APPENDIX

ABBREVIATIONS

ASI	Annual Survey of Industries
BSI	Botanical Survey of India
CEA	Central Electricity Authority
CFC	Chloro-Floro-Carbons
CO	Carbon Monoxide
CH_4	Methane
Cl	Chlorine
CPCB	Central Pollution Control Board
Cu.m	Cubic Metre
Fe	Iron
GWP	Global Warming Potential
GOI	Government of India
H_2S	Hydrogen Sulphide
ha	Hectares
HC	Hydro Carbons
IQ	Institutional Qualified
Kms	Kilometers
M.C.M.	Million Cubic Metre
Mg	Magnesium
Mha	Million Hectares
MOEF	Ministry of Environment and Forests
MW	Megawatts
NA	Not Available
Neg.	Negligible
NH_3	Ammonia
NIQ	Non-Institutional Qualified
NO_X	Oxides of Nitrogen
COD	Chemical Oxygen Demand
µg	Microgram
NO_2	Nitrogen Dioxide
NO_3	Nitrate
NSFP	National Social Forestry Project
ODP	Ozone Depletion Potential
PM	Particulate Matter
ppm	Parts per Million
ppbv	Part per Billion by Volume
ppmv/year	Parts per Million by Volume per year
Pb	Lead
ppmv	Part per Million by Volume
pptv	Part per Trillion by Volume
Rs.	Rupees
RSC	Residual Sodium Carbonate
SAR	Sodium Absorption Ratio
SFP	Social Forestry Project
SO_2	Sulphur dioxide
SO_4	Sulphate
SP	Sodium Percentage
SPM	Solid Particulate Matter
SWS	Sub-Water Shed
RSPM	Residual Suspended Particulate Matter
Sq. Kms.	Square Kilometers
TDS	Total Dissolved Solids
TERI	The Energy Resources Institute
WB	World Bank
ZSI	Zoological Survey of India
BOD	Biological Oxygen Demand
TSP	Total Suspended Particulate
m	Meter

Appendix 2

Concepts and Definitions of the Terms Used

Area under miscellaneous tree crops, groves, etc.:
All culturable land which is not included under 'net area sown' but is put to some other agricultural use, such as land under casuarina trees, thatching grasses, bamboo bushes, and other groves for fuel, etc.

Barren and unculturable land:
Land which cannot be brought under cultivation unless at high cost, irrespective of whether such land is in isolated blocks or within cultivated holdings.

Critical:
A taxon is critical when it is facing an extremely high probability of extinction in the wild in immediate future.

Crown cover:
The canopy formed by the crowns of all the trees in a forest or in an uneven aged forest by the crowns of all trees in a specified crowns class.

Culturable waste:
Land available for cultivation but not taken up for cultivation or abandoned after a few years for one reason or the other. Such lands may be either fallow or covered with shrubs and jungles not put to any use. These may be assessed or unassessed and may lie in isolated blocks or within cultivated during the year and the last five or more consecutive years in succession, will be included in this category.

Current fallow:
Cultivable area kept fallow during the current agricultural year. Any seedling area in the current agricultural year not cropped in the same year is also treated as current fallow.

Demersal:
Refers to fish that live on or adjacent to the sea bottom.

Dense Forest:
Forests whose crown density is 40 percent or above.

Endangered:
Species in danger of extinction and whose survival is unlikely if the casual factors continue operating. Included are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Expectation of Life at Birth:
The Expectation of life at birth is defined as the average number of years expected to be lived at the time of birth if current mortality trends were to continue.

Extinct:
Species that are no longer known to exist in the wild after repeated searches of the type in localities and other known or likely places.

Flush system latrine:
The type of latrine which is connected to an under ground sewerage system, from which human excreta and wastes are flushed out by water.

Forest:
Includes all actually forested area on the lands so classed or administered as forests under any legal enactment dealing with forests, whether state-owned or private.

Gross area irrigated:
An irrigated plot growing crop in more than one season, is counted as many times as it is cropped to arrive at gross area irrigated. In case of mixed crops, the area under component crops as reported by household is taken into account.

Habitat:
An area and not a particular location is called habitat. The site or environment which a plant or animal lives, such as forest.

Household:
A household is a group of persons who commonly live together and would take their meal from common kitchen unless the exigencies of work prevented any of them from doing so. There may be a household of persons related by blood or a household of unrelated persons or having a mix of both. Examples of unrelated households are boarding houses, messes, hostels, residential hotels, rescue homes, jails, ashrams, etc. These are called "Institutional Households".

Infant Mortality Rate:
Infant mortality rate is defined as the number of deaths under one year of age to thousand live births in a year.

Insufficiently Known:
A taxon is insufficiently known when an evaluation has been made but the available data are inadequate to assign a category.

Irrigation:
A device of purposely providing land with water other than rain water by artificial means.

Land put to non-agricultural uses:
Includes all land occupied by buildings, paths, etc. or under water (e.g. tank, canals, etc.) and land put to uses other than agricultural production.

Neretic :
The part of the pelagic environment that extends from the nearshore zone out to depth of about 200 m; the water overlying the continental shelf related to shallow water on the margin of the sea, generally that overlying the continental shelf.

Net area irrigated:
The total of all the areas irrigated from different sources, counting each area irrigated only once even though it was irrigated more than once in the same year.

Net area sown:
Area sown with crops and orchards, counting the area sown more than once in the same year, only once.

The above definition was elaborated as follows:

The net area sown was defined as the difference between the total geographical area of all plots of land of the holding and the sum of the areas of land under

(1) forest, (2) barren & uncultivable wastes, (3) put to non-agricultural uses, (4) culturable wastes, (5) permanent pastures & other grazing land, (6) miscellaneous tree crops excluding orchards and (7) all type of fallow lands.

Open Forest:
Forest whose crown density is more than 10 percent but less than 40 percent.

Other fallow:
All lands which are taken up for cultivation in the past, but are temporarily out of cultivation for a period of not less than one year and not more than five years including the current agricultural year are classified under 'other fallow'.

Pastures and grazing land:
Include all grazing lands irrespective of whether they are permanent pastures and meadows or not. Grazing lands within forest area shall be included under this category.

pH:
The logarithm to the base 10 of the reciprocal of Hydrogen ion concentration.

Rare:
The species with small world populations that are not at present endangered or vulnerable but are at risk. These species are usually localised within restricted geographic areas or habitats or are thinly scattered over a more extensive range.

Room:
Covered space enclosed by walls on all sides reaching from the floor to the roof and having a door way. The rooms have been further classified as NBO rooms (specification for a room as recommended by the National Buildings Organisation)and other rooms. An NBO room is defined as a room having a floor space of at least four square metres and height of at least two metres from the floor to the ceiling.

Service latrine:
The types of latrine which are attended by the scavenging services of the Municipalities or Corporations.

Slum:
A slum is defined as an areal unit having twenty five or more kachcha structures mostly of temporary nature, or fifty or more households residing mostly in kachcha structures, huddled together, or inhabited persons with practically no private latrine and inadequate public latrine and water facilities.

Species:
A group of individual specimens having close resemblance but differing from others and belonging to the same genus.

Tap:
Source through which the drinking water is distributed through pipes laid out by corporations, municipalities or other local authorities like metropolitan or town development authorities or housing estates or similar agencies. But drinking water distributed through pipes by the house owner by pumping out from unprotected wells, tanks or springs should not be regarded as tap.

Type of dwelling:
Dwellings, have been classified under three categories, namely, chawl/bustee, independent house and flat.

(a) Chawl/Bustee:
A collection of poorly built katcha or semi-pucca huts or tenements.

(b) Independent house:
A separate structure with a room or rooms and having all its accessories and a separate entrance to it. In other words, if the dwelling unit and the entire structure of the building are physically coterminous, it should be considered an independent house.

(c) Flat:
All housing arrangements other than chawl/bustee and independent house are to be taken as flats. Flat thus includes any self-contained dwelling unit with a room or rooms provided with normal housing facilities like water supply, bath and latrine used exclusively by the family residing there or jointly with other families. It also includes detached room

or rooms with or without other housing facilities.

Type of structure:
The structures have been classified into three categories, namely pucca, semi-pucca and kachcha on the basis of the materials used for construction.

(a) Pucca Structure:
A structure whose walls and roof at least are made of pucca materials.

(b) Kachcha Structure:
A structure which has walls and roof made of non-pucca materials.

(c) Semi-Pucca Structure:
A structure which has either the walls or the roof, but not both, made of pucca materials. Walls/roof made partially of pucca materials will be regarded as kachcha walls/roof. Materials such as oven-burnt bricks, stone, stone-blocks, cement, concrete, jack-board (cement plastered reed), tiles and timber are pucca materials. Corrugated iron or asbestos sheets used in the construction of roof will also be treated as pucca materials.

Urban:
The criteria adopted for treating the urban for 1991 census is:

All statutory towns, i.e., all places with a municipality, corporation, cantonment board or notified town area committee, etc.

(a) All places which satisfied the following criteria:

(i) A minimum population of 5000;

(ii) At least 75% of the male working population engaged in non-agricultural pursuits; and

(iii) A density of population of atleast 400 per sq. km. Mile (1000 per sq. mile).

Urban Agglomeration:

(i) A city or a town with a continuous outgrowth, the outgrowth being outside the statutory limits but falling within the boundaries of the adjoining villages ; or

(ii) Two or more adjoining towns with their outgrowths, if any, as in (i) above ; or

(iii) A city and one or more adjoining towns with or without outgrowths all of which form a continuous spread.

Vulnerable:
The species believed likely to move into the endangered category in the near future if the casual factors continue operating. Included are species of which most or all the populations are decreasing because of overexploitation, extensive destruction of habitat or other environmental disturbance; species with populations that have been seriously depleted and whose ultimate security is not yet assured; and species with populations that are still abundant but are under threat from serious adverse factors throughout their range.

Appendix 3

REFERENCES

- Different Data Sources Agencies dealing with environment subject

- Agriculture Research DATA BOOK 2005 : Indian Council of Agricultural Research
- Central Pollution Control Board : Assessment of vehicular pollution in metropolitan cities

- Central Pollution Control Board (2001) : Water Quality – Status and Statistics Air Quality – Status and Statistics

- Economic Survey 2007-08 : Department of Economic Affairs, Ministry of Finance

- Statistics at a Glance 2008 : Ministry of Agriculture, Directorate of Economics & Statistics

- Annual Report 2008 : Ministry of Environment and Forests
- Forestry Statistics India, 2005 : Ministry of Environment and Forests

- The State of Forest Report, 2005 : Ministry of Environment and Forests

- Annual Report 2006-07 : Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries
- Slum Population India (series 1) : Registrar General and Census Commissioner of India
- Annual Report : Central Pollution Control Board
- Housing Condition in India Household Amenities & other Characteristics (NSS Report 489) : National Sample Survey Organisation
- Condition of Urban Slums 2002 (NSS Report 486) : National Sample Survey Organisation
- Selected Socio-Economic, Statistics India, 2002. : Central Statistical Organisation

- TEDDY (2008) : The Energy Research Institute, New Delhi.

- Women & Men in India, 2006. : Central Statistical Organisation

Appendix 4

METHODS OF MEASUREMENT OF AIR POLLUTION

Methods of measurement of air pollution followed by the Central Pollution Control Board are as follows:

A. Sulpher dioxide (SO_2)

The SO_2 is absorbed from air in a solution of potassium tetrachloromercurate (TCM). The resultant complex is made to react with pararosaniline and formaldehyde to form the coloured pararosaniline methylsulphunic acid, the absorbance of this solution is measured by means of a suitable spectrophotometer at 560 nm.

B. Nitrogen dioxide (NO_2)

The NO_2 in ambient air is collected by bubbling it through a solution of sodium hydroxide and sodium arsenate. The resultant nitrite ion concentration is colorimetrically determined by reacting it with sulfanilamide and N- (1-napthyl)-ethylene diamine dihydrochloride, the absorbance is then measured at 540 nm.

C. Suspended Particulate Matter (SPM)

SPM is measured gravimetrically high volume sampling with whatman filter paper is used at average flow rate being not less than 1.1 cubic meter per minute.

Source: Ambient Air Quality – Status and Statistics, 1997, Central Pollution Control Board, Delhi

Appendix 5

Methods of Determination of Water Quality Parameters

Parameter	Recommended Method
1. Temperature	Thermometeric method
2. pH	Electromatic method
3. TSS	Nephlometric method
4. Velocity of Flow	1) Current method
	2) Float method
	3) Chemical method
5. Dissolved Oxygen	Iodometric method
6. Biochemical Oxygen Demand	Dilution method
7. Total Kjeldahl Nitrogen	a) Digestion
	b) Distillation
	1) Titration method (>5mg/1)
	2) Nesslerization method (<5mg/1)
8. Nitrogen, nitrate + nitrite	Amalgamated Cadmium Reduction method for reduction of nitrate to nitrite by diazotisation method
9. Total Coliform (MPN)	Multiple Tube Dilution technique
10. Fecal Coliform (MPN)	Multiple Tube Dilution technique
11. Conductivity	Conductometric method
12. Chloride*	1) Argentometric method
	2) Mercurimetric method
13. Hardness	EDTA Titrimetric method
14. Calcium	EDTA Titrimetric method
15. Magnesium	By difference of 13 & 14
16. Alkalinity	1) Electrometric method
	2) Visual titration method

Parameter	Recommended Method
17. Sulphate**	Turbidimetric method
18. Sodium	Flame photometric method
19. Chemical Oxygen Demand	Dichromate reflux method
20. Total Dissolved Solids	
&	Gravemetric method
21. Fixed Dissolved Solids	
22. Phosphate	Molybdate method (Colorimetry)
23. Boron	Curcumine method (Colorimetry)
24. Free Ammonia	

Source: Water Quality - Status & Statistics (1996 & 1997)
Central Pollution Control Board

Argentometric method has been given first preference but if the colour of the sample interferes with the chromate end point then mercurimetric method should be used. Usually sulphate concentration is low in surface waters & hence gravimetric method may not be accurate as turbidimetric method, therefore, turbidimetric method is suggested.

Note: Wherever more than one methods are given, they are in order of preference.

Appendix 6

METHODOLOGY FOR ESTIMATION OF POVERTY LINES

The Planning Commission as the Nodal agency in the Government of India for estimation of poverty has been estimating the number and percentage of poor at national and state levels. Since, March 1997 it has been using the Expert Group Method (Expert Group on Estimation of Proportion and Number of Poor) to estimate poverty. According to this method the estimates of poverty are made from the large sample survey data on household consumer expenditure conducted by the National Sample Survey Organization (NSSO) of the Ministry of Statistics and Programme Implementation. Using this methodology the Planning Commission, in the past, has released poverty estimates for the year 1973-74, 1977-78, 1983, 1987-88 and 1993-94 by the Government of India, Press Information Bureau on 11th March 1997. Subsequently, the poverty estimates for 1999-2000 were released by the Government of India, Press Information Bureau on 22nd February 2001. While releasing the estimates of poverty for 1999-2000, it had been noted that these estimates were not strictly comparable with the estimates for the previous years.

2. The state-wise rural and urban poverty lines for the year 2004-05 are estimated using the original state-specific poverty lines identified by the Expert Group and updating them to 2004-05 prices using the Consumer Price Index of Agricultural Labourers (CPIAL) for rural poverty lines and Consumer Price Index for Industrial Workers (CPIIW) for urban poverty lines.

3. The NSSO has now released the result of the latest large sample survey data on household consumer expenditure (NSS 61st Round), covering the period July 2004 to June 2005 [Report No.508 (61/1.0/1)]. From this data, two different consumption distributions for the year 2004-05 have been obtained. The first one from the consumption data collected using 30-day recall period (also known as reference period) for all the items. The other distribution is obtained from the consumer expenditure data collected using 365-day recall period for five infrequently purchased non-food items, namely, clothing, footwear, durable goods, education and institutional medical expenses and 30-day recall period for the remaining items. These two consumption distributions have been termed as Uniform Recall Period (URP) consumption distribution and Mixed Recall Period (MRP) consumption distribution respectively. The Planning Commission, using the Expert Group methodology has estimated poverty in 2004-05 using both the distributions.

4. The state specific percentage and number of poor in rural and urban areas estimated from URP consumption distribution. The state specific percentage and number of poor in rural and urban areas are estimated from MRP consumption distribution.

5. The percentage and number of poor in 2004-05 estimated from URP consumption distribution of NSS 61st Round of consumer expenditure data are comparable with the poverty estimates of 1993-94. The percentage and number of poor in 2004-05 estimated from MRP consumption distribution of NSS 61st Round of consumer expenditure data are roughly (but not strictly) comparable with the poverty estimates of 1999-2000.

6. The URP-consumption distribution data of the 61st Round yields a poverty ratio of 28.3 percent in the rural areas, 25.7 percent in the urban areas and 27.5 percent for the country as a whole in 2004-05. The corresponding figures obtained from the MRP-consumption distribution data of the 61st Round are 21.8 percent in the rural areas, 21.7 percent in the urban areas and 21.8 percent for the country as a whole.

7. The poverty estimates in 2004-05 based on URP consumption distribution (27.5 percent) is comparable with the poverty estimates of 1993-94, which was 36 percent. (Table-1)

The poverty estimates in 2004-05 based on MRP consumption (21.8 percent) is roughly (but not strictly) comparable with the poverty estimates of 1999-2000, which was 26.1 percent. (Table-2).

Table1: Comparison of Poverty Estimates Based on Uniform Recall Period

	1993-94	**2004-05**
Rural	**37.3**	**28.3**
Urban	**32.4**	**25.7**
Total	**36.0**	**27.5**

Table-2 Comparison of Poverty Estimates Based on Mixed Recall Period

	1999-2000	**2004-05**
Rural	**27.1**	**21.8**
Urban	**23.6**	**21.7**
Total	**26.1**	**21.8**

Environment Legislation, Acts, Rules, Notifications and Amendments

In the Constitution of India it is clearly stated that it is the duty of the state to *'protect and improve the environment and to safeguard the forests and wildlife of the country'*. It imposes a duty on every citizen **'to protect and improve the natural environment including forests, lakes rivers and wildlife'**. Reference to the environment has also been made in the Directive Principles of State Policy as well as the Fundamental Rights. The Department of Environment was established in India in 1980 to ensure a healthy environment for the country. This later became the Ministry of Environment and Forests in 1985.

The constitutional provisions are backed by a number of laws – acts, rules and notifications. The Environment Protection Act of 1986(EPA) came into force soon after the Bhopal Gas Tragedy and is considered an umbrella legislation as it fills many gaps in the existing laws. Thereafter a large number of laws came into existence as the problems began arising e.g. Handling and Management of Hazardous Waste Rules in 1989.

Following is a list of the environmental legislations that have come into effect:

- General
- Forest and wildlife
- Water
- Air

General

1986 – The Environment (Protection) Act authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds.

1986 – The Environment (Protection) Rules lays down procedures for setting standards of emission or discharge of environmental pollutants.

1989 – Hazardous waste (Management and Handling) Rules objective is to control generation, collection, treatment, import, storage and handling of hazardous waste.

1989 – The Manufacture, Storage and Import of Hazardous Chemical Rules defines the terms used in this context, and sets up an Authority to inspect, once a year, the industrial activity connected with hazardous chemicals and isolated storage facilities.

1989 – The Manufacture, Use, Import, Export and Storage of hazardous Micro-organisms/ Genetically Engineered Organisms or Cells Rules were introduced with a view to protect the environment, nature and health, in connection with the application of gene technology and micro organisms.

1991 – The Public Liability Insurance Act and Rules and Amendment, 1992 was drawn up to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident while handling any hazardous substance.

1995 – National environmental Tribunal Act has been created to award compensation for damages to persons, property and the environment arising from any activity involving hazardous substances.

1997 – The National Environment Appellate Authority Act has been created to hear appeals with respect to restrictions of areas in which classes of industries etc are carried out or prescribed subject to certain safeguards under the EPA (Environment Protection Act).

1998 – Biomedical waste (Management and Handling) Rules is a legal binding on the health care institutions to streamline the process of proper handling of hospital waste such as segregation, disposal, collection and treatment.

Forest and wildlife

1927 – Indian Forest Act and Amendment 1984 is one of the many surviving colonial statutes. It was enacted to 'consolidate the law related to forest, the transit of forest produce and the duty leviable on timber and other forest produce.

1972 – Wildlife Protection Act, Rules 1973 and Amendment 1991 provides for the protection of birds and animals and for all matters that are connected to it whether it be their habitat or the waterhole or the forest that sustain them.

1980 – The Forest (Conservation) Act and Rules 1981 provides for the protection of and the conservation of the forests.

Water

1882 – The Easement Act allows private rights to use a resource i.e. groundwater, by viewing it as an attachment to the land. It also states that all surface water belongs to the state and is a state property.

1897– Indian Fisheries Act establishes two sets of penal offences whereby the government can sue any person who uses dynamite or other explosive substance in any way (whether coastal or inland) with intent to catch or destroy any fish or poisons fish in order to kill.

1956 – The River Boards Act enables the states to enroll the Central Government in setting up an Advisory River Board to resolve issues in inter state cooperation.

1970 – Merchant Shipping Act aims to deal with waste arising from ships along the coastal areas within a specified radius.

1974 – The Water (Prevention and Control of Pollution) Act establishes an institutional structure for preventing and abating water pollution. It establishes standards for water quality and effluent. Polluting industries must seek permission to discharge waste into effluent bodies. The Pollution Control Board (CPCB) was constituted under this act.

1977 – The Water (Prevention and Control of Pollution) Cess Act provides for the levy and collection of cess or a fees on water consuming industries and local authorities.

1978 – The Water (Prevention and Control of Pollution) Cess Rules contains the standard definitions and indicate the kind of and location of meters

that every consumer of water is required to affix.

1991 – Coastal Regulation Zone Notification puts regulations on various activities, including construction, are regulated. It gives some protection to the backwaters and estuaries.

Air

1948 – Factories Act and Amendment in 1987 was the first to express concern for the working environment of the workers. The amendment of 1987 has sharpened its environmental focus and expanded its application to hazardous processes.

1981 – Air (Prevention and Control of Pollution) Act provides for the control and abatement of air pollution. It entrusts the power of enforcing this act to the Central Pollution Control Board.

1982 – Air (Prevention and Control of Pollution) Rules defines the procedures of the meetings of the Boards and the powers entrusted on them.

1982 – Atomic Energy Act deals with the radioactive waste.

1987 – Air (Prevention and Control of Pollution) Amendment Act empowers the central and state pollution boards to meet with grave emergencies of air pollution.

1988 – Motor Vehicles Act states that all hazardous waste is to be properly packaged, labeled and transported.

Source: http://edugreen.teri.res.in/explore/laws.htm

Appendix 8

Land–use classification in India

1. **Forest**: Includes all lands classed as forests under any legal enactment dealing with forests or administered as forests.
2. **Area under Non-agricultural Uses**: Includes all lands occupied by buildings, roads and railways or under water, *e.g.* river, and canals and other lands used for non-agriculture purpose.
3. **Barren and un-cultivable land**: Includes all barren and un-cultivable land like mountains, desert etc.
4. **Permanent pastures and other grazing lands:** Includes all grazing lands where they are permanent pastures and meadows or not. Village common grazing land is included under this head.
5. **Land under miscellaneous tree crops and groves etc**: This includes all cultivable land, which is not included in 'Net Area Sown' but is put to some agricultural uses. Lands under Casuarina trees, thatching grasses, bamboo bushes, and other groves for fuel, etc which are not included under 'Orchards' are classified under this category.

6. **Culturable Wasteland:** This includes lands available for cultivation. Such lands may be either fallow or covered with shrubs or jungles, which are not put to any use. Land once cultivated but not cultivated for five years in succession should be include in this category at the end of the five years**.**
7. **Fallow lands other than current fallows**: This includes all lands, which were taken up for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five years.
8. **Current Fallows**: This represents cropped area, which are kept fallow during the current year. For example, if any seeding area is not cropped in the same year again, it may be treated as current fallows.
9. **Net Area Sown**: This represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once.

Agriculture land/Cultivable land/Culturable land = 5+6+7+8+9
Cultivated Land= 8+9
Reporting are of land utilization= 1 to 9