

Environmental Degradation, Sustainable Development and Human Well-being: Evidence from India

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ABSTRACT

Environmental problems are multidisciplinary in nature. Some problems are global and regional while some are local. This paper is an attempt to study the local environmental problems in India and establish their linkage with environmental degradation and human well-being. It also lists India's major environmental problems and suggests changes in policies for sustainable development in India. The paper particularly focuses on water and water contamination related water-borne diseases which affect human well-being and other health aspects. Due to such hindrances, India is finding it hard to achieve the Millennium Development Goal of environmental sustainability.

Keywords: Environmental degradation, Human well-being, Environmental sustainability, Sustainable Development.

1.0 Introduction

Environmental problems which cause environmental degradation are multidisciplinary in nature and the scale of problems varies (Sankar, 2009). Some of these problems are global while some are local. Problems like acid rain, climate change, forest fires, depletion of ozone layer, loss of biodiversity, global warming and extinction of endangered species are global problems in nature and require international co-operation for their solution. On the other hand, problems such as land degradation, water pollution and contamination, vehicular and air pollution, domestic solid waste, industrial hazardous waste, soil degradation, deforestation and loss of biodiversity are local environmental problems and require policies at national or regional level (MDG Reports, 2009 & 2010; Sakiko et al. 2009; and Sankar, 2009).

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Environmental degradation mostly occurs due to the excess extraction of natural resources which are basically known as the so-called means for development (Thakur, 2010). Environmental degradation by United Nations is defined as “Environmental degradation is the deterioration in environmental quality from ambient concentrations of pollutants and/other activities and processes such as improper land use and natural disasters” (United Nations, 1997).

The seventh of the millennium development goals (MDG) talks about ensuring ‘environmental sustainability’ and sets the following four targets¹:

- a) integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;
- b) reduce biodiversity loss, achieving by 2010, a significant reduction in the rate of loss;
- c) halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation; and
- d) achieved a significant improvement in the lives of at least 100 million slum dwellers by 2020.

The objective of the seventh MDG was to “assess the consequence of the ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being” (First MDG Reports, 2004).

Environmental problems have been neglected for a long time. After United Nations Conference on the Human Environment (UNCHD) which held in Stockholm in 1972, environmental concerns were known as globally. Later on, in 1987, World Commission on Environment and Development (WCED) proposed the idea of sustainable development and defines it as "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission Report, 1987). Agenda 21 of the Rio declaration

¹ These four targets of the Millennium development goals have been taken from the Millennium Development Reports 2010. The first report of Millennium Development Goals was published in 2004. It has 8 goals and 18 targets. Presently MDG is having 8 goals and 21 targets. In the first MDG report, in the 7th goals having 3 targets, a fourth target was later added relating to "reducing biodiversity loss, achieving by 2010, and a significant reduction in the rate of loss" was added in 2009 MDG reports.

gives further improvement on the issues on environmental concerns which were ignored earlier. Most of the principles were exclusively on environmental degradation and sustainable development in the agenda² of the Rio declaration. Further, the Johannesburg declaration³ on sustainable development and plan of implementation stated “to reverse the current trend in natural resource degradation as soon as possible, it is necessary to implement strategies which should include targets adopted at the national and, where appropriate, regional levels to protect ecosystems and to achieve integrated management of land, water, and living resources, while strengthening regional, national, and local capacities” (Johannesburg declaration on sustainable development, 2002).

Under the auspices of United Nations, Millennium Ecosystem Assessment Report (MEA) was first published in 2003 and in the next 2005 MEA report, it stated the following in the context of ecosystem and human well-beings: “assess the consequence of the ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being” (MEA, 2005). Environment and human well-being can be defined further “as meeting human needs without undermining the capacity of the environment to provide for those needs and support life over the long term” (Melnick et al., 2005, and UN Millennium project task, 2005).

This paper is an attempt to study the local problems of environmental degradation which affects the human well-being and focuses mainly on local environmental problems prevailing in India. The rest of the paper is organised as follows. The second section is on the causes of environmental degradation and

² Agenda 21 of Rio de Janeiro was held at Rio Declaration on Environment and Development from 3 to 14 June 1992 in Brazil. This is also known as the Earth summit. Rio Declaration on Environment and Development having 27 principles and mostly related on sustainable development and environmental degradation. Principles 2, 7, 12, 14 and 15 were more concerned on environmental degradation and some principles were concerned on sustainable development.

³ Johannesburg declaration on sustainable development was held from 2 to 4 September 2002 at Johannesburg, South Africa. The declaration was based on six themes to reaffirm our commitment on sustainable development. The themes were on from our origins to the future, from Stockholm to Rio de Janeiro to Johannesburg, the challenges we face, our commitment to sustainable development, multilateralism is the future and making it happen.

elaborates the consequences. This section also emphasises linkages of environmental degradation to human well-being and includes the drivers of changes (both direct and indirect) for human well-being. The third section presents the dimensions and measurement of human well-being. The fourth section delineates Indian environmental problems and mainly focuses on the local problem of water pollution and contamination. The last section presents concluding remarks.

2.0 Environmental Degradation: Causes and Consequences

Environmental degradation occurs when uncontrolled and unsustainable extraction of natural resources takes place rapidly. The swiftly growing trend of industrialisation, population and economic development and unrestrained growth in urbanisation is a major concern for environmental degradation. Environmental degradation can take place naturally or can be caused by human beings or both. When resources get depleted or lost in biodiversity and habitats, it leads to environmental degradation. Environmental degradation can be local, regional and global. Local as well as global environmental problems hurt poor people most. Local environmental concerns like water pollution and contamination, air pollution, waste disposal, deforestation and soil degradation have a direct impact on human-being (more details on direct and indirect impact on human well-being are in table 1). Waste and water related diseases are increasing and they affect the livelihood and survival of the poor people most.

The United Nations Conference on the Human Environment (UNCHD) held at Stockholm in 1972 and later, the United Nations Conference on Environment and Development (UNCED) held at Rio de Janeiro reaffirmed the need to protect the integrity of the global environment. Some of the principles which proclaims on environmental degradation and sustainable development at Rio declaration⁴ are as follows:

- States have, in accordance with the charter of the United Nations and the principles of international law, the sovereign right to exploit their own

⁴ For more details see agenda 21 of Rio Declaration 1992.

resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction (Principle 2 of UNCED, 1992);

- States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command (Principle 7 of UNCED, 1992);
- States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on international consensus (Principle 12 of UNCED, 1992).
- States should effectively cooperate to discourage or prevent the relocation and transfer to other states of any activities and substances that causes severe environmental degradation or are found to be harmful to human health (Principle 14 of UNCED, 1992)); and
- In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (Principle 15 of UNCED, 1992).

Under the patronage of the United Nations, the Millennium Ecosystem Assessment (MEA) was conducted to assess the consequences of ecosystem change for human development and also to establish the action needed to enhance the conservation and sustainable use of ecosystems and their contribution to the

human well-being on the scientific basis. MEA finds four main conclusions which are given below:⁵

- (a) Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on earth.
- (b) The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of non-linear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.
- (c) The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium development goals.
- (d) The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the Millennium Assessment considered, but these involve significant changes in policies, institutions, and practices that are not currently under way.

2.1 Linkages on environmental degradation to human well-being

Linkages and relationship of ecosystem and the flow of services to the well-being are diverse and complex in individuals as well as groups of people and its changes over the period of time. The causal linkages which unite the link between ecosystems change and human well-being are not consistent.

Ecosystem Services, human well-being and drivers of change can be seen from Figure 1. MEA defines both direct and indirect drivers of changes of

⁵ These four measures were taken from the Millennium Ecosystem Assessment (2005), *Ecosystems and human well-being: synthesis*, island press, Washington D.C.

ecosystems and categories ecosystem services in four ways that allow directly on human well-being: Provisioning (food, fresh water, fuel wood, fiber, biochemical's and genetic resources), Regulating (climate regulation, disease regulation, water regulation and water purification), Cultural (spiritual and religious, recreation and ecotourism, aesthetic, inspirational, educational, sense of place and cultural heritage), and Supporting Services (soil formation, nutrient cycling and primary production). Five indirect categories of services which affect ecosystem services are: a) demographic, b) economic (globalization, trade, market and policy framework), c) sociopolitical (governance, institutional and legal framework), d) science and technology, and e) cultural and religious (beliefs and consumption choices).

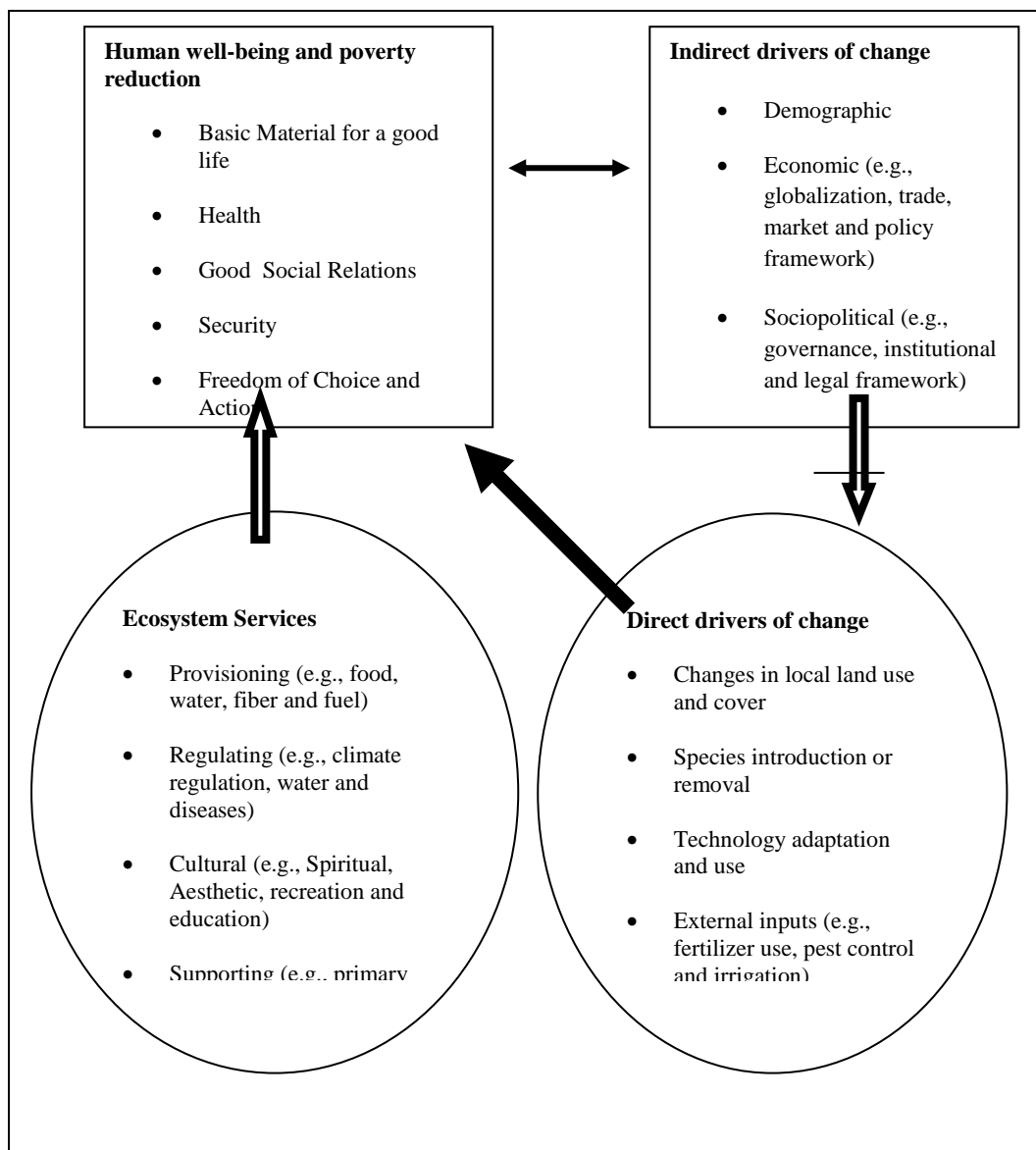
The provisioning of ecosystems supplies goods and other services that sustain a combination of aspect on human well-being. Adverse impacts on livelihoods are of particular importance. In both social and environmental contexts, livelihood sustainability has three aspects:

- A livelihood is sustainable “when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future” (DFID,1999 and Ashley & Carney, 1999);
- A livelihood is sustainable in a social context when it enhances or does not diminish the livelihood of others; and
- A livelihood is sustainable when it does not deplete or disrupt ecosystems to the prejudice of the livelihoods and well-being of others now or in the future.

Regulating services of ecosystems includes the purification of air, fresh water, reduced flooding or drought, stabilization of local and regional climate, and checks and balances that control the range and transmission of certain diseases, including some vector-borne diseases which manipulate human well-being in multiple behaviours.

Ecosystems can influence the human well-being through cultural services. Cultural services of ecosystem influence the aesthetic, recreational, educational, cultural, spiritual, beliefs and consumptions of choices based on the human experience. Through the process of disruption, contamination, depletion, and extinction cultural aspects changes ecosystems in many ways which have negative impact.

Figure 1: Ecosystem Services, human well-being and drivers of change



Source: Millennium Ecosystem Assessment (2005)

The fourth aspect of ecosystem services defined by MEA is essential for sustaining the other three. Supporting services includes soil formation, nutrient cycling, and primary production. Therefore, supporting services act as linking between ecosystem services and human well-being in both ways.

Human well-being and poverty reduction and indirect drivers of ecosystem change are related with each other in a reverse way. Direct drivers of changes of ecosystem services have impact on human well-being and poverty reduction (for details see Figure 1).

3.0 Dimensions and Measurement of Human Well-being

Millennium Ecosystem Assessment (2003) defines five dimensions of human well-being and the sixth one 'Aggregations' was added on MEA (2005). Five dimensions of well-being are: a) basic material for a good life; b) health; c) good social relations; d) freedom of choice and action; e) security; and the sixth dimension added as f) aggregations on later.

Basic material for a good life

Basic materials are necessary to leading a good and healthy life which includes adequate income, household assets, food, water, and shelter. More efforts have been put into measurements, but it did not provide enough pictures to support complete understanding of the distribution of well-being and its relation to ecosystem services. Due to the degree which well-being varies across ecosystem which is not identical everywhere.

Health

Health issues related to human have been mostly affected by environmental degradation. Declining ecosystem services and human health have certain linkages and mostly poor suffer from that. Rich degrades environment by a large amount and poor has to pay most for that (Human development report, 1998 and MEA, 2005). Human health is measured in variety of ways, concerning good health. Life expectancy, infant mortality, child mortality are measured as health parameter. The environmental impact on health is more among poor and depends on the level of poverty. According to WHO reports, poor countries are

with high mortality rates, where unsafe water and indoor smoke from solid fuel use account for 9-10% of DALYs (WHO, 2002).

Good social relations

Human is a social⁶ animal and enjoy a state of good social relations (Aristotle, 1948 & Fred, 1995) when they are able to realize aesthetic and recreational values, express cultural and spiritual values, develop institutional linkages that create social capital, show mutual respect, have good gender and family relations, and have the ability to help others and provide for their children (Dasgupta, 1993). Declining ecosystem disrupt social relations. Deterioration in ecosystem can also provide an opportunity for social relations when communities join together to form community-based institutions in response to degraded ecosystem services (Hasan, Scholes & Ash, 2005 p.139).

Freedom of choice and actions

There is some direct relationship between ecosystem services, freedom of choice and dimensions of well-being. Freedom can be defined as not only on the range of options a person has in deciding on and realizing the kind of life to lead (Hassan et al., 2006) and also on the range of options a person has in deciding what kind of life to lead (Dreze & Sen, 1995). In developing and transition economies, declining provision of fuel wood and drinking water as the result of deteriorating ecosystem has been shown to increase the amount of time needed to collect such basic necessities which, in turn, reduces the amount of time available for education, employment, and care of family members. Further, it has been seen in the maximum cases that these impacts are disproportionately experienced by women members of the family.

Education can be enhanced well-being; it is a clear aspect of well-being which enhances life prospects. In the Human Development Index (HDI), literacy

⁶ The concept of man being a social animal was firstly argued by Aristotle. In his famous work Politics I, he remarks as 'hence it is evident that the state is a creation of nature and that man by nature is a political animal. He further clarifies the relationship on society and social well-beings as 'society is the web of social relationship'.

is one of the components; but literacy is difficult to measure accurately and comparably as it is only small representation of education.

Security

Humans can be said to live in a state of security when they do not suffer abrupt threats to their well-beings. Most silent threats on security are organised violence, economic crises, and natural disasters. Terrorism is seen as a big threat on security in the last few decades. Civil war is among countries is the important concerns among or for security. The poor, sick and malnourished are more likely to suffer severely because they have fewer assets and coping strategies compared to their rich counterparts.

Aggregations

Human Development Index (HDI) is the most prominent aggregate used for the multiple dimensions of human well-being under the aegis of United Nations General Assembly and widely used in policy. Mostly countries calculate their own HDI at sub-national levels. Some of the Indian states also have their own HDI estimates. The HDI⁷ measures of economic well-being is on three parameters namely, income (per capita), health (life expectancy at the birth), and education (literacy and gross enrolment). HDI do not take other aspects⁸ of well-being. However, it still is a useful indicator of development consistent with the development-as-freedom approach (Sen, 1999).

3.1 Trends in distributions of human well-being

Well-being is not distributed uniformly among individuals, countries, or social groups (UN Millennium project task, 2005). Inequality is high, and the gaps between the well-off and the underprivileged are increasing. For example, a

⁷ Human Development Index was first proposed by noted Pakistani economist Mahbub-ul-Haq in 1990. The purpose was 'to shift the focus of development economics from national income accounting to people centered policies'. The original HDI was based on income, health and education.

⁸ Other aspects of well-being are cultural and social aspects and security dimensions which are reflecting in economic and health concerns.

child born in sub-Saharan Africa is 20 times more likely to die before age five than a child born in an OECD country, and this ratio is higher than it was a decade ago (MDG Reports, 2009, 2010, and MEA, 2005).

In the last 50 years, the changes brought about humans have degraded the ecosystems the most compared to any other point of time in human history. However, irrespective of that, human well-being has improved noticeably. Global trends have shown that incomes have risen, life expectancy has gone up, food supplies have risen, culture has become enriched, and political institutions have become more participatory⁹. Distributional pattern revealed that well-being is not distributed uniformly across individuals, social groups, or nations. However, overall well-being globally is going to increase. In spatial patterns, human well-being is not evenly distributed with respect to global ecosystems. Globally measurements of human well-being are limited. Some indicators of human well-being are given in Table 1. When we look at the GDP contribution, cultivated land and forest contribute the most to the GDP of the economy followed by dry lands, inland water and coastal areas. Infant Mortality rates are highest at dry lands area followed by mountain, forest and inland water and lowest in polar arctic. Dry lands consists highest area with 59.9 million square kilometers and coastal with 6 million square kilometers has the lowest. Population on cultivated area is around 4.1 billion and in polar arctic it's very minute. Population density is highest in coastal area among the other five indicators of human well-being while lowest in polar arctic. Further details on the human well-being indicators can be seen from Table 1.

4.0 Evidence from India

Over the years, rapidly growing population and economic development are most important issues leading to environmental degradation in India. Uncontrolled and unsustainable growth of urbanisation and industrialisation, expansion and massive increase of agriculture, destruction of forests and

⁹ Hunger and warfare are two exceptions. Globally, poverty is also increasing among the poor countries. According to the Millennium development report, out of 900 million people which resides below poverty, one third resides in India.

extraction of natural resources are the important factors for environmental degradation. Environmental concerns which affect ecosystems are multidisciplinary in nature and vary in the scale of problems.

Table 1: Human well-being Indicators

System	GDP (billion dollars)	IMR (deaths per thousand live births)	Area (Million sq. km.)	Population (billion)	P D (People per sq. km.)
Coastal	9,148	41.5	6.0	1.0	169.7
Cultivated	27,941	54.3	35.3	4.1	116.2
Dry lands	10,395	66.6	59.9	0.1	35.2
Forest	11,406	57.7	41.9	0.2	28.4
Inland Water	10,215	57.6	29.1	0.4	48.1
Island	7,029	30.4	7.1	0.6	85.5
Mountain	7,890	57.9	31.9	0.2	38.2
Polar (Arctic)	96	12.8	8.1	0.0	0.7

Source: Millennium Ecosystem Assessment (2005)

4.1 India's environmental problems

In this section, local problems (air and vehicular pollution, biodiversity, land and water pollution etc.) which affect the Indian ecosystem and finally the human well-being and human health are discussed in detail. Problems on land, forest, air and vehicular pollution, water, biodiversity and solid waste are the most common environmental problems prevail in India.

Land and forest

India is the second largest country in the world with a population of around 1.2 billion and seventh largest in the area wise with a total land area of 3,287,263 square kilometer. It measures 3,214 kilometer from North to South and 2,993 kilometer from East to west, has a land frontier of 15,200 kilometer, coastline of 7,517 kilometer. Out of India's total geographical area of 328.73 million hectare, 306 million hectare comprises the reporting area and 146.82 million hectare is degraded land. Land degradation happening due to the natural and human induced causes, similar to wind erosion and water logging, is one of

the priority concerns in India. The varying degrees and types of degradation stem mainly from unsustainable use and inappropriate land management practices. Loss of vegetation occurs as a result of deforestation, unsustainable fuel-wood and fodder extraction, shifting cultivation, encroachment into forest lands, forest fires and overgrazing, all of which subject the land to degradational forces. Other important factors responsible for large-scale degradation are; non-adoption of adequate soil conservation measures, improper crop rotation, indiscriminate use of agro-chemicals such as fertilizers and pesticides, improper planning and management of irrigation systems and extraction of groundwater in excess of the recharge capacity. Due to excess extraction of groundwater in irrigation and pesticides use groundwater contamination problems prevails in states like Bihar, West Bengal, some parts of Uttar Pradesh and north eastern India (MOEF, 2009). Water contaminations are mainly from arsenic, fluoride, iron, and some other contaminant which causes severe health problems.

India has about 17 per cent of the global population but only 2.5 per cent of the total global land and 1.8 per cent of the whole worldwide forest area. India is one of the 17 countries which are known as mega biodiversity countries in the world. As a norm of the 33 per cent forest land coverage, India's forest coverage of land area is 20.6 percent and requires additional coverage of 16 million hectare. About 41 per cent of forest cover has been degraded, 70 per cent of forests have no natural regeneration and 55 per cent are prone to fire. Forest cover of India is 67.71 million hectare, which is 20.6 per cent of its geographical area, in which 5.46 million hectare (1.66 per cent) is very dense forest, 33.26 million hectare (10.12 per cent) is moderately dense and the rest 28.99 million hectare is open forest area including 0.44 million hectare of mangroves (MOEF, 2009).

Air and vehicular pollution

Air pollution and the consequential impacts in India could be mostly attributed to the emissions from vehicular, industrial and domestic activities. Air quality has been, therefore, an issue of worry in the milieu of various developmental activities (MOEF, 2009).

In the last 30 years, there has been a tremendous increase in the air pollution mostly in the larger segment in urban and industrial centre. The rapid industrialisation and exceeding extraction of natural resources are primarily

responsible for that. Initially air pollutants were sulphur dioxide, black smoke and lead, which were mainly resulted from the use of combustions of fossil fuels. In recent year's nitrogen monoxide, nitrogen dioxide and ozone have also appeared in air pollution. In India, Central Pollution Control Board (CPCB) monitors air quality of 95 cities and towns with respect to 3 main pollutants: SO₂, NO_x and RSPm. In the case of large and medium scale polluting units, very few have pollution control devices. In the case of unorganised sector and small units, the problem is more serious. Due to increase in pollution level, respiratory and other related diseases have phenomenally increased over the last 15 years. Vehicular pollution also causes air pollution and it is increasing due to rising number of vehicles. The drastic increase in number of vehicles has also resulted in a significant increase in the emission load of various pollutants. The quantum of vehicular pollutants emitted is highest in Delhi followed by Mumbai, Bangalore, Calcutta and Ahmadabad. Carbon monoxide (CO) and hydrocarbons (HC) account for 64 and 23 per cent respectively, of the total emission load due to vehicles in all these cities considered together (CPCB, 2005).

Water

Water is one of the most important components for human beings to survive. It is increasingly becoming a scarce resource both in terms of quantity as well as quality. Water disputes among different user groups, within the different states of the same country are also increasing. Water-borne diseases are on monotonous path. 10 per cent of the people have no access to drinking water and access to safe drinking water is even less. Chemical contaminations are increasing. Industrial water pollution leads to excessive nitrate leached into groundwater and causes water borne disease. In the last two decades, it has been observed that there is a decline in water quality in most of the sources.

Biodiversity

India is one of the 17 known mega diverse countries of the world (MOEF, 2009, and Sankar, 2009). Out of all the hot spots in the world, India has two: Eastern Himalaya and Western Ghats. India, with a varied terrain, topography, land use, geographic and climatic factors, can be divided into ten recognisable bio-geographic zones. These zones cover a variety of ecosystems: mountains, plateaus, rivers, forests, deserts, wetlands, lakes, mangroves, coral reefs, coasts and islands. Human activities, both directly and indirectly, responsible for current

high rates of biodiversity loss are - habitat loss; fragmentation and degradation due to agricultural activities; extraction (including mining, fishing, logging and harvesting); and development (human settlements, industry and associated infrastructure). Habitat loss and disintegration leads to the formation of isolated, small and scattered populations.

Solid Waste

The increasing trend in consumerism, progress in human civilisation, population growth, rapid industrialisation and urbanisation leads to more waste generation. Creation of more non-biodegradable solid waste propels water and land pollution. According to World Bank estimates, in the early nineties the economic value of depletion and degradation was found around 4.5 per cent of GDP where growth rate was nearly around 5 per cent. The problems prevailing in the area of solid waste in India are as follows¹⁰:

- Households and other wastes in cities and towns: sorting¹¹ and safe disposal;
- Disposal of fly ash in thermal power stations;
- Handling of bio-medical wastes in hospitals; and
- Safe disposal of hazardous wastes in chemical and other industries.

5.0 Concluding Remarks

Over the last 50 years, ecosystems have degraded more than ever in human history. This has certain direct and indirect effects on human well-being. Globally, the well-being of present and future human populations depends on ecologically sustainable and socially equitable ways of living. The six dimensions of human well-being are: a) basic material for a good life; b) health; c) good social relations; d) freedom of choice and action; e) security; and f) aggregations define by MEA has direct and indirect links. India is one of the 17 identified mega diverse countries of the world. Indian environmental problems

¹⁰ Four set of problems taken from Sankar, 2009 and compendium of environmental economics in India.

¹¹ Sorting in solid waste management generally refers to all polluting mechanisms like biodegradable, non-biodegradable, non-biodegradable and hazardous elements.

occurs mainly from land, air and vehicular problems, water related problems and biodiversity. Air quality in Delhi in the period 2000-2008 has seen a decrease in 72 per cent and 50 per cent of SO₂ and CO but increase in 33 per cent, 2 per cent and 21 per cent of NO₂, Suspended Particulate Matter (SPM) and RSPM irrespective of 57 per cent increase in number of vehicles in the same period. Due to excess vehicular emission human health as TB, Asthma, and other respiratory are increasing. The pollutants in air, namely – SO₂, NO and SPM - damage the human respiratory and cardio-respiratory systems in various ways. The rapidly growing population and economic development are leading to the ‘environmental degradation in India’ through the uncontrolled growth of urbanisation and industrialisation, expansion and massive intensification of agriculture, and the destruction of forests. Therefore it is time to take decisions which give sustainable growth without hurting our ecosystem and well-being.

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