

CHAPTER SEVEN

HUMAN SETTLEMENTS



7.1 Population and Poverty

7.1.1 The components of environment include the natural environment comprising the environmental media of air, water and land/soil, as well as the biota found in these media. The man-made environment is represented by human settlements which consist of physical elements, namely, shelter and infrastructure; and services to these elements which provide the material support. Rapid population growth and economic development in country are degrading the environment through the urbanization and industrialization, expansion and intensification of agriculture, and the destruction of natural habitats. The existence or the absence of natural resources can facilitate or retard the process of economic development. The three fundamental demographic factors of births, deaths and migration produce changes in population size; composition, distribution and these changes raise a number of important questions of cause and effect. India has approximately 18 per cent of the world population but only 2 per cent of the geographical area. The Country's population growth can be assessed from the table 7.1.1 .

7.1.2 Human development is also adversely affected by the environmental degradation. Two of the environmental indicators, viz. access to the safe drinking water and the sanitation are closely linked with two of the very important human development indicators, viz. an infant mortality rate and the life expectancy. Polluted air and poor and unhygienic conditions in settlements contribute to reduction in life expectancy and increase in infant mortality.

7.1.3 Life expectancy at birth in India since 1901 is given in Table 7.1.2 . In India, the expectation of life at birth of female was lower than that of male till 1980 and has shown a reverse trend thereafter. Infant Mortality Rate refers to the number of deaths of children in the age 0-1 year per thousand live births. Infant mortality rate has been declining steadily in India since 1958. Details of these are given in Table 7.1.3. However, infant mortality rate in high is rural India compared to the urban sector which is evident from Table 7.1.3.

7.1.4 Reducing poverty and fostering human development are fundamental pre requisites for achieving sustainable development. Poverty is an indicative of a situation where a person fails to maintain a living standard adequate for comfortable living. In India, Planning Commission is the nodal agency in the Government of India for estimation of poverty. It estimates the incidence of poverty at the national and as well as state level separately. The table 7.1.4 gives the state-wise percentage of population below poverty line (according to Tendulkar Methodology). During 2011-12, nearly 25.7% of the population in rural India and almost 13.7% of those in urban areas were observed to be living below poverty line as per the estimates of Planning Commission.(erstwhile)

Table 7.1.1: Population Totals - India and States

(Numbers)

Sl. No.	States/U.Ts.	1981		1991		2001		2011	
		Male	Female	Male	Female	Male	Female	Male	Female
1	2	3	4	5	6	7	8	9	10
1	Andhra Pradesh	27,109,616	26,441,410	33,724,581	32,783,427	38,527,413	37,682,594	42,442,146	42,138,631
2	Arunachal Pradesh	339,322	292,517	465,004	399,554	579,941	518,027	713,912	669,815
3	Assam	9,444,037	8,597,211	11,657,989	10,756,333	13,777,037	12,878,491	15,939,443	15,266,133
4	Bihar	35,930,560	33,984,174	33,838,238	30,692,316	43,243,795	39,754,714	54,278,157	49,821,295
5	Chhattisgarh++	..	..	8,872,620	8,742,308	10,474,218	10,359,585	12,832,895	12,712,303
6	Goa	510,152	497,597	594,790	575,003	687,248	660,420	739,140	719,405
7	Gujarat	17,552,640	16,533,159	21,355,209	19,954,373	26,385,577	24,285,440	31,491,260	28,948,432
8	Haryana	6,909,679	6,012,440	8,827,474	7,636,174	11,363,953	9,780,611	13,494,734	11,856,728
9	Himachal Pradesh	2,169,931	2,110,887	2,617,467	2,553,410	3,087,940	2,989,960	3,481,873	3,382,729
10	Jammu & Kashmir+	3,164,660	2,822,729	4,142,082	3,694,969	5,360,926	4,782,774	6,640,662	5,900,640
11	Jharkhand++	..	..	11,363,853	10,480,058	13,885,037	13,060,792	16,930,315	16,057,819
12	Karnataka	18,922,627	18,213,087	22,951,917	22,025,284	26,898,918	25,951,644	30,966,657	30,128,640
13	Kerala	12,527,767	12,925,913	14,288,995	14,809,523	15,468,614	16,372,760	16,027,412	17,378,649
14	Madhya Pradesh	26,886,305	25,292,539	25,394,673	23,171,569	31,443,652	28,904,371	37,612,306	35,014,503
15	Maharashtra	32,414,432	30,368,386	40,825,618	38,111,569	50,400,596	46,478,031	58,243,056	54,131,277
16	Manipur ¹	721,006	699,947	938,359	898,790	1,161,952	1,131,944	1,438,586	1,417,208
17	Meghalaya	683,710	652,109	907,687	867,091	1,176,087	1,142,735	1,491,832	1,475,057
18	Mizoram	257,239	236,518	358,978	330,778	459,109	429,464	555,339	541,867
19	Nagaland	415,910	359,020	641,282	568,264	1,047,141	942,895	1,024,649	953,853
20	Odisha	13,309,786	13,060,485	16,064,146	15,595,590	18,660,570	18,144,090	21,212,136	20,762,082
21	Punjab	8,937,210	7,851,705	10,778,034	9,503,935	12,985,045	11,373,954	14,639,465	13,103,873
22	Rajasthan	17,854,154	16,407,708	23,042,780	20,963,210	29,420,011	27,087,177	35,550,997	32,997,440
23	Sikkim	172,440	143,945	216,427	190,030	288,484	252,367	323,070	287,507
24	Tamil Nadu	24,487,624	23,920,453	28,298,975	27,559,971	31,400,909	31,004,770	36,137,975	36,009,055
25	Tripura	1,054,846	998,212	1,417,930	1,339,275	1,642,225	1,556,978	1,874,376	1,799,541
26	Uttarakhand++	..	..	3,674,540	3,438,943	4,325,924	4,163,425	5,137,773	4,948,519
27	Uttar Pradesh	58,819,535	52,042,977	70,362,417	61,636,387	87,565,369	78,632,552	104,480,510	95,331,831
28	West Bengal	28,560,901	26,019,746	35,510,633	32,567,332	41,465,985	38,710,212	46,809,027	44,467,088
Union Territories									
1	A&N Islands	107,261	81,480	154,369	126,292	192,972	163,180	202,871	177,710
2	Chandigarh	255,278	196,332	358,614	283,401	506,938	393,697	580,663	474,787
3	D&N Haveli	52,515	51,161	70,953	67,524	121,666	98,824	193,760	149,949
4	Daman & Diu	38,298	40,683	51,595	49,991	92,512	65,692	150,301	92,946
5	Delhi	3,440,081	2,780,325	5,155,512	4,265,132	7,607,234	6,243,273	8,987,326	7,800,615
6	Lakshadweep	20,377	19,872	26,618	25,089	31,131	29,519	33,123	31,350
7	Puducherry	304,561	299,910	408,081	399,704	486,961	487,384	612,511	635,442
All India⁺ & ¹		353,374,460	329,954,637	439,358,440	407,062,599	532,223,090	496,514,346	623,270,258	587,584,719

Source : Office of the Registrar General, India

+ : The 1991 Census was not held in Jammu & Kashmir. 1991 Census figures include interpolated Population of Jammu & Kashmir.

++ : The States of Uttarakhand, Jharkhand and Chhattisgarh are carved out from Uttar Pradesh, Bihar, and Madhya Pradesh respectively, in 2001 Census. In 1991 the recasted figures for these States are given as per jurisdiction of 2001 Census.

1 - : India and Manipur figures include estimated figures for those of the three sub-divisions viz. Mao Maram, Paomata and Purul of Senapati district of Manipur as population Census 2001 in these three sub-divisions were cancelled due to technical and administrative reasons.

Table 7.1.2 : Expectation of life at Birth by Sex -India				
(In Years)				
Sl. No.	Year	Female	Male	Combined
1	2	3	4	5
1	1901-11	23.3	22.6	22.9
2	1911-21	20.9	19.4	20.1
3	1921-31	26.6	26.9	26.8
4	1931-41	31.4	32.1	31.8
5	1941-51	31.7	32.4	32.1
6	1951-61	40.6	41.9	41.3
7	1961-71	44.7	46.4	45.6
8	1970-75	49.0	50.5	49.7
9	1976-80	52.1	52.5	52.3
10	1981-85	55.7	55.4	55.4
11	1986-90	58.1	57.7	57.7
12	1987-91	58.6	58.1	58.3
13	1988-92	59.0	58.6	58.7
14	1989-93	59.7	59.0	59.4
15	1990-94	60.4	59.4	60.0
16	1991-95	60.9	59.7	60.3
17	1992-96	61.4	60.1	60.7
18	1993-97	61.8	60.4	61.1
19	1994-98	62.2	60.6	61.4
20	1995-99	62.3	60.8	61.5
21	1996-00	62.7	61.2	61.9
22	1997-01	63.3	61.4	62.3
23	1998-02	64.0	61.9	62.9
24	1999-03	64.6	62.3	63.4
25	2000-04	65.2	62.8	63.9
26	2001-05	65.6	63.1	64.3
27	2002-06	66.1	63.5	64.7
28	2003-07	66.5	63.7	65.0
29	2004-08	66.9	64.0	65.4
30	2005-09	67.2	64.3	65.7
31	2006-10	67.7	64.6	66.1
32	2007-11	68.2	64.9	66.5
33	2008-12	68.8	65.4	67.0
34	2009-13	69.3	65.8	67.5
35	2010-14	69.6	66.4	67.9
Source : Office of the Registrar General, Government of India				

Table 7.1.3 : Infant mortality rate by sex (Per Thousand Live Births)						
Sl. No.	Year	Sex		Sector		Overall
		Female	Male	Rural	Urban	
1	2	3	4	5	6	7
1	1985	98	96	107	59	97
2	1990	81	78	86	50	80
3	1995*	76	73	80	48	74
4	1996*	73	71	77	46	72
5	1997*	72	70	77	45	71
6	1998*	73	70	77	45	72
7	1999	71	70	75	44	70
8	2000	69	67	74	44	68
9	2001	68	64	72	42	66
10	2002**	65	62	69	40	63
11	2003*	64	57	66	38	60
12	2004	58	58	64	40	58
13	2005	61	56	64	40	58
14	2006	59	56	62	39	57
15	2007	56	55	61	37	55
16	2008	55	52	58	36	53
17	2009	52	49	55	34	50
18	2010	49	46	51	31	47
19	2011	46	43	48	29	44
20	2012	44	41	46	28	42
21	2013	42	39	44	27	40
22	2014	40	37	43	26	39
23	2015	39	35	41	25	37

Source : Office of the Registrar General, India, Sample Registration System-2015

* : Excludes Jammu and Kashmir due to non-receipt of returns.

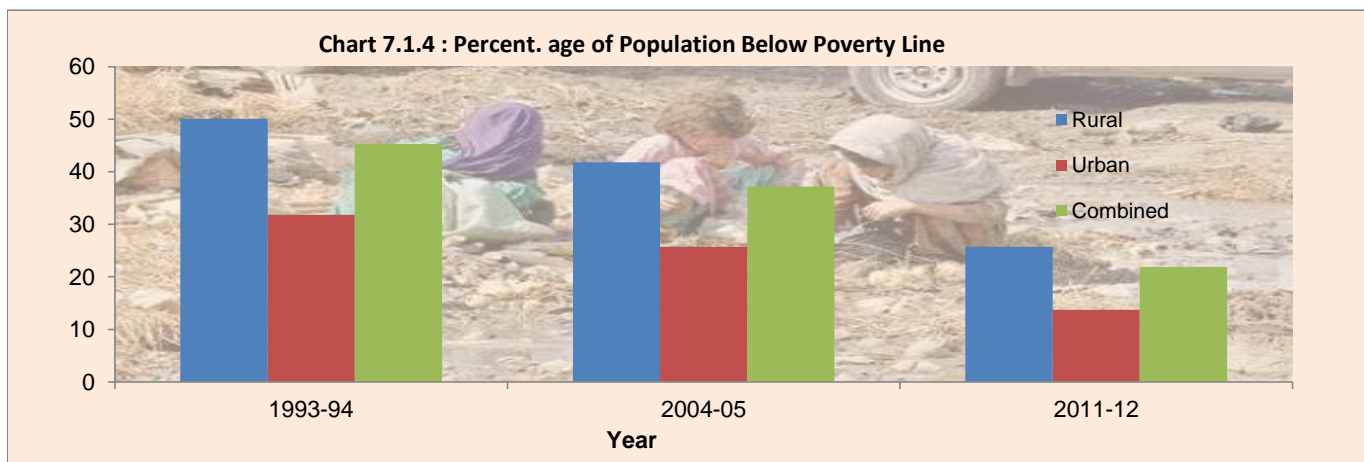
* * : Excludes Nagaland (Rural) due to part-receipt of returns.

Table 7.1.4 : State-wise percentage of population below the poverty line -Rural, Urban & Combined (1993-94, 2004-05 and 2011-12) (% of Population)										
Sl. No.	States/ Union Territories	1993-94			2004-05			2011-12		
		Rural	Urban	combined	Rural	Urban	combined	Rural	Urban	combined
1	2	7	4	5	9	9	9	10	11	12
	States									
1	Andhra Pradesh	48.10	35.20	44.60	32.30	23.40	29.90	10.96	5.81	9.20
2	Arunachal Pradesh	60.00	22.60	54.50	33.60	23.50	31.10	38.93	20.33	34.67
3	Assam	54.90	27.70	51.80	36.40	21.80	34.40	33.89	20.49	31.98
4	Bihar	62.30	44.70	60.50	55.70	43.70	54.40	34.06	31.23	33.74
5	Chattisgarh	55.90	28.10	50.90	55.10	28.40	49.40	44.61	24.75	39.93
6	Delhi	16.20	15.70	15.70	15.60	12.90	13.10	12.92	9.84	9.91
7	Goa	25.50	14.60	20.80	28.10	22.20	25.00	6.81	4.09	5.09
8	Gujarat	43.10	28.00	37.80	39.10	20.10	31.80	21.54	10.14	16.63
9	Haryana	40.00	24.20	35.90	24.80	22.40	24.10	11.64	10.28	11.16
10	Himachal Pradesh	36.70	13.60	34.60	25.00	4.60	22.90	8.48	4.33	8.06
11	Jammu & Kashmir	32.50	6.90	26.30	14.10	10.40	13.20	11.54	7.20	10.35
12	Jharkhand	65.90	41.80	60.70	51.60	23.80	45.30	40.84	24.83	36.96
13	Karnataka	56.60	34.20	49.50	37.50	25.90	33.40	24.53	15.25	20.91
14	Kerala	33.90	23.90	31.30	20.20	18.40	19.70	9.14	4.97	7.05
15	Madhya Pradesh	49.00	31.80	44.60	53.60	35.10	48.60	35.74	21.00	31.65
16	Maharashtra	59.30	30.30	47.80	47.90	25.60	38.10	24.22	9.12	17.35
17	Manipur	64.40	67.20	65.10	39.30	34.50	38.00	38.80	32.59	36.89
18	Meghalaya	38.00	23.00	35.20	14.00	24.70	16.10	12.53	9.26	11.87
19	Mizoram	16.60	6.30	11.80	23.00	7.90	15.30	35.43	6.36	20.40
20	Nagaland	20.10	21.80	20.40	10.00	4.30	9.00	19.93	16.48	18.88
21	Odisha	63.00	34.50	59.10	60.80	37.60	57.20	35.69	17.29	32.59
22	Punjab	20.30	27.20	22.40	22.10	18.70	20.90	7.66	9.24	8.26
23	Rajasthan	40.80	29.90	38.30	35.80	29.70	34.40	16.05	10.69	14.71
24	Sikkim	33.00	20.40	31.80	31.80	25.90	31.10	9.85	3.66	8.19
25	Tamil Nadu	51.00	33.70	44.60	37.50	19.70	28.90	15.83	6.54	11.28
26	Tripura	34.20	25.40	32.90	44.50	22.50	40.60	16.53	7.42	14.05
27	Uttarkhand	36.70	18.70	32.00	35.10	26.50	32.73	11.62	10.48	11.26
28	Uttar Pradesh	50.90	38.30	48.40	42.70	34.10	40.90	30.40	26.06	29.43
29	West Bengal	42.50	31.20	39.40	38.20	24.40	34.30	22.52	14.66	19.98
30	Puducherry	28.10	32.40	30.90	22.90	9.90	14.10	17.06	6.30	6.69
31	Andaman & Nicobar Islands							1.57	0.00	1.00
32	Chandigarh							1.64	22.31	21.81
33	Dadar & Nagar Haveli							62.59	15.38	39.31
34	Daman & Diu							0.00	12.62	9.86
35	Lakshadweep							0.00	3.44	2.77
	All India	50.10	31.8	45.30	41.80	25.70	37.20	25.70	13.70	21.92

Source : Niti Aayog (Tendulkar Methodology)

Note: 1. Population as on 1st March 2012 has been used for estimating number of persons below poverty line. (2011 Census population extrapolated)

2. Poverty line of Tamil Nadu is used for Andaman and Nicobar Island.
3. Urban poverty line of Punjab is used for both rural and urban areas of Chandigarh.
4. Poverty line of Maharashtra is used for Dadra & Nagar Haveli.
5. Poverty line of Goa is used for Daman & Diu
6. Poverty line of Kerala is used for Lakshadweep.



7.2 Housing and basic facilities

7.2.1 Agenda 21, as mentioned in chapter 1, that resulted from Rio Earth Summit of 1992 recognised that people were at the core of sustainable development. For hundred's of people world wide, poor living conditions in urban & rural area are destroying lives health and social and moral values. Access to safe healthy shelter is essential to a persons physical, social, psychological and economic well being.

7.2.2 In India, Census of India, RGI under take a house listing and housing census in 2011 as a first phase of census of India-2011. One of the objectives of Census of India 2011 was to identify each building/census house and also to ascertain the quality of the census house, amenities accessible to it and assets available to the households living in those census houses. As is evident from Table 7.2.1 the census houses increased to 33 crore. The average size of the households however decreased to 4.9. Urban-Rural breakup of population with number of households distribution of households by this number of dwelling units is presented in Table 7.2.2 and 7.2.3. Table 7.2.4 gives the number of houseless household & the houseless population in census year.

Table 7.2.1 : Urban-rural breakup of total population, number of households, houses and average size of households, average no of households and persons per house							
Sl. No.	Year	Total Population	No. of Households	No. of Houses	Av. Size of Households	Av. No of Household Per House	Av. No. of Persons Per House
1	2	3	4	5	6	7	8
1	1981*						
	Total	665,287,849	119,772,545	121,782,109**	5.6	1.0	5.5
	Urban	157,680,171	28,905,949	29,897,491	5.5	1.0	5.3
	Rural	507,607,678	90,866,596	91,884,618	5.6	1.0	5.5
2	1991+						
	Total	838,583,988	152,009,467	159,425,666**	5.5	1.0	5.3
	Urban	215,771,612	40,418,141	43,518,317	5.3	0.9	5.0
	Rural	622,812,376	111,591,326	115,907,349	5.6	1.0	5.4
3	2001++						
	Total	1,028,610,328	193,579,954	202,973,364	5.3	1.0	5.1
	Urban	286,119,689	55,832,570	58,514,738	5.1	1.0	4.9
	Rural	742,490,639	137,747,384	144,458,626	5.4	1.0	5.1
4	2011						
	Total	1,210,854,977	246,740,228	330835767^	4.9	0.7	3.7^
	Urban	377,106,125	78,865,937	110139853^	4.7	0.8	3.4^
	Rural	833,748,852	167,874,291	220695914^	3.8	0.8	3.8^

Source : Office of Registrar General of India

* : Excluding Assam + : Excluding J & K

** : No. of Occupied residential houses + No. of Census houses vacant at the time of house listing.

++ India figures are final and exclude those of the three sub-divisions viz. Mao Maram, Paomata and Purul of Senapati district of Manipur as population Census 2001 in these three sub-divisions were cancelled due to technical and administrative reasons although a population census was carried out in these sub-divisions as per schedule.

The occupied residential houses and vacant houses are based on Census 2001 Houselisting data.

^ Provisional Population totals, paper 2, volume 1 of 2011, Rural-Urban distribution, INDIA series 1.
Tables on houses, household Amenities and Assets, India series-1, Census of India-2011.

Table 7.2.2 : Number of households, population and occupied residential and vacant houses with rural/urban break up

Sl. No.	Total/ Urban/ Rural		Number of Households	Population			No. of Houses at the time of		
				Total	Male	Female	Total #	Occupied residential	Vacant
1	2	3	4	5	6	7	8	9	10
1		1981*							
	Total	Total	119,772,545	665,287,849	343,930,423	321,357,426	121,782,109	113,735,542	8,046,567
		Institutional	247,457	3,790,700	3,116,289	674,411			
	Urban	Total	28,905,949	157,680,171	83,876,403	73,803,768	29,897,491	27,604,947	2,292,544
		Institutional	143,015	2,377,559	1,956,711	420,848			
	Rural	Total	90,866,596	507,607,678	260,054,020	247,553,658	91,884,618	86,130,595	5,754,023
		Institutional	104,442	1,413,141	1,159,578	253,563			
2		1991+							
	Total	Total	152,009,467	838,583,988	435,216,358	403,367,630	159,425,666	147,013,766	12,411,900
		Institutional	244,881	4,252,976	3,351,584	901,392			
	Urban	Total	40,418,141	215,771,612	113,936,953	101,834,659	43,518,317	39,073,337	4,444,980
		Institutional	140,702	2,406,841	1,893,949	512,892			
	Rural	Total	111,591,326	622,812,376	321,279,405	301,532,971	115,907,349	107,940,429	7,966,920
		Institutional	104,179	1,846,135	1,457,635	388,500			
3		2001++							
	Total	Total	193,579,954	1,028,610,328	532,156,772	496,453,556	202,973,364	187,162,172	15,811,192
		Institutional	460,717	7,802,866	5,460,238	2,342,628			
	Urban	Total	55,832,570	286,119,689	150,554,098	135,565,591	58,514,738	52,062,718	6,452,020
		Institutional	208,470	3,758,714	2,717,220	1,041,494			
	Rural	Total	137,747,384	742,490,639	381,602,674	360,887,965	144,458,626	135,099,454	9,359,172
		Institutional	252,247	4,044,152	2,743,018	1,301,134			
4		2011							
	Total	Total	246,740,228	1,210,193,422	623,121,843	587,447,730	271,413,517	246,740,228	24,673,289
		Institutional							
	Urban	Total	78,865,937	377,105,760	195,489,200	181,616,925	89,959,567	78,865,937	11,093,630
		Institutional							
	Rural	Total	167,874,291	833,087,662	427,632,643	405,830,805	181,453,950	167,874,291	13,579,659
		Institutional							

Source : Office of Registrar General of India

Note : # : No. of census houses (occupied residential + vacant)

* : Excluding Assam + : Excluding Jammu & Kashmir

++ India figures are final and exclude those of the three sub-divisions viz. Mao Maram, Paomata and Purul of Senapati district of Manipur as population Census 2001 in these three sub-divisions were cancelled due to technical and administrative reasons although a population census was carried out in these sub-divisions as per schedule.

Table 7.2.3 : Household by number of dwelling rooms

	No. of Households	Distribution of Households according to number of dwelling rooms						
		One Room	Two Rooms	Three Rooms	Four Rooms	Five Rooms	No exclusive room	Six Rooms & above
1	2	3	4	5	6	7	8	9
1981*								
Total	118,614,803	53,046,175	33,948,809	14,496,724	7,482,461	6,852,624	769,506	2,018,504
Percentage	100.00	44.70	28.60	12.20	6.30	5.80	0.65	1.70
Urban	28,541,877	13,072,617	7,947,026	3,484,741	1,804,721	1,626,979	149,001	456,792
Percentage	100.00	45.80	27.80	12.30	6.30	5.70	0.52	1.60
Rural	90,072,926	39,973,558	26,001,783	11,011,983	5,677,740	5,225,645	620,505	1,561,712
Percentage	100.00	44.40	28.90	12.20	6.30	5.80	0.69	1.73
1991+								
Total	151,032,898	61,154,743	46,180,064	20,910,465	10,791,101	10,608,294	43,538	1,344,693
Percentage	100.00	40.50	30.60	13.80	7.20	7.00	0.03	0.89
Urban	39,493,450	15,620,078	11,992,915	5,852,191	3,070,829	2,751,947	16,578	188,912
Percentage	100.00	39.50	30.40	14.80	7.80	7.00	0.04	0.48
Rural	111,539,448	45,534,665	34,187,149	15,058,274	7,720,272	7,856,347	26,960	1,155,781
Percentage	100.00	40.80	30.70	13.50	6.90	7.00	0.02	1.04
2001								
Total	191,963,935	73,856,117	57,571,314	27,541,899	14,361,957	12,660,232	5,972,416	-
Percentage	100.00	38.47	29.99	14.35	7.48	6.60	3.11	-
Urban	53,692,376	18,852,794	15,857,448	9,176,931	4,656,850	3,900,405	1,247,948	-
Percentage	100.00	35.11	29.53	17.09	8.67	7.26	2.32	-
Rural	138,271,559	55,003,323	41,713,866	18,364,968	9,705,107	8,759,827	4,724,468	-
Percentage	100.00	39.78	30.17	13.28	7.02	6.34	3.42	-
2011^								
Total	246740228	91491894	78124581	35803824	18377481	6395066	9638369	6909013 **
Percentage	100	37.08	31.66	14.51	7.45	2.59	3.91	2.80
Rural	167874291	66155450	53987801	21308634	11071009	3842346	7211590	4297461 **
Percentage	100	39.41	32.16	12.69	6.59	2.29	4.30	2.56
Urban	78865937	25336444	24136780	14495190	7306472	2552720	2426779	2611552 **
Percentage	100	32.13	30.60	18.38	9.26	3.24	3.08	3.31

Source: Office of the Registrar General of India

* : Excluding Assam Excluding houseless and Institutional Households

+ : Excluding J& K ,Excluding houseless and Institutional Households

^ Tables on houses, household Amenities and Assets, India series-1, Census of India-2011.

** : Six rooms & above

Table 7.2.4 : Number of houseless households and population					
Sl. No.	Year	Numbers of houseless households	Houseless Population		
			Total	Male	Female
1	2	3	4	5	6
1	1981*				
	Total	629,929	2,342,954	1,376,512	966,442
	Urban	209,520	618,843	406,154	212,689
	Rural	420,409	1,724,111	970,358	753,753
2	1991+				
	Total	522,445	2,007,489	1,180,368	827,121
	Urban	216,917	725,592	471,077	254,515
	Rural	305,528	1,281,897	709,291	572,606
3	2001				
	Total	447,585	1,943,766	1,136,496	807,270
	Urban	187,810	778,599	502,344	276,255
	Rural	259,775	1,165,167	634,152	531,015
4	2011				
	Total	449,787	1,773,040	1,046,871	726,169
	Urban	256,896	938,348	602,421	335,927
	Rural	192,891	834,692	444,450	390,242

Source: Primary census Abstract for total population and houseless population, 2011, Office of the Registrar General of India

* : Excluding Assam

+ : Excludes Jammu & Kashmir



7.3 Water and Sanitation

7.3.1 Access to safe drinking water and proper sanitation is both a right and a basic need. It has a significant bearing on the achievements of other Millennium Development Goals including poverty reduction, and gender equality. However, despite two decades of concerted efforts by national governments and international communities, equitable access to safe drinking water supply and improved sanitation for all remains elusive. It is a pressing development issue.

7.3.2 Access to safe drinking water remains an urgent need as only 70.6% of occupied housing unit in urban areas received organized piped water supply and rest have to depend on surface or ground water which is untreated. The situation in rural areas is much worse with only 30.8% households reported water supply through Tap Water. In India, almost all surface water sources are contaminated and unfit for human consumption. The diseases commonly caused due to contaminated water are diarrhoea, trachoma, intestine worms, hepatitis. Inadequate access to safe drinking water and sanitation facilities leads to infant mortality and intestinal diseases. As per Census 2011, 69.3% rural households 18.6% urban households are still without toilet of any type.

7.3.3 The detailed Rural –Urban classification of Households by water supply and toilet installation is in Table 7.3.1

Table 7.3.1 : Households classified by supply of water and toilet installation by rural and urban						
Year	Total number of Households	Households with Water Supply through Tap Water			Toilet Installation	
		Total	Treated	Untreated	With Toilet of Any Type*	Without Toilet of Any Type*
1	2	3	4	5	6	7
2011						
Total	246740228	107,426,831	78,880,843	28,545,988	115,737,458	130,972,879
Percentage	100	43.5	32.0	11.6	46.9	53.1
Rural	167874291	51,724,820	29,976,500	21,748,320	51,575,339	116,298,952
Percentage	100	30.8	17.9	13.0	30.7	69.3
Urban	78865937	55,702,011	48,904,343	6,797,668	64,162,119	14,703,818
Percentage	100.0	70.6	62.0	8.6	81.4	18.6

Source : Office of the Registrar General of India (Census 2011)

* Within the Premises

7.3.4 Water is a finite resource. Conserving water is one way of ensuring that more is available for those who do not have it. The state wise estimated requirement of water for domestic purposes including for cattle is presented in Table 7.3.2 .

7.3.5 The source of drinking water is an indicator of development towards availability of safe drinking water. The distribution of households by major source of drinking water in rural and urban areas is exhibited in table 7.3.3

7.3.6 Food, potable drinking water, adequate system for disposal of excreta, good sanitation and personal hygiene etc. are pre – requisite to reduce prevalence of morbidity. Sewage treatment is an important initiative in this direction, however, in Indian Metropolitan cities, on an average sewage treatment capacity is only 30.81% of the sewage generation in class I cities and 8.67% of the sewage generation in Class II towns. The data on this is depicted in tables 7.3.4 a, 7.3.4 b&7.3.4 c .

Table 7.3.2 : State -wise estimated annual requirement of water for domestic purposes including for cattle in different states											
Sl. No.	State/UT	Population in Thousand					Water Requirement in BCM				
		1991	2001	2004	2006	2025	1991	2001	2004	2006	2025
1	2	3	4	5	6	7	8	9	10	11	12
1	Andhra Pradesh	66,508	75,728	78,527	80,430	94,276	2.50	3.20	3.45	3.63	4.91
2	Arunachal Pradesh	865	1,091	1,139	1,170	1,429	0.03	0.05	0.05	0.05	0.07
3	Assam	22,414	26,638	28,050	29,009	36,766	0.84	1.13	1.23	1.31	1.91
4	Bihar	86,374	82,879	87,810	90,830	114,845	3.25	3.50	3.86	4.09	5.98
5	Chandigarh	642	901	969	1,013	1,642	0.02	0.04	0.04	0.05	0.09
6	Chhattisgarh	@	20,796	22,011	22,859	29,513	@	0.88	0.97	1.03	1.54
7	Goa	1,170	1,344	1,451	1,537	2,703	0.04	0.06	0.06	0.07	0.14
8	Gujarat	41,310	50,597	53,195	54,814	67,402	1.55	2.14	2.34	2.47	3.51
9	Haryana	16,464	21,083	22,296	23,040	28,941	0.62	0.89	0.98	1.04	1.51
10	Himachal Pradesh	5,171	6,077	6,294	6,425	7,345	0.19	0.26	0.28	0.29	0.38
11	Jammu & Kashmir	7,719	10,070	10,935	11,603	21,767	0.29	0.43	0.48	0.52	1.13
12	Jharkhand	@	26,909	28,303	29,173	35,730	@	1.14	1.24	1.32	1.86
13	Karnataka	44,977	52,734	54,824	56,137	65,879	1.69	2.23	2.41	2.53	3.43
14	Kerala	29,099	31,839	32,862	33,569	38,360	1.09	1.34	1.45	1.51	2.00
15	Madhya Pradesh	66,181	60,385	64,237	66,801	88,062	2.49	2.55	2.82	3.01	4.58
16	Maharashtra	78,937	96,752	101,275	104,104	127,719	2.97	4.09	4.45	4.69	6.65
17	Manipur	1,837	2,389	2,499	2,561	3,128	0.07	0.10	0.11	0.12	0.16
18	Meghalaya	1,775	2,306	2,411	2,472	3,021	0.07	0.10	0.11	0.11	0.16
19	Mizoram	690	891	932	955	1,167	0.03	0.04	0.04	0.04	0.06
20	Nagaland	1,210	1,989	2,090	2,132	2,606	0.05	0.08	0.09	0.10	0.14
21	Odisha	31,660	36,707	38,139	39,053	45,763	1.19	1.55	1.68	1.76	2.38
22	Punjab	20,282	24,289	25,336	25,976	30,609	0.76	1.03	1.11	1.17	1.59
23	Rajasthan	44,006	56,473	60,127	62,431	80,005	1.66	2.39	2.64	2.81	4.16
24	Sikkim	406	540	566	579	708	0.02	0.02	0.02	0.03	0.04
25	Tamil Nadu	55,859	62,111	64,019	65,261	73,569	2.10	2.62	2.82	2.94	3.83
26	Tripura	2,757	3,191	3,326	3,421	4,180	0.10	0.13	0.15	0.15	0.22
27	Uttar Pradesh	139,112	166,053	176,765	183,856	245,772	5.23	7.01	7.77	8.29	12.79
28	Uttarakhand	@	8,480	8,925	9,216	11,506	@	0.36	0.39	0.42	0.60
29	West Bengal	68,078	80,221	83,585	85,780	103,194	2.56	3.39	3.68	3.70	5.37
30	A. & N. Islands	281	356	377	394	606	0.01	0.02	0.02	0.02	0.03
31	D. & N. Haveli	138	220	237	248	429	0.01	0.01	0.01	0.01	0.02
32	Lakshadweep	52	61	64	66	97	0.00	0.00	0.00	0.00	0.01
33	Puducherry	808	974	1,013	1,042	1,427	0.03	0.04	0.04	0.05	0.07
34	Delhi	9,421	13,783	15,128	16,065	28,394	0.35	0.58	0.67	0.72	1.48
35	Daman & Diu	102	158	170	178	301	0.00	0.01	0.01	0.01	0.02
	TOTAL	846,303	1,027,015	1,079,887	1,114,200	1,398,861	31.84	43.38	47.49	50.23	72.81

Source: Central Water Commission

BCM : Billion Cubic Metres

Note : + : All India figures relate to the estimated requirement as worked out by the standing sub committee for Assessment of availability and requirement of water for diverse uses in the country, 2000. (distributed prorata in the states in proportion to population).

@ : Three States namely Jharkhand, Uttarakhand & Chhattisgarh have been formed after 1991 as such their population as well water requirement in year 1991 have been included in the respective states: Chhattisgarh in M.P., Jharkhand in Bihar and Uttaranchal in Uttar Pradesh.

Table: 7.3.3 Distribution of households by availability of drinking water facility (%)

Sl.No	India/ State/ Union Territory #	Distribution of households by availability of drinking water facility													Availability of Drinking Water Source		
		Total No. of Households (Excluding institutional households)	Tap water			Well			Handpump	Tubewell	Spring	River, Canal	Tank, Pond, Lake	Any other source	Within the premises	Near the premises	Away
			Total	From treated source	From un- treated source	Total	Covered well	Un- covered well									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	A & N Islands #	93,376	85.0	68.9	16.2	7.3	0.7	6.6	0.0	0.5	1.2	2.6	1.5	1.9	60.6	27.0	12.4
2	Andhra Pradesh	21,024,534	69.9	49.0	20.9	6.4	0.5	5.9	13.7	6.9	0.5	0.3	0.3	2.1	43.2	37.3	19.5
3	Arunachal Pradesh	261,614	65.5	26.4	39.1	5.7	1.4	4.3	10.7	2.4	5.7	6.0	0.9	3.2	41.1	37.4	21.6
4	Assam	6,367,295	10.5	9.2	1.3	18.9	1.7	17.2	50.2	9.2	1.3	3.4	4.6	2.0	54.8	26.7	18.5
5	Bihar	18,940,629	4.4	3.1	1.3	4.3	0.7	3.7	86.6	3.0	0.0	0.2	0.1	1.4	50.1	37.9	12.0
6	Chandigarh #	235,061	96.7	93.7	3.0	0.1	0.1	0.0	1.8	0.9	0.0	0.0	0.1	0.5	86.2	11.7	2.2
7	Chhattisgarh	5,622,850	20.7	12.3	8.4	11.4	0.8	10.6	58.4	7.2	0.7	0.9	0.2	0.5	19.0	54.5	26.5
8	Dadra & Nagar Haveli #	73,063	46.5	26.0	20.5	7.2	1.5	5.7	24.5	20.6	0.6	0.3	0.0	0.4	52.6	36.4	11.0
9	Daman & Diu #	60,381	75.2	54.6	20.6	0.7	0.5	0.2	5.5	18.1	0.0	0.0	0.0	0.5	76.4	22.1	1.5
10	Delhi #	3,340,538	81.3	75.2	6.1	0.1	0.1	0.0	5.3	8.4	0.0	0.0	1.2	3.6	78.4	15.4	6.2
11	Goa	322,813	85.4	82.1	3.4	11.1	4.0	7.1	0.1	0.3	1.2	0.3	0.4	1.3	79.7	15.5	4.8
12	Gujarat	12,181,718	69.0	39.9	29.2	7.1	2.3	4.8	11.6	9.6	0.1	0.3	0.2	2.0	64.0	23.5	12.4
13	Haryana	4,717,954	68.8	55.9	12.9	3.0	0.7	2.3	12.0	12.9	0.0	0.3	0.9	1.9	66.5	21.4	12.1
14	Himachal Pradesh	1,476,581	89.5	83.9	5.6	2.9	1.6	1.3	3.6	0.7	0.7	0.3	0.5	1.9	55.5	35.0	9.5
15	Jammu & Kashmir	2,015,088	63.9	34.7	29.2	6.5	1.9	4.7	11.4	1.5	6.2	6.7	0.7	3.1	48.2	28.7	23.1
16	Jharkhand	6,181,607	12.9	10.0	2.9	36.5	1.9	34.6	43.8	3.5	0.8	1.6	0.2	0.8	23.2	44.9	31.9
17	Karnataka	13,179,911	66.1	41.2	24.8	9.0	1.0	8.0	5.5	16.0	0.3	0.8	1.0	1.4	44.5	37.3	18.2
18	Kerala	7,716,370	29.3	23.4	6.0	62.0	14.6	47.4	0.5	3.7	1.4	0.2	0.7	2.1	77.7	14.1	8.2
19	Lakshadweep #	10,703	20.3	9.1	11.1	71.7	6.9	64.9	2.5	0.1	0.0	0.0	0.4	5.1	83.7	14.3	2.0
20	Madhya Pradesh	14,967,597	23.4	16.5	6.9	20.0	1.1	18.9	47.1	7.6	0.3	0.7	0.4	0.6	23.9	45.6	30.5
21	Maharashtra	23,830,580	67.9	56.3	11.6	14.4	2.2	12.2	9.9	5.7	0.4	0.4	0.4	1.0	59.4	27.6	13.1
22	Manipur	554,713	38.8	24.7	14.1	7.6	2.7	4.9	5.9	0.3	7.4	13.9	22.8	3.1	15.5	47.3	37.2
23	Meghalaya	538,299	39.3	27.8	11.5	25.4	6.9	18.5	2.8	2.6	19.0	2.6	5.7	2.6	24.1	43.2	32.7
24	Mizoram	221,077	58.7	39.4	19.3	4.7	2.0	2.7	0.8	0.9	18.4	7.7	1.8	6.9	31.2	46.7	22.2
25	Nagaland	399,965	47.2	6.1	41.1	25.7	6.6	19.1	2.2	4.5	5.6	2.0	10.3	2.7	29.3	42.4	28.3
26	Odisha	9,661,085	13.8	10.0	3.9	19.5	2.2	17.3	41.5	20.0	1.8	1.7	0.9	0.8	22.4	42.2	35.4
27	Puducherry #	301,276	95.3	90.8	4.5	1.9	0.1	1.8	1.2	1.4	0.0	0.0	0.0	0.3	77.4	21.5	1.1
28	Punjab	5,409,699	51.0	41.1	9.9	0.5	0.2	0.2	24.7	21.9	0.0	0.2	0.1	1.7	85.9	10.0	4.1
29	Rajasthan	12,581,303	40.6	32.0	8.5	10.8	1.2	9.6	25.3	12.2	0.1	0.8	5.9	4.3	35.0	39.0	25.9
30	Sikkim	128,131	85.3	29.2	56.1	0.6	0.5	0.2	0.0	0.0	11.1	0.4	0.6	2.0	52.6	29.7	17.7
31	Tamil Nadu	18,493,003	79.8	55.8	24.0	5.1	1.2	3.8	4.6	8.2	0.2	0.2	0.5	1.5	34.9	58.1	7.0
32	Tripura	842,781	33.2	20.3	12.9	27.4	2.9	24.5	18.1	16.3	1.9	1.8	0.5	0.9	37.1	30.5	32.4
33	Uttar Pradesh	32,924,266	27.3	20.2	7.1	4.0	0.6	3.4	64.9	2.9	0.0	0.1	0.1	0.7	51.9	36.0	12.1
34	Uttarakhand	1,997,068	68.2	53.9	14.3	1.1	0.7	0.4	22.0	2.0	1.1	0.9	0.7	4.0	58.3	26.6	15.2
35	West Bengal	20,067,299	25.4	21.0	4.4	6.0	0.7	5.4	50.1	16.7	0.5	0.3	0.2	0.8	38.6	34.7	26.6
	INDIA	246,692,667	43.5	32.0	11.6	11.0	1.6	9.4	33.5	8.5	0.5	0.6	0.8	1.5	46.6	35.8	17.6

Source: Registrar General of India, 2011

Table 7.3.4 (a) : Status of sewage generation and treatment capacity in Metropolitan cities

Sl.No.	Name of the city	Sewage generation (in MLD)	Sewage Treatment Capacity (in MLD)	Percent of treatment capacity
1	2	3	4	5
1	Agra	260.36	88	33
2	Ahmadabad	472.00	488	96
3	Allahabad	176.00	60	34
4	Amritsar	192.00	-	-
5	Asansol	147.00	-	-
6	Bangalore	771.75	-	-
7	Bhopal	334.75	22	6
8	Chennai	158.00	264	100
9	Coimbatore	120.00	-	-
10	Delhi	3800.00	2330	61
11	Dhanbad	192.00	-	-
12	Faridabad	164.00	65	39
13	Hyderabad	426.21	593	100
14	Indore	204.00	78	38
15	Jabalpur	143.34	-	-
16	Jaipur	451.71	54	11
17	Jamshedpur	199.43	-	-
18	Kanpur	417.35	171	41
19	Kochi	188.40	-	-
20	Kolkata	705.86	172	24
21	Lucknow	363.81	42	11
22	Ludhiana	235.20	311	100
23	Madurai	97.93	-	-
24	Meerut	177.05	-	-
25	Mumbai	2671.00	2130	80
26	Nagpur	380.00	100	26
27	Nasik	227.84	107.5	47
28	Patna	279.14	105	37
29	Pune	474.00	305	64
30	Rajkot	108.80	44.5	40
31	Surat	432.00	202	46
32	Vadodara	180.00	206	100
33	Varanasi	230.17	102	44
34	Vijayawada	128.39	-	-
35	Vishakhapatnam	134.99	-	-
Total		15644.48	8040	51

Source: Status of sewage treatment in India (CUPS/61/2005-06) Central Pollution Control Board

MLD: Million litre per day

Note: Information related to Sewage Generation and Treatment Capacities of Metropolitan Cities.

- Status of Municipal Wastewater Generation and treatment capacity of Metro Politian Cities.
- There are 35 metropolitan cities (more than 10 Lac population), 15,644 Millions Litre Per Day (MLD) of sewage is generated from these metropolitan cities. The treatment capacity exists for 8040 MLD i.e. 51% is treatment capacity is created.
- Among the Metropolitan cites, Delhi has the maximum treatment capacity that is 2330 MLD (30% of the total treatment capacity of metropolitan cities)
- Next to Delhi, Mumbai has the capacity of 2130 MLD, which is 26% of total capacity in metropolitan cities.
- Delhi and Mumbai therefore in combination have 55% of treatment capacity of the metropolitan cities.
- Some cities such as Hyderabad, Vadodara, Chennai and Ludhiana and Ahmadabad treatment capacity meets the volume of generation.
- Cities like Delhi, Dhanbad have more than 50% capacity, rest of the cities have the capacity less than 50%

Table 7.3.4 (b): State-wise sewage generation of class-I cities				
Sl.No.	State/Union Territory	No. of Cities*	Sewage Generation* (in MLD)	Sewage Treatment Capacity* (in MLD)
1	Andaman & Nicobar	1	12.00	10.42
2	Andhra Pradesh	99	1978.19	654.00
3	Assam	13	386.60	-
4	Bihar	37	1117.12	137.50
5	Chandigarh	1	429.76	164.79
6	Chhattisgarh	14	391.29	69.00
7	Delhi	1	3800.00	2330.00
8	Goa	3	23.68	18.18
9	Gujarat	59	1908.47	782.50
10	Haryana	27	670.21	312.00
11	Himachal Pradesh	1	28.94	35.63
12	Jammu & Kashmir	6	241.79	-
13	Jharkhand	24	908.68	-
14	Karnataka	59	2023.77	55.62
15	Kerala	34	806.49	-
16	Madhya Pradesh	48	1379.62	195.10
17	Maharashtra	84	10200.02	4254.25
18	Manipur	1	26.74	-
19	Meghalaya	2	32.09	-
20	Mizoram	1	5.71	-
21	Nagaland	2	14.98	-
22	Odisha	24	739.15	53.00
23	Puducherry	3	64.44	-
24	Punjab	33	1685.66	453.80
25	Rajasthan	45	1530.16	54.00
26	Tamilnadu	84	1261.88	362.72
27	Tripura	1	24.00	-
28	Uttar Pradesh	107	3851.71	1252.74
29	Uttarakhand	7	186.04	24.33
30	West Bengal	87	2525.63	567.80
Total		908	38254.824	11787.38

Source: Central Pollution Control Board. MLD: Million litre per day

* Based on the report, CPCB reported that out of 38254 MLD of sewage generated by class I cities and class II towns of the country, only 11787 MLD has been treated. CPCB reassessed sewage generation and treatment capacity for Urban Population of India for the year 2015.



Table 7.3.4 (c) : State-wise sewage generation of class-II towns

Sl.No.	State/Union Territory	Population in Year 2008	No of Class - II Towns	Sewage generation of Class-II Towns (in MLD)	Sewage Treatment capacity (in MLD)
1	2	3	4	5	6
1	Andhra Pradesh	3448610	52	217.59	10.42
2	Assam	573290	8	6.46	-
3	Bihar	1113800	14	107.42	2.00
4	Chhattisgarh	566080	7	40.82	
5	Goa	172850	2	13.89	18.18
6	Gujarat	2180590	31	227.55	-
7	Haryana	544040	7	43.52	-
8	Jammu & Kashmir	244990	4	27.86	-
9	Jharkhand	826300	10	78.21	-
10	Karnataka	1800258	26	233.37	12.18
11	Kerala	1686660	26	231.32	-
12	Madhya Pradesh	1745050	23	130.90	9.00
13	Maharashtra	2503080	34	213.73	29.00
14	Meghalaya	81750	1	11.25	-
15	Nagaland	126520	1	1.36	-
16	Odisha	904510	12	78.42	-
17	Puducherry	79690	1	7.98	-
18	Punjab	1109670	14	157.40	42.80
19	Rajasthan	1599260	21	147.79	-
20	Tamilnadu	3254950	42	184.67	29.30
21	Uttar Pradesh	3382520	46	345.70	12.61
22	Uttarakhand	69490	1	9.07	6.33
23	West Bengal	2004440	27	180.42	61.88
	Total	30018398	410	2696.70	233.70

Source: Status of water supply, waste water generation and treatment in class I cities and class II towns of India Central Pollution Control Board.(UPS/70/2009-10)

MLD: Million litre per day

(-): Indicates that no information is received same data online

7.4 Fuel and Lighting

7.4.1 The primary source of energy for cooking and lighting is an indicator of conditions of living as well as within household air pollution. The Tables 7.4.1 (a) & (b) and 7.4.2(a),(b) & (c) present the sources of energy for cooking and lighting in India. As far as the main source of lighting is concerned 67% households use electricity which shows an increase of 11 points over 2001. The rural-urban gap has reduced by 7 percentage points from 44% in 2001 to 37%.

Table 7.4.1 (a) Per 1000 distribution of households by primary source of energy for cooking (Rural)													
States/UT	Primary source of energy for cooking											Estd. No of house holds (00)	No. of sample house holds surveyed
	Coke, Coal	Fire wood and chips	L.P.G.	Gobar gas	Dung-cake	Charcoal	Kerosene	Electricity	Others	With no cooking arrangement	all*		
Andhra Pradesh	2	675	289	0	2	1	2	0	2	27	1000	151556	3925
Arunachal Pradesh	3	654	314	0	1	0	9	1	0	18	1000	1807	1066
Assam	1	810	172	4	0	0	3	0	1	9	1000	50592	2607
Bihar	6	564	59	0	208	0	5	0	157	1	1000	162107	3310
Chhattisgarh	9	932	15	1	31	0	2	1	3	6	1000	39514	1440
Delhi	0	23	922	0	0	0	0	0	0	55	1000	2387	63
Goa	0	169	662	6	0	0	164	0	0	0	1000	1610	159
Gujarat	0	797	139	6	9	0	35	1	0	12	1000	69060	1712
Haryana	0	417	267	0	244	0	12	2	56	3	1000	35153	1423
Himachal Pradesh	1	727	252	0	1	0	10	2	0	8	1000	13237	1657
Jammu & Kashmir	0	678	265	0	21	0	22	8	3	4	1000	14417	2032
Jharkhand	143	777	29	0	29	0	3	0	2	16	1000	44869	1757
Karnataka	0	805	147	7	0	0	20	0	0	21	1000	81325	2048
Kerala	1	663	308	5	0	0	1	2	0	20	1000	56925	2608
Madhya Pradesh	2	808	62	7	106	0	5	0	0	8	1000	105234	2735
Maharashtra	0	621	231	5	2	0	10	0	92	38	1000	134674	4031
Manipur	0	635	346	0	1	4	2	0	0	12	1000	3329	1376
Meghalaya	0	910	55	0	0	0	10	11	0	15	1000	4138	856
Mizoram	0	602	391	0	0	0	7	0	0	0	1000	1090	640
Nagaland	0	466	534	0	0	0	0	0	0	0	1000	1448	672
Odisha	9	870	39	2	18	1	2	2	51	6	1000	76142	2974
Punjab	0	305	305	7	303	0	27	2	33	19	1000	34161	1552
Rajasthan	0	893	89	0	6	0	7	0	4	1	1000	94456	2579
Sikkim	1	404	560	4	0	0	6	0	0	26	1000	1038	608
Tamil Nadu	0	583	372	0	0	0	25	2	0	18	1000	101853	3319
Tripura	0	925	63	2	0	0	5	0	0	5	1000	7204	1312
Uttar Pradesh	2	561	67	0	334	0	1	0	28	6	1000	263726	5915
Uttarakhand	0	698	288	0	1	0	9	0	0	3	1000	15685	1048
West Bengal	65	629	66	0	53	0	5	0	175	6	1000	149793	3566
A&N Islands	0	411	382	0	0	0	189	1	0	17	1000	533	278
Chandigarh	0	3	752	0	15	0	229	0	0	0	1000	193	64
Dadar & N. Haveli	0	683	37	0	0	0	114	0	0	166	1000	404	96
Daman & Diu	0	130	238	0	0	0	542	0	0	90	1000	415	64
Lakshadweep	0	793	37	0	0	0	26	80	0	65	1000	56	63
Puducherry	0	306	592	0	3	0	40	0	0	59	1000	1175	128
All India	11	673	150	2	96	0	9	1	46	13	1000	1721307	59683

Source : NSS Report No. 567: Energy Sources of Indian Households for Cooking and Lighting in India, 2011-12 (NSS 68th Round) (P-A-37 to A-57)

* all including n.r. cases

Table 7.4.1 (b) Per 1000 distribution of households by primary source of energy for cooking (Urban)

States/UT	Primary source of energy for cooking											Estd. No of house holds (00)	No. of sample house hold surveyed
	Coke, Coal	Fire wood and chips	L.P.G.	Gobar gas	Dung-cake	Charcoal	Kerosene	Electricity	Charcoal & others	With no cooking arrangement	All		
Andhra Pradesh	1	101	773	0	0	1	27	6	0	91	1000	75569	2971
Arunachal Pradesh	0	122	841	0	0	0	12	25	0	0	1000	486	608
Assam	1	168	710	0	1	0	57	0	23	40	1000	7287	832
Bihar	40	249	605	0	55	6	5	2	25	13	1000	17948	1270
Chhattisgarh	113	347	398	1	33	1	27	10	9	59	1000	11874	734
Delhi	2	6	856	0	0	0	17	3	46	71	1000	29486	882
Goa	0	33	903	0	0	0	26	0	0	38	1000	1710	288
Gujarat	9	159	620	0	3	0	105	0	57	47	1000	57668	1717
Haryana	0	60	865	0	31	1	14	1	3	25	1000	17793	1166
Himachal Pradesh	0	56	718	0	5	2	74	13	0	132	1000	2269	383
Jammu & Kashmir	1	98	783	0	3	4	39	37	0	28	1000	4708	1355
Jharkhand	311	56	539	0	5	0	12	9	0	68	1000	13323	980
Karnataka	0	148	640	1	0	0	68	3	0	139	1000	52095	2048
Kerala	0	363	554	0	0	0	6	4	1	72	1000	21916	1854
Madhya Pradesh	8	257	652	0	18	0	36	2	0	27	1000	36909	1981
Maharashtra	2	57	745	0	0	0	101	2	13	80	1000	117361	4013
Manipur	1	285	647	0	1	54	8	2	0	2	1000	1289	1184
Meghalaya	0	141	640	0	3	31	57	80	0	48	1000	1114	404
Mizoram	0	58	936	0	0	1	5	0	0	0	1000	923	896
Nagaland	0	135	863	0	0	0	3	0	0	0	1000	866	352
Odisha	38	365	435	0	2	3	48	14	10	85	1000	15242	1052
Punjab	1	67	754	1	32	0	100	4	2	38	1000	22670	1566
Rajasthan	5	187	716	0	2	0	20	0	0	70	1000	31248	1552
Sikkim	0	3	826	0	0	0	22	0	0	149	1000	315	160
Tamil Nadu	0	112	709	0	0	0	85	2	0	92	1000	87098	3327
Tripura	0	281	668	0	0	0	38	0	0	13	1000	1548	544
Uttar Pradesh	6	210	668	0	75	1	10	4	3	23	1000	80002	3099
Uttarakhand	0	161	788	0	5	0	16	0	0	31	1000	5648	734
West Bengal	135	107	565	0	6	0	87	2	13	84	1000	60705	2746
A&N Island	0	22	713	0	0	0	215	0	5	46	1000	355	288
Chandigarh	0	48	756	0	0	0	136	0	0	61	1000	2152	248
Dadar & N. Haveli	0	54	731	0	0	0	211	0	0	3	1000	359	94
Daman & Diu	0	67	757	0	0	0	65	0	0	110	1000	154	64
Lakshadweep	0	263	453	0	0	0	163	55	0	67	1000	51	128
Puducherry	0	81	762	0	0	0	30	0	0	126	1000	2182	448
All India	21	140	684	0	13	1	57	3	11	69	1000	782319	41968

Source : NSS Report No. 567: Energy Sources of Indian Households for Cooking and Lighting in India, 2011-12 (NSS 68th Round) (P-A-37 to A-57)

* all including n.r. cases

Table :7.4.2(a) Distribution of households by source of lighting (India)											
Sl. No.	India/ State/ Union Territory	Percentage of households having									
		Total No. of Households		Electricity		Kerosene		Any other sources		No lighting	
		2011	2001	2011	2001	2011	2001	2011	2001	2011	2001
1	2	3	4	5	6	7	8	9	10	11	12
1	A & N Islands	93376	73062	86.1	76.8	12.9	21.7	0.6	0.9	0.5	0.6
2	Andhra Pradesh	21024534	16849857	92.2	67.2	6.9	32.1	0.6	0.4	0.4	0.3
3	Arunachal Pradesh	261614	212615	65.7	54.7	18.5	31.4	5.3	5.6	10.5	8.3
4	Assam	6367295	4935358	37.0	24.9	61.8	74.7	1.0	0.3	0.2	0.1
5	Bihar	18940629	13982590	16.4	10.3	82.4	89.3	1.2	0.4	0.1	0.0
6	Chandigarh	235061	201878	98.4	96.8	1.2	2.8	0.3	0.2	0.2	0.2
7	Chhattisgarh	5622850	4148518	75.3	53.1	23.2	46.0	1.2	0.5	0.3	0.4
8	Dadra & Nagar Haveli	73063	43973	95.2	86.0	4.4	12.9	0.0	0.3	0.3	0.8
9	Daman & Diu	60381	34342	99.1	97.8	0.8	1.8	0.1	0.1	0.1	0.3
10	Goa	322813	279216	96.9	93.6	2.4	5.7	0.4	0.3	0.4	0.4
11	Gujarat	12181718	9643989	90.4	80.4	8.1	18.1	0.5	0.6	1.0	0.9
12	Haryana	4717954	3529642	90.5	82.9	8.1	16.2	1.0	0.5	0.5	0.4
13	Himachal Pradesh	1476581	1240633	96.8	94.8	2.8	4.6	0.3	0.4	0.1	0.2
14	Jammu & Kashmir	2015088	1551768	85.1	80.6	9.7	14.8	3.2	4.2	2.0	0.5
15	Jharkhand	6181607	4862590	45.8	24.3	53.1	75.3	1.0	0.4	0.1	0.1
16	Karnataka	13179911	10232133	90.6	78.5	8.6	20.8	0.4	0.3	0.4	0.3
17	Kerala	7716370	6595206	94.4	70.2	5.2	29.1	0.4	0.6	0.0	0.0
18	Lakshadweep	10703	9240	99.7	99.7	0.2	0.2	0.1	0.1	0.0	0.0
19	Madhya Pradesh	14967597	10919653	67.1	70.0	32.1	29.5	0.6	0.3	0.2	0.2
20	Maharashtra	23830580	19063149	83.9	77.5	14.5	21.5	0.7	0.5	0.9	0.5
21	Manipur	554713	397656	69.3	60.0	24.3	38.0	5.7	1.0	0.6	0.9
22	Meghalaya	538299	420246	60.9	42.7	37.0	55.9	1.3	0.7	0.8	0.7
23	Mizoram	221077	160966	84.2	69.6	13.5	27.8	1.9	1.3	0.3	0.4
24	Nagaland	399965	332050	81.6	63.6	15.6	31.6	1.6	2.0	1.1	2.8
25	NCT of Delhi	3340538	2554149	99.1	92.9	0.7	6.2	0.2	0.7	0.1	0.2
26	Odisha	9661085	7870127	43.0	26.9	55.3	72.1	0.6	0.5	1.1	0.5
27	Puducherry	301276	208655	97.7	87.8	2.1	11.8	0.1	0.2	0.2	0.1
28	Punjab	5409699	4265156	96.6	91.9	2.2	6.7	0.6	0.5	0.7	0.9
29	Rajasthan	12581303	9342294	67.0	54.7	30.9	44.1	1.2	0.7	0.8	0.5
30	Sikkim	128131	104738	92.5	77.8	6.6	21.6	0.4	0.3	0.5	0.4
31	Tamil Nadu	18493003	14173626	93.4	78.2	5.9	21.1	0.4	0.4	0.4	0.4
32	Tripura	842781	662023	68.4	41.8	29.1	57.5	2.1	0.4	0.3	0.2
33	Uttar Pradesh	32924266	25760601	36.8	31.9	61.9	67.4	1.1	0.5	0.2	0.1
34	Uttarakhand	1997068	1586321	87.0	60.3	11.1	37.3	1.6	2.1	0.3	0.3
35	West Bengal	20067299	15715915	54.5	37.5	43.5	61.9	1.5	0.5	0.5	0.2
	INDIA	246740228	191963935	67.3	55.8	31.4	43.3	0.8	0.5	0.5	0.3

Source : Office of the Registrar General

Table :7.4.2(b) Distribution of households by source of lighting (Rural)											
Sl. No.	India/ State/ Union Territory	Percentage of households having									
		Total No. of Households		Electricity		Kerosene		Any other sources		No lighting	
		2011	2001	2011	2001	2011	2001	2011	2001	2011	2001
1	2	3	4	5	6	7	8	9	10	11	12
1	A & N Islands	59030	49653	79.4	68.1	19.3	29.9	0.8	1.2	0.6	0.8
2	Andhra Pradesh	14246309	12676218	89.7	59.7	9.2	39.7	0.6	0.4	0.5	0.3
3	Arunachal Pradesh	195723	164501	55.5	44.5	23.6	37.9	7.0	7.1	14.0	10.5
4	Assam	5374553	4220173	28.4	16.5	70.4	83.1	1.1	0.3	0.2	0.1
5	Bihar	16926958	12660007	10.4	5.1	88.4	94.5	1.2	0.4	0.1	0.0
6	Chandigarh	6785	21302	97.3	97.4	2.4	2.1	0.2	0.3	0.1	0.2
7	Chhattisgarh	4384112	3359078	70.0	46.1	28.2	52.9	1.5	0.6	0.3	0.4
8	Dadra & Nagar Haveli	35408	32783	91.7	82.6	7.9	16.0	0.1	0.3	0.6	1.0
9	Daman & Diu	12750	22091	98.3	97.5	1.5	2.0	0.1	0.2	0.2	0.4
10	Goa	124674	140755	95.6	92.4	3.4	6.9	0.3	0.3	0.6	0.4
11	Gujarat	6765403	5885961	85.0	72.1	12.8	26.2	0.8	0.7	1.4	0.1
12	Haryana	2966053	2454463	87.2	78.5	11.3	20.6	1.0	0.5	0.5	0.4
13	Himachal Pradesh	1310538	1097520	96.6	94.5	3.0	4.9	0.3	0.4	0.1	0.2
14	Jammu & Kashmir	1497920	1161357	80.7	74.8	12.6	19.2	4.1	5.4	2.6	0.6
15	Jharkhand	4685965	3802412	32.3	10.0	66.4	89.6	1.2	0.3	0.0	0.0
16	Karnataka	7864196	6675173	86.7	72.2	12.3	27.2	0.5	0.3	0.5	0.3
17	Kerala	4095674	4942550	92.1	65.5	7.4	33.8	0.4	0.7	0.0	0.0
18	Lakshadweep	2523	5351	99.8	99.7	0.2	0.1	0.0	0.1	0.0	0.0
19	Madhya Pradesh	11122365	8124795	58.3	62.3	40.9	37.2	0.6	0.3	0.2	0.2
20	Maharashtra	13016652	10993623	73.8	65.2	23.9	33.6	1.0	0.7	1.3	0.6
21	Manipur	383313	296354	63.5	52.5	30.2	45.1	5.6	1.2	0.7	1.1
22	Meghalaya	422197	329678	51.6	30.3	45.9	68.2	1.6	0.8	0.9	0.8
23	Mizoram	104874	79362	68.8	44.1	26.9	52.8	3.9	2.3	0.5	0.7
24	Nagaland	284911	265334	75.2	56.9	21.1	37.5	2.2	2.4	1.5	3.2
25	NCT of Delhi	79115	169528	97.8	85.5	1.4	13.0	0.6	0.9	0.2	0.6
26	Odisha	8144012	6782879	35.6	19.4	62.8	79.8	0.6	0.5	1.1	0.4
27	Puducherry	95133	72199	95.8	81.0	3.6	18.6	0.2	0.2	0.5	0.1
28	Punjab	3315632	2775462	95.5	89.5	2.9	8.9	0.7	0.5	0.9	1.1
29	Rajasthan	9490363	7156703	58.3	44.0	39.3	54.7	1.5	0.8	1.0	0.5
30	Sikkim	92370	91723	90.2	75.0	8.7	24.3	0.5	0.3	0.6	0.4
31	Tamil Nadu	9563899	8274790	90.8	71.2	8.3	28.2	0.3	0.3	0.6	0.4
32	Tripura	607779	539680	59.8	31.8	37.7	67.6	2.5	0.4	0.4	0.2
33	Uttar Pradesh	25475071	20590074	23.8	19.8	75.0	79.5	1.1	0.6	0.1	0.1
34	Uttarakhand	1404845	1196157	83.1	50.3	14.5	46.7	2.1	2.7	0.3	0.3
35	West Bengal	13717186	11161870	40.3	20.3	57.8	79.2	1.5	0.5	0.4	0.1
	INDIA	167874294	138271559	55.3	43.5	43.2	55.6	1.0	0.6	0.5	0.3

Source : Office of the Registrar General

Table :7.4.2(c) Distribution of households by source of lighting (Urban)											
Sl. No.	India/ State/ Union Territory	Percentage of households having									
		Total No. of Households		Electricity		Kerosene		Any other sources		No lighting	
		2011	2001	2011	2001	2011	2001	2011	2001	2011	2001
1	2	3	4	5	6	7	8	9	10	11	12
1	A & N Islands	34346	23409	97.7	95.2	1.9	4.3	0.1	0.2	0.2	0.2
2	Andhra Pradesh	6778225	4173639	97.3	90.0	2.0	9.2	0.5	0.5	0.2	0.3
3	Arunachal Pradesh	65891	48114	96.0	89.4	3.2	9.4	0.4	0.5	0.4	0.7
4	Assam	992742	715185	84.1	74.3	15.2	25.0	0.5	0.6	0.3	0.2
5	Bihar	2013671	1322583	66.7	59.3	32.2	39.9	0.8	0.7	0.2	0.2
6	Chandigarh	228276	180576	98.4	96.7	1.1	2.9	0.2	0.2	0.2	0.2
7	Chhattisgarh	1238738	789440	93.7	82.9	5.7	16.5	0.3	0.3	0.2	0.3
8	Dadra & Nagar Haveli	37655	11190	98.5	95.8	1.4	3.8	0.0	0.3	0.1	0.0
9	Daman & Diu	47631	12251	99.3	98.3	0.6	1.3	0.1	0.1	0.1	0.3
10	Goa	198139	138461	97.7	94.7	1.8	4.6	0.3	0.3	0.3	0.4
11	Gujarat	5416315	3758028	97.2	93.4	2.1	5.5	0.2	0.5	0.5	0.7
12	Haryana	1751901	1075179	96.2	92.9	2.7	6.1	0.7	0.5	0.4	0.4
13	Himachal Pradesh	166043	143113	98.1	97.4	1.6	2.2	0.2	0.3	0.1	0.1
14	Jammu & Kashmir	517168	390411	98.0	97.9	1.2	1.6	0.6	0.4	0.2	0.1
15	Jharkhand	1495642	1060178	88.0	75.6	11.4	23.8	0.5	0.5	0.1	0.1
16	Karnataka	5315715	3556960	96.4	90.5	3.1	8.8	0.3	0.4	0.2	0.3
17	Kerala	3620696	1652656	97.0	84.3	2.8	15.1	0.2	0.5	0.0	0.0
18	Lakshadweep	8180	3889	99.7	99.7	0.2	0.3	0.1	0.0	0.0	0.0
19	Madhya Pradesh	3845232	2794858	92.7	92.3	6.6	7.1	0.4	0.3	0.2	0.2
20	Maharashtra	10813928	8069526	96.2	94.3	3.1	5.1	0.3	0.3	0.4	0.3
21	Manipur	171400	101302	82.4	82.0	11.2	17.3	5.9	0.5	0.5	0.3
22	Meghalaya	116102	90568	94.9	88.1	4.4	10.9	0.3	0.5	0.3	0.5
23	Mizoram	116203	81604	98.1	94.4	1.5	5.2	0.3	0.2	0.1	0.2
24	Nagaland	115054	66716	97.4	90.3	2.1	8.3	0.3	0.5	0.2	0.9
25	NCT of Delhi	3261423	2384621	99.1	93.4	0.6	5.7	0.2	0.7	0.1	0.2
26	Odisha	1517073	1087248	83.1	74.1	15.3	24.3	0.4	0.7	1.2	1.0
27	Puducherry	206143	136456	98.5	91.4	1.3	8.2	0.1	0.2	0.1	0.1
28	Punjab	2094067	1489694	98.3	96.5	1.0	2.6	0.3	0.4	0.3	0.5
29	Rajasthan	3090940	2185591	93.9	89.6	5.2	9.6	0.5	0.4	0.5	0.4
30	Sikkim	35761	13015	98.7	97.1	0.9	2.8	0.1	0.1	0.3	0.0
31	Tamil Nadu	8929104	5898836	96.1	88.0	3.4	11.1	0.2	0.4	0.3	0.4
32	Tripura	235002	122343	91.6	86.4	7.0	13.0	1.2	0.4	0.2	0.2
33	Uttar Pradesh	7449195	5170527	81.4	79.9	17.2	19.3	0.9	0.5	0.4	0.3
34	Uttarakhand	592223	390164	96.5	90.9	2.9	8.4	0.4	0.4	0.3	0.3
35	West Bengal	6350113	4554045	85.1	79.6	12.7	19.5	1.6	0.6	6.0	0.3
	INDIA	78865937	53692376	92.7	87.6	6.5	11.6	0.5	0.5	0.3	0.4

Source : Office of the Registrar General

7.5 SLUM POPULATION

7.5.1 As per UN Habitat, a slum is characterized by lack of durable housing, insufficient living area, lack of access to clean water, inadequate sanitation and insecure tenure. Under, Section -3 of the Slum Area Improvement and Clearance Act, 1956, slums have been defined as mainly those residential areas where dwellings are in any respect unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and designs of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety, health and morals.

7.5.2 In India, according to the census 2001, 1743 cities/towns reported slums. Total slum population was around 42 million which accounted for 23.1% of the population of cities/towns reporting slums. However, as per the Census 2011 total number of towns reported slums has increased to 2613. Only 4 States/UTs in India- Manipur, Daman & Diu, Dadra & Nagar Haveli, Lakshadweep were classified "Not Reporting Slums". The details of slums may be seen in table 7.5.1 and Table 7.5.2.

Table 7.5.1 : Number of statutory and slum reported towns with type wise slum population							
Sl. No.	State/UT's	Towns		Type wise slum population			
		Statutory towns	Slum reported towns	Total Population	Notified slums	Recognised slums	Identified slums
1	2	3	4	5	6	7	8
1	A & N Islands	1	1	14172	0	0	14172
2	Arunachal Pradesh	26	5	15562	0	0	15562
3	Andhra Pradesh	125	125	10186934	8338154	877172	971608
4	Assam	88	31	197266	9163	70979	117124
5	Bihar	139	88	1237682	0	0	1237682
6	Chandigarh	1	1	95135	95135	0	0
7	Chhattisgarh	168	94	1898931	713654	764851	420426
8	Delhi*	3	22	1785390	738915	0	1046475
9	Goa	14	3	26247	6107	0	20140
10	Gujarat	195	103	1680095	0	0	1680095
11	Haryana	80	75	1662305	14912	0	1647393
12	Himachal Pradesh	56	22	61312	60201	0	1111
13	Jammu & Kashmir	86	40	662062	162909	136649	362504
14	Jharkhand	40	31	372999	64399	59432	249168
15	Karnataka	220	206	3291434	2271990	445899	573545
16	Kerala	59	19	202048	186835	8215	6998
17	Madhya Pradesh	364	303	5688993	1900942	2530637	1257414
18	Maharashtra	256	189	11848423	3709309	3485783	4653331
19	Meghalaya	10	6	57418	34699	8006	14713
20	Manipur	28	0	0	0	0	0
21	Mizoram	23	1	78561	0	78561	0
22	Nagaland	19	11	82324	0	48249	34075
23	Odisha	107	76	1560303	0	812737	747566
24	Puducherry	6	6	144573	70092	73928	553
25	Punjab	143	73	1460518	787696	193305	479517
26	Rajasthan	185	107	2068000	0	0	2068000
27	Sikkim	8	7	31378	31378	0	0
28	Tamil Nadu	721	507	5798459	2541345	1978441	1278673
29	Tripura	16	15	139780	0	124036	15744
30	Uttar Pradesh*	648	293	6239965	562548	4678326	999091
31	Uttarakhand	74	31	487741	185832	52278	249631
32	Daman & Diu	2	0	0	0	0	0
33	Dadra & Nagar Haveli	1	0	0	0	0	0
34	West Bengal	129	122	6418594	48918	3703852	2665824
35	Lakshadweep	0	0	0	0	0	0
INDIA		4041	2613	65494604	22535133	20131336	22828135

Source :Slum Population -Census of India, 2011

Note : Himachal Pradesh, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Daman & Diu, Dadra & Nagar Haveli and Lakshadweep have not reported any slums in 2001

* Delhi and Uttar Pradesh includes 19 and 1 census town.

Table 7.5.2 : State-wise households by type of drainage connectivity for waste water outlet in India-2011

Sl. No.	States/UT's	Total number of households	Waste water outlet connected to		
			Closed drainage	Open Drainage	No Drainage
1	2	3	4	5	6
1	Andhra Pradesh	2421268	1046362	1073653	301253
2	Arunachal Pradesh	4005	167	1342	2496
3	Assam	48122	5816	18197	24109
4	Bihar	194065	37351	76664	80050
5	Chhattisgarh	395297	40181	224370	130746
6	Goa	4846	2980	1155	711
7	Gujarat	360291	182157	78861	99273
8	Haryana	325997	125103	169676	31218
9	Himachal Pradesh	14240	8249	4497	1494
10	Jammu & Kashmir	96990	26103	52575	18312
11	Jharkhand	79200	11437	32909	34854
12	Karnataka	728277	253874	357117	117286
13	Kerala	54849	17411	16842	20596
14	Madhya Pradesh	1086692	225749	620412	240531
15	Maharashtra	2449530	1407141	853050	189339
16	Meghalaya	10936	2140	6733	2063
17	Mizoram	16240	3866	9964	2410
18	Nagaland	15268	765	12208	2295
19	Odisha	350306	32821	128589	188896
20	Punjab	296482	147782	115160	33540
21	Rajasthan	383134	101944	216983	64207
22	Sikkim	8612	3043	5149	420
23	Tamil Nadu	1451690	610503	421360	419827
24	Tripura	33830	1315	14665	17850
25	Uttar Pradesh	992728	213616	702274	76838
26	Uttarakhand	89398	26661	57555	5182
27	West Bengal	1393319	347827	609599	435893
28	A & N Islands	3053	313	2506	234
29	Chandigarh	22080	3441	12545	6094
30	Delhi	383609	186803	174837	21969
31	Puducherry	35070	7324	18656	9090
India		13749424	5080245	6090103	2579076

Source: Census of India 2011, Slum Houses, Household Amenities and Assets.

Note : This appendix excludes institutional households.

Table 7.5.3: State-Wise slum households by availability of latrine facility in India-2011.

Sl.No	States/Uts	Total number of households	Number of households having latrine facility within the premises	Number of households not having latrine facility within the	No latrine with in premises Alternative source	
					Public latrine	Open
1	2	3	4	5	6	7
1	Andhra Pradesh	2421268	1993862	427406	69498	357908
2	Arunachal Pradesh	4005	3351	654	113	541
3	Assam	48122	41593	6529	1468	5061
4	Bihar	194065	104494	89571	7118	82453
5	Chhattisgarh	395297	192393	202904	38278	164626
6	Goa	4846	2953	1893	1537	356
7	Gujarat	360291	232075	128216	51636	76580
8	Haryana	325997	260675	65322	8878	56444
9	Himachal Pradesh	14240	12169	2071	727	1344
10	Jammu & Kashmir	96990	85539	11451	2630	8821
11	Jharkhand	79200	41731	37469	4297	33172
12	Karnataka	728277	461029	267248	85387	181861
13	Kerala	54849	51123	3726	1895	1831
14	Madhya Pradesh	1086692	683061	403631	59725	343906
15	Maharashtra	2449530	1019634	1429896	1191026	238870
16	Meghalaya	10936	10141	795	392	403
17	Mizoram	16240	16120	120	41	79
18	Nagaland	15268	14240	1028	830	198
19	Odisha	350306	168666	181640	12315	169325
20	Punjab	296482	262906	33576	2488	31088
21	Rajasthan	383134	274306	108828	8219	100609
22	Sikkim	8612	7840	772	544	228
23	Tamil Nadu	1451690	885619	566071	231050	335021
24	Tripura	33830	32259	1571	891	680
25	Uttar Pradesh	992728	769145	223583	37311	186272
26	Uttarakhand	89398	81977	7421	2000	5421
27	West Bengal	1393319	1149877	243442	88733	154709
28	A & N Islands	3053	2017	1036	610	426
29	Chandigarh	22080	869	21211	16921	4290
30	Delhi	383609	192171	191438	143589	47849
31	Puducherry	35070	22014	13056	4322	8734
India		13749424	9075849	4673575	2074469	2599106

Source: Census of India 2011, Slum Houses, Household Amenities and Assets.

Note : This appendix excludes institutional households.

Table 7.5.4 : State-wise slum households classified by source and location of drinking water by them in India-2011

Sl. No.	States/Uts	Number of households (Hhs) by source of drinking water						
		Total number of households	Tap		Hand pump & tube well, borehole	Well		All others
			Treated source	Un treated source		Covered	Uncovered	
1	2	3	4	5	6	7	8	9
1	Andhra Pradesh	2421268	1883817	150341	261637	10417	47244	67812
2	Arunachal Pradesh	4005	444	1494	1861	12	38	156
3	Assam	48122	12410	1074	25490	1521	4677	2950
4	Bihar	194065	22760	7509	152564	1515	5252	4465
5	Chhattisgarh	395297	168218	72374	127204	3891	19432	4178
6	Goa	4846	4538	189	6	17	18	78
7	Gujarat	360291	261793	42761	37413	1478	708	16138
8	Haryana	325997	208355	30227	72908	1558	932	12017
9	Himachal Pradesh	14240	13174	218	503	86	37	222
10	Jammu & Kashmir	96990	61904	26350	5080	567	139	2950
11	Jharkhand	79200	17134	4631	39013	2531	14319	1572
12	Karnataka	728277	491339	117819	75900	4903	15130	23186
13	Kerala	54849	29185	2601	1273	7742	13619	429
14	Madhya Pradesh	1086692	525635	135668	325874	12871	51128	35516
15	Maharashtra	2449530	2121907	90313	153705	11617	22251	49737
16	Meghalaya	10936	6717	543	215	637	483	2341
17	Mizoram	16240	9189	1707	377	460	289	4218
18	Nagaland	15268	626	4859	2331	1383	2304	3765
19	Odisha	350306	122649	19897	137272	15335	46841	8312
20	Punjab	296482	179047	27849	85062	377	258	3889
21	Rajasthan	383134	291176	26933	41139	2059	2461	19366
22	Sikkim	8612	6170	1808	6	24	-	604
23	Tamil Nadu	1451690	974400	196122	193264	12137	28245	47522
24	Tripura	33830	16372	3555	12527	203	732	441
25	Uttar Pradesh	992728	383273	67573	518549	3602	3772	15959
26	Uttarakhand	89398	61001	4944	22357	132	51	913
27	West Bengal	1393319	776557	103869	452838	8305	28696	23054
28	A & N Islands	3053	2923	16	3	-	94	17
29	Chandigarh	22080	16019	4544	1121	81	7	308
30	Delhi	383609	281081	42153	44138	474	247	15516
31	Puducherry	35070	31959	2487	406	12	136	70
India		13749424	8981772	1192428	2792036	105947	309540	367701

Source: Census of India 2011, Slum Houses, Household Amenities and Assets.

Note : This appendix excludes institutional households.

Table 7.5.5 : State-wise Number of Towns/Cities Reporting Slums, percentage of Slum Population to the Total Urban Population and SC/ST Slum Population to Total Slum Population-2011

Sl. No	State/UT's	Number of Cities/towns reporting slums	Total Urban population of State/UT	Slum population	% of slum population to total urban population	Slum Population		% of Slum Population	
						Scheduled Caste	Scheduled Tribe	Scheduled Caste	Scheduled Tribe
1	2	3	4	5	6	7	8	9	10
1	Jammu & Kashmir	40	3433242	662062	19.28	11136	10797	1.68	1.63
2	Himachal Pradesh	22	688552	61312	8.90	16062	488	26.20	0.80
3	Punjab	73	10399146	1460518	14.04	581984	NST	39.85	0.00
4	Chandigarh	1	1026459	95135	9.27	29230	NST	30.72	0.00
5	Uttarakhand	31	3049338	487741	15.99	91953	2321	18.85	0.48
6	Haryana	75	8842103	1662305	18.80	497042	NST	29.90	0.00
7	Delhi	22	16368899	1785390	10.91	482870	NST	27.05	0.00
8	Rajasthan	107	17048085	2068000	12.13	582562	100675	28.17	4.87
9	Uttar Pradesh	293	44495063	6239965	14.02	1373211	19186	22.01	0.31
10	Bihar	88	11758016	1237682	10.53	260442	16630	21.04	1.34
11	Sikkim	7	153578	31378	20.43	1658	8745	5.28	27.87
12	Arunachal Pradesh	5	317369	15562	4.90	NSC	4631	0.00	29.76
13	Nagaland	11	570966	82324	14.42	NSC	64253	0.00	78.05
14	Manipur	0	834154	0	0.00	0	0	0.00	0.00
15	Mizoram	1	571771	78561	13.74	69	73552	0.09	93.62
16	Tripura	15	961453	139780	14.54	40291	3337	28.82	2.39
17	Meghalaya	6	595450	57418	9.64	1589	40752	2.77	70.97
18	Assam	31	4398542	197266	4.48	42358	3702	21.47	1.88
19	West Bengal	122	29093002	6418594	22.06	1060811	106373	16.53	1.66
20	Jharkhand	31	7933061	372999	4.70	58164	66680	15.59	17.88
21	Odisha	76	7003656	1560303	22.28	321167	199836	20.58	12.81
22	Chhattisgarh	94	5937237	1898931	31.98	338098	174050	17.80	9.17
23	Madhya Pradesh	303	20069405	5688993	28.35	1251713	356481	22.00	6.27
24	Gujarat	103	25745083	1680095	6.53	186577	125538	11.11	7.47
25	Daman & Diu	0	182851	0	0.00	0	0	0.00	0.00
26	D&N Haveli	0	160595	0	0.00	0	0	0.00	0.00
27	Maharashtra	189	50818259	11848423	23.32	1863882	364254	15.73	3.07
28	Andhra Pradesh	125	28219075	10186934	36.10	1428212	270556	14.02	2.66
29	Karnataka	206	23625962	3291434	13.93	922589	172129	28.03	5.23
30	Goa	3	906814	26247	2.89	651	112	2.48	0.43
31	Lakshadweep	0	50332	0	0.00	0	0	0.00	0.00
32	Kerala	19	15934926	202048	1.27	21923	411	10.85	0.20
33	Tamil Nadu	507	34917440	5798459	16.61	1853315	30996	31.96	0.53
34	Puducherry	6	852753	144573	16.95	34521	NST	23.88	0.00
35	A&N Islands	1	143488	14172	9.88	NSC	48	0.00	0.34
India		2613	377106125	65494604	17.37	13354080	2216533	20.39	3.38

Source: Registrar General of India, Census of India 2011

Note: Manipur, Daman & Diu, Dadra & Nagar Haveli and Lakshadweep have not reported any slum in 2011 Census.

NSC : No Scheduled Caste/ NST: No Scheduled Tribes

Table 7.5.6 : Total Urban Population, Slum Population and percentage of Slum Population in Million plus cities and percentage of Slum Population of SC/ST to Total Slum Population-2011

Sl. No	Million plus cities (M. Corp.)	State	Total Urban Population	Slum Population	% of Slum Population	Slum Population		% of SC/ST Slum Population to Total Slum Population	
						Scheduled Caste	Scheduled Tribe	Scheduled Caste	Scheduled Tribe
1	2	3	4	5	6	7	8	9	10
1	Greater Mumbai	Maharashtra	12442373	5206473	41.84	410300	66370	7.88	1.27
2	DMC	Delhi	11034555	1617239	14.66	420204	NST	25.98	NST
3	Bangalore BBMP	Karnataka	8495492	712801	8.39	265900	16449	37.30	2.31
4	Hyderabad ,GHMC	Andhra Pradesh	6993262	2287014	32.70	226208	49859	9.89	2.18
5	Ahmadabad	Gujarat	5633927	250681	4.45	47218	5817	18.84	2.32
6	Chennai	Tamil Nadu	4646732	1342337	28.89	394081	2995	29.36	0.22
7	Surat	Gujarat	4501610	467434	10.38	18802	41390	4.02	8.85
8	Kolkata	West Bengal	4496694	1409721	31.35	78337	3981	5.56	0.28
9	Pune	Maharashtra	3124458	690545	22.10	192442	9256	27.87	1.34
10	Jaipur	Rajasthan	3046163	323400	10.62	78606	15679	24.31	4.85
11	Lucknow	Uttar Pradesh	2817105	364941	12.95	58214	2585	15.95	0.71
12	Kanpur	Uttar Pradesh	2768057	425008	15.35	116166	741	27.33	0.17
13	Nagpur	Maharashtra	2405665	859487	35.73	209217	99646	24.34	11.59
14	Indore	Madhya Pradesh	1994397	590257	29.60	142868	17825	24.20	3.02
15	Thane	Maharashtra	1841488	326798	17.75	35988	13156	11.01	4.03
16	Bhopal	Madhya Pradesh	1798218	479699	26.68	96950	17919	20.21	3.74
17	Vadodara	Gujarat	1752371	84804	4.84	6386	7443	7.53	8.78
18	Visakhapatnam	Andhra Pradesh	1728128	770971	44.61	81953	9321	10.63	1.21
19	Pimpri Chinchwad	Maharashtra	1727692	129099	7.47	65946	2289	51.08	1.77
20	Patna	Bihar	1684297	77034	4.57	18979	112	24.64	0.15
21	Ghaziabad	Uttar Pradesh	1648643	333962	20.26	57854	840	17.32	0.25
22	Ludhiana	Punjab	1618879	244163	15.08	59567	NST	24.40	NST
23	Agra	Uttar Pradesh	1585704	533554	33.65	175582	4031	32.91	0.76
24	Nashik	Maharashtra	1486053	189721	12.77	61662	24843	32.50	13.09
25	Faridabad	Haryana	1414050	215053	15.21	58055	NST	27.00	NST
26	Rajkot	Gujarat	1323363	189360	14.31	36880	3138	19.48	1.66
27	Meerut	Uttar Pradesh	1305429	544859	41.74	130045	2366	23.87	0.43
28	Kalyan-Dombivli	Maharashtra	1247327	98157	7.87	28486	1951	29.02	1.99
29	Vasai-Virar City	Maharashtra	1222390	35691	2.92	1888	1907	5.29	5.34
30	Srinagar	Jammu & Kashmir	1206419	343125	28.44	4	957	0.00	0.28
31	Varanasi	Uttar Pradesh	1198491	302025	25.20	37023	1995	12.26	0.66

Cont...

Table 7.5.6 : Total Urban Population, Slum Population and percentage of Slum Population in Million plus cities and percentage of Slum Population of SC/ST to Total Slum Population-2011

Sl. No	Million plus cities (M. Corp.)	State	Total Urban Population	Slum Population	% of Slum Population	Slum Population		% of SC/ST Slum Population to Total Slum Population	
						Scheduled Caste	Scheduled Tribe	Scheduled Caste	Scheduled Tribe
1	2	3	4	5	6	7	8	9	10
32	Aurangabad	Maharashtra	1175116	221001	18.81	66077	2668	29.90	1.21
33	Allahabad	Uttar Pradesh	1168385	91689	7.85	25001	235	27.27	0.26
34	Dhanbad	Jharkhand	1162472	14275	1.23	4077	414	28.56	2.90
35	Amritsar	Punjab	1159227	329797	28.45	127432	NST	38.64	NST
36	Vijaywada	Andhra Pradesh	1143232	451231	39.47	59195	9994	13.12	2.21
37	Navi Mumbai	Maharashtra	1120547	207645	18.53	37196	4577	17.91	2.20
38	Jabalpur	Madhya Pradesh	1081677	483626	44.71	99299	23168	20.53	4.79
39	Haora	West Bengal	1077075	83509	7.75	3631	307	4.35	0.37
40	Ranchi	Jharkhand	1073427	74287	6.92	6817	28605	9.18	38.51
41	Jhodhpur	Rajasthan	1056191	254096	24.06	71417	14511	28.11	5.71
42	Gwalior	Madhya Pradesh	1054420	309793	29.38	78106	5918	25.21	1.91
43	Coimbatore	Tamil Nadu	1050721	129181	12.29	55474	33	42.94	0.03
44	Rajpur	Chhattisgarh	1027264	406571	39.58	71440	19314	17.57	4.75
45	Madurai	Tamil Nadu	1017865	278153	27.33	32420	1839	11.66	0.66
46	Kota	Rajasthan	1001694	319309	31.88	83864	15667	26.26	4.91
			116558749	25099581	21.53	4433264	552119	17.66	2.20

Source: Registrar General of India, Census of India 2011

NST: No Scheduled Tribe

conclud.

7.6 Solid and Hazardous Waste

7.6.1 Hazardous waste has been defined as any waste, which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances. (AS per Rule 3 of the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008). Regulatory Quantities of Hazardous Waste are given in Table 7.6.1.

Table 7.6.1 : Hazardous waste regulatory quantities		
Waste Category category Numbers)	Types of Wastes	Regulatory Quantities
1	2	3
1	Cyanide wastes	1 kilogram per year calculated as cyanide
2	Metal finishing wastes	10 kilograms per year the sum of the specified substance 'calculated as pure metal
3	Waste containing water soluble chemical compounds of lead, copper, zinc, chromium, nickel, selenium, barium and antimony	10 kilograms per year the sum of the specified substance 'calculated as pure metal
4	Mercury, arsenic, thallium, and cadmium bearing wastes	5 kilograms per year the sum of the specified substance 'calculated as pure metal
5	Non-halogenated hydrocarbons including solvents	200 kilograms per year calculated as non-halogenated 'hydrocarbons
6	Halogenated hydrocarbons including solvents	50 kilograms per year calculated as halogenated 'hydrocarbons
7	Wastes from paints, pigments, glue, varnish and printing ink	250 kilograms per year calculated as oil or oil emulsions
8	Wastes from dyes and dye intermediates containing inorganic chemical compounds	200 kilograms per year calculated as inorganic chemicals
9	Wastes from dyes and dye intermediates containing organic chemical compounds	50 kilograms per year calculated as organic chemicals
10	Waste oils and oil-emulsions	1000 kilograms per year calculated as oil and oil emulsions
11	Tarry wastes from refining and tar residues from distillation or pyrolytic treatment	200 kilograms per year calculated as tar
12	Sludge arising from treatment of waste water containing heavy metals, toxic organics, oils, emulsions, and spent chemicals and incineration ash	Irrespective of any quantity
13	Phenols	5 kilograms per year calculated as phenols
14	Asbestos	200 kilograms per year calculated as asbestos
15	Wastes from manufacture of pesticides, herbicides, and residues from pesticides and herbicide formulation units.	5 kilograms per year calculated as pesticides and their intermediate products
16	Acidic/alkaline/slurry wastes	200 kilograms per year calculated as acids/alkalies
17	Off-specification and discarded products	Irrespective of any quantity
18	Discarded containers and container liners of hazardous and toxic wastes	Irrespective of any quantity

Source : Central Pollution Control Board

7.6.2 The State wise quantity of hazardous waste generation in India in 2015 can be assessed from the table 7.6.2

7.6.3 When solid waste is not collected and disposed of efficiently and effectively, it attracts rodents and flies which spread diseases. It also pollutes and degrades land and water resources. If these wastes are left untreated, they would ferment slowly and produce bio-gas which would be distributed in the atmosphere. The bio-gas contains 65-70% methane gas which is a green house gas, have a global warming potential 34 times more than that of Carbon Dioxide. Therefore, development of suitable technologies for utilization of wastes is essential to minimize adverse health and environment consequences. Comprehensive guidelines are available with Central Pollution Control Board for Toxic Waste Management including hospital wastes.

7.6.4 The details of quantities and waste generation rates (table 7.6.3), waste characterization (table 7.6.4) and status of landfill sites (table 7.6.5) in 59 cities as per a survey conducted by CPCB in the year 2004-05 are given in Table 7.6.3, 7.6.4 and 7.6.5.

7.6.5 The criteria fallow for direct waste of hazardous waste into secured landfill in given in Table 7.6.6.

Table 7.6.2 : State-wise status of hazardous waste generation -2015					
SI. NO.	STATE/UT	Quantity of Hazardous Waste Generation			
		Landfill able	Incinerable	Recyclable	Total
1	2	3	4	5	6
1	Andhra Pradesh	414747	42826	629167	1086740
2	Assam	3835	269	14386	18490
3	Bihar	3612	8	725	4345
4	Chattisgarh	83055	7436	196069	286560
5	Delhi	3338	1740	203	5281
6	Gujarat	1107130	108622	577037	1792789
7	Goa	12955	30579	12964	56498
8	Haryana	14862	6745	7952	29559
9	Himachal Pradesh	9202	652	20143	29997
10	Jammu & Kashmir	9946	141	6867	16954
11	Jharkhand	23135	9813	204236	237184
12	Karnataka	47266	38239	96334	181839
13	Kerala	46295	184	16750	63229
14	Madhya Pradesh	36397	4709	324371	365477
15	Maharashtra	514866	236156	1054363	1805385
16	Manipur	0	115	137	252
17	Meghalaya	13	241	3935	4189
18	Mizoram	31	186	0	217
19	Nagaland	0	0	10	10
20	Odisha	81076	13201	28041	122318
21	Punjab	18432	17515	54280	90227
22	Rajasthan	545396	38465	179179	763040
23	Tripura	4	21	255	280
24	Tamil Nadu	240939	17976	138347	397262
25	Uttar Pradesh	34975	15986	161025	211986
26	Uttarakhand	3957	3942	10110	18009
27	West Bengal	44389	5629	146516	196534
	Union Territory				
1	Daman, Diu, Dadra & NH	17219	421	56350	73990
2	Puducherry	133	25	35093	35251
3	Chandigarh	3942	0	5794	9736
	Total	3321147	601842	3980639	7903628

Source: Central Pollution Control Board, 2015

Table 7.6.3 : Quantities and waste generation rates in 59 cities

Sl. No.	Name of city	Population (as per 2001 census)	Area (Sq. Km)	Waste Quantity (Tonnes Per Day)	Waste generation rate (Kcal/day)	Population (as per 2011 census)	Waste Quantity (Tonnes Per Day)	Waste generation rate (Kcal/day)
1	2	3	4	5	6	7	8	9
1	Agartala	189998	63	77	0.40	250417	114	0.456
2	Agra	1275135	140	654	0.51	1754705	1021	0.852
3	Ahemdabad	3520085	191	1302	0.37	5963967	2518	0.422
4	Aizwal	228280	117	57	0.25	300873	86	0.285
5	Allahabad	975393	71	509	0.52	1373658	815	0.593
6	Amritsar	966862	77	438	0.45	1323163	679	0.514
7	Asansol	745439	127	207	0.44	1406792	706	0.502
8	Bangalore	4301326	226	1669	0.39	7514506	3344	0.445
9	Bhopal	1437354	286	574	0.40	1922192	877	0.456
10	Bhubaneswar	648032	135	234	0.36	867534	356	0.411
11	Chandigarh	808515	114	326	0.40	1065623	486	0.456
12	Chennai	4343645	174	3036	0.62	8646399	6118	0.708
13	Coimbatore	930882	107	530	0.57	1925781	1253	0.65
14	Daman	35770	7	15	0.42	47145	23	0.479
15	Dehradun	426674	67	131	0.31	698887	247	0.54
16	Delhi'	10306452	1483	5922	0.57	16972505	11040	0.65
17	Dhanbad	199258	24	77	0.39	1404101	625	0.445
18	Faridabad	1055938	216	448	0.42	1391726	667	0.479
19	Gandhinagar	195985	57	44	0.22	258308	65	0.251
20	Gangtok	29354	15	13	0.44	38689	19	0.502
21	Greater Mumbai	11978450	437	5320	0.45	21660521	11124	0.514
22	Guwahati	809895	218	166	0.20	1079190	246	0.228
23	Hyderabad	3843585	169	2187	0.57	7568003	4923	0.65
24	Impal	221492	34	43	0.19	329808	72	0.217
25	Indore	1474968	130	557	0.38	1999298	867	0.434
26	Itanagar	35022	22	12	0.34	46159	18	0.388
27	Jabalpur	932484	134	216	0.23	1447164	380	0.262
28	Jaipur	2322575	518	904	0.39	3061154	1362	0.445
29	Jammu	369659	102	215	0.58	806831	534	0.662
30	Jamshedpur	1104713	64	338	0.31	1456012	515	0.354
31	Kanpur	2551337	267	1100	0.43	3579101	1756	0.491
32	Kavarati	10119	4	3	0.30	13337	5	0.342
33	Kochi	595575	98	400	0.67	1787171	1366	0.765
34	Kohima	77030	30	13	0.17	101526	20	0.194
35	Kolkata	4572876	187	2653	0.58	17405109	11520	0.662
36	Lucknow	2185927	310	475	0.22	2959581	743	0.251
37	Ludhiana	1398467	159	735	0.53	1843180	1115	0.605
38	Madurai	928868	52	275	0.30	1585679	543	0.342
39	Meerut	1068772	142	490	0.46	1531142	804	0.525
40	Nagpur	2052066	218	504	0.25	2806681	801	0.285
41	Nashik	1077236	269	200	0.19	1518766	329	0.217
42	Panjim	69066	69	32	0.54	131374	81	0.616
43	Patna	1366444	107	511	0.37	2237932	945	0.422
44	Pondicherry	220865	19	130	0.59	666854	449	0.673
45	Port Blair	99984	18	76	0.76	131779	114	0.867
46	Pune	2538473	244	1175	0.46	4959518	2602	0.525
47	Raipur	605747	56	184	0.30	443362	153	0.346
48	Rajkot	967476	105	207	0.21	1321974	317	0.24
49	Ranchi	847093	224	208	0.25	1138086	325	0.285
50	Shillong	132867	10	45	0.34	352779	137	0.388
51	Silvassa	50463	17	16	0.32	28855	11	0.365
52	Simla	142555	20	39	0.27	191077	59	0.308
53	Srinagar	989440	341	428	0.48	1302461	713	0.548
54	Surat	2433835	112	1000	0.41	3705707	1734	0.468
55	Tiruvananthapuram	744983	142	171	0.23			
	Thiruvchirapalli					435101	537	1.234
56	Vadodara	1306227	240	357	0.27	1965197	606	0.308
57	Varanasi	1091918	80	425	0.39	1586821	706	0.445
58	Vijaywada	851282	58	374	0.44	1370085	688	0.502
59	Vishakhapatnam	982904	110	584	0.59	1773946	1194	0.673

Source: Central Pollution Control Board (CPCB)

CPCB with the assistance of NEERI conducted survey of solid waste management in 59 cities (35 metro cities and 24 State Capital -2004-05)

Table 7.6.4 : Waste characterisation in 59 cities

Sr. No.	Name of City	Compostables (%)	Recyclables (%)	C/N Ratio	HCV* (Kcal/Kg)	Moisture in (%)
1	2	3	4	5	6	7
1	Agartala	58.57	13.68	30.02	2427	60
2	Agra	46.38	15.76	21.56	520	28
3	Ahemdabad	40.81	11.65	29.64	1180	32
4	Aizwal	54.24	20.97	27.45	3766	43
5	Allahabad	35.49	19.22	19.00	1180	18
6	Amritsar	65.02	13.94	30.69	1836	61
7	Asansol	50.33	14.21	14.08	1156	54
8	Bangalore	51.84	22.43	35.12	2386	55
9	Bhopal	52.44	22.33	21.58	1421	43
10	Bhubaneswar	49.81	12.69	20.57	742	59
11	Chandigarh	57.18	10.91	20.52	1408	64
12	Chennai	41.34	16.34	29.25	2594	47
13	Coimbatore	50.06	15.52	45.83	2381	54
14	Daman	29.60	22.02	22.34	2588	53
15	Dehradun	51.37	19.58	25.90	2445	60
16	Delhi'	54.42	15.52	34.87	1802	49
17	Dhanbad	46.93	16.16	18.22	591	50
18	Faridabad	42.06	23.31	18.58	1319	34
19	Gandhinagar	34.30	13.20	36.05	698	24
20	Gangtok	46.52	16.48	25.61	1234	44
21	Greater Mumbai	62.44	16.66	39.04	1786	54
22	Guwahati	53.69	23.28	17.71	1519	61
23	Hyderabad	54.20	21.60	25.90	1969	46
24	Impal	60.00	18.51	22.34	3766	40
25	Indore	48.97	12.57	29.30	1437	31
26	Itanagar	52.02	20.57	17.68	3414	50
27	Jabalpur	58.07	16.61	28.22	2051	35
28	Jaipur	45.50	12.10	43.29	834	21
29	Jammu	51.51	21.08	26.79	1782	40
30	Jamshedpur	43.36	15.69	19.69	1009	48
31	Kanpur	47.52	11.93	27.64	1571	46
32	Kavarati	46.01	27.20	18.04	2242	25
33	Kochi	57.24	19.36	18.22	591	50
34	Kohima	57.48	22.67	30.84	2844	65
35	Kolkata	50.56	11.48	31.81	1201	46
36	Lucknow	47.41	15.53	21.41	1557	60
37	Ludhiana	49.80	19.32	52.17	2559	65
38	Madurai	55.32	17.25	32.69	1813	46

cont../

Sr. No.	Name of City	Compostables (%)	Recyclables (%)	C/N Ratio	HCV* (Kcal/Kg)	Moisture in (%)
1	2	3	4	5	6	7
39	Meerut	54.54	10.96	19.24	1089	32
40	Nagpur	47.41	15.53	26.37	2632	41
41	Nashik	39.52	25.11	37.20	2762	62
42	Panjim	61.75	17.44	23.77	2211	47
43	Patna	51.96	12.57	18.62	819	36
44	Pondicherry	49.96	24.29	36.86	1846	54
45	Port Blair	48.25	27.66	35.88	1474	63
46	Pune	62.44	16.66	35.54	2531	63
47	Raipur	51.40	16.31	22.35	1273	30
48	Rajkot	41.50	11.20	52.56	687	17
49	Ranchi	51.49	9.86	20.23	1060	49
50	Shilong	62.54	17.27	28.86	2736	63
51	Silvassa	71.67	13.97	35.24	1281	42
52	Simla	43.02	36.64	23.76	2572	60
53	Srinagar	61.77	17.76	22.46	1264	61
54	Surat	56.87	11.21	42.16	990	51
55	Tiruvananthapuram	72.96	14.36	35.19	2378	60
56	Vadodara	47.43	14.50	40.34	1781	25
57	Varanasi	45.18	17.23	19.40	804	44
58	Vijaywada	59.43	17.40	33.90	1910	46
59	Vishakhapatnam	45.96	24.20	41.70	1602	53

Source : Central Pollution Control Board (CPCB)

conclude

CPCB with the assistance of National Environmental Engineering Research Institute (NEERI) conducted survey of solid waste management in 59 cities (35 metro cities and 24 State Capital -2004-05)

HCV : High colorific value

C/N Ratio : Carbon to Nitrogen Ratio

Table 7.6.5 : Status of landfill sites in 59 cities

Sr. No.	Name of City	No. of landfill sites	Area of landfill (ha)	Life of landfill (years)	New site proposed
1	2	3	4	5	6
1	Agartala	1	6.80	14	Yes
2	Agra	1	1.50	30	No
3	Ahmedabad	1	84.00	30	Yes
4	Aizwal	1	-	-	No
5	Allahabad	2	-	-	No
6	Amritsar	1	-	-	Yes
7	Asansol	1	2.00	7	No
8	Bangalore	2	40.70	-	No
9	Bhopal	1	-	-	No
10	Bhubaneswar	4	-	-	Yes
11	Chandigarh	1	18.00	-	No
12	Chennai	2	465.50	1	No
13	Coimbatore	2	292.00	-	No
14	Daman	2	-	-	No
15	Dehradun	1	4.5	-	Yes
16	Delhi	3	66.40	-	No
17	Dhanbad	3	-	-	No
18	Faridabad	3	2.40	-	No
19	Gandhinagar	-	-	-	Yes
20	Gangtok	1	2.80	-	No
21	Greater Mumbai	3	140.00	-	No
22	Guwahati	1	13.2	-	No
23	Hyderabad	1	121.50	-	No
24	Imphal	1	-	-	No
25	Indore	1	59.50	-	No
26	Itanagar	1	-	-	No
27	Jabalpur	1	60.70	-	Yes
28	Jaipur	3	31.40	-	No
29	Jammu	1	-	10	Yes
30	Jamshedpur	2	4.10	-	No
31	Kanpur	1	27.00	-	No
32	Kavarati	1	0.20	-	No
33	Kochi	1	-	-	No
34	Kohima	1	-	-	No
35	Kolkata	1	24.70	35	Yes
36	Lucknow	1	1.40	3	Yes
37	Ludhiana	1	40.4	-	No
38	Madurai	1	48.60	35	No
39	Meerut	2	14.20	-	No
40	Nagpur	1	-	-	No
41	Nashik	1	34.40	15	No
42	Panjim	1	1.20	30	No
43	Patna	-	-	-	Yes
44	Pondicherry	-	-	-	Yes
45	Port Blair	1	0.20	6	Yes
46	Pune	1	-	-	No
47	Raipur	1	14.60	-	Yes
48	Rajkot	2	1.20	-	Yes
49	Ranchi	1	15.00	-	No
50	Shillong	1	-	-	No
51	Silvassa	1	-	-	No
52	Simla	1	0.60	-	No
53	Srinagar	1	30.40	-	No
54	Surat	1	200.00	-	No
55	Thiruvananthpuram	1	12.15	-	No
56	Vadodara	1	8.1	-	Yes
57	Varanasi	1	2.00	-	Yes
58	Vijayawada	-	-	-	No
59	Vishakhapatnam	1	40.5	25	No

Source :Central Pollution Control Board (CPCB)

CPCB with the assistance of NEERI conducted survey of solid waste management in 59 cities (35 metro cities and 24 State Capital -2004-05)

Table 7.6.6: Criteria for direct disposal of hazardous waste into secured landfill

Leachate Quality	Concentration	
1	2	
pH	,4-12	
Total Phenols	<100	mg./l.
Arsenic	<1	mg./l.
Lead	<2	mg./l.
Cadmium	<0.2	mg /l.
Chromium-VI	<0.5	mg./l.
Copper	<10	mg./l.
Nickel	<3	mg./l.
Mercury	<0.1	mg./l.
Zinc	<10	mg./l.
Fluoride	<50	mg./l.
Ammonia	<1,000	mg./l.
Cyanide	<2	mg./l
Nitrate	<30	mg./l
Absorbable organic bound Chlorine	<3	mg./l
Water soluble compounds except salts	<10	%
Strength		
Transversal Strength (Vane Testing)	>25	KN/m2
Unconfined Compression Test	>50	KN/m2
Axial Deformation	<20	%
Degree of Mineralization or Content of Organic Materials (original sample)		
Annealing loss of the dry residue at 550°	C <20	Wt. % (for non-
Extractable Lipophylic contents (Oil & Grease)	<4	Wt. %

Source: CPCB, Hazardous waste management series/2010-11

Note: 1). leachate quality is based on water leachate test i.e. Leachability tests are conducted by preparing a suspension of waste and water i.e. taking 100 gm of waste and filling up to 1 liter with distilled water, stirring or shaking for 24 hrs, filtering the solids and analyzing the filtrate.

2) Calorific value of the land disposable hazardous waste should be less than 2500 K. Cal/Kg

Tot. Dis. : Total Dissolved

Tot. kj : Total Kilo joule

