

Environmental Disruption

Abstract

Ever since the dawn of creation humanity has been enjoying 'Environment's life Supporting capabilities without any discrimination but with the close of the twentieth century violent dissolution of environment has been noted by physical, natural, geo and social scientists, Environmental disruption includes degradation, deterioration etc. in its physical components, brought in by biological processes mainly by human activities to such an extent that it cannot be set right by its inbuilt self-regulatory mechanism (or homeostatic mechanism) to counterbalance or regenerate the lost life supporting capabilities of environment.

Keywords: Environmental Disruption, Earthquake, Industrialization, Natural

Introduction

Environment's disruption becomes synonymous of pollution because both are responsible for bringing qualitative deterioration in environment. They can be differentiated with reference to their causative factors, scope of effects and bases of measurement. To be more specific, pollution is more local. This environmental crisis is caused by the economic and technological man. e.g. contamination of natural elements, indiscriminate exploitation of forests, wild life, minerals etc. 'Disruption', on the other hand, is a wider term-it is the outcome of human activity and natural calamities, it deteriorates the environment on local, regional or global levels e.g. volcanic eruptions earthquakes forest fires, coastal hazards, floods, droughts, landslides, lightning, storms (typhoons, hurricanes and tornadoes etc.), changes in earth's surface (both by rise and fall), global warming, global climate change, rise in sea level and so on.

Typology

Environments qualitative deterioration may be dropped under two heads:

- I Disasters and
- II Pollution

Disasters

Disasters may be further classified under three heads

1. Natural Calamities

Which includes,

Physical disasterous

Physical disasterous activities are seen on the surface of the earth e.g. Earthquake, Volcanic eruption, landslide, cloud burst, snow avalanche etc.

Atmospheric Natural Calamities

These disasterous activities are caused in the atmosphere effecting adversely the biological populations and other components of environment e.g. atmospheric storms (typhoon, hurricane, tornado), lightning, forest fire etc.

Cumulative atmospheric Natural Calamities

Caused by long-term atmospheric conditions e.g. Loo, Cold wave, Flood, Drought etc.

Extraterrrestrial Hazards e.g. Meteorite

2. Manmade Physical Disasters

Manmade Physical Disasters are caused by human activity an fall into three categories:-

1. Manmade Physical Disasters: e.g. large scale landslides and forest fires with a purpose.
2. Chemical and Industrial Disasters: e.g. Bhopal Disaster- leakage of Methyl ISO cyanate (MIC) from union carbide corporation plant in the night of 2/3 December, 1984.
3. Nuclear Disaster: e.g. Chernobyl nuclear Disaster- in U.S.S.R. at 4:00 p.m. on April 25, 1986 release of radio activity.



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Manmade Biological Disasters in the forms of the following:-

1. Population explosion,
2. Abrupt increase in the biological species, and
3. Use of micro-biological weapons.

Pollution

Pollution is caused mainly by human activity.

It falls into two groups

Physical Pollution

Caused by the human activity diminishing the quality of physical non-biological components of environment,

This can be classified in three subgroups:-

Surface land pollution e.g. desertification, salinization etc.

Water pollution e.g. oceanic water pollution, ground water pollution river water pollution, lake water pollution etc.

Air pollution e.g. depletion of ozone layer, increase of carbon-dioxide (CO₂) etc. in atmosphere and bring out green house effect and deteriorate air qualitatively.

Social Pollution

Social Pollution is caused by physical and social factors. It may be divided in three subgroups:-

1. **Population explosion**
2. **Sociological Pollution:** e.g. educational and Social backwardness, crime, violence, communal, ethnic and caste-conflicts, theft, dacoity, war etc,
3. **Economic pollution:** e.g. poverty, starvation, misery etc.

Causative factors

Environment can bear natural and manmade changes to a great extent through its inbuilt self-regulatory mechanisms and it counterbalances the lost quality of life- supporting capabilities but it is rendered unable to bear the same on account of (i) accelerating the rate of natural disasters by human activity and (ii) indiscriminate exploitation of natural resources by their multipurpose utilization. Forests were cut or destroyed but their regeneration could not be possible. This human activity created the open necked earth surface making it easy victim of denudation and deterioration specially when the fertility of the soil is taking by surface run-off creating gross imbalance in ecology of that area and area around it. There is a chain of interlinking and interacting relationship between environments on the one hand and biological and other elements on the other. Man contributes towards environmental pollution in many ways viz. (1) by destruction of natural vegetation, (2) by destruction of original species of an area or region, (3) by replacement of original vegetation by newer one, (4) by replacement of original species by newer ones, (5) by it exotic plants or animals in any area, (6) by bringing change in one or more components of natural environment e.g. change in land use (Agriculture instead of forests). (7) by introducing chemical fertilizers, insecticide, pesticides and making the soil poisonous in a particular area, (8) by disturbing the original ratio of atmospheric gases, (9) by manipulating

environment processes e.g. cloud setting, prevention and changing the course of uteri meteorite.

The modern economic and technological man has brought rapid urbanisation and industrialization and consequently contaminated the surface and ground water by (a) discharge of factory waste, (b) discharge of sewerage waste in cities, (c) discharge of poisonous chemical fertilizers, insecticides and pesticides from agricultural fields.

The destruction of forests is responsible for (i) Reduction in infiltration of rain water in the ground and resultant lowering of recharge of groundwater, (ii) Increase in the surf ice runoff, (iii) Increase in the incidence of soil-erosion, (iv) change in the climate, (v) decrease in agricultural productivity and reduction in gross agricultural production, (vi) Increased incidence of flood's frequency and size, (vii) Decrease in the number of biological species and (viii) Tilting of the ecological balance.

In this way it is clear that rapid growth in (i) production potential, (ii) Scientific and industrial research and development and (iii) Qualitative explosion of world-population have polluted the environment directly (brought in purposely) or indirectly (which were not intended). There is still a great lack of environmental perception and awareness in the common man. The developed countries are getting richer by indiscriminate and unscientific exploitation of natural resources, Their Judo-Christian religious custom contributes to the belief that everything in nature has been created for the use of man, who is the best of all creatures. On the other hand, there should be harmony and not hostility between man and nature.

Effects

The vicious circle situation of environmental disruption has to be identified and nipped in the bud. The ill-effects are innumerable on man and material. Actually, the environmental disruption mars the development by bringing losses of resources which are scarce and essential for development. There is also an impact on investment-climate, creating financial fiscal and other such problem. It also results in the political destabilization.

There are noted tremendous losses of life among human being and livestock. Further, various types of injuries are inflicted in various forms e.g. (a) physical, atmospheric, extra-terrestrial hazards (lightning) (b) mental, (c) moral, (d) psychological (shock, trauma, anxiety, phobia, neuroticism, mental problems (including mental illness), (e) social and economic etc.

The environmental degradation has brought in mass migration, urbanisation, increase in crime rate, damage to roads, buildings, bridges, wildlife, forests, plantations, agricultural fields, horticultural groves, sericulture farms and aquatics life.

There are many examples of various effects of environmental disruption in the recent past. Only three, are described here in details.

1. Rise in Sea level,
2. Depletion of ozone layer and
3. Shrinking Forest cover

Three Examples Of Environment Disruption Rise in sea level threatens coastline*

About 6,000 kilometres of India's coast line is threatened by a rise in sea level (SLR) by one metre. Compendium of Environmental Statistics brought out by CSO (Central Statistical Organization) of the ministry of Planning and Programme Implementation predicts that the islands of Lakshadweep archipelago would be totally lost, if the current rate of rise continues. The areas affected most are noted below.

Serial no.	Place	Population affected	Land Area affected
1.	Goa	7.5%	4.84%
2.	West Bengal	2.35%	1.88%
3.	Tamilnadu	2.91%	0.52%
4.	Gujrat	1.75%	0.18%
5.	Maharashtra	1.75%	0.18%
6.	Andman and Nicobar	0.72%	0.72%
7.	Karnataka	0.56%	0.15%
8.	Andhra Pradesh	0.93%	0.19%

*Hindustan Times, New Delhi dated February 2, 1998.

The worst effects have been noted in Gujarat, Southern Kerala, deltas of Kaveri (Tamil Nadu), Godavari (Andhra Pradesh), Mahanadi (Orissa), Ganga (West Bengal), East coast of India is more vulnerable.

The projected GLOBAL WARMING is expected to increase global sea level by expanding Ocean water, melting mountain-glaciers and causing the ice sheet of Greenland and Antarctica to melt or slide into the oceans. A rise in Sea Level would inundate wastelands and lowlands and erode shoreline, exacerbate coastal flooding, increase the salinity of estuaries and aquifers and impair water quality.

Depletion of Ozone Layer

Ozone layer is concentrated between 12 to 35 Kms. from sea level. It is known as stratospheric ozone layer also. This unstable gas works as an umbrella to protect plants, animals, man and microorganisms from the ultra violet rays produced by solar radiation. Ozone is defined as 'Three atom isotope of oxygen' and is expressed as O₂. It is of light blue colour and has stinking smell. In the absence of this ozonosphere no bio organism can survive. The ultra violet rays will reach the globe and will bring out blast furnace-effect burning the entire biological population. This life-supporting ozone layer has attracted the attention in the past two decades as it is found that its depletion is being done by human activity which one day can create a disastrous and incurable hazard.

Soviet Russia and United States of America in 1960-70 and 1974-75 respectively found that the depletion is taking place. These studies were conducted by computers and satellites. The causes of this change are nuclear tests by developed countries like Soviet Russia, U.S.A., France etc. Ozone patches and ozone hole are being formed as there is noted a reduction of about 50% in ozone layer natural

concentration responsible for creation of ozone layer. The manmade chemicals* are concentrating in the atmosphere. The atmosphere above Antarctica has an ozone depletion point (1985) discovered by British expedition.

Consequently, to protect ozone layer and prohibit production of and consumption of CFCs. United Nation's Environment Programme (UNEP) convinced 33 Nations to sign the Montreal Protocol in September 1987. World Watch Institute (U.S.A.) in 1989 compiled a report "State of the world" and mentioned therein causative factors and processes of environmental degradation as under: -

1. Depletion of Ozone layer,
2. green house affect,
3. soil erosion,
4. Destruction of Forests and
5. Population explosion.

*halogenated gas e.g. chlorofluorocarbons (C.F.C.S.) and suggested some cures to save the world from the ill-effects of manmade environmental problems Depletion of Ozone layer by technological man should be stopped: -

1. **Chlorine Hypothesis:** Chlorofluorocarbons (CFCS) based refrigerators; Air conditioners emit these gases which are shifted in stratosphere within 10 years or so.
2. **Sulphate hypothesis:** Manmade volcanoes (factory chimneys emit sulphate aerosol in atmosphere which concentrate at 15 to 22 Km height at every longitude.
3. **Nitrogen Oxide hypothesis:** emitted by super-sonic jet planes (500 Jet will deplete 3 to 23%).

Shrinking Forest Cover

India's Forest Cover is Shrinking*

"Environment and Forest ministry 1997 State of Forest Report: Forest cover has shrunk by 5,500 square kilometres since last assessment in 1995(AP 3, 822 sq. kilometres, M.P. 3,969 Sq. Kms (1997) N.E. 783 Square Kilometres (1997) 316 sq. Kms.

The total forest cover is estimated at 63.34 million hectares or 19.27% of Indian's area. 11% has crown density of 40%, 8% is open forest (crown density of 10% to 40%). Between 1995 and 1997 the area of dense forest-cover has diminished by 17,777 square kilometres, while the area of open forest has increased by 12,001 square kilometres. The forest cover in Maharashtra has increased by 2,300 square kilometres, in Haryana plantation forestry is 10.3 million cubic metres which is about 10 times of the amount in the natural forests 1.4 million cubic metres.

* Hindustan Times, New Delhi dated February 7, 1993.

Reasons enumerated for the loss of the forest cover

1. Population pressure,
2. Operation of need and greed,
3. Exploitation of minerals
4. Development.

The real vitality of the country was its forests and if these were finished human and animal life would suffer. Therefore, let us stop clearance projects in rich forest areas in the name of development.

Though 2/3rd of the hills are supposed to be under forest cover, only 19 of 98 hill districts identified by the Planning commission have the stipulated forest cover. In hill areas the forest cover averages to 37%.

Cures

For any treatment or cure first of all a proper and Scientific diagnosis is a pre-requisite. The cure pollution the sources of pollution have to be identified. The sources are mainly to:-

1. Natural Sources

Which include volcanic eruption and its lava, cracks caused by earthquakes on the earth-surface, flood water, soil erosion etc.

2. Human sources

Which are primary sources and include (a) industrial sources, (b) agriculture sources, (c) population sources etc.

Again, types of pollution should clearly be understood through they are very closely interrelated and interconnected. Two types of pollution have been noted (A) Physical and (B) Social.

(A) Physical pollution is further divided into three distinct subtypes (i) Land, (ii) water and, (iii) Air.

(B) Social Pollution again is further divided into five sub types (a) Economic (based on poverty and unemployment) (b) religious (communal riots, religious violence) (c) Political (war), (d) Ethnic (Shree Lanka, J. & K.), (e) Social pollution (crimes like Loot, dacoity, rape, murder, etc.)

Some authors classify pollution on the basis of its medium. They classify it into three main heads:

1. Land pollution,
2. Water Pollution,
3. Air Pollution

Again, there are others who classify on the basis of the area and sources e.g.

1. Urban Pollution
2. rural pollution
3. Industrial Pollution and
4. Agricultural Pollution. Some further divide it into two categories: -

(a) Point pollution (b) Non-point pollution.

Government and non-government organizations (N.G.Os) (Voluntary organizations) are making sincere efforts by bringing Social awareness in the fields of pollution-control and prevention both at national and global levels Legislative measures have tightened the machinery created for the enforcement by personnel training and issuing literature for their guidance.

Scientific research and development have been under-taking at various levels.

1. Planning land reclamation,
2. Implementation various new methods of cultivation,
3. Curbing soil pollution, mining, soil-erosion and water-logging. Afforestation, social forestry, restricted use of chemicals etc. are being popularised.

The efforts towards the control and prevention of Air Pollution are noted in the changes brought in 1989 in the Motor Vehicles Rules. The Air (Prevention and Control of pollution) Act, 1981, the

Environment (Protection) Act, 1986. Modification of the Factory Act, 1948 is also aimed at keeping air at usable levels i.e. free from pollution and noise.

The water (Prevention and Control of Pollution) Act 1974, The water (Pollution and Control of Pollution) Cess Act 1977 are legislative efforts in this field. Central Ganga Authority was organised in 1985 by Central Pollution Control Board to implement five years Ganga Plan. Sewer Treatment Plants were established to clean municipal waste water before dropping it into the rivers. Similar efforts are also being made in the cases of lakes and seas by restricting Sedimentation and deposition of poisonous chemicals which are injurious to man and aquatics organism.

There is a great need to supplement government efforts by people's participation. This can be mobilised by environmental perception, awareness and environmental planning. There is a great lacuna in our educational curricular. Environmental studies ought to be introduced at all levels viz. School, College, University. Then environmental impact-assessment is necessary for which methodology should be evolved to regenerate degraded environment and to reduce extreme events, natural calamities, and hazards. New strategies have to be developed.

Efforts have to be made in the spheres of curing

1. Natural vulnerability
2. Physical vulnerability
3. Social vulnerability
4. Ideological vulnerability
5. Political vulnerability
6. educational vulnerability
7. Ecological vulnerability
8. institutional vulnerability
9. economic vulnerability
10. Scientific vulnerability,
11. technological vulnerability and
12. biotechnological vulnerability as suggested by Dr. Indu Prakash*.

These efforts ought to be on local, national and global levels and both in the government as well as non-government sectors.

"Global Climate Meet" of 161 nations at Delhi from April 1 to 8, 1996 is to discuss global climate change under the auspices of the **Global Environmental Facility** (GEF), the largest funder of the environmental projects, was established in 1991. It was designated as the financial mechanism for the "Convention on Biological* Diversity" as well as "Convention on Climate change". The purposes is five fold: -

1. to reduce the risk of climate change,
2. to conserve and use biodiversity sustainability,
3. to protect international waters,
4. to combat deforestation and desertification,
5. to phase-out ozone depletion substances.

G.E.F. has provided over \$ 125 million in granting funds to ten projects in India. This funding has attracted over - 442 million in Co-financing. Seven projects in India are being organised with the GEF assistance including the following: -

At Roorkee "Alternative Hydro Energy" centre,

At Thiruvananthapuram "Wind Farm",
At Bangalore (1) "The Economic Development Project" and (2) "The Biomass Energy for Rural India Project" In Haryana "Solar Energy Centre" *Disaster Management pp3-13.

References

1. Botkin, D.B. and Keller, E.A., 1982: *Environmental Studies*, C.E. Merrill Publishing Co., A. Bill and Howell Co., Columbus, PP 505.
2. Brown, E.H., 1970: *Man shapes The Earth*, *Geographical Journal*, Vol. 136 pp 74-85
3. Chroley, R.J., 1971: *The Role and Relation of Physical Geography*, Vol. 3 pp 87-109.
4. Clapham, W.B. , 1973: *National Eco System*, Macmillan, London
5. Cole, M., 1971: *Plants, Animals and Environment*, *Geographical Magazines* Vol. 44 pp 230-231.
6. Crossland, J., 1978: *Reporting Pollution*, *Environment* Vol. 20, pp 29-31.
7. Dikshit, K.R. , 1984: (1) A Prologue to the Symposium on "Geography and Teaching of Environment" Department of Geography, Poona University. (2) *Geography and Teaching of Environment*.
8. Hewitt, K and Hare, F.K., 1973: *Man and Environment*, *Conceptual Frame works*, Commission on College Geography, Resource Paper 20.
9. Kurma, V.K., 1982: *Kanpur City: A Study In Environmental Pollution*, Tara Book Agency, Varanasi PP 205.
10. Maddox, J., 1972: *The Doomsday Syndrom*, Mc Grew Hill, New York.
11. O'Riordan, T. 1971: *Perspectives on Resource Management*, Pion, London
12. Park, C.C., 1980: *Ecology and Environment Management*, Butterworth's, London
13. Poelmans-Kirchen, J. 1974: *Consumption and the Environment*, *Naturopa*, Vol. 21, 23-5
14. Prakash, Indu, 1994: *Disaster Management*, *Rashtra Prahari Prakashan*, Sahibabad, Ghaziabad
15. Simmons, I.G. 1974: *The Ecology of Natural Resources*, Edward Arnold, London.
16. Singh, Savinder, 1997: (i) *Environmental Geography*, Prayag Pustak Bhawan, Allahabad. (ii) *Environmental Management*, Geography Deptt., Allahabad University. (iii) *Geomorphology and Environment*, Deptt. of Geography, Allahabad University
17. Stoddart, DR. 1965: *Geography and the ecological approach the ecosystem as a geographical principle and method*, *Geography*, Vol. 50 pp-242-51
18. Thacker, M.S., 1965: *India's Urban Problem*, University of Mysore Press, Mysore
19. Warrant, A and Goldsmith, F.B., 1974: *Conservation in practice*, John Wiley, London.
20. Zabler, L. 1962: *An economic historical view of national resources use and conservation*, *Economic Geography* Vol. 38

21. Ziff, George K., 1949: *Human Behaviour and the Principle of Least Effort*, Addison-Wesley Press, Cambridge and New York.

Journals

22. *National Geographer*
23. *The Geography*: Aligarh Muslim University, Aligarh
24. *Journal of Environmental Management*.
25. *Kurukshetra*:Vol. XII, No.3, December, 1992 Special issue on fighting natural Disasters (Publication Division, Govt. of India)
26. *Geographical Magazine*
27. *Current Science*
28. *Chemical and Engineering News*
29. *Loss Prevention News*
30. *Vigyan*
31. *UPNEP: Industry and Environment*
32. *The Week India Today Dailies*
33. *The Hindustan Times*, New Delhi.
34. *The Times of India*, New Delhi.