CHAPTER FIVE

Land and Soil

CHAPTER FIVE

LAND AND SOIL

5.1 On the basis of nine-fold land-use classification, the land use statistics is available for roughly 305 million hectares (mha) of land out of the 329 million hectares of the total geographic area which accounts for 93% of the total land.

5.2 The area under barren and uncultivable land is generally unsuitable for agriculture either because of topography or its inaccessibility. Instances are the desert areas in Rajasthan, the saline land in part of the Rann of Kutch in Gujarat, and the weed infected and ravine land in Madhya Pradesh. Recently, the area under non-agricultural land has increased due to increase in developmental activities; e.g. housing, transport system, irrigation, etc. About 22 mha are occupied by the housing, the industry and for other non-agricultural uses, 19.5 mha are snowbound and remote, leaving only 264 million hectare for agriculture, forestry, pasture and other biomass production. The net sown area increased from 119 mha in 1950-51 to 140 mha in 1970-71, mostly through reclamation of old fallow and cultivable wastelands and diversion of groves. Since 1970-71, the net area sown has remained almost the same at around 142 mha levels. The data shows that land use in the country, over the last five decades, has undergone drastic change. Land under agriculture has almost doubled, forest cover has dwindled to less than half, large tracts of fertile agriculture and forest land have been diverted for urbanization and settlements. Deforestation contributes to loss of precious top soil which amounts to about 35 percent of the global sediment load going to oceans even though water flowing through our rivers is only about five percent of the flow of rivers in the world.

Land Degradation

5.3 Land is degraded when it suffers a loss of intrinsic qualities, decline in its capabilities or loss in its productive capacity. Land degradation may be due to natural causes or human causes or it may be due to combination of both. Soil erosion is the major cause of land degradation.

Soil Erosion

5.4 Soil is the non-renewable natural resource which supports life on earth. It is estimated that one-sixth of the world's soils have already been degraded by water and wind erosion. This has two important consequences: the reduced ability of society to produce sufficient food due to loss of quality and depth of soils; and resulted in off-site pollution associated with erosion. These include siltation of dams, pollution of water-courses by agricultural chemicals and damage to property by soil-laden runoff. On-site issues of declining soil quality tend to be spatially dispersed occurring on many different soil types whereas off-site pollution issues tend to be locally concentrated.

5.5 Soil erosion problems are not confined to the Developing World. In the last two decades, there has been a growing appreciation of the threat to European soils as a result of intensification of agriculture, overgrazing and climate change. The threat is most apparent in the Mediterranean Region where the term "desertification" has been used to describe a series of inter-related

changes which include soil erosion. The EU-funded Mediterranean Desertification and Land Use (MEDALUS) project is currently addressing these latter issues for much of Southern Europe.

5.6 In India, about 130 mha of land (45% of total geographical area) is affected by serious soil erosion through ravine and gully, shifting cultivation, cultivated wastelands, sandy areas, deserts and water logging (Govt. of India, 1989).

5.7 Soil erosion by rain and river that takes place in hilly areas causes landslides and floods, while cutting trees for firewood, agricultural implements and timber, grazing by a large number of livestock, over and above, the carrying capacity of grass lands, traditional agricultural practices, construction of roads, indiscriminate (limestone) quarrying and other activities, have all led to the opening of hill-faces to heavy soil erosion. Wind erosion causes expansion of deserts, dust, storms, whirlwinds and destruction of crops, while moving sand covers the land and makes it sterile. Excessive soil erosion with consequent high rate of sedimentation in the reservoirs and decreased fertility has become serious environmental problems with disastrous economic consequences. Of the 16 rivers of world, which experience severe erosion and carry heavy sediment load, 3 rivers, namely; Ganges, Brahmaputra and Kosy occupy the 2nd, 3rd and 12th position, respectively.

5.8 Soil erosion results in huge loss of nutrients in suspension or solution, which are removed away from one place to another, thus causing depletion or enrichment of nutrients. Besides the loss of nutrients from the topsoil, there is also degradation through the creation of gullies and ravines, which makes the land unsuitable for agricultural production. Subsidence of the land in some areas and landslides in the hilly tracts are problems affecting highways, habitations and irrigation dams.

5.9 The use of pesticides above permissible limits enters the food chain, causing health hazards. A major concern particularly about chlorinated hydrocarbons like DDT is their persistence in soil.

5.10 Among fertilizers, the conversion of fertilizer-N to gaseous forms-ammonia (NH_3) and various oxides of Nitrogen leads to atmospheric pollution. Escape of fertilizer-N as ammonia gas is called ammonia volatilization. The presence of ammonia and sulphur dioxide may lead to acid rains which ultimately degrade the soil. Atmospheric ammonia contaminates water bodies, impairs visibility and causes corrosion. Nitrous oxide also contributes to global warming.

Mining

5.11 The activity of mining and quarrying covers underground and surface mines, quarries and wells and includes extraction of minerals and also all the supplemental activities such as dressing and benefaction of ores, crushing, screening, washing, cleaning, grading, milling floatation, melting floatation and other preparations carried out at the mine site which are needed to render the material marketable.

5.12 The mining activities in the country are governed by the Mineral Conservation Development Rules (MCDR), 1988. Every license holder of mining lease shall take all possible precautions for protection of environment and control of pollution while conducting prospecting, mining beneficiation or metallurgical operations in the area. Specific provisions for

proper removal and utilization of top soil, storage of over burden and waste rocks, reclamation and rehabilitation of lands, precautions against air pollution, noise and ground vibrations, restoration of flora, discharge of toxic liquid, control of surface subsidence have been provided under the MCDR. The Indian Bureau of Mines collects the statistics on all these aspects under the above rules.

TABLE 5.1.1 : LAND USE CLASSIFICATION IN INDIA

(Million hectares)

Classification	1950-51	1960-61	1970-71	1980-81	1990-91	1993-94P	1994-95P	1995-96P	1996-97P	1997-98P	1998-99P	1999-00P
1	2	3	4	5	6	8	9	10	11	12	13	14
I. Geographical Area	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**	**328.73**
II. Reporting Area for Land Utilisation Statistics (1 to 5)	**284.32**	**298.46**	**303.76**	**304.15**	**304.86**	**304.86**	**304.83**	**304.88**	**304.88**	**305.79**	**306.05**	**306.05**
1. Forests	40.48	54.05	63.91	67.47	67.80	68.31	68.60	68.82	68.75	69.01	68.98	69.02
2. Not Available for Cultivation (a+b)	47.52	50.75	44.64	39.62	40.48	40.92	41.02	41.37	41.54	42.14	42.31	42.41
(a) Non Agricultural Uses	9.36	14.84	16.48	19.66	21.09	22.21	22.56	22.36	22.45	22.7	22.8	22.97
(b) Barren and Unculturable Land	38.16	35.91	28.16	19.96	19.39	18.71	18.46	19.01	19.09	19.44	19.51	19.44
3. Other Uncultivated Land (excluding fallow land (a+b+c)	49.45	37.64	35.06	32.31	30.22	29.08	29.03	28.64	28.55	28.54	28.66	28.49
(a)Permanent Pastures and Other Grazing Land	6.68	13.97	13.26	11.97	11.40	10.96	11.03	11.06	11.04	11.05	11.13	11.04
(b) Land Under Miscellaneous Tree Crops and Groves not Included in Net Area Sown	19.83	4.46	4.30	3.60	3.82	3.71	3.73	3.48	3.57	3.62	3.63	3.62
(c) Culturable Wasteland	22.94	19.21	17.50	16.74	15.00	14.41	14.26	14.10	13.95	13.88	13.90	13.83
4. Fallow Land (a+b)	28.12	22.82	19.88	24.75	23.36	24.21	23.22	23.85	23.22	24.01	23.52	24.91
(a) Fallow Land Other Than Current Fallows	17.44	11.18	8.76	9.92	9.66	9.83	9.97	10.02	9.89	9.75	9.93	10.11
(b) Current Fallows	10.68	11.64	11.12	14.83	13.70	14.38	13.25	13.83	13.33	14.26	13.59	14.8
5. Net Area Sown (6-7)	118.75	133.20	140.27	140.00	143.00	142.34	142.96	142.20	142.81	142.08	142.58	141.23
6. Gross Cropped Area	131.89	152.77	165.79	172.63	185.74	186.58	188.05	187.47	189.59	190.57	193.03	189.74
7. Area Sown More Than Once	13.14	19.57	25.52	32.63	42.74	44.24	45.09	45.27	46.78	48.49	50.45	48.51
8. Cropping Intensity*	111.1	114.7	118.2	123.3	129.9	131.1	131.5	131.8	132.8	134.1	135.4	134.30
III. Net Irrigated Area	**20.85**	**24.66**	**31.10**	**38.72**	**47.78**	**51.34**	**53.00**	**53.40**	**55.05**	**54.98**	**57.08**	**57.24**
IV. Gross Irrigated Area	**22.56**	**27.98**	**38.19**	**49.78**	**62.47**	**68.25**	**70.65**	**71.35**	**73.25**	**73**	**75.95**	**76.34**

Source : Department of Agriculture & Cooperation, Ministry of Agriculture.

P : Provisional

* : Cropping Intensity is obtained by dividing the gross cropped area by the net area sown.

Out of total geographic area of 329 mha, only 306 mha is the reporting area (the rest being unadministered for various reasons). About 23 mha are occupied for non-agricultural uses (housing, industry and others), 19 mha are snow bound and remote leaving only 263 mha for agriculture, forestry, pasture and other bio-mass production. The net sown area increased from 119 mha in 1950-51 to 140 mha in 1970-71 mostly through reclamation of old fallow and culturable wastelands and diversion of groves. Net area sown has increased only marginally from 140 mha in 1970-71 to 141 mha in 1999-2000, indicating that the private efforts have peaked and the intervention of the Government is required for further land reclamation.

CHART 10 : LAND USE CLASSIFICATION IN INDIA

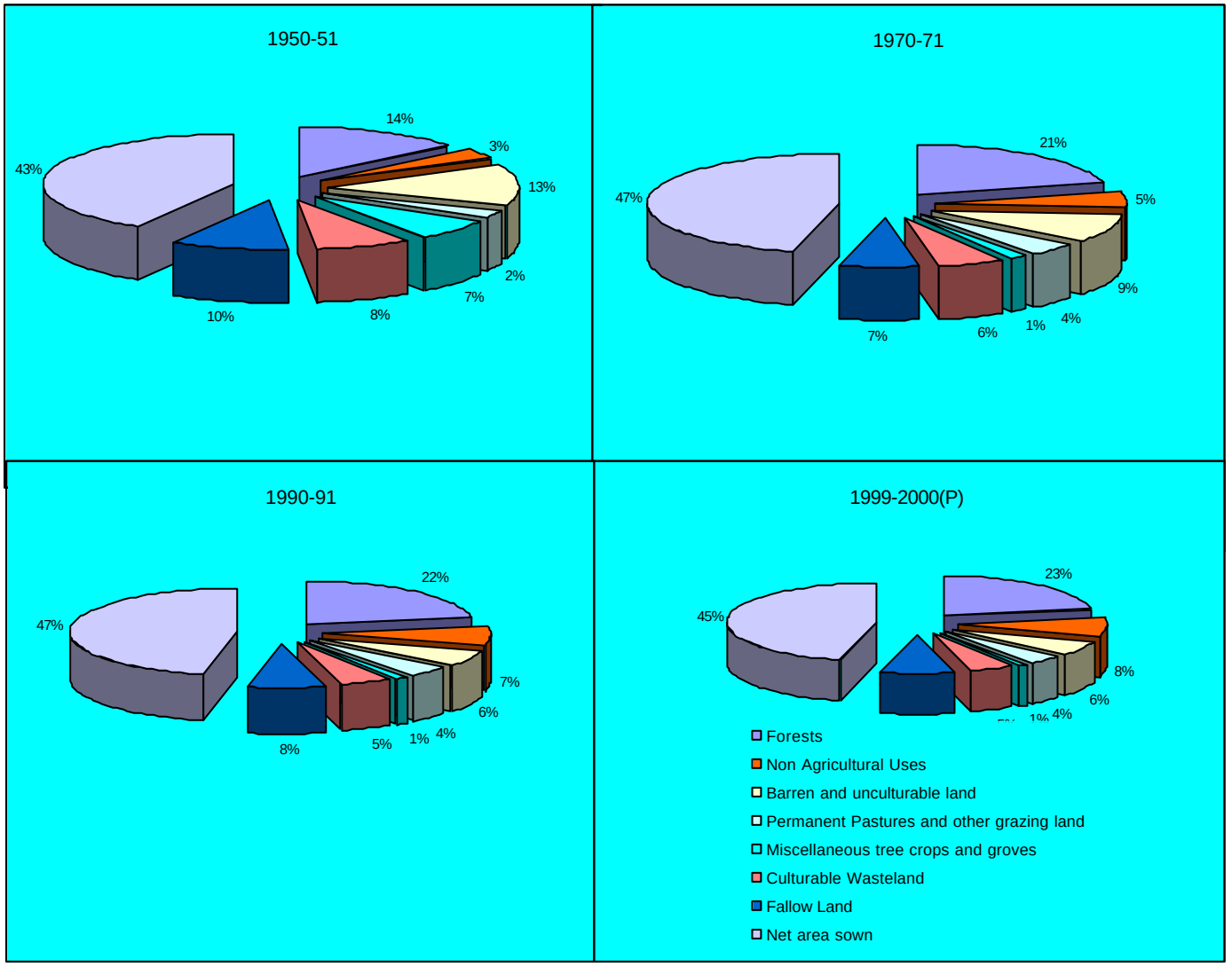

TABLE 5.1.2 : SELECTED CATEGORIES OF LAND USE CLASSIFICATION

(Million hectare)

Sl. No.	Years	Net Sown Area (A)	Gross Sown Area (B)	Area Sown More Than Once (B-A)	Net Irrigated Area (C)	Gross Irrigated Area (D)	Area Irrigated More Than Once (D-C)
1	2	3	4	5	6	7	8
1	1950-51	118.75	131.89	13.14	20.85	22.56	1.71
2	1960-61	133.20	152.77	19.57	24.66	27.98	3.32
3	1970-71	140.27	165.79	25.52	31.10	38.19	7.09
4	1980-81	140.00	172.63	32.63	38.72	49.78	11.06
5	1985-86	140.90	178.46	37.56	41.86	54.28	12.42
6	1990-91	143.00	185.74	42.74	47.78	62.47	14.69
7	1991-92	141.63	182.24	40.61	49.87	65.68	15.81
8	1992-93	142.72	185.70	42.98	50.30	66.76	16.46
9	1993-94P	142.34	186.58	44.24	51.34	68.25	16.91
10	1994-95P	142.96	188.05	45.09	53.00	70.65	17.65
11	1995-96P	142.20	187.47	45.27	53.40	71.35	17.95
12	1996-97P	142.81	189.59	46.78	55.05	73.25	18.20
13	1997-98P	142.08	190.57	48.49	54.98	73.00	18.02
14	1998-99P	142.58	193.03	50.45	57.08	75.95	18.87
15	1999-2000P	141.23	189.74	48.51	57.24	76.34	19.10

Source : Department of Agriculture & Cooperation, Ministry of Agriculture.
P : Provisional

The net area under irrigation has increased from 21 mha in 1950-51 to 57.24 mha in 1999-2000. The development in irrigation potential is largely due to the efforts of the Govt. in developing irrigation facilities through major/medium and minor irrigation projects.

Ground water sources contributed nearly 51% of the total area irrigated in 1991-92. There has been a drastic increase in the utilization of ground water since the 1960's due to rural electrification. As a result our ground water resources are getting depleted .Surface water sources, rivers, canals, tanks and rivulets have also been affected considerably due to the degradation and siltation of riverbeds.

TABLE 5.1.3 : STATE-WISE INFORMATION ON PRIORITY WATERSHEDS OF RIVER VALLEY PROJECTS/FLOOD PRONE RIVER CATCHMENTS

(Area in Lakh hectare)

Sl. No.	State/UT	Total Area	Surveyed Area	Total SWS/MWS		Very High		Area	High		Area	Total Priority SWS/MWS		Area
				Full	Partly	Full	Partly		Full	Partly		Full	Partly	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	State													
1	Andhra Pradesh	57.55	57.55	1587.00	21.00	159.00		4.62	338.00		10.79	497.00		15.41
2	Arunachal Pradesh	0.00	0.00	--		--		0.00	--		0.00	--		0.00
3	Assam	1.53	1.53	66.00	2.00	21.00	2.00	0.52	14.00		0.34	35.00	2.00	0.86
4	Bihar	83.59	83.59	3103.00	13.00	321.00	1.00	7.90	656.00	8.00	16.25	977.00	9.00	24.15
5	Goa	0.00	0.00	--		--		0.00	--		0.00	--		0.00
6	Gujarat	5.74	5.74	232.00	25.00	54.00	5.00	0.88	55.00	6.00	1.31	109.00	11.00	2.19
7	Haryana	18.13	18.13	624.00		66.00		1.58	55.00		1.49	121.00		3.07
8	Himachal Pradesh	28.96	28.96	1719.00	2.00	497.00	2.00	8.85	404.00		6.97	901.00	2.00	15.82
9	Jammu & Kashmir	2.76	2.76	338.00	2.00	36.00	2.00	0.69	25.00		0.48	61.00	2.00	1.17
10	Karnataka	103.90	103.90	3148.00	66.00	318.00		11.83	594.00	2.00	14.15	912.00	2.00	25.98
11	Kerala	2.86	2.86	106.00	11.00	25.00		0.48	28.00		1.10	53.00		1.58
12	Madhya Pradesh	287.67	261.39	9400.00	153.00	1321.00	15.00	30.68	1742.00	38.00	44.02	3063.00	53.00	74.70
13	Maharashtra	201.71	197.08	5201.00	49.00	449.00	3.00	16.33	774.00	5.00	29.42	1223.00	8.00	45.75
14	Manipur	0.00	0.00	--		--		0.00	--		0.00	--		0.00
15	Meghalaya	0.00	0.00	--		--		0.00	--		0.00	--		0.00
16	Mizoram	0.05	0.05	--	2.00	--	2.00	0.05	--		0.00	--	2.00	0.05
17	Nagaland	0.00	0.00	--		--		0.00	--		0.00	--		0.00
18	Orissa	30.37	27.39	997.00	41.00	134.00	5.00	3.20	204.00	5.00	5.48	338.00	10.00	8.68
19	Punjab	10.32	10.32	326.00		12.00		0.17	12.00		0.35	24.00		0.52
20	Rajasthan	51.49	35.71	1402.00	107.00	185.00	10.00	4.23	222.00	28.00	6.13	407.00	38.00	10.36
21	Sikkim	9.68	4.09	97.00		39.00		1.74	12.00		0.40	51.00		2.14
22	Tamil Nadu	5.38	5.38	313.00	1.00	41.00		0.53	43.00		0.56	84.00		1.09
23	Tripura	0.45	0.45	34.00		7.00		0.09	18.00		0.26	25.00		0.35
24	Uttar Pradesh	65.39	62.28	2592.00		458.00		8.59	737.00		16.16	1195.00		24.75
25	West Bengal	19.74	19.74	788.00	2.00	53.00		1.42	105.00	1.00	2.65	158.00	1.00	4.07
	UT													
1	Andaman & Nicobar	0.00	0.00	--		--		0.00	--		0.00	6.00		0.00
2	Chandigarh	0.10	0.10	11.00		6.00		0.04	--		0.00	2.00		0.04
3	Dadra & Nagar Haveli	0.13	0.13	4.00	12.00	2.00	4.00	0.04	--	2.00	0.03	--	6.00	0.07
4	Daman & Diu	0.00	0.00	--		--		0.00	--		0.08	12.00		0.00
5	Delhi	1.06	1.06	54.00		8.00		0.09	4.00		0.00	--		0.17
6	Lakshadweep	0.00	0.00	--		--		0.00	--		0.00	--		0.00
7	Pondicherry	0.00	0.00	--		--		0.00	--		0.00	--		0.00
	Total	**988.56**	**930.19**	**32142.00**	**509.00**	**4212.00**	**51.00**	**104.55**	**6042.00**	**95.00**	**158.42**	**10254.00**	**146.00**	**262.97**

Source : All India Soil and Land Use Survey, Ministry of Agriculture.

SWS : Sub Watershed MWS : Micro Watershed (P) : Partly

TABLE 5.1.4 : STATEWISE INFORMATION ON SOILS OF PRIORITY WATERSHEDS OF RIVER VALLEY PROJECTS/ FLOODPRONE RIVER CATCHMENTS

(Area in lakh hectares)

Sl. No.	State/UT	Catchment Area	Surveyed Area	Priority Area	Subwatershed Area On Which Reports Available
1	2	3	4	5	6
	State				
1	Andhra Pradesh	57.55	57.55	15.41	7.27
2	Arunachal Pradesh	0.00	0.00	0.00	0.00
3	Assam	1.53	1.53	0.86	0.24
4	Bihar	83.59	83.59	24.15	11.34
5	Goa	0.00	0.00	0.00	0.00
6	Gujarat	5.74	5.74	2.19	1.88
7	Haryana	18.13	18.13	3.07	0.22
8	Himachal Pradesh	28.96	28.96	15.82	4.85
9	Jammu & Kashmir	2.76	2.76	1.17	0.16
10	Karnataka	103.90	103.90	25.98	12.19
11	Kerala	2.86	2.86	1.58	0.88
12	Madhya Pradesh	287.67	261.39	74.70	27.78
13	Maharashtra	201.71	197.08	45.75	14.82
14	Manipur	0.00	0.00	0.00	0.00
15	Meghalaya	0.00	0.00	0.00	0.00
16	Mizoram	0.05	0.05	0.05	0.00
17	Nagaland	0.00	0.00	0.00	0.00
18	Orissa	30.37	27.39	8.68	10.67
19	Punjab	10.32	10.32	0.52	0.01
20	Rajasthan	51.49	35.71	10.36	4.60
21	Sikkim	9.68	4.09	2.14	1.10
22	Tamil Nadu	5.38	5.38	1.09	1.19
23	Tripura	0.45	0.45	0.35	0.04
24	Uttar Pradesh	65.39	62.28	24.75	3.90
25	West Bengal	19.74	19.74	4.07	7.10
	UT				
1	Andaman & Nicobar	0.00	0.00	0.00	0.00
2	Chandigarh	0.10	0.10	0.04	0.00
3	Dadra & Nagar Haveli	0.13	0.13	0.07	0.10
4	Daman & Diu	0.00	0.00	--	--
5	Delhi	1.06	1.06	0.17	0.00
6	Lakshadweep	0.00	0.00	0.00	0.00
7	Pondicherry	0.00	0.00	0.00	0.00
Total		**988.56**	**930.19**	**262.97**	**110.34**

Source: All India Soil and Land Use Survey, Ministry of Agriculture

TABLE 5.2.1 : USE OF AGRICULTURAL INPUTS

Sl. No.	Programme	Unit	1980-81	1990-91	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
1	2	3	4	5	6	7	8	9	10	11
1.	Seeds									
	I. Production of Breeder Seeds	Thousand Quintals	5.27	33.89	40.11	43.36	46.03	46.13	38.99	51.13
	II. Production of Foundation Seeds	Lakh Quintals	--	3.35	4.73	4.76	5.76	6.84	6.75	4.66
	III. Distribution of Certified/Quality Seeds	Lakh Quintals	25.01	57.10	65.86	69.90	73.27	78.79	83.00	87.98
2.	Consumption of Chemical Fertilizers (I+II+III)	Lakh Tonnes	55.16	125.46	135.64	138.77	143.08	161.88	167.98	180.69
		Kg./ha	31.83	67.49	72.13	74.02	75.47	84.86	88.05	94.72
	I. Nitrogenous(N)	Lakh Tonnes	36.78	79.97	95.07	98.23	103.02	109.02	113.54	115.92
	II. Phosphatic(P)	Lakh Tonnes	12.14	32.21	29.32	28.98	29.77	39.14	41.12	47.99
	III. Potassic(K)	Lakh Tonnes	6.24	13.28	11.25	11.56	10.29	13.72	13.32	16.78
3.	Consumption of Pesticides(Technical Grade Material)	Thousand Tonnes	45.00	75.00	61.36	61.26	56.11	52.24	49.16	46.20
4.	Area under High Yielding Varieties	Million ha	43.08	64.98	71.19	72.29	76.40	76.00	N.A.	N.A.
	Paddy	Million ha	18.23	27.39	31.00	31.40	33.40	32.20	N.A.	N.A.
	Wheat	Million ha	16.10	20.97	23.20	23.10	23.70	23.00	N.A.	N.A.
	Jowar	Million ha	3.50	7.06	7.10	7.49	8.30	9.00	N.A.	N.A.
	Bajra	Million ha	3.64	5.70	5.40	5.50	6.10	7.00	N.A.	N.A.
	Maize	Million ha	1.60	2.61	3.39	3.60	3.80	3.60	N.A.	N.A.
	Ragi	Million ha	--	1.25	1.10	1.20	1.10	1.20	N.A.	N.A.
5.	Area covered under Soil Conservation (Cummulative)	Million ha	24.37	34.90	38.20	39.30	39.40*	39.40*	39.44*	39.4*
6.	Irrigated Area	Million ha	54.10	70.80	77.5	79.3	80.70	81.80	83.60	N.A.
	Major & Medium	Million ha	22.70	26.00	27.50	27.90	28.40	28.90	30.10	N.A.
	Minor @	Million ha	31.40	44.80	50.20	51.40	52.30	52.90	53.50	N.A.

Source : Agricultural Statistics at a Glance, 2003, Department of Agriculture & Cooperation, Ministry of Agriculture

N.A. : Not available (E) : Estimated
@ : The figures for minor irrigation indicate the net benefit after allowing for seepage.
* : excluding state sector soil conservation programme

TABLE 5.2.2 : PERFORMANCE OF CROP PRODUCTION

Sl. No.	Crops	Production (Million Tonne)									
		1991-92	1992-93	1993-94	1994-95	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02 $
1	2	3	4	5	6	7	8	9	10	11	12
1	Rice	74.68	72.86	80.30	81.81	81.73	82.54	86.08	89.68	87.70	93.08
2	Wheat	55.69	57.21	59.84	65.77	69.35	66.35	71.29	76.37	69.68	71.81
3	Coarse Cereals	25.99	36.59	30.82	29.88	34.11	30.40	31.33	30.33	31.08	33.94
4	Total Cereals	156.36	166.67	170.96	177.46	185.19	179.29	188.70	196.38	188.46	198.84
5	Total Pulses	12.02	12.82	13.30	14.04	14.25	12.97	14.91	13.42	11.08	13.19
6	Total Foodgrains	168.38	179.48	184.26	191.50	199.44	192.26	203.61	209.80	199.54	212.03
7	Sugarcane	254.00	228.03	229.66	275.54	277.56	279.54	29.57	299.32	295.96	300.10
8	Total Oilseeds	18.60	20.11	21.50	21.34	24.38	21.32	24.75	20.72	18.44	20.46
9	Cotton @	9.71	11.40	10.74	11.89	14.23	10.85	12.29	11.53	9.52	10.09
10	Jute & Mesta #	10.29	8.59	8.43	9.08	11.13	11.02	9.81	10.56	10.56	11.64
11	Non-Foodgrains *	158.80	164.00	169.50	180.90	200.90	181.80	200.20	189.00	177.90	186.00
	All Crops *	145.50	151.60	157.30	165.20	175.70	165.40	178.20	176.90	167.30	177.10

Source : Department of Agriculture & Cooperation, Ministry of Agriculture

$: Final Estimate for 2001-2002

@ : Production in million bales of 170 kg. each

: Production in million bales of 180 kg. each

* : Index number base : 1981-82 = 100

The crop yields have increased greatly in India over the past 20-25 years. Most of these increases have been due to the development of crop varieties which respond to fertilizers. The different types of cropping systems practised in traditional agriculture have given way to systems involving only a few crops which are highly nutrient depleting but high yielding. The legumes, grasses, and millets which were regular components of cropping systems in Indian agriculture have largely been phased out in highly productive areas due to poor economic returns and replaced by high yielding rice, wheat, sugarcane, etc. As a result, the water level is receding at an alarming rate. This has created the problems of soil erosion and the destruction and disturbances to wild life habitats.

TABLE 5.2.3 : AREA UNDER PRINCIPAL CROPS

(Million hectare)

Sl. No.	Crops	1970-71	1980-81	1990-91	1994-95	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
1	2	3	4	5	6	7	8	9	10	11	12
1	Rice	37.6	40.2	42.7	42.8	43.4	43.4	44.8	45.2	44.7	44.6
2	Wheat	18.2	22.3	24.2	25.8	25.9	26.7	27.5	27.5	25.7	25.9
3	Pulses	22.5	22.5	24.7	23.0	22.4	22.9	23.5	21.1	20.3	21.7
4	Foodgrains	124.3	126.7	127.8	123.9	123.6	123.8	125.2	123.1	121.0	121.9
5	Cotton	7.6	7.8	7.4	7.9	9.1	8.9	9.3	8.7	8.5	9.1
6	Jute & Mesta	1.1	1.3	1.0	0.9	1.1	1.1	1.0	1.0	1.0	1.0
7	Sugarcane	2.6	2.7	3.7	3.9	4.2	3.9	4.1	4.2	4.3	4.4
8	Tobacco	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.3	N.A.
9	Oilseeds	16.6	17.6	24.1	25.3	26.3	26.1	26.2	24.3	22.8	22.8

Source : Department of Agriculture and Cooperation, Ministry of Agricuture

TABLE 5.2.4 : CONSUMPTION OF TECHNICAL GRADE PESTICIDES

(Tonnes)

Sl. No.	Names	1971	1994-95 *
1	Insecticides	22013	51755
2	Fungicides	2067	22895
3	Herbicides	30	7620
4	Rodenticides	195	1860
5	Others	NA	900
	Total	**24305**	**85030**

Source : Teri Energy Data Directory & Yearbook, 1996-97
* : Projected

Most part of the applied pesticide, irrespective of crop, applicator or the formulation used, ultimately finds its way into the soil. Before pesticides are completely inactivated, they may adversely affect the functioning of non-target microbes and other forms of life inhabiting the soil. They may also be taken up by the plants or get translocated in the aquatic system by leaching or run-off, thus contaminating the plankton, fish, invertebrate and other forms of life using their water.

Pesticide residues in food items have been a matter of considerable concern. Even small quantities of these residues ingested daily along with food can build up high levels in the body fat. The long term effects of these residues in the human body include carcinogenecity, reduced life span and fertility, increased cholesterol, high infant mortality and varied metabolic and genetic disorders.

TABLE 5.2.5(a) : CAPACITY AND PRODUCTION IN THE CHEMICAL INDUSTRY (INSECTICIDES) IN INDIA

(Thousand Tonnes)

Sl. No.	Products	1998-99		1999-2000		2000-2001		2001-2002	
		Inst. Cap.	Production	Inst. Cap.	Production	Inst. Cap.	Production	Inst. Cap.	Production
1	2	3	4	5	6	7	8	9	10
	Insecticides								
1	B.H.C.	37.00	0.00	0.00	0.00	*	*	*	*
2	D.D.T.	6.30	3.40	6.30	3.60	6.34	3.80	6.34	3.51
3	Malathion	9.90	5.20	9.50	5.90	9.45	5.90	9.45	5.60
4	Parathion (Methyl)	4.50	2.30	4.00	1.90	4.00	1.98	4.00	2.06
5	Dimethoate	3.60	1.60	0.80	1.40	0.81	1.50	0.81	0.85
6	D.D.V.P.	4.50	2.50	3.90	2.50	3.92	2.60	3.92	2.83
7	Quinalphos	5.60	3.40	5.60	2.20	5.58	2.60	5.58	2.06
8	Monocrotophos	17.10	10.20	16.20	9.50	16.15	8.30	16.15	6.71
9	Phosphamidon	4.70	3.00	5.70	3.20	5.70	3.50	5.70	3.13
10	Phorate	5.30	3.80	7.50	6.10	7.55	6.10	7.55	4.72
11	Ethion	1.90	1.80	5.10	3.40	5.08	3.50	5.08	3.84
12	Endosulphan	10.10	8.40	10.10	8.30	10.10	8.50	10.10	4.49
13	Fenvalerate	2.30	1.80	2.10	1.40	2.13	1.60	2.13	1.07
14	Cypermethrin	3.00	3.20	4.60	3.70	4.64	4.40	4.64	5.06
15	Anilophos	0.60	1.00	0.60	0.90	0.60	0.80	0.60	0.60
16	Acephate	4.80	4.80	4.80	2.90	4.80	3.10	4.80	4.01
17	Chlorpyriphos	10.30	7.20	10.30	7.50	10.34	8.03	10.34	6.62
18	Phosalone	1.00	0.90	1.00	0.50	1.00	0.60	1.00	0.44
19	Metasystox	*	0.80	*	0.70	*	0.60	*	0.66
20	Abate	*	0.20	*	0.20	*	0.30	*	NA
21	Fenthion	*	0.20	*	0.20	*	0.20	*	0.07
22	Triazaphos	*	0.80	*	0.80	*	0.80	*	1.51
23	Lindane	1.20	0.90	1.30	1.10	1.28	0.50	1.28	0.27
24	Temephos	0.10	0.02	0.10	NEG	0.10	0.20	0.10	0.14
25	Deltamethrin	*	0.20	0.25	0.10	0.25	0.10	0.25	0.10
26	Alphamethrin	*	0.10	0.40	0.40	0.36	0.10	0.36	0.30
Total		**133.80**	**67.72**	**100.15**	**64.80**	**100.15**	**69.61**	**100.15**	**60.64**

Source : Department of Chemicals & Petrochemical, Ministry of Chemicals & Fertilizers

***** : Not available

TABLE 5.2.5(b) : CAPACITY AND PRODUCTION IN THE CHEMICAL INDUSTRY IN INDIA (FUNGICIDES, HERBICIDES, WEEDICIDES, RODENTICIDES, FUMIGENTS)

(Thousand Tonnes)

Sl. No.	Products	1998-99		1999-2000		2000-2001		2001-2002	
		Inst. Cap.	Production	Inst. Cap.	Production	Inst. Cap.	Production	Inst. Cap.	Production
1	2	3	4	5	6	7	8	9	10
I	**Fungicides**	**16.00**	**11.40**	**14.80**	**12.54**	**14.80**	**12.14**	**14.60**	**13.54**
1	Captan & Captafol	1.80	1.00	1.80	1.10	1.8	1.40	1.80	1.18
2	Ziram	0.40	0.20	0.40	0.00	0.4	0.10	0.38	0.00
3	Thiram	1.40	0.90	0.20	0.20	0.2	0.00	N/A	N/A
4	Carbendazim (Bavistin)	1.20	0.80	1.20	0.90	1.2	0.70	1.22	0.67
5	Calixin	0.20	0.20	0.20	0.04	0.2	0.04	0.20	0.07
6	Mancozeb	11.00	8.30	11.00	10.30	11.0	9.90	11.00	11.63
7	Copperoxychloride	N/A	N/A	N/A	N/A	1.5	0.00	1.5	0.02
II	**Herbicides**	**4.80**	**2.80**	**3.80**	**2.00**	**4.30**	**2.02**	**4.30**	**0.51**
1	2, 4-D	2.20	2.10	2.90	1.30	2.9	1.3	2.9	0.20
2	Butachlor	2.60	0.70	0.90	0.70	0.9	0.22	0.9	0.31
3	Metamitron	N/A	N/A	N/A	N/A	0.5	0.50	N/A	N/A
III	**Weedicides**	**11.20**	**7.13**	**15.04**	**8.00**	**14.98**	**5.75**	**14.68**	**5.52**
1	Isoproturon	7.00	5.50	8.50	4.60	8.54	3.75	8.54	3.78
2	ODUC	0.30	0.30	0.30	0.00	0.30	0.00		
3	Glyphosate	1.80	1.30	1.80	1.70	1.80	0.67	1.80	0.41
4	Paraquat	2.00	0.00	4.00	1.40	4.00	1.24	4.00	1.00
5	Atrazine	0.00	0.00	0.04	0.10	0.04	0.01	0.04	0.20
6	Diuron	0.10	0.03	0.10	0.00	N/A	0.02	N/A	0.00
7	Fluchloralin	N/A	0.00	0.30	0.20	0.30	0.05	0.30	0.13
IV	**Rodenticides**	**0.90**	**0.60**	**0.90**	**0.50**	**0.86**	**0.59**	**0.86**	**0.34**
1	Zinc Phosphide	0.90	0.60	0.90	0.50	0.86	0.59	0.86	0.34
V	**Fumigants**	**2.70**	**2.20**	**2.75**	**3.02**	**2.75**	**2.63**	**2.75**	**2.33**
1	Aluminium Phosphide	2.30	2.00	2.30	1.80	2.30	2.46	2.30	2.18
2	Methyl Bromide	0.30	0.10	0.30	0.10	0.30	0.06	0.30	0.04
3	Dicofol	0.10	0.10	0.15	1.12	0.15	0.11	0.15	0.11

Source : Department of Chemicals & Petrochemical, Ministry of Chemicals & Fertilizers

N/A : Not Available

TABLE 5.2.6 : STATE-WISE CONSUMPTION OF PESTICIDES

(MT's Technical Grade)

Sl. No.	Name of State/ U.T.s	1995-96	1996-97	1997-98	1998-99	1999-00
1	2	3	4	5	6	7
1	Andhra Pradesh	10957	8702	7298	4741	4054
2	Assam	316	300	284	260	260
3	Arunachal Pradesh	22	20	18	18	17
4	Bihar	1383	1039	1150	834	832
5	Gujarat	4560	4545	4642	4803	3646
6	Goa	4	2	2	4	4
7	Haryana	5100	5040	5045	5035	5025
8	Himachal Pradesh	300	300	200	276	385
9	Jammu & Kashmir	108	63	78	75	26
10	Karnataka	3924	3665	2962	2600	2484
11	Kerala	1280	1141	602	1161	1069
12	Madhya Pradesh	1748	1159	1641	1643	1528
13	Maharashtra	5097	4567	3649	3468	3614
14	Manipur	41	31	20	31	21
15	Meghalaya	20	20	8	9	8
16	Mizoram	21	18	17	16	19
17	Nagaland	9	9	9	9	10
18	Orissa	1293	885	924	942	998
19	Punjab	7200	7300	7150	6760	6972
20	Rajasthan	3210	3075	3211	3465	2547
21	Sikkim	26	16	16	15	N.A.
22	Tamil Nadu	2080	1851	1809	1730	1685
23	Tripura	25	22	19	16	17
24	Uttar Pradesh	8110	7859	7444	7419	7459
25	West Bengal	4213	4291	3882	3678	3370
26	Andaman & Nicobar Islands	7	9	4	5	5
27	Chandigarh	3	3	3	3	4
28	Delhi	76	61	65	64	62
29	Dadra & Nagar Haveli	7	4	4	4	2
30	Daman and Diu	1	1	1	1	1
31	Lakshadweep	1	1	1	1	1
32	Pondicherry	118	115	81	71	70
All-India		**61260**	**56114**	**52239**	**49157**	**46195**

Source : Department of Chemical and Petrochemicals, Ministry of Chemicals & Fertilizers

TABLE 5.2.7 : CONSUMPTION OF CHEMICAL FERTILIZERS

(Thousand Tonnes)

Sl. No.	Year	Nitrogen (N)	Phosphate (P_2O_5)	Potash (K_2O)	Total
1	2	3	4	5	6
1	1960-61	210.0	53.1	29.0	292.1
2	1970-71	1487.0	462.0	228.0	2177.0
3	1980-81	3678.1	1213.6	623.9	5515.6
4	1990-91	7997.2	3221.0	1328.0	12546.2
5	1991-92	8046.3	3321.2	1360.5	12728.0
6	1992-93	8426.8	2843.8	883.9	12154.5
7	1993-94	8788.3	2669.3	908.4	12366.0
8	1994-95	9507.1	2931.7	1124.7	13563.5
9	1995-96	9822.8	2897.5	1155.8	13876.1
10	1996-97	10301.7	2976.8	1029.6	14308.1
11	1997-98	10901.7	3913.6	1372.5	16187.8
12	1998-99	11353.8	4112.2	1331.5	16797.5
13	1999-2000(P)	11593.0	4799.0	1678.0	18070.0
14	2000-01(P)	10920.0	4215.0	1567.0	16702.0
15	2001-02(P)	12197.0	5198.0	1911.0	19306.0

Source :Department of Chemicals and Petrochemicals, Ministry of Chemicals & Fertilizers
P : Provisional

TABLE 5.2.8 : INSECTICIDE LEVEL IN SOIL

Sl. No.	Location	Year	No. of Samples		Insecticide Detected	Residue (PPM)
			Analysed	Contaminated		
1	2	3	4	5	6	7
1	Uttar Pradesh	1966	138	120	DDT	0.67-15
2	Punjab	1978	108	91	DDT	0.17-1.63
					HCH	0.5
		1979	12	12	DDT	0.036-.0.08
					HCH	0.032-0.32
		1980	16	12	DDT	0.02-0.09
					HCH	0.02-0.05
3	Karnataka	1973	----	----	HCH	0.125
4	Delhi	1979	50	49	DDT	0.08-4.88
		1981	----	----	DDT	0.01-2.61
		1986	50	50	DDT	0-2.6

Source : State of the Environment, 1995

TABLE 5.2.9 : INSECTICIDE LEVEL IN WATER

Location	Year	No. of Samples		Insecticide	Residue	
		Analysed	Detected	Detected	Water	Sediments
1	2	3	4	5	6	7
Yamuna River						
Delhi						
Upstream	1979	12	12	DDT	0.1-0.528	0.007-1.121
Downstream	1979	9	9	DDT	0.063-0.404	0.010-0.258
Wazirabad						
Upstream	1979	14	14	DDT	0.062-0.639	0.017-1.121
Downstream	1979	15	15	DDT	0.083-3.416	0.012-1.326
Ujjain	1989	--	--	HCH	2.720	--
				DDT	0.219	--
				ALABIN	5.000	--
Kala	1989	--	--	HCH	.0154-1.412	--
	1989	--	--	HCH	0.166	--
				DDT	0.166	--

Source : State of the Environment, 1995

TABLE 5.3.1 : FREQUENTLY OCCURRING NATURAL DISASTERS IN INDIA

Sl. No.	Type	Location/ Area	Affected Population (in Million)
1	2	3	4
1	Cyclones	Entire 5700 km long coastline of Southern, Peninsular India covering 9 States viz Gujarat, Maharashtra,Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal and Union Territory of Pondicherry besides Islands of Lakshadweep and Andaman and Nicobar	10
2	Floods	8 major river valleys spread over 40 million hectares of area in the entire country	260
3	Drought	About 68% of total sown area and 16% of total area of the country spread in 14 States of Andhra Pradesh, Bihar, Gujarat, Haryana, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal & Himachal Pradesh covering a total of 116 districts and 746 blocks	86
4	Earthquake	56% of the total area of the countrysusceptible to seismic disturbances	400
5	Landslide	Entire sub Himalayan region and Western Ghats	10
6	Avalanche	Many parts of the Himalaya	1
7	Fires	States of Bihar, West Bengal, Orissa and north eastern States	140

Source : India: State of the Environment, 2001

India is prone to natural disasters. Due to its locational and geographical features, it is vulnerable to a number of natural hazards like cyclones, droughts, floods, earthquakes, fires, landslides and avalanches.

Natural disasters result in heavy economic losses, apart from the loss of human life and the hardship inflicted on the survivors. On an average, atleast one major disaster hits India every year, causing irrepairable damage to life and property.

TABLE 5.3.2 : MAJOR EARTHQUAKES IN INDIA

Sl. No.	Date	Lattitude (Degree N)	Longitude (Degree E)	Magnitude	Yield in Mega/ Others at Source	Region	Remarks
1	2	3	4	5	6	7	8
1	16.06.1819	24.00	70.00	8.0	12.59(0.62)	Kutch	About 2000 people killed
2	12.06.1897	25.00	92.00	8.7	63.1	Assam	One of the greatest earthquake of historical time Shillong city was razed to the ground 1542 killed.
3	04.04.1905	32.30	76.25	8.0	12.59(0.62)	Kangra	20000 lives lost
4	15.01.1934	26.60	86.80	8.3	25.12(1.25)	India-Nepal Border	Most severe in Indian history, More than 10000 killed
6	26.06.1941	12.40	92.50	8.1	15.85(0.79)	Andaman Islands	Flooding in port Blair
7	15.08.1950	28.46	96.66	8.5	39.81(1.99)	Assam	532 people killed
8	06.08.1988	25.14	95.12	5.8	0.79(0.04)	Burma-India Borde	3 killed 11 injured
9	20.08.1988	26.78	86.61	6.5	0.04(0.02)	Nepal-India Border	1000 people killed, 1000 injured Extensive damage in Northern Bihar
10	19.10.1991	30.75	78.86	6.6	0.50(0.03)	West UP Hills(Uttarkashi)	768 people killed
11	30.09.1993	18.07	76.00	6.3	0.48(0.2)	Latur, Osmanabad	7601 people killed
12	22.05.1997			6.0		Jabalpur	38 People killed
13	29.03.1999	--	--	--	--	Uttar Pradesh	106 Human Lives lost, 395 Persons injured
14	26.01.2001	--	--	--	--	Gujarat	Over 20000 people killed, 150000 injured and 15900000 affected

Source : Ministry of Environment & Forests and State Forest Report 2001

The two thirds of India lies in the Seismic zones of moderate to severe intensity. The Himalayan Range, the Indo-gangetic plains and the Kuthch and Kathaiwar region of Western India are geologically the most unstable parts, and are most prone to earthquakes. The Himalayan frontal arc flanked by the chaman fault in the west constitutes one of the most seismically active intra-continental regions in the world. In a span of 53 years, four earthquakes, exceeding magnitude 8 on the Richter scale, occurred in this region. These are the Assam earthquakes of 1897 and 1950, the Kangra earthquake of 1905 and the Bihar-Nepal earthquake of 1935. Besides the Himalayan regions, the Union Territories of Andaman and Nicobar Islands are also quite vulnerable to earthquakes. Peninsular India comprises stable continental crust regions, which are considered stable since they are away from tectonic activity of the boundaries. These regions are considered seismically the least active but the Latur earthquake in Maharashtra on September 30, 1993 of magnitude 6.4 in the Richter scale showed that this region, too, is unstable and earthquake prone.

The Department of earthquake engineering, University of Roorkee was established in 1960 to carry out Research and Development, Consultancy and Training in Earthquake Engineering. The Department helps in designing earthquake resistant structure. They use various techniques of seismic methods of geophysics in assessing the status of a locality.

TABLE 5.3.3 : LIST OF IDENTIFIED DROUGHT PRONE DISTRICTS IN THE COUNTRY

Sl. No.	State/ District	No. of Talukas	Area of the District (Sq. Kms.)	As Per CWC's Study-1982		
				No. of Talukas Affected by Drought	Area Affected by Drought (Sq. Kms)	Percentage Area Affected
1	2	3	4	5	6	7
I	**Andhra Pradesh**	**79**	**125113.03**	**19**	**32839.51**	26
	1. Anantpur	11	19134.9	5	10455.8	55
	2. Chittoor	11	15143.1	-	-	
	3. Cuddapah	9	15372.9	1	1473.7	10
	4. Hyderabad	9	7762.49	3	3157.9	41
	5. Kurnool	11	17600.4	2	3825.97	22
	6. Mahboob Nagar	12	18472	3	4285	23
	7. Nalgonda	7	14223.24	1	1772.05	12
	8. Prakasam	9	17404	4	7869	45
II	**Jharkhand**	**3**	**12019.9**	**--**	**--**	
	9. Palamau	3	12019.9	--	--	
III	**Bihar**	**12**	**31364.6**	**-**	**-**	
	10. Munger	4	7884.5	-	-	
	11. Nawadah	1	2494	-	-	
	12. Rohtas	2	7199.7	-	-	
	13. Bhojpur	2	3971.1	-	-	
	14. Aurangabad	1	3305	-	-	
	15. Gaya	2	6510.3	-	-	
IV	**Gujarat**	**124**	**121238.9**	**103**	**106818.4**	88
	16. Ahmedabad	7	8565.9	5	7530.3	88
	17. Amreli	10	6711.4	10	6711.4	100
	18. Banaskantha	11	12404.3	9	11018.1	89
	19. Bhawnagar	12	9786.3	12	9786.3	100
	20. Bharuch	11	7805.7	11	7805.7	100
	21. Jamnagar	10	10143	10	10143	100
	22. Kheda	10	6888.1	3	2407	35
	23. Kachchh	9	19476.5	9	19476.5	100
	24. Mahesana	11	9011.8	3	2803.5	31
	25. Panchmahal	11	8849.8	10	7975.1	90
	26. Rajkot	13	11152.3	12	10667.7	96
	27. Surender Nagar	9	10443.8	9	10443.8	100
V	**Haryana**	**15**	**16587.85**	**8**	**8338.5**	50
	28. Bhiwani	4	4657.38	4	4657.38	100
	29. Gurgaon	5	4862.8	2	1462.44	30
	30. Mahendergarh	3	3221.67	2	2218.68	69
	31. Rohtak	3	3846	-	-	
VI	**Jammu & Kashmir**	**8**	**15999.3**	**2**	**2407.6**	15
	32. Doda	4	11691	-	-	
	33. Udhampur	4	4308.3	2	2407.6	56

TABLE 5.3.3 : LIST OF IDENTIFIED DROUGHT PRONE DISTRICTS IN THE COUNTRY- Contd.

Sl. No.	State/ District	No. of Talukas	Area of the District (Sq. Kms.)	As Per CWC's Study-1982		
				No. of Talukas Affected by Drought	Area Affected by Drought (Sq. Kms)	Percentage Area Affected
1	2	3	4	5	6	7
VII	**Karnataka**	**139**	**152163.33**	**42**	**57645.54**	38
	34. Bangalore	11	7949.5	-	-	
	35. Belgaum	10	13460.8	1	1996	15
	36. Bellary	8	9548.5	3	3994.3	42
	37. Bijapur	11	17092.83	7	12477.44	73
	38. Chikmagalur	7	7222	1	804.8	11
	39. Chitradurga	9	10754.5	5	7477.5	70
	40. Dharwar	17	13480.1	3	2772.32	21
	41. Gulbarga	10	16167.8	5	8131	50
	42. Hasan	8	6833.3	1	1277.8	19
	43. Kolar	11	8215.2	4	3444.7	42
	44. Mandya	7	4961	1	1034.28	21
	45. Mysore	11	11947	1	1235.9	10
	46. Raichur	9	13972.4	4	6347.6	45
	47. Tumkur	10	10557.7	6	6651.9	63
VIII	**Madhya Pradesh**	**47**	**87219.52**	**26**	**37307.93**	43
	48. Betul	3	7062.9	-	-	
	49. Datia	2	2034	-	-	
	50. Dewas	5	6723.5	3	4219	63
	51. Dhar	5	8195.41	4	6287	77
	52. Jhabua	5	6792.8	5	6792.8	100
	53. Khandwa	3	6379.6	1	1865	29
	54. Khargone	8	13490	5	6955.37	52
	55. Shahdol	4	13860.06	-	-	
	56. Shajapur	4	6178	3	4533.07	73
	57. Sidhi	3	10390.75	1	3768.49	36
	58. Ujjain	5	6112.5	4	4887.2	80
IX	**Maharashtra**	**100**	**123767.05**	**45**	**57664.7**	47
	59. Ahmednagar	13	16762.2	7	9491.8	57
	60. Aurangabad	12	16385	2	3111.3	19
	61. Bir	7	11169	3	4595	41
	62. Nasik	13	15631.5	7	8098.9	52
	63. Oosmandabad	11	14027	7	9515	68
	64. Pune	14	15688.2	4	4932.1	31
	65. Sangli	8	8610.25	5	5939.66	69
	66. Satara	11	10436.9	4	3878.5	37
	67. Solapur	11	15057	6	8102.5	54
X	**Orissa**	**6**	**22862.41**	**1**	**2002.07**	9
	68. Phulbani	3	11090.41	1	2002.07	18
	69. Kalahandi	3	11771	-	-	

TABLE 5.3.3 : LIST OF IDENTIFIED DROUGHT PRONE DISTRICTS IN THE COUNTRY- Concld.

Sl. No.	State/ District	No. of Talukas	Area of the District (Sq. Kms.)	As Per CWC's Study-1982		
				No. of Talukas Affected by Drought	Area Affected by Drought (Sq. Kms)	Percentage Area Affected
1	2	3	4	5	6	7
XI	**Rajasthan**	**76**	**218950.45**	**57**	**194203.27**	**89**
	70. Ajmer	5	8449.6	3	4317.8	51
	71. Banswara	5	5055	5	5055	100
	72. Barmer	5	29521.4	5	29521.4	100
	73. Bikaner	4	27396.4	4	27396.4	100
	74. Churu	7	16861.35	7	16861.35	100
	75. Dungerpur	3	3770	3	3770	100
	76. Jaisalmer	2	41674.3	2	41674.3	100
	77. Jalore	4	10554.4	3	8308.8	79
	78. Jhunjhunun	4	5928	3	4460.2	75
	79. Jodhpur	5	22633.8	5	22633.8	100
	80. Nagpur	8	17628	8	17628	100
	81. Pali	7	12211.2	2	4763.8	39
	82. Udaipur	17	17267	7	7812.42	45
XII	**Tamilnadu**	**77**	**84091.14**	**8**	**7451.66**	9
	83. Coimbatore	10	15603.79	-	-	
	84. Dharmapuri	8	9718.6	1	1227.8	13
	85. Madurai	12	12264.1	-	-	
	86. Ramanathapuram	12	12575.49	3	3090.36	25
	87. Salem	9	8543	-	-	
	88. Tiruchirapalli	10	11078.86	1	943.3	9
	89. Tirunelveli	12	12505.5	3	2190.2	18
	90. Kanyakumari	4	1701.8	-	-	
XIII	**Uttar Pradesh**	**31**	**43033.1**	**4**	**4609.4**	11
	91. Allahabad	8	7255	-	-	
	92. Banda	5	7645.1	1	1354.4	18
	93. Hamirpur	6	7192	1	1072	45
	94. Jalaun	4	4549	2	2183	48
	95. Mirzapur	4	11301	-	-	
	96. Varanasi	4	5091	-	-	
XIV	**West Bengal**	**8**	**26720.8**	**-**	**-**	
	97. Bankura	2	6855.8	-	-	
	98. Midnapur	5	13606	-	-	
	99. Puruliya	1	6259	-	-	
Total		**725**	**1081131.38 in 99 Districts**	**315**	**511288.64 in 74 Districts**	**47**

Source : Central Water Commission.

TABLE 5.3.4 : DAMAGE DUE TO DROUGHTS, 1984-87

Sl. No.	Damage	1984	1985	1986	1987
1	2	3	4	5	6
1	Number of Districts affected	151	109	280	263
2	Population affected (lakh)	704.58	785.91	1919.42	2854.19
3	Cropped Area affected (lakh ha)	153.69	282.10	400.13	586.00
4	Cattle population affected (lakh)	475.06	654.30	1119.89	1681.11

Source : The Drought of 1987, Response and Management, Ministry of Agriculture,1989

TABLE 5.3.5 : FLOOD AFFECTED AREA & FLOOD DAMAGES IN INDIA (ABSTRACT FOR THE PERIOD 1953 TO 1999)

Sl. No.	Item	Unit	Average Flood Damage During 1953-2001	Maximum Damage (With Year)	Damage During 2001 (Tentative)
1	2	3	4	5	6
1	Area Affected	Million ha.	7.48	17.50 (1978)	3.01
2	Population Affected	Million	33.18	70.45 (1978)	22.44
3	Human Lives Lost	No.	1579.00	11316.00 (1977)	811.00
4	Cattle Lost	No.	94610	618248 (1979)	25025.00
5	Crop Area Affected	Million ha.	3.52	10.15 (1988)	1.91
6	Value of damage to crops	Rs. Crore	597.98	2510.90 (1988)	446.73
7	Houses damaged	Million	1.20	3.51 (1978)	0.49
8	Value of damage to houses	Rs. Crore	183.67	1307.80 (1988)	357.74
9	Value of damage to public utilities	Rs. Crore	567.86	3171.40 (1998)	1820.34
10	Value of damage to houses, crops and public utilities	Rs. Crore	1373.78	5845.98 (1998)	2624.81

Source : Central Water Commission.
Note : Figures from 1998, 1999,2000 & 2001 are tentative

ıBLE 5.3.6(a) : STATEWISE DAMAGE DUE TO HEAVY RAINS, FLOOD, CYCLONE DURING SOUTH-WEST MONSOON --199

(As on 28.1.2000)

Sl. No.	State/UT's	Period/Date o Occurrence	Calamity	Total Districts (No.)	District Affected (No.)	Villages Affected (No.)	Area Affected (Lakh Hectares)	Population Affected (Lakh)	Damage to Crop Area (Lakh Ha.)	Damage to Houses/ Huts (No.)	Human Lives Lost (No.)	Animals Lost (No.)
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Arunachal Pradesh	1 June, 1999	H.R./L	12	1							
2	Assam - I Wave	24 June, 1999	H.R./F	23	12	813	1.45	3.39	0.52	126	1	N.R.
	Assam - II Wave	23 Aug., 1999	H.R./F		10	923	1.48	5.37	0.54		2	
3	Bihar	5 July, 1999	H.R./F	55	21	4028	7.4	60.56	2.82	23538	216	12
		22-29 Sep., 1999	H.R./C.R.		12	8812	0.62	15.72	0.62	225365	69	2016
4	Gujarat	16 July-30 Aug. 1999	H.R./F	24	15						46	Nil
5	Himachal Pradesh	July-Aug. 99	H.R./F	12	12	8461		22.05		2224	30	129
6	Karnataka	12 July, 1999	H.R./F	27	27	3701	0.40	68.62	0.40	16828	122	959
7	Kerala	25 May-8 Oct., 1999	H.R./F/Lig./L	14	14	1368				20083	131	
8	Madhya Pradesh	20 Sep., 1999	H.R./F	45	7	1807	0.62	4.36	0.62	29168	27	654
9	Orissa	7 Aug., 1999	H.R./F	30	7	2486	1.53	17.73	1.53		14	
10	Punjab	12 July, 1999	H.R./F	17	3		0.02		0.02	2	11	
11	Rajasthan	June-Sep., 1999	H.R./F	30	15						46	
12	Tripura	9-12 July, 1999	H.R./F	4	2		0.2		0.05	4014	16	82
13	Uttar Pradesh	18 Aug. 1999	H.R./F/L	83	11	620	0.39	1.84	0.33	1023	86	9
14	West Bengal	25-26 June, 1999	L	18	1					10		
	West Bengal	23-26 Sep. 1999	H.R./F	18	14			128.48		559527	79	
Total				**412**	**184**	**33019**	**14.11**	**328.12**	**7.45**	**881908**	**896**	**3861**

Source : Natural Disaster Management, Ministry of Agriculture

Note : F- Flood L- Landslide HR - Heavy Rain

TABLE 5.3.6(c) : STATEWISE DAMAGE DUE TO HEAVY RAINS, FLOOD, CYCLONE DURING SOUTH-WEST MONSOON --2002 (Provisional)

(As on 23-09-2002)

Sl. No.	States/UT's	Calamity	Total Districts (No.)	Affected					Damage					Lives lost		Remarks
				Districts (No.)	Talukas/ Blocks/ Mpls.	Villages	Total Area (in Lakh Ha.)	Population (in Lakh)	Crops Area (in Lakh Ha.)	Estimated Value of Crops (Rs. in Crores)	Houses (No.)	Estimated Value of Houses (Rs. in Crores)	Estimated Value of Public Properties (Rs. in Crores)	Human (No.)	Cattles (No.)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Andhra Pradesh	HR	NR	3	NR	NR	NR	NR	NR	NR	800	NR	NR	7		
2	Arunachal Pradesh	FF/L	15	14	NR	75.00	0.2	NR	0.10	0.65	7	0.06	34.66	11	20	
3	Assam	HR/L	23	22	NR	6560.00	57.08	8.37	3.30	NR	19827	NR	NR	41	482	
4	Bihar	HR	38	25	205.00	8208.00	18.45	158.18	8.10	467.44	396096	451.98	296.21	434	1380	
5	Gujarat	HR	25	10	23.00	134.00	6.50	NR	NR	NR	2753	13.57	27.71	134	1152	
6	Himachal Pradesh	HR/L	12	1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	3 missing
7	Kerala	HR/F/L	14	14	NR	776.00	0.23	NR	NR	1.57	2335	1.09	0.01	21	NR	8 missing
8	Madhya Pradesh	HR	45	1	NR	2.00	NR	NR	NR	NR	NR	NR	NR	4	NR	7 missing
9	Manipur	HR/F	NR	4	NR	NR	NR	NR	0.49	NR	30024	NR	NR	2	NR	
10	Maharashtra	HR/L	35	8	NR	311.00	NR	NR	NR	NR	13466	NR	149.23	138	593	
11	Uttar Pradesh	HR	70	8	NR	443.00	1.07	2.58	0.33	NR	1615	NR	NR	6	15	
12	Uttranchal	HR/L	13	2	2.00	50.00	0.03	Neg	Neg	NR	541	NR	NR	33	87	
13	West Bengal	HR/L	NR	3	22.00	617.00	3.07	NR	0.26	27.62	17584	2.31	25.64	4	NR	
TOTAL				**115**		**17176**					**485048**			**841**	**3729**	

Source: Website of Natural Disaster Management, Ministry of Home Affairs

Note: F - Flood, FF- Flash Flood, L - Landslide, HR - Heavy Rains, C – Cyclone, NR - Not Reported, Neg.- Negligible

TABLE 5.3.7 : STATEWISE DAMAGE DUE TO HEAVY RAINS, CYCLONE ETC. DURING PRE-MONSOON, 1999

as on 8.12.1999

Sl. No.	State/UT's	Period/Date of Occurrence	Total Districts (No.)	District Affected (No.)	Villages Affected (No.)	Area Affected (Lakh Hectares)	Population Affected (Lakh)	Damage to crop Area (Lakh Ha.)	Value of Rs. Lakhs	Damage to Houses/ Huts (No.)	Value of Houses Damaged Rs. lakhs	Human Lives Lost (No.)	Animals Lost (No.)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Arunachal Pradesh	9 May, 1999	14	1	--	--	0.02	--	--	17	--	1	--
2	Gujarat	17 May. 1999	24	3	--	--	--	--	--	--	--	453	--
3	Kerala	4 Feb.- 9 April, 99	14	14	139	55.36	--	1.00	541.61	2898	72.07	25	--
Total			**52**	**18**	**139**	**55.36**	**0.02**	**1**	**541.61**	**2915**	**72.07**	**479**	

Source : Natural Disaster Management, Ministry of Agriculture

TABLE 5.3.8 : STATE-WISE DAMAGE DUE TO HEAVY RAINS, FLOOD AND SUPER CYCLONIC STORMS DURING NORTH-EAST MONSOON --1999

(As on 23-2-2000)

Sl. No.	State/UT's	Period/Date of Occurrence	Calamity	Total Districts (No.)	District Affected (No.)	Villages Affected (No.)	Area Affected (Lakh Hectares)	Population Affected (Lakh)	Damage to Crop Area (Lakh Ha.)	Damage to Houses/ Huts (No.)	Human Lives Lost (No.)	Animals Lost (No.)	No. of Persons Injured (No.)	Value of Crops Damaged Rs. In Lakhs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Andhra Pradesh	17-18 Oct. 99	Cyclone	23	1	1044	--	1.89	--	3425	3	388	--	--
2	Kerala	22 oct.- 22 Nov. 99	H.R./Lig./Lan.	14	14	50	--	--	--	1218	21	--	--	110.35
3	Orissa	17-18 Oct. 99	Cyclone	30	4	5181	1.58	37.47	1.58	331580	199	10578	406	--
		29-30 Oct. 99	Super Cyclone	30	12	14643	18.43	129.22	18.43	1828532	9887	444531	2507	--
4	Tamilnadu	1st Oct. - 15 Dec.99	Heavy Rains	30	29	--	--	--	0.20	36072	103	573		--
5	West Bengal	28-29 Oct. 99	Super Cyclone	18	4	1109 & 1901 *	1.02	7.85	0.34	16240	--	--	2913	5773.00

Source : Natural Disaster Management, Ministry of Agriculture

* : Mandals/Mouzas

TABLE 5.3.9 : INFORMATION ON DROUGHT-EXTENT OF DAMAGE, 2001-2002

(As on December 2001)

Sl. No.	State/UT's	Total District (No.)	District Affected (No.)	Villages Affected (No.)	Population Affected (Lakh)	Damage to Crop Area (Lakh Ha.)	Estimated Value of Dameged Crop (Rs. In Thousand)	Cattle Population Affected (In Lakhs)
1	2	3	4	5	6	7	8	9
1	Andhra Pradesh	23	22	142	61.55	17.69	NR	NR
2	Bihar	37	32	NR	NR	3	NR	NR
3	Karnataka	27	15	NR	NR	16.22	NR	NR
4	Madhya Pradesh	45	22	14851	26.64	9.53	NR	34.28
5	Maharashtra	35	12	7262	NR	21	NR	NR
Total		**167**	**103**	**22255**	**88.19**	**67.44**	**0**	**34.28**

Source : Natural Disaster Management, Ministry of Agriculture

TABLE 5.3.10 : DAMAGE DUE TO EARTHQUAKE DURING 2001-2002

(As on 27.11.2001)

Sl. No.	State	Priod of Occurrenc	Total Districts (No.)	District Affected (No.)	Talukas/ Blocks/ Mpls.	Villages Affected (No.)	Population Affected (Lakh)	Damage to Houses/ Huts (No. in Lakh)	Estimaed Value of Houses (Rs in Crores)	Estimaed Value of Public Properties . (Rs in Crores)	Human Lives Lost (No.)	Animals Lost (No.)
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Gujarat	26.01.2001	25	21	181	7633	157	12.54	--	21262	13805	20717

Source : Natural Disaster Management, Ministry of Agriculture

TABLE 5.3.11(a) : INCIDENCE OF ACCIDENTAL DEATHS (BY NATURAL CAUSES)

Sl. No.	Year/State/ U.T.	Avalanche	Cold & Exposure	Cyclone/ Tornado	Starvation/ Thirst	Earthquake	Epidemic
1	2	3	4	5	6	7	8
1	1995	106	618	180	183	537	1165
2	1996	61	547	1104	442	483	180
3	1997	27	743	73	227	396	82
4	1998	90	651	1283	299	7	161
5	1999	52	761	3958	472	101	174
6	2000	13	762	115	587	1	102
	State: Year 2000	**13**	**500**	**114**	**295**	**1**	**102**
1	Andhra Pradesh	1	14	14	22	0	12
2	Arunachal Pradesh	0	0	0	0	0	0
3	Assam	0	0	0	0	0	39
4	Bihar *	6	39	9	3	1	14
5	Goa	0	0	0	0	0	0
6	Gujarat	0	36	3	138	0	2
7	Haryana	2	11	0	31	0	8
8	Himachal Pradesh	1	13	0	0	0	0
9	Jammu & Kashmir	1	5	0	0	0	0
10	Karnataka	0	0	0	18	0	0
11	Kerala	0	0	0	0	0	0
12	Madhya Pradesh	0	24	3	1	0	5
13	Maharashtra	0	12	3	1	0	8
14	Manipur	0	0	0	0	0	0
15	Meghalaya	0	6	2	2	0	0
16	Mizoram	0	0	0	0	0	0
17	Nagaland	0	0	0	0	0	0
18	Orissa	0	3	4	0	0	5
19	Punjab	0	65	39	5	0	4
20	Rajasthan	0	39	2	23	0	0
21	Sikkim	0	0	0	0	0	0
22	Tamil Nadu	2	0	0	13	0	0
23	Tripura	0	0	0	0	0	0
24	Uttar Pradesh	0	229	34	34	0	5
25	West Bengal	0	4	1	4	0	0
	Union Territory:	**0**	**262**	**1**	**292**	**0**	**0**
1	A. & N.Islands	0	0	0	0	0	0
2	Chandigarh	0	3	0	0	0	0
3	D. & N. Haveli	0	0	0	0	0	0
4	Daman & Diu	0	0	0	8	0	0
5	Delhi	0	259	0	284	0	0
6	Lakshadweep	0	0	0	0	0	0
7	Pondicherry	0	0	1	0	0	0
All India		**13**	**762**	**115**	**587**	**1**	**102**

TABLE 5.3.11(a) : INCIDENCE OF ACCIDENTAL DEATHS (BY NATURAL CAUSES) Concld.

Sl. No.	Year/State/ U.T.	Flood	Heatstroke	Landslide	Lightning	Torrential Rains	Other Natural Causes	Total
1	2	9	10	11	12	13	14	15
1	1995	822	1677		1664	335	14313	23596
2	1996	708	434		1699	110	13162	20928
3	1997	580	393		1957	129	14301	20908
4	1998	958	1016	423	1891	411	15572	22762
5	1999	740	628	331	1621	398	18260	27506
6	2000	1863	534	264	1472	150	11503	17366
	State: Year 2000	**1857**	**500**	**263**	**1471**	**150**	**10903**	**16169**
1	Andhra Pradesh	116	56	2	62	3	386	688
2	Arunachal Pradesh	10	0	4	0	0	0	16
3	Assam	25	5	6	9	1	130	215
4	Bihar *	142	19	3	51	27	336	650
5	Goa	0	0	0	0	0	220	220
6	Gujarat	24	19	17	29	33	726	1027
7	Haryana	0	7	2	12	4	2	79
8	Himachal Pradesh	53	1	28	5	1	235	337
9	Jammu & Kashmir	1	0	6	9	0	196	218
10	Karnataka	19	5	3	96	9	82	232
11	Kerala	2	1	18	45	1	148	215
12	Madhya Pradesh	18	36	12	361	8	170	638
13	Maharashtra	78	12	52	293	14	1795	2268
14	Manipur	0	0	0	0	0	17	17
15	Meghalaya	0	0	5	4	0	5	24
16	Mizoram	0	0	3	0	0	0	3
17	Nagaland	0	0	0	0	0	0	0
18	Orissa	0	74	11	170	4	1304	1575
19	Punjab	0	52	12	1	0	41	219
20	Rajasthan	3	22	2	16	2	1824	1933
21	Sikkim	0	0	10	0	0	0	10
22	Tamil Nadu	12	25	5	73	3	168	301
23	Tripura	0	6	0	11	0	27	44
24	Uttar Pradesh	90	115	54	110	38	1827	2536
25	West Bengal	1264	45	8	114	2	1264	2706
	Union Territory:	**6**	**34**	**1**	**1**	**0**	**600**	**1197**
1	A. & N.Islands	0	0	0	0	0	0	0
2	Chandigarh	0	0	0	0	0	96	99
3	D. & N. Haveli	0	0	0	0	0	0	0
4	Daman & Diu	0	0	0	0	0	0	8
5	Delhi	6	34	1	0	0	504	1088
6	Lakshadweep	0	0	0	0	0	0	0
7	Pondicherry	0	0	0	1	0	0	2
All India		**1863**	**534**	**264**	**1472**	**150**	**11503**	**17366**

Source : National Crime Record Bureau, Ministry of Home Affairs

* : The figures of Jharkhand,chattisgarh & uttranchal the newly carved state are not included due to non-availability

TABLE 5.3.11(b) : INCIDENCE OF ACCIDENTAL DEATHS(BY UN-NATURAL CAUSES)

Sl. No.	Year/State/U.T./City	Air crash	Collapse of Structure	Drowning	Electrocution	Explosion	Falls	Factory/ Machine Accidents	Fire	Fire Arms	Sudden Deaths	Killed by Animals
1	2	3	4	5	6	7	8	9	10	11	12	13
1	1995	10	2881	21226	3861	581	5149	616	22922	1052	7598	804
2	1996	338	2050	20873	4303	563	5413	613	22649	1400	9749	735
3	1997	16	2126	21821	4583	933	6172	669	25166	1496	11041	771
4	1998	13	2412	23041	5304	511	6201	642	25898	2917	13509	730
5	1999	36	2386	21457	5671	697	6613	667	28400	2303	12937	692
	2000	20	2233	21996	5663	725	7087	625	25467	2634	13934	669
	State: Year 2000	**19**	**2209**	**21654**	**5415**	**714**	**6689**	**589**	**24677**	**2624**	**13284**	**661**
1	Andhra Pradesh	1	275	1680	757	132	768	61	2124	2	517	46
2	Arunachal Pradesh	0	0	24	6	0	18	2	7	0	5	5
3	Assam	0	22	274	46	1	16	6	173	12	38	62
4	Bihar	0	61	205	68	11	46	8	367	13	118	2
5	Goa	0	8	166	18	3	66	3	76	0	51	1
6	Gujarat	7	227	860	425	103	786	91	2989	2	1381	57
7	Haryana	0	38	268	168	1	176	21	496	12	482	5
8	Himachal Pradesh	7	19	119	11	1	112	1	40	2	92	2
9	Jammu & Kashmir	0	6	53	17	132	54	0	25	270	46	1
10	Karnataka	0	118	1673	264	10	386	17	1675	19	641	38
11	Kerala	0	70	1193	148	9	396	14	340	13	511	30
12	Madhya Pradesh	0	240	4889	1296	84	952	117	3359	88	1411	98
13	Maharashtra	1	306	5551	866	35	1226	93	7791	4	5380	82
14	Manipur	0	2	8	6	13	4	0	2	0	17	0
15	Meghalaya	0	0	19	5	5	15	1	10	10	13	1
16	Mizoram	0	2	10	2	0	6	0	3	4	5	1
17	Nagaland	0	1	5	1	0	2	0	0	1	0	0
18	Orissa	0	24	486	148	8	279	8	326	3	195	67
19	Punjab	0	18	234	141	15	54	21	395	23	308	1
20	Rajasthan	2	129	1371	304	13	425	48	993	7	600	24
21	Sikkim	0	2	13	5	0	42	0	5	0	8	0
22	Tamil Nadu	0	153	1133	247	10	339	24	1998	11	566	38
23	Tripura	0	4	43	4	0	6	0	8	0	10	0
24	Uttar Pradesh	0	431	690	366	92	358	41	885	2108	450	52
25	West Bengal	1	53	687	96	36	157	12	590	20	439	48
	Union Territory:	**1**	**24**	**342**	**248**	**11**	**398**	**36**	**790**	**10**	**650**	**8**
1	A. & N.Islands	0	0	29	6	0	4	0	25	0	28	0
2	Chandigarh	0	0	6	11	0	20	1	38	0	42	0
3	D. & N. Haveli	0	0	15	3	0	6	0	7	0	17	2
4	Daman & Diu	0	0	14	1	0	6	2	0	0	10	0
5	Delhi	1	24	188	201	11	328	33	660	10	351	6
6	Lakshadweep	0	0	1	0	0	0	0	0	0	0	0
7	Pondicherry	0	0	89	26	0	34	0	60	0	202	0
	All India	**20**	**2233**	**21996**	**5663**	**725**	**7087**	**625**	**25467**	**2634**	**13934**	**669**

TABLE 5.3.11(b) : INCIDENCE OF ACCIDENTAL DEATHS(BY UN-NATURAL CAUSES)-Concld.

Sl. No.	Year/State/U.T./City	Mines or quary Disaster	Poisoning	Stampede	Suffocation	Traffic Accidents	Rail-Road Accident	Other Railway Accident	Other Causes	Causes not known	Total
1	2	14	15	16	17	18	19	20	21	22	23
1	1995	349	20135	233	444	84803			14001	14222	222487
2	1996	447	18907	64	665	84775			13552	14068	201164
3	1997	614	21552	19	584	88474			14665	14293	214995
4	1998	426	24262	19	628	93996			17839	17299	155199
5	1999	446	25734	20	838	99541			19059	16915	52767
	2000	467	23395	50	981	80118			19500	15033	238550
	State: Year 2000	**466**	**23025**	**50**	**940**	**77714**	**1282**	**15900**	**18880**	**14648**	**231440**
1	Andhra Pradesh	26	1313	0	11	9730	581	727	1439	822	**21012**
2	Arunachal Pradesh	0	5	0	0	89	0	0	1	37	**199**
3	Assam	0	214	0	0	618	5	275	61	76	**1899**
4	Bihar	0	562	0	7	2080	66	728	122	63	**4527**
5	Goa	0	5	0	1	272	21	12	61	8	**772**
6	Gujarat	32	1224	30	64	5100	13	1172	821	386	**15770**
7	Haryana	9	588	0	35	2870	15	1195	355	210	**6944**
8	Himachal Pradesh	0	156	0	18	808	10	9	76	20	**1503**
9	Jammu & Kashmir	4	21	0	0	741	0	11	32	46	**1459**
10	Karnataka	2	1640	6	98	5632	17	557	223	1238	**14254**
11	Kerala	15	126	1	4	2789	4	234	420	109	**6426**
12	Madhya Pradesh	171	5744	9	217	5324	153	1231	1219	4189	**30791**
13	Maharashtra	89	4730	4	226	10369	64	4034	6140	2518	**49509**
14	Manipur	0	1	0	0	131	0	0	2	13	**199**
15	Meghalaya	0	1	0	1	131	0	0	3	5	**220**
16	Mizoram	0	6	0	0	62	0	0	5	31	**137**
17	Nagaland	0	0	0	0	27	0	37	0	0	**74**
18	Orissa	3	948	0	4	1920	7	315	510	718	**5969**
19	Punjab	0	556	0	12	1324	18	567	334	169	**4190**
20	Rajasthan	88	1090	0	136	5378	34	141	1436	939	**13158**
21	Sikkim	0	4	0	1	40	0	0	0	6	**126**
22	Tamil Nadu	4	1616	0	9	9300	37	0	3134	335	**18954**
23	Tripura	0	0	0	0	125	0	0	0	0	**200**
24	Uttar Pradesh	22	1224	0	95	9197	195	2426	1353	957	**20942**
25	West Bengal	1	1251	0	1	3657	42	2229	1133	1753	**12206**
	Union Territory:	**1**	**370**	**0**	**41**	**2404**	**0**	**771**	**620**	**385**	**7110**
1	A. & N.Islands	0	11	0	0	24	0	0	37	0	**164**
2	Chandigarh	0	49	0	0	126	0	0	81	0	**374**
3	D. & N. Haveli	0	8	0	0	32	0	0	16	7	**113**
4	Daman & Diu	0	1	0	1	20	0	0	8	2	**65**
5	Delhi	1	275	0	40	2051	0	763	478	369	**5790**
	Lakshadweep	0	0	0	0	0	0	0	0	0	**1**
	Pondicherry	0	26	0	0	151	0	8	0	7	**603**
	All India	**467**	**23395**	**50**	**981**	**80118**	**1282**	**16671**	**19500**	**15033**	**238550**

Source : National Crime Records Bureau, Ministry of Home Affairs

TABLE 5.3.12 : INDIA'S MAJOR NATURAL DISASTERS SINCE 1980

Sl. No.	Year		Type	Affected Population Location/Area	Loss of Human (Million)	Life	Loss to Crops and Property
1	1980		Floods	Uttar Pradesh	30	1525	Rs. 2.0 Billion
2	1981		Floods	Uttar Pradesh	13	362	1.5 Million hectares of cropped area affected
3	1982		Floods	Orissa	10	1000	3 Million hectares of agricultural land affected. Loss estimated to run into thousands of millions of Rupees
4	1982		Cyclone	Saurashtra	--	514	Livestock death toll nearly 0.15 million.Loss to crops estimated at about Rs. 1.27 Billion
5	1983		Cyclone	Andhra Pradesh	--	134	Livestock death toll-42800. Damage to crops estimated at Rs. 0.34 Billion
6	1984		Cyclone	Andhra Pradesh and Tamil Nadu	--	658	Livestock death toll-90650. Damage to crops estimated at Rs. 2.32 Billion
7	1985		Floods	Haryana, Punjab and Uttar Pradesh	--	Heavy Toll	Large area of standing Kharif crop affected heavily
8	1986		Floods	Andhra Pradesh, Bihar and Uttar Pradesh	--	Heavy Toll	Large area of standing Kharif crop affected heavily
9	1987		Floods	Assam, Bihr and West Bengal	--	Over 1400	--
10	1988		Cyclone	West Bengal	--	532	Livestock death toll-57604
11	1989		Floods	Andhra Pradesh, Assam, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Maharashtra, Orissa, Uttar Pradesh and West Bengal	--	Over 1400	--
12	1990	*	Cyclone	Andhra Pradesh and Tamil Nadu	7.78	928	Rs. 22.470 Billion
13	1991	*	Earthquake	Uttarkashi, Uttar Pradesh	0.4	768	Rs. 0.890 Billion
14	1992		Drought	Maharashtra			Rs. 28.23 Billion
15	1993	*	Floods	Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, J & K, Mizoram, Punjab, Rajasthan, Tripura and Uttar Pradesh	28.8	1643	Rs. 21.060 Billion
16	1994		Cyclone	Andhra Pradesh and Tamil Nadu	--	226	Loss to propertty estimated at Rs. 6.12 Billion in Tamil Nadu and 444194 Hectares of land in Andhra Pradesh
17	1995		Floods	Large parts of the country	--	1360	Property worth Rs. 17.7 Billion and crop in 2.35 Million Hectares dameaged
18	1996		Floods	Large parts of the country	--	1700	Property worth Rs. 22.0 Billion and crop in 20.0 Million Hectares dameaged
19	1996		Cyclone	Andhra Pradesh	--	1058	0.3 Million houses fully and a similar number partially damaged. 0.1 Million Hectares of crop damaged. Loss to property worth Rs. 61.26 Billion.
20	1997	*	Earthquake	Jabalpur	--	39	--
21	1998	*	Earthquake	Chamoli	--	100	--
22	1999	**	Cyclone	Orissa	12.9	9887	1.8 Million Hectares of crop area and 1.6 Houses damaged

Source : India: State of Environment Report 2001 & State Forest Report, 2001

* : State of the Environment: India 1995, Ministry of Environment and Forests, Government of India

** : Minstry of Agrivulture

TABLE 5.4.1 : NUMBER OF MINES IN INDIA

Sl. No.	State	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
1	2	3	4	5	6	7	8	9
1	Andhra Pradesh	431	418	412	406	385	394	375
2	Arunanchal Pradesh	0	--	--	--	--	--	
3	Assam	8	9	9	9	10	10	10
4	Bihar	371	360	23	20	13	10	9
5	Chhattisgarh	--	…	87	86	66	113	107
7	Goa	81	77	74	76	71	74	68
8	Gujarat	510	475	461	443	454	432	408
9	Haryana	25	99	31	29	30	32	26
10	Himachal Pradesh	34	36	39	38	33	33	32
11	Jammu & Kashmir	5	6	5	6	7	7	7
12	Jharkhand	--	…	312	311	343	336	327
13	Karnataka	236	236	207	202	184	171	182
14	Kerala	47	51	54	54	45	42	39
15	Madhya Pradesh	546	552	427	425	436	374	357
16	Maharashtra	148	155	148	142	150	135	130
17	Manipur	1	1	1	--	--	--	
18	Meghalaya	2	2	2	2	2	2	2
21	Orissa	264	257	238	239	229	236	231
23	Rajasthan	616	579	526	501	465	456	442
24	Sikkim	1	1	2	2	2	2	2
25	Tamilnadu	133	126	122	130	134	148	161
26	Uttar Pradesh	51	51	31	21	21	28	25
28	Uttaranchal	--	…	12	16	8	15	18
29	West Bengal	124	130	129	125	121	123	120
Total		**3634**	**3641**	**3352**	**3283**	**3209**	**3173**	**3078**

Source : Indian Bureau of Mines

TABLE 5.4.2 : PRODUCTION OF MINERALS

Sl. No.	Minerals	Unit	Production						
			1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02(P)
1	2	3	4	5	6	7	8	9	10
1	Coal	000 t	273415	286080	296656	296508	304103	313696	327644
2	Lignite	000 t	22144	22540	23052	23419	22124	22947	23503
3	Natural Gas (U)	M.C.M.	20929	21325	24544	25705	26885	27860	27863
4	Petroleum (Crude)	000 t	34517	32900	33858	32722	31949	32426	32037
5	Bauxite	Tonne	5564775	6E+06	6108214	6609525	7053582	7992782	8585368
6	Chromite	Tonne	1699534	1E+06	1515286	1418119	1737985	1971806	1810920
7	Copper Ore	Tonne		4E+06	4514615	4229996	3084849	3498270	3496824
8	Copper Conc.	Tonne	4747683	201582	223328	198531	165024	163564	164465
9	Gold Ore	Tonne	453334	476225	437475	644059	569824	471042	458131
10	Gold	Kg.	2036	2892	2846	2683	2586	2615	2759
11	Iron Ore	000 t	67418	68161	75723	72230	74946	80762	83367
13	Lead & Zinc Ore	Tonne	2386894	2E+06	2483419	2650854	2755390	2505265	2745641
12	Lead Conc.	Tonne	61583	60271	60881	62842	62899	54487	51594
14	Manganese Ore	Tonne	1836705	2E+06	1641963	1537693	1585726	1595458	1552723
15	Silver	Kg.	35531	39717	5395t	55409	53641	46150	57672
16	Tin Conc.	Kg.	54991	31184	39351	39391	22812	12979	13887
17	Tungsten	Tonne	6451	3826	-	-	-	-	-
18	Zinc Conc.	Tonne	289072	276992	292524	349934	360138	365164	399105
19	Agate	Tonne	542	400	239	154	120	120	53
20	Apatite	Tonne	10777	9147	7150	14031	11642	11117	12084
21	Asbestos	Tonne	23844	27180	26034	20111	18550	15397	10629
22	Ball Clay	Tonne	507681	492207	464201	448949	423989	461836	574700
23	Barytes	Tonne	442733	381832	453073	660854	360538	845001	915557
24	Calcareous Sand	Tonne	312652	107968	32008	14067	-	-	-
25	Calcite	Tonne	74705	37254	51686	61908	60134	62044	67310
26	Chalk	Tonne	147293	123336	114838	118623	142065	129173	110910
27	Clay (Others)	Tonne	75117	69304	93855	95671	217446	216354	183103
28	Corundum	Kg.	1416	3758	945	807	20	9	1
29	Corundum (Ruby)	Kg.	215	168	400	-	0	0	0
30	Diamond	Carat	29931	31836	30994	34580	40956	57407	81448
31	Diaspore	Tonne	10287	14874	6956	9334	9406	8818	8749
32	Dolomite	Tonne	3717541	3E+06	2990857	2921748	2841607	3077573	3087705
33	Dunite	Tonne	171491	158808	193777	230203	229667	168121	52068
34	Emerald	Kg.	0	-	-	-	-	-	-
35	Felsite	Tonne	1183	1209	1481	657	656	928	1121
36	Felspar	Tonne	106896	101697	112238	114948	194158	179046	204275
37	Fire Clay	Tonne	452817	406695	450214	469721	407296	440982	367625
38	Fluorite (Conc.)	Tonne	22944	19926	11338	48	220	3253	6799
39	Fluorite (Graded)	Tonne	4099	5135	5519	4025	44784	44302	47646
40	Fuch. Quartzite	Tonne	17	1	-	195	-		-
41	Garnet (Abrasive)	Tonne	62314	42296	76946	133107	193406	232259	281546
42	Garnet (Gem)	Kg.	602	654	742	950	800	502	677
43	Graphite	Tonne	136263	117761	112786	135668	108826	124790	105375
44	Gypsum	Tonne	2195111	2E+06	2195423	2267240	3247009	2644415	2887834
45	Jasper	Tonne	4780	5059	6119	5570	5709	5041	4340
46	Kaolin	Tonne	831098	775283	790802	740542	815595	871331	807559

TABLE 5.4.2 : PRODUCTION OF MINERALS-Concld.

Sl. No.	Minerals	Unit	Production						
			1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
1	2	3	4	5	6	7	8	9	10
47	Kyanite	Tonne	8944	6996	6068	6134	6191	4773	3850
48	Laterite	Tonne	677173	661843	591875	594665	795017	605598	572200
49	Lime Kankar	Tonne	307050	330154	378844	252125	206767	228926	171737
50	Lime Shell	Tonne	105973	80015	82294	91761	98033	82008	128247
51	Lime Stone	000 t	96832	102723	110417	110968	128787	127202	129771
52	Magnesite	Tonne	345077	377510	373520	349852	325764	317765	280450
53	Mica (Crude)	Tonne	1832	1954	1697	1484	1807	1154	1266
54	Mica (Waste & SCR)	Tonne	1240	1109	909	1067	1579	2963	2886
55	Ochre	Tonne	346682	322383	358155	375371	424019	390019	516247
56	Perlite	Tonne	452	310	80	207	383	274	176
57	Phosphorite	Tonne	1308551	1E+06	1141671	1262238	1191640	1252918	1056965
58	Pyrites	Tonne	141000	143602	125474	88730	9539	-	0
59	Pyrophyllite	Tonne	144050	141655	103022	91924	107458	148346	146051
60	Quartz	Tonne	139283	178378	209133	253859	251157	302226	205888
61	Quartzite	Tonne	116085	111110	58714	45109	60506	55311	23571
62	Salt (Rock)	Tonne	1827	2700	2801	2607	2813	2530	2606
63	Sand (Others)	Tonne	1723559	2E+06	2060426	2589600	2152751	1817439	2354146
64	Shale	Tonne	302959	467283	614198	816492	779949	828422	872187
65	Silica Sand	Tonne	1146418	2E+06	1451156	1718325	1558419	2357601	1428193
66	Sillimanite	Tonne	9086	8528	12458	12123	14938	15498	14618
67	Slate	Tonne	9696	7826	10655	9711	10559	10046	4122
68	Steatite	Tonne	540570	531224	474541	481554	557112	553241	548845
69	Sulphur	Tonne	19826	8820	12852	14889	24883	62047	85818
70	Vermiculite	Tonne	1798	4064	4699	4274	3123	5003	5025
71	Wollastonite	Tonne	96017	97330	97742	94700	117094	121891	134763

Source : Indian Bureau of Mines P : Provisional;

TABLE 5.4.3 : INFORMATION ON REHABILITATION OF MINING LAND/ RECLAIMATION OF ABANDONED MINES

Sl. No.	Item	For the Year 2000-2001	Cumulative
1	2	3	4
1	**No. of abandoned mines**	10	38
2	**No. of abandoned mines reclaimed**	4	18
3	**Total area reclaimed in abnandoned mines (hect.)**	0.03	461.185
4	**No. of mines (working) where reclaimation / rehabilitation is being carried out**	109	450
5	**Area of such reclaimed / rehabilitation in working mines(in hect.)**	1303.6	7236.256

Source : Indian Bureau of Mines

TABLE 5.4.4 : STATUS OF AFFORESTATION IN MAJOR NON-COAL MINES From 1989-90 to 2000-01

Sl. No.	Minerals	Mines Covered	Area Covered (Hects.)	Trees Planted (000 No.)	Trees Survived (000 No.)	Survival Rate (%)
1	2	3	4	5	6	7
1	Limestone	312	8220.00	13420	9796	73.00
2	Iron Ore	130	8109.00	23062	16294	71.00
3	Manganese Ore	57	2031.00	5147	3331	65.00
4	Bauxite	83	1547.00	5224	3929	75.00
5	Lead & Zinc	8	1344.00	680	596	88.00
6	Magnesite	16	491.00	449	309	69.00
7	Gold	5	412.00	906	634	70.00
8	Chromite	14	351.00	1507	911	60.00
9	Copper Ore	7	337.00	1297	815	63.00
10	Dolomite	67	284.00	489	331	68.00
11	Iron and Manganese	31	172.00	514	383	74.00
12	Pyrites	1	7.00	21	15	71.00
13	Others	375	1725.00	2723	1793	66.00
Total		**1106**	**25030**	**55439**	**39137**	**913**

Source : Indian Bureau of Mines

TABLE 5.4.5 : MINING MACHINERY IN METALLIFERROUS OPEN CAST MECHANISED MINES DURING 2000-01
(Excluding Fuel, Atomic and Minor Minerals)

Sl. No.	Machinery	In Use	In Reserve
1	2	3	4
1	Dipper Shovels	622	45
2	Loaders	477	20
3	Bulldozers	456	33
4	Motor Graders	62	3
5	Haulers/Dumpers	4454	287
6	Drills	924	179
7	Crushers	270	14
8	Air Compressors	776	144
9	Locomotives	33	12
10	Hydraulic Excavators	353	14
11	Cranes	118	17
12	Surface Miner	14	-
13	Drag Lines	1	-

Source : Indian Bureau of Mines

TABLE 5.4.6 : CONSUMPTION OF EXPLOSIVES FOR MINING
(excluding fuel, atomic & minor minerals)

Explosives	Unit	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01
1	2	3	4	5	6	7	8	9	10	11
Gun Powder	Tonne	54	93	124	354	97	71	43	53	35
High Explosive	Tonne	40270	42075	48235	44110	41295	44925	46237	52250	52805
Liquid Oxygen	Tonne	252	189	211	176	129	208	364	345	303
Detonators	000 No.	15588	14580	16195	14336	13452	14257	12914	11441	10848
Fuse	M (000)	23028	23907	26044	23977	22820	24729	25988	26178	24768

Source : Indian Bureau of Mines