Environment impact analysis

Need, action, and consequence

Every country strives to progress: economic development through manufacturing and trading.

Every country want to give employment: builds industries, serve the consumers needs and help to generate revenue.

Development projects in the past: without any consideration to their environmental consequences; pollution reached at threatening level.

Industrialization and economic growth provided material comforts and luxuries of life but at the same time deteriorated the quality of life.

People are now concerned about the environmental impact of developmental projects.

Environment impact assessment

Environment Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment.

EIA is a tool that links the environment with developmental activities.

It is an assessment of the impact of social development on environmental health.

It ensures that the development of a project is environmentally sound and sustainable.

The Ministry of Environment and Forest under the Environmental Protection Act of 1986, initiated the Environmental Impact Assessment (EIA) in 1994. It was reengineered in 2006.

Environment impact assesment

Objectives

Protecting the environmental side by side with industrial development.

Define the concept, methods, procedures and legal aspect of EIA.

Enumerate how undesirable impacts of developmental projects can be anticipated and also overcome.

“The purpose of an EIA is to determine the potential environmental, social, and health effects of a proposed development, so that those who take the decisions in developing the project and in authorizing the project are informed about the likely consequences of their decisions before they take those decisions and are thereby more accountable”.

Environment impact assesment

EIA originated in early 1970s, with the implementation of first National Environment Policy Act (NEPA) 1969 in USA.

The EIA was initially practiced by developed nations such as Canada, Australia and Newzeland.

Columbia and the Philippines are the earliest examples of developing nations who introduced EIA in their policies. Columbia brought it in 1974 while the Philippines in 1978.

Worldwide, EIA is now practiced in more than 100 countries. By the mid-1990s, some 110 countries applied EIA as a major environmental policy.

In 1989, EIA was adopted as the major development project by the World Bank.

Environment impact assesment

EIA is to-

-serve as a primary environmental tool with clear provisions.

-apply consistently to all proposals with potential environmental impacts.

-use scientific practice and suggests strategies for mitigation.

-address all possible factors such as short term, long term, small scale and large scale effects.

-lay down a flexible approach with and provides for public involvement.

-include mechanisms for monitoring, auditing and evaluation.

EIA-India

EIA was introduced in India in 1978, with respect to river valley projects and later enhanced to include other developmental sections.

EIA comes under Notification on Environmental Impact Assessment (EIA) of developmental projects 1994 under the provisions of Environment (Protection) Act, 1986.

Besides EIA, the Government of India under Environment (Protection) Act 1986 issued a number of other notifications, which are related to environmental impact assessment.

EIA is now mandatory for more than 30 categories of projects, and these projects get Environmental Clearance (EC) only after the EIA requirements are fulfilled.

EIA-India

Some of the projects that require clearance

1. Nuclear Power
2. River Valley projects
3. Ports, Harbors, Airports
4. Petroleum Refineries
5. Chemical Fertilizers
6. Bulk drugs and pharmaceuticals
7. Synthetic Rubber
8. Asbestos and Asbestos products
9. Hydrocyanic acid and its derivatives
10. Primary metallurgical industries
11. Chloro alkali industry
12. Storage batteries
13. All tourism projects
14. Thermal Power Plants
15. Highway Projects
16. Tarred Roads in Forest areas
17. Distilleries.
18. Raw Skins and Hides
19. Pulp, paper and newsprint
20. Dyes
21. Cement.

Environmental clearance (EC)

Environmental clearance granted by the EIA Agency in the Ministry of Environment and Forests (MoEF), Government of India.

Category and its approval

– **Category A** projects: At Central level MOEF, based on decisions of Expert Appraisal Committee (EAC)

– **Category B** projects: At state level, the State Environment Impact Assessment Authority (SEIAA), based on decision of a State level Expert Appraisal Committee (SEAC) as to be constituted for in this notification

Who require EIA?

– Construction of new projects or activities

– Expansion or modernization of existing projects or activities

– Change in process and or technology

Environmental clearance (EC)

Category A and Category B are based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources.

Industry	Category A	Category B
Mining of minerals	≥ 50 ha. of mining lease area	< 50 ha. And ≥ 1 ha. of mining lease area
Thermal power plants	≥ 500 MW	< 500 MW
Cement	≥ 1 M tons per year	< 1 M tons per year
Metallurgical industries	Primary metallurgical processing	Secondary metallurgical processing

Environmental acts

Environment Protection Act, 1986

Water (Prevention and Control of Pollution) Act, 1974 (amended in 1988), Water (Prevention and Control of Pollution) (Cess) Act. 1977 (amended in 1991),

Forest Conservation Act, 1980

Environmental Impact Assessment Notification of 1994 (amended in 1997 and later superseded by EIA Notification of September, 2006)

The Ministry of Environment and Forest's Notification of Jan. 1997, constituting the Central Ground Water Authority,

Biological Diversity Act, 2002 and Wildlife Protection Act, 1972.

Environmental acts

The Air (Prevention and Control of Pollution) Act : It was enacted in 1981 and amended in 1987 to provide for the prevention, control and abatement of air pollution in India.

This is an act to provide for the prevention, control and abatement of air pollution, for the establishment, and functions relating thereto and for matters connecting therewith.

The Ministry of Environment and Forest (MoEF), Govt. of India in 2009 have notified the National Ambient Air Quality Standards by amending the Environment (Protection) Rules 1986.

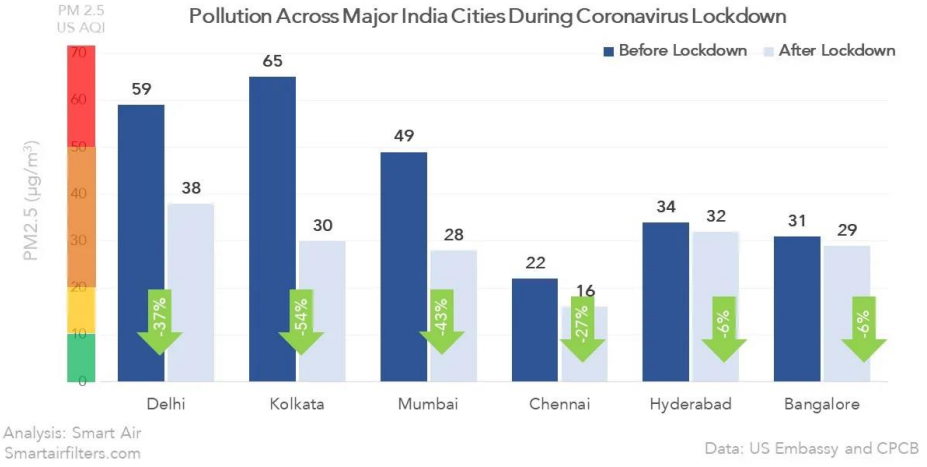
Air quality standard are established according to areas
– Industrial , Residential , Rural, and other areas
– Ecologically Sensitive Area

Environmental acts

Ambient air quality data generated under National Ambient Air Quality Monitoring Program (NAMP)

Pollutants	Time-weighted average	Concentration of ambient air (in μg/m^3)		
		Industrial area	Residential rural	Sensitive area
SO_2	Annual average	80	60	15
	24 h	120	80	30
NO_2	Annual average	80	60	15
	24 h	120	80	30
SPM	Annual average	360	140	70
	24 h	500	200	100
RSPM	Annual average	120	60	50
	24 h	150	100	75

Source: http://dpcc.delhigovt.nic.in/airstd.htm



Environmental acts

The Water (Prevention and Control of Pollution) Act: It was enacted in 1974 to provide for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country. The act was amended in 1988.

The main objectives of the Water Act are to provide for prevention, control and abatement of water pollution and the maintenance or restoration of the wholesomeness of water. It is designed to assess pollution levels and punish polluters.

The Water (Prevention and Control of Pollution) Cess Act: It was enacted in 1977, to provide for the levy and collection of a cess on water consumed by persons operating and carrying on certain types of industrial activities. The act was amended in 2003.

Environmental acts

According to this Act, anyone consuming water has to pay certain amount of cess depending on:

1. Whether the industry is using water for industrial cooling, spraying in mine pits or boilers feed,

2. For domestic purposes.

3. In processing, whereby water gets polluted and pollutants are easily biodegradable.

4. In processing whereby water gets polluted and the pollutants are not easily bio-degradable and are toxic.

Industries with suitable treatment plant can get a rebate of 70 per cent on the cess payable

Environmental acts

Wild Life (Protection) Act: It was enacted in 1972 with the objective of effectively protecting the wild life of this country and to control poaching, smuggling and illegal trade in wildlife and its derivatives. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent.

Prohibition of Hunting:

1. Hunting of Wild animals to be permitted in certain cases; wild animal become dangerous to human life or is so disabled or diseased as to be beyond recovery.

2. Any wild animal killed or wounded in defense of any person shall be Government property.

3. Grant of permit for special purposes: Education or research

Environmental acts

Wild Animal, etc. to be Government property.

Prohibition of picking, uprooting, etc., of specified plants.

Grant of permit for special purposes: Education or research

Cultivation of specified plants without licence prohibited.

Dealing in specified plants without licence prohibited.

Environmental acts

Declaration of Sanctuary: The State Government declare any area as Sanctuary for the purpose of protecting, propagating or developing wildlife or its environment.

Declaration of National Parks: An area, by reason of its ecological, faunal, floral, geomorphological, or zoological association or importance, needed to be constituted as a National Park for the purpose of protecting, propagating or developing wildlife therein or its environment.

Declaration of closed area: State Government, by notification, declare any area closed to hunting for such period as may be specified in the notification.

Environmental acts

Forest Conservation Act: It was enacted in 1980 to help conserve the country's forests. It strictly restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of Central Government. To this end the Act lays down the pre-requisites for the diversion of forest land for non-forest purposes.

Indian Forest Act, 1927 consolidates the law relating to forests, the transit of forest-produce and the duty liable on timber and other forest-produce.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, recognizes the rights of forest-dwelling Scheduled Tribes and other traditional forest dwellers over the forest areas inhabited by them and provides a framework for according the same.

Pollution control board

There are two type of pollution control boards in India:
(a) Central
(b) State

-Pollution assessment (survey and monitoring).
-R&D and laboratory management.
-Development of standards and guidelines for industry specific emissions and effluents standards
-Training
-Information database management and library
-Pollution control technology
-Pollution control enforcement
-Mass awareness and publications
-Hazard waste management

EIA guidelines for industries

To avoid use of Agricultural land/forest land for industrial site as far as possible.

Minimum - 500 meters from highways and railway line, 25 km from Major Settlements (3,00,000 population), 1/2 km from the high tide line as per CRZ (Coastal Regulation Zone) notification.

200 meters from the estuary boundaries, 500 meters from flood plain.

Land Size - adequate to provide green belt , solid waste etc.

Plant Layout must conform to the landscape of the surrounding area.

EIA assesment

What all is assessed:

Existing environmental status, Various factors of ecosystem (air, water, land, biological), Adverse environmental impacts of the proposed project to be started, Impact on people in the neighborhood.

Environmental Impact Value

$$EIV = \sum_{i=1}^{n} (V_i)\, W_i$$

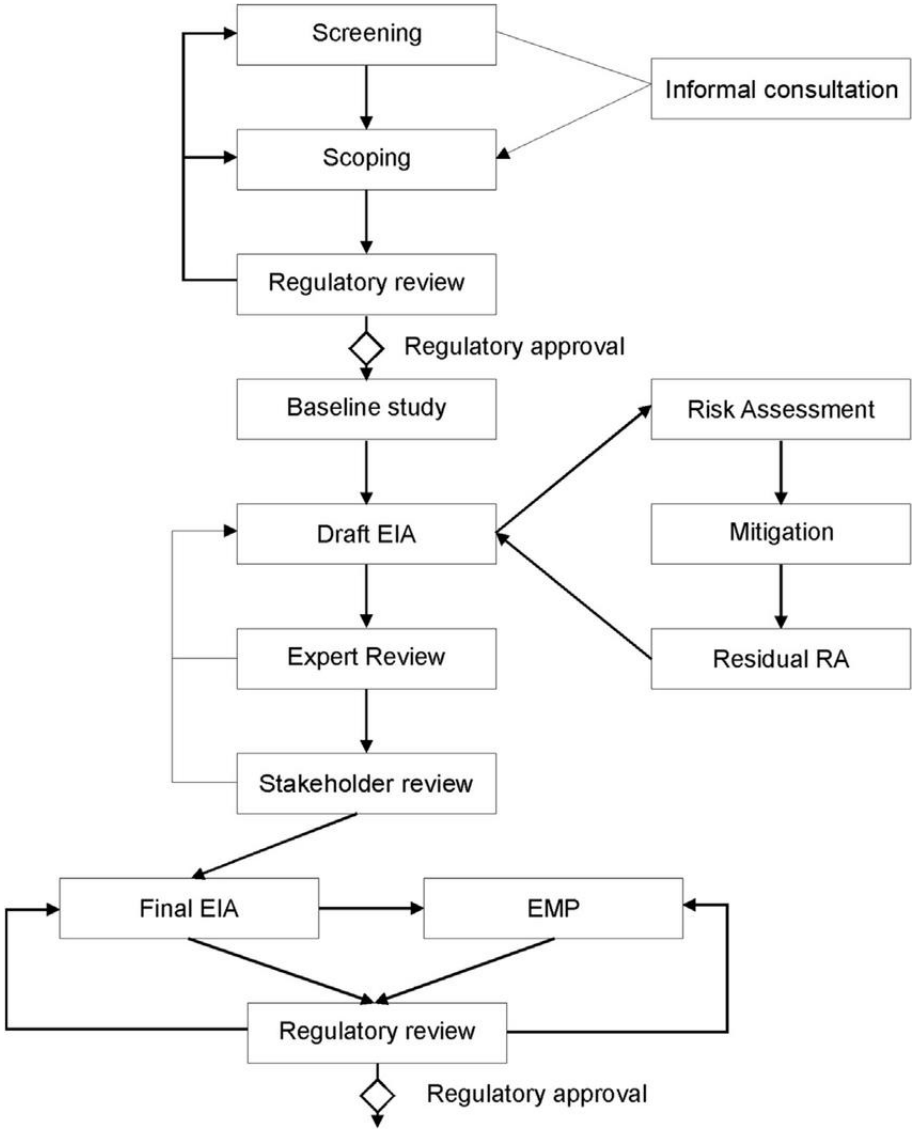
V_i = Relative change of the environmental quality of parameters;
W_i= Relative importance or weight or parameter;
n = total number of environmental parameters

EIA assesment

Screening: It takes into account whether a project requires environmental clearance or not.

Scoping: it is the preliminary assessment. It scans the Ministry's guidelines to see which significant issues are to be addressed in the EIA study.

Baseline Data: it monitors the existing data and the environmental status of the area under study. It learns it and supplements it with secondary data.

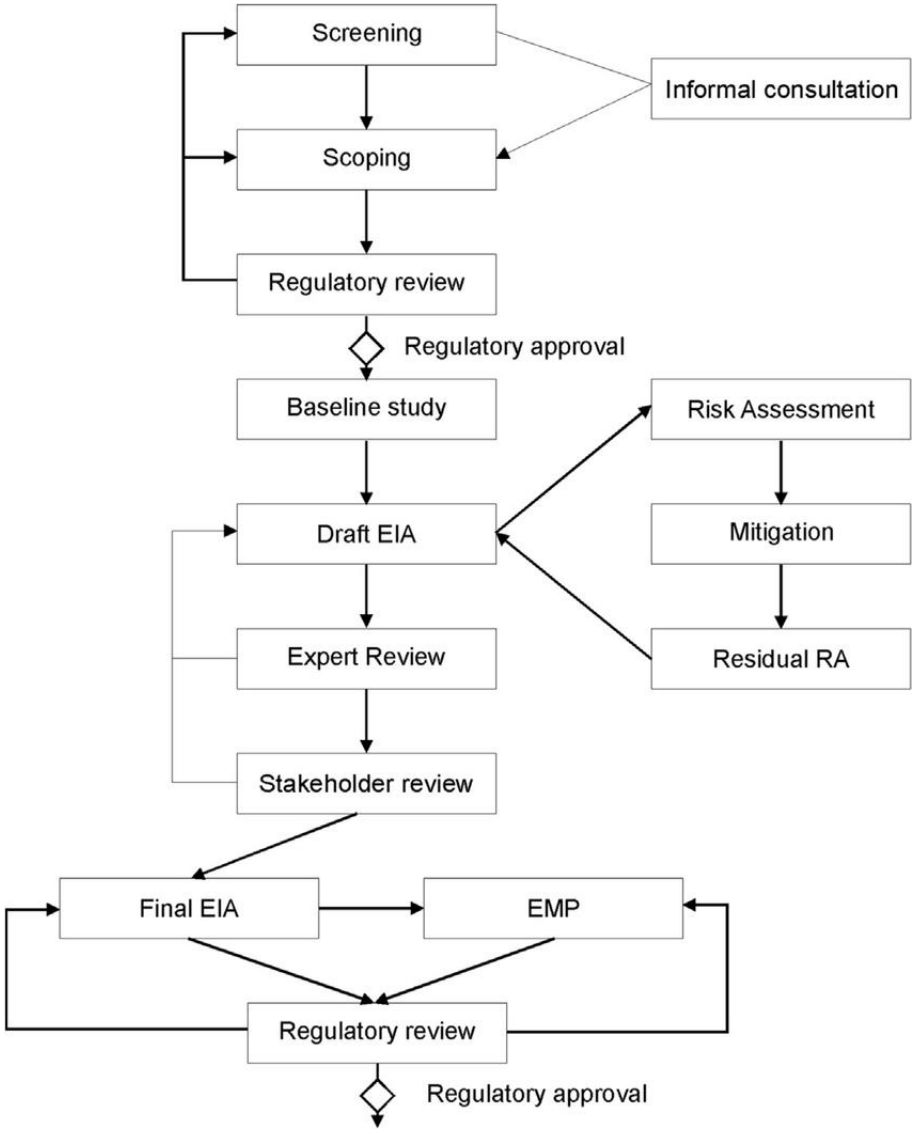


EIA assesment

Impact prediction: It is the most important analysis. It involves assessment of impacts of projects. Impacts can be: direct, indirect or Cumulative impact AND Positive/negative, Reversible/irreversible

Risk assessment: it mainly involves the hazard identifications including any probability of natural hazards.

Mitigation measures and EIA report: It involves the possible alternatives

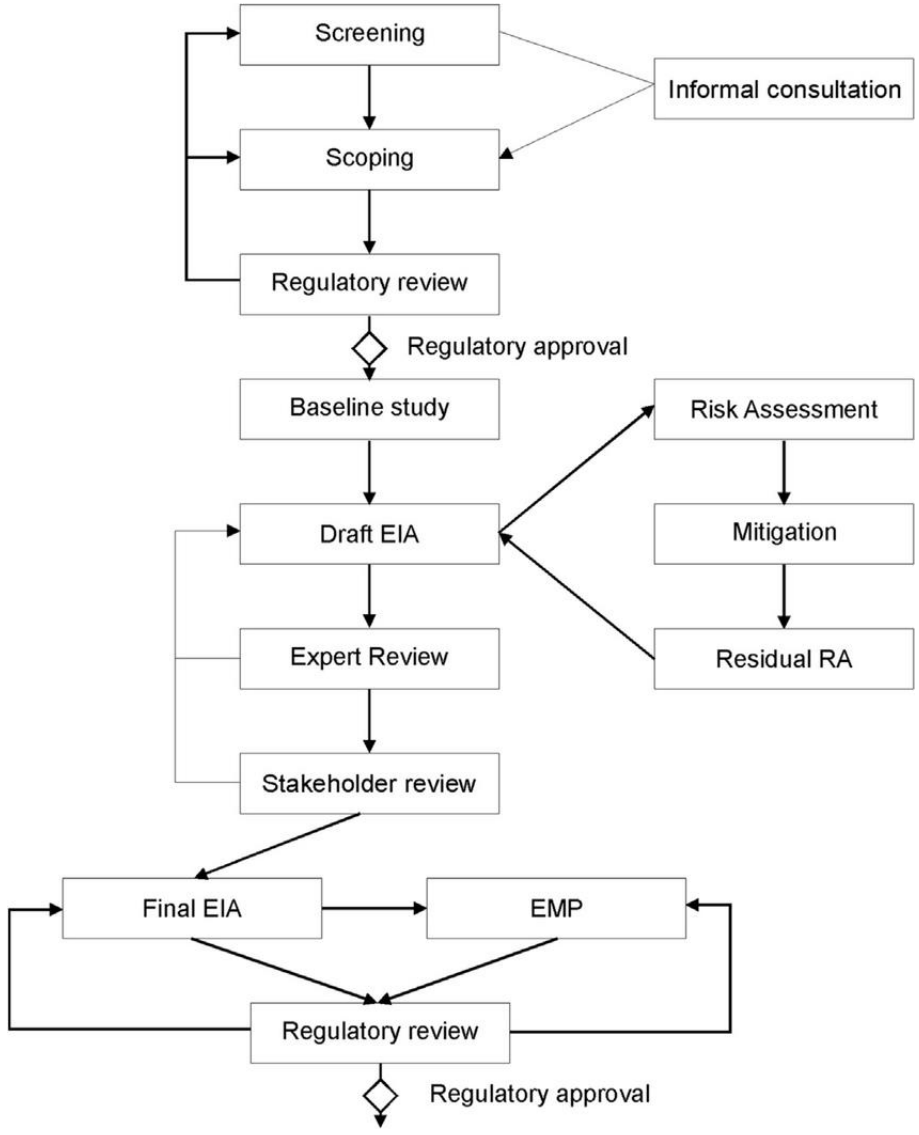


EIA assesment

Decision Making: It involves the consultation between the project proponent and the impact assessment authority.

Public Hearing Law: Public has to be informed and consulted on any development after the completion of EIA report through local associations, environmental groups, etc.

Monitoring as per the clearance conditions: it has to be done during both construction and operation phases of the project.



Public awareness

Environmental degradation is detrimental and is jeopardizing the long-term health and security of animals, plants and humans.

As we are all responsible for damaging the environment, it is important for everyone to improve their environmental awareness.

It is need of the time and also our moral obligation to protect the environment.

It is especially imperative to teach children about the importance of environmental awareness, to ensure that the lives of future generations are secure.

A little change in our daily habits can be detrimental.

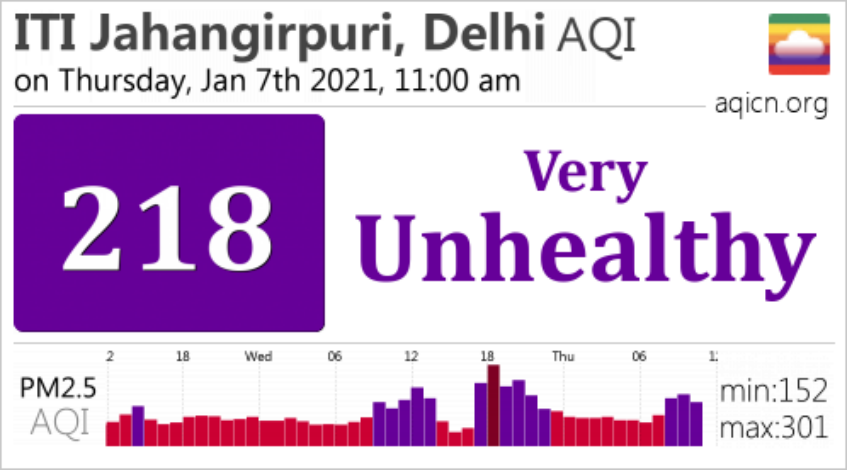
Public awareness

It can be created through formal and informal education to all sections of the society

Among students through education via school college curriculum

Among the public or common man through media

Among the planners, decision makers and leaders.



Development goals in India

Accelerating the growth rate of economy

Ensuring food and nutritional security

Providing the basic minimum services like safe drinking water, primary health care facilities, universal primary education, connectivity to all

Containing the growth rate of population - Increasing population has led to a number of interlinked issues: inequalities of income levels, low level of literacy, unemployment and ultimately poverty

Strengthening efforts to build self-reliance (capacity building) – Rapid urbanization has progressively declined essential services and the quality of life in urban areas.

Sustainable development and environmental priorities

Environment protection and sustainable development does not only involve prevention of pollution and degradation of natural resources, but it also involves integrating with the overall development process and the well-being of people

1. **Population Stabilization**: We account for 17.51 per cent of the world population, with only 2.4 per cent of the world area available to us. The crux of the matter is that future population growth has to be related to the resource base. Resources shrink as people multiply and demographic pressures lead to economic pressures.

2. **Natural Resource Assessment and Management**: Natural resources provide fundamental life support, in the form of both consumptive and public-good services. Management of natural resources is necessary to ensuring food, nutritional and environmental security in the country.

Sustainable development and environmental priorities

3. **Pollution Monitoring and Control**: All kinds of environmental pollution are man-made problems, which arise from anthropogenic, industrial and agricultural sources. The nature of pollutants and their quantification by regular monitoring is thus necessary. Strict control of pollutants discharge/emission to environment can help in improving the situation.

4. **Human Settlement and Public Health**: Due to continued rise of population, the demand for housing, drinking water, sewerage disposal and various other public health support systems was increased enormously. At present, there is shortage of at least 25 million houses, 18 million (75 per cent) in rural areas and 7 million (25 per cent) in urban areas.

Sustainable development and environmental priorities

5. **Environmental Laws and Regulations**: In spite of these laws, the improvement of environmental quality is not substantial. There are a lot of fallacies in the laws that have to be amended — otherwise effective implementation could not be possible.

6. **Environmental Education and Awareness**: There is need of objective orientation of environmental education—either in formal system or in non-formal sector.

Importance of agriculture

India ranks second worldwide in farm output.

Contribution of agriculture to India’s GDP is 14.5% (2011 census). However, nearly 50% of the Indian population dependent on it for livelihood.

India has a significant agro-export in few crops, namely—cotton, rice, meat, oil meals, spice, guar gum meal and sugar.

Agriculture accounts for about 10% of the total export earnings.

The agriculture sector is crucial in maintaining food security and in the process, national security as well.

Green Revolution made the country self-reliant in food grain production.

Issues in agriculture

Productivity of Indian farms is relatively low as compared to that of European countries, USA or China.

Indian agriculture is primarily dependent on monsoon for irrigation.

Indian agriculture is very poorly mechanized which has both decreased productivity and increased disguised employment.

There have been paradoxes in the policies of the government. It is more favourable to consumers and not to farmers.

Very low seed replacement ratio, poor quality of seeds, increasing the cost of seeds, and unscientific use of farm-produced seeds have also impacted productivity.

Issues in agriculture

The problems of the green revolution can be seen now. Misuse and abuse of technology have destroyed the agricultural sector. Extensive use of fertilizers, groundwater has impacted land and soil.

Farmers, still have been dependent on informal sources like money lenders. Around 40% of the credits come from these sources.

Research and development in agriculture have been more or less stagnant at below 1%.

Sector is suffering from cheap imports, a sharp fall in prices both in domestic and international markets.

Solutions to agricultural issues

To improve irrigation efficiency, new methods such as rainwater harvesting, sprinkler irrigation, drip water irrigation need to be implemented.

The consolidation of lands is necessary to improve mechanization optimize productivity.

Post-harvest loss reduction can be of great importance in providing enough remuneration to farmers and increasing their profitability.

Financial solutions like credit facilities and insurances should be taken to all farmers