous wastes are generated worldwide and it results landfills in the developed and developing countries both. The generations of the plastics in urbanizations and populations may considered as important and valuable.

Therefore increasing landfills are effecting in human health, agricultural productivity, air pollutions atmospheric effects, ground water pollutions and allied effects, soil and land pollutions, landfill fire effects environment and air pollutions, economic issues and problems.



Fig. 8: Different Composting Moments

Composting is the natural process of recycling organic matter, such as leaves and food scraps, into a valuable fertilizer that can enrich soil and plants. Composting simply speeds up the process by providing an ideal environment (Spehn et al. 2005).

Benefits of Composting

- Reduces the Waste Stream
- Cuts Methane Emissions from Landfills
- Improves Soil Health and Lessens Erosion
- Conserve Water
- Reduce Personal Food Waste

Therefore composting considered as vital and important in support of environmental management and protections. The home generated pollutions can be management and helps in environmental sustainability as well.

Ocean Pollutions & Dumping

Ocean Pollutions are also called as marine pollutions which is the merger of chemicals and trash, and mostly comes from the land and then blown to the sea water (Refer Fig. 9).



Fig. 9: Marine Pollutions at a glance

Therefore the inclusion of the wastes results environmental pollutions or marine dumping. The environmental pollutions comes from the vessels, aircraft, platforms, land, industrial structures (Lahey, 1982). The ocean pollutions leads the environmental waste and affects life of the fish and other marine creatures. Marine pollution is growing day by day and in this regard the reasons majorly classified as—

- Ocean Dumping
- Land Runoff
- Oil Spills
- Littering

- Ocean Mining
- Noise Pollution (Kindt, 1983).

The marine disposal is responsible in destroying or degrading different marine plants, trees, species and even coastal erosion (Messieh *et al.* 1991).

Biodiversity in concentration of Environmental Pollutions

Environmental pollution is majorly by the human and become an important global concern. Pollutant is a kind of substance which can be defined as constituents and ultimate responsible for the pollutions. Therefore it leads various diseases, even death to the plants and animals including humans. Environmental pollution is become an universal challenges of developed and developing countries and effects the entire environmental health. Continuous population growth, environmental disorders leads the climate change and effecting or spoilage of natural resources, therefore the traditional biodiversity and the whole ecosystem is under the threat. The most primitive ecosystems are amongst the threatened ones. As far as name is concern, Biological diversity convey the variability among living organisms including the 'inter alia', terrestrial, marine, aquatic ecosystem. Biodiversity consists on forests, birds, plants, humans etc. and its proper growth is essential and that can lead to the proper sustainability as depicted in Fig. 10.



Fig. 10: Biodiversity emphasizing ways in sustainable development

Biodiversity of inland water is considered as valuable as it has economic value as habitat for species. The Millennium Ecosystem Assessment (MEA5) announced in 2005 that biodiversity degradation in freshwater systems occur double the ratio of other ecosystems. Therefore the present ecosystem

services decreases causing negative impacts on human health. Assessment of biodiversity basically impacts on ecosystems and further to be elucidated and finally what are the conservation challenges facing biodiversity.

The main threats to biodiversity

Global biodiversity suffers from major threats can be classified into the following categories—

- Climate change
- Pollution
- Invasion by exotic species
- Overexploitation and
- Habitat degradation

Climate change is simple the changes of the contents in the atmospheric, it also means that it is the changes in biogeochemical and hydrological cycles. There are many fluctuations like delicate variations in daily temperatures (average), the period of rainy seasons, carbon cycle, temperate at night, solar radiation that may affect biological organisms.

Impact of Pollution on Biodiversity can be noted from different context such as some oceanic coral reef ecosystems declined. The coastal regions may be quickly submerged due to the rapid increase of sea levels, which estimated to increase 0.1 to 0.2 meters by the last century. And this climatic changes defiantly will lead to ecosystems with various species composition.

Impact of Invasion by exotic species on Biodiversity, it is noted that climate affects the normal life cycle of plant and it is become a critical threat to native species such as *Lantana camara*, *Eupatorium odoratum*, *Eupatorium adenophorum*, *Parthenium hysterophorus*, *Ageratum conyzoides*, *Mikania micrantha*, *Prosopis juliflora* and *Cytisusscoparius* Variation. Therefore it is the high time to think the context.

Impact of Overexploitation on Biodiversity, the rapid increase of human population is putting an incredible effect into the environment. Humans are also in challenge and natural resources as well. The growth of population and we have limited resources and here are the issues on keeping the biodiversity, the production of waste, solving the serious of problems. There are certain reasons that effects the biodiversity such as—

- Day by day increase of global average sea level.
- Higher ocean levels may effects the underground water sources including Indian oceans, Caribbean Sea and some of the most productive deltas.
- Arid and semiarid regions are becoming drier and this is reaching towards prolonged droughts.
- Atmosphere water content is increasing globally and mid to high altitudes are becoming wetter.
- Possibilities and chances in proper heat waves, wild fire, stromes, and flash, flood etc.

Thus, there is urgent need of environmental management and towards sustainability in the environmental systems, proper water environment, flora and fauna, air environment, aesthetic and socio-economic aspects etc. Internationally the aspects of global warming affect almost all the nations and humans populations therefore huge amount of public awareness is required in keeping biodiversity conservation and the effects of pollution on biodiversity. All such conservations are important in this regard as depicted in depicted Fig. 11.



Fig. 11: Biodiversity conservation with stakeholders

CONCLUSION

Environment become an important aspect of our society, we all are concern about the environment but there are certain issues and problems considered

as major one and among these important is environmental pollutions. Due to various activities of human being such as urbanization, industrialization, mining, and exploration environmental pollution become an important global problem. Pollution is the contamination of the environment by introduction of contaminants that can damage or destroy the environment or in other words doing the discomfort to humans or other living species. Therefore solving the environmental problems become a major issue, and Government of different countries and territories are engaged in proper solutions by enacting laws, regulations and frameworks etc. The growing environmental pollution is become important in effecting global warming, biodiversity etc.

ACKNOWLEDGEMENTS

We sincerely acknowledge the Administrations, and batch mates of the 3rd FIP at HRDC-GGV, Bilaspur, CG, India for their support, role and encouragement for preparation this work.

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