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Assessment of Domestic Pollution Load from Urban Agglomeration in Ganga Basin: Gandak and Kosi Sub-Basin

GRBMP: Ganga River Basin Management Plan by

Indian Institutes of Technology















IIT Bombay IIT Delhi IIT Guwahati IIT Kanpur

Kharagpur

IIT Madras IIT Roorkee

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin Environment Management Plan (GRBMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin Management Plan (GRB EMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRB EMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report is given on the reverse side.

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The Kosi basin is bounded on the north by the Himalayas, on the east by Mahananda basin, on the west by the Burhi Gandak basin and on the south by the river Ganga. The basin extends over areas of districts Saharsa, Purnea, Khagaria, Madhubani, Sitamarhi, Muzaffarpur and Darbhanga in Bihar state. Kosi (main stem), Kamla Balan Adhwara, Group of riversan Bagmati are the most important rivers in this basin

Class of Town	Name	Total Area (sq. km)	Population (as in 2011)
Class I	Muzzafarpur	26.43	330560
Class I	Dharbhanga	19.18	318144
Class I	Chhapra	16.96	201597
Class I	Siwan	15.68	134221
Class I	Bettiah	11.55	132928
Class II	Dumra	6	55215
Class II	Sitamarhi town	8	87279
Class II	Gopalganj	11.11	66624
Class III	Motipur	12.77	26852
Class III	kanti	6.6	25542
Class III	Birgania	5.5	42500
Class III	Belsand	4	20000
Class III	Jonakpur road (Purpi)	5	18000

Table1: Demographic details of Major urban centres in Gandak – Kosi sub basin

Pollution Load from the major urban centers

The details of the ground/surface water utilization were obtained from the various government bodies. The total domestic sewage is calculated on the basis of the field survey and actual flow measurements in all the major drains (as measured on the day of visit). The parameters BOD, COD and TKN are estimated based on per capita contribution.

As per the data available from Jal Nigam/Nagar Nigam none of the other major urban cities have an installed STP. All the sewage carried by the domestic drains are discharged into the river without any treatment.

The pollution load on the river in terms of BOD₅, COD and TKN is estimated based on the per capita contribution for all the major cities. *Figure 1a & 1b* shows the pollution load from major urban centers in Gandak – Kosi sub basin. *Table 2* gives the details of the pollution load from the major urban centers in Gandak – Kosi sub basin.

Class	BOD (kg/day)	COD (kg/day)	TKN (kg/day)
1	2418.4	2902.0	9599.9
П	14687.4	17624.8	1882.1
III	33223.5	39868.2	1196.0
Total	50329.2	60395.1	12678.0

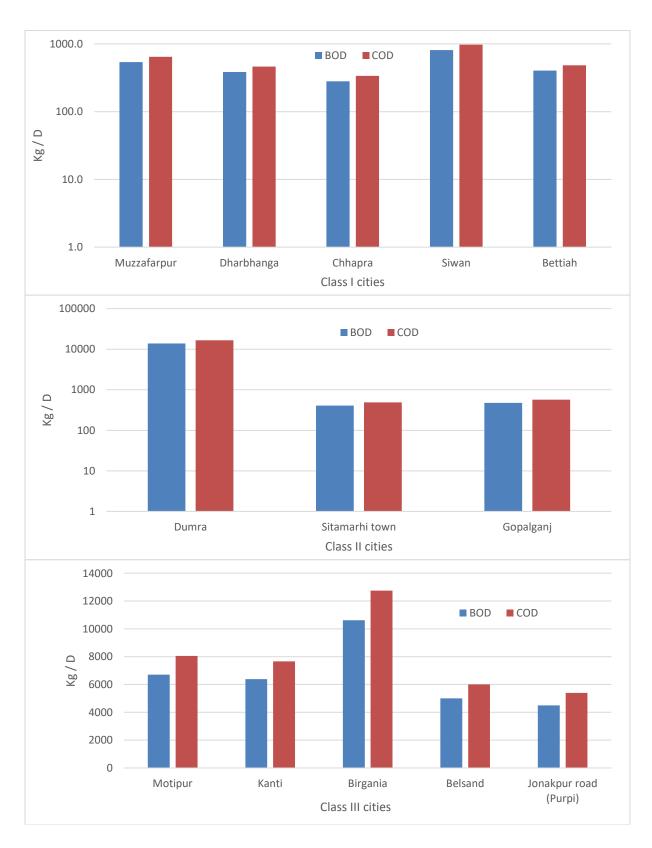


Fig 1a: Contribution of Pollution Load (BOD, COD from Class I, II, III Cities)

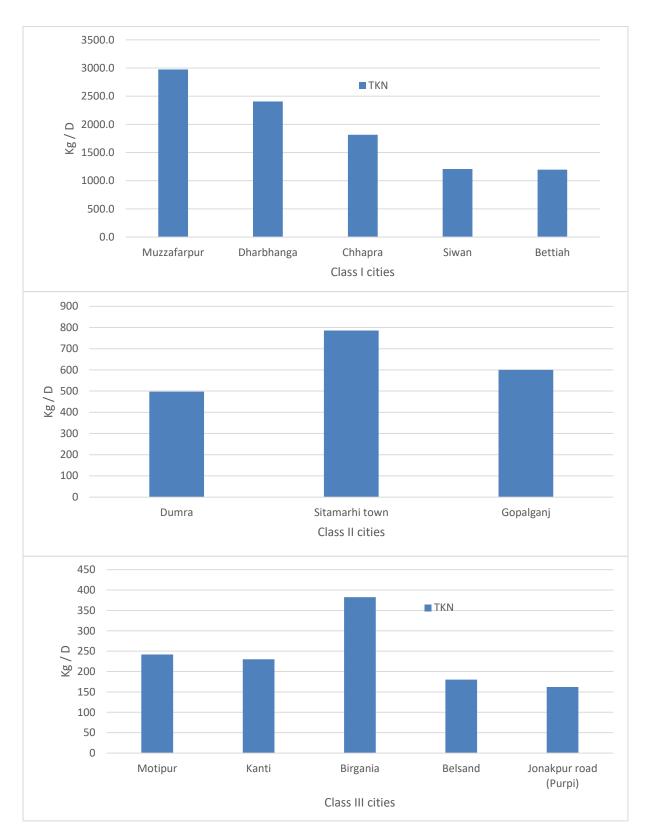


Fig 1b: Contribution of Pollution Load (TKN from Class I, II, III Cities)









City: Muzaffarpur Town State: Bihar

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Total Area (sq km)	S. No.	Items		V	alue
Population Growth Rate as in 2011 (%)	1	Total Area (sq km)		: 26.43	
Total Number of Wards 5 Population per Ward (Thousands) 1 6,746	2	Population as in 2011		: 330560	0
5 Population per Ward (Thousands) : 6,746 6 Total Number of Household as in 2011 : 49922 7 Number of Household per Ward : 1019 8 Surface Water Supply (MLD) : NIL 9 Ground Water Extraction per Bore Wells : 29.5 10 Number of Bore Wells : 25 11 Ground Water Extraction per Bore Well (MLD) : 5 12 Number of Hand Pumps : 10000 13 Ground Water Extraction per Hand Pump (lpd) : 500 14 Number of Pumping Stations for Water Supply : 4 15 Total Pumping Capacity (MLD) : NIL 16 Average Water Supply Rate from ULB Sources (lpcd) : 80.20256877 17 Total Water Supply Rate from ULB Sources (MLD) : 34.5 Average Water Supply Rate from ULB Sources (MLD) : 34.5 Average Water Supply Rate from ULB Sources (MLD) : 34.5 10 Per Capita Sewage Generation (MLD) : 27.6 20 Per Capita Sewage Generation (MLD) : NA 21 Sewage Collection (MLD) : NA <td>3</td> <td>Population Growth Rate as in 2011 (%)</td> <td></td> <td>:</td> <td></td>	3	Population Growth Rate as in 2011 (%)		:	
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Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita COD TKN : NA Pollution Load (Domestic) (Method 2: Per Capita COD : NA Contribution) (kg/d) Wastewater Disposal Means Wastewater Disposal Means Name of River/Streams for Wastewater Disposal : Gandak River Number of Drains/Nallah for Wastewater Disposal : 20 Number of Water Bodies : 14 Gross Area of Water Bodies (sq km) : 3.01635	21	Capacity of STPs Sanctioned under JNNORW & Of			
Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (sq km) TKN BOD ₅ COD NA TKN River & Land Disposal Gandak River 20 14 33 TKN SNA River & Land 15 16 17 17 18 18 18 18 18 18 18 18	28	Pollution Load (Domestic) (Method 1: Actual	-		
Pollution Load (Domestic) (Method 2: Per Capita COD : NA TKN : NA River & Land S10	20	Flow) (kg/d)			
Pollution Load (Domestic) (Method 2: Per Capita COD : NA Contribution) (kg/d) : NA Wastewater Disposal Means : Disposal : Disposal : Gandak River Number of Drains/Nallah for Wastewater Disposal : 20 Number of Water Bodies : 14 Gross Area of Water Bodies (sq km) : 3.01635					
Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (sq km) TKN : NA River & Land : Disposal : Gandak River : 20 : 14	20	Pollution Load (Domestic) (Method 2: Per Capita			
Wastewater Disposal Means River & Land Disposal Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (sq km) River & Land Charles	29	Contribution) (kg/d)			
30 Wastewater Disposal Means : Disposal 31 Name of River/Streams for Wastewater Disposal : Gandak River 32 Number of Drains/Nallah for Wastewater Disposal : 20 33 Number of Water Bodies : 14 34 Gross Area of Water Bodies (sq km) : 3.01635			TIXIN		& Land
31Name of River/Streams for Wastewater Disposal: Gandak River32Number of Drains/Nallah for Wastewater Disposal: 2033Number of Water Bodies: 1434Gross Area of Water Bodies (sq km): 3.01635	30	Wastewater Disposal Means			
33 Number of Water Bodies : 14 34 Gross Area of Water Bodies (sq km) : 3.01635	31	Name of River/Streams for Wastewater Disposal		_	
33 Number of Water Bodies : 14 34 Gross Area of Water Bodies (sq km) : 3.01635		<u> </u>		: 20	
· • · · · · · · · · · · · · · · · · · ·	33	<u>-</u>		: 14	
35 Area of Water Bodies as % of Total Area : <<1.0	34	Gross Area of Water Bodies (sq km)		: 3.0163	35
	35	Area of Water Bodies as % of Total Area		: <<1.0	

Water Balance & Pollution Load (Domestic) Fact Sheet City: Darbanga State: Bihar

S. No.	Items	2	Va	lue
1	Total Area (sq km)		: 19.	.18
2	Population as in 2001		: 2,67	,348
3	Population Growth Rate as in 2011 (%)			.00
4	Total Number of Wards		: 4	8
5	Population per Ward (Thousands)		: 5,5	570
6	Total Number of Household as in 2001		: 41,	578
7	Number of Household per Ward		: 86	56
8	Surface Water Supply (MLD)		: ()
9	Ground Water (GW) Supply (MLD)		: 13.	.37
10	Number of Tube Wells		: 8	3
11	Ground Water Extraction per Tube Well (I	MLD)	: 4.	.5
12	Number of Hand Pumps		: 30	00
13	Ground Water Extraction per Hand Pump	(lpd)	: 100	000
14	Number of Pumping Stations for Water Su		: 4	4
15	Total Pumping Capacity (MLD)		: 1.	.7
16	Average Water Supply Rate from ULB So	urces (lpcd)	: 5	0
17	Total Water Supply from ULB and Non-U	LB Sources (MLD)	: 43	3.4
	Average Water Supply Rate from ULB &	Non-ULB Sources	16	2.2
18	(lpcd)		:	
19	Total Sewage Generation (MLD)		: 34	
20	Per Capita Sewage Generation (lpcd)			9.8
21	Sewage Collection (MLD)			A
22	Percentage of Sewage Collection (%)			A
23	Number of STPs			A
24	Total Installed Capacity of STPs under GA	AP I & II (MLD)		A
25	Current Utilized Capacity of STPs (MLD)			A
26	Percentage Utilization of Installed Capacit			A
27	Capacity of STPs Sanctioned under JNNU	, ,		A
	Pollution Load (Domestic) (Method 1:	BOD_5		A
28	Actual Flow) (kg/d)	COD		A
	retual riow) (kg/u)	TKN		A
	Pollution Load (Domestic) (Method 2:	BOD_5		5.0
29	Per Capita Contribution) (kg/d)	COD	: 462	2.0
	Ter Capita Contribution) (kg/a)	TKN	: 240	
	Wastewater Disposal Means		River &	
30	•		: Disposa	al
31	Name of River/Streams for Wastewater Di	=	:	-
32	Number of Drains/Nallah for Wastewater	Disposal		9
33	Number of Water Bodies			06
34	Gross Area of Water Bodies (sq km)			16
35	Area of Water Bodies as % of Total Area		: 21.	.69

Water Balance & Pollution Load (Domestic) Fact Sheet City: Chhapra State: Bihar

Total Area (sq km)	City: Chnapra State:			111	
2	S.	Items			Value
3		, • <i>•</i>		:	
4 Total Number of Wards : 44,582 5 Population per Ward (Thousands) : 4,582 6 Total Number of Household as in 2011 : 7950 7 Number of Household per Ward : 795 8 Surface Water Supply (MLD) : 0 9 Ground Water (GW) Supply (MLD) : 4,35 10 Number of Bore Wells : 13 11 Ground Water Extraction per Bore Well (MLD) : 0,33 12 Number of Hand Pumps/ Tubewells : 515 13 Ground Water Extraction per Hand Pump (lpd) : 500 14 Number of Pumping Stations for Water Supply : NIL 15 Total Pumping Capacity (MLD) : NIL 16 Average Water Supply Rate from ULB Sources (lpcd) : * 17 Total Water Supply Rate from ULB Sources (MLD) : 4.6 18 Average Water Supply Rate from ULB Sources (MLD) : 4.6 19 Total Sewage Generation (HLD)** : 1.1 20 Per Capita Sewage Generation (Ipcd) : * 21 Sewage Collection (MLD) : NIL <td></td> <td>Population as in 2011/2001</td> <td></td> <td>:</td> <td>201597/</td>		Population as in 2011/2001		:	201597/
5 Population per Ward (Thousands) 6 Total Number of Household as in 2011 7 Number of Household per Ward 8 Surface Water Supply (MLD) 9 Ground Water (GW) Supply (MLD) 10 Number of Bore Wells 11 Ground Water Extraction per Bore Well (MLD) 12 Number of Hand Pumps/ Tubewells 13 Ground Water Extraction per Hand Pump (lpd) 13 Ground Water Extraction per Hand Pump (lpd) 14 Number of Pumping Stations for Water Supply 15 Total Pumping Capacity (MLD) 16 Average Water Supply Rate from ULB Sources (lpcd) 17 Total Water Supply Rate from ULB Sources (MLD) 18 Average Water Supply Rate from ULB Sources (MLD) 19 Total Sewage Generation (MLD)** 10 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 23 Number of STPs 24 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs (MLD) 26 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) 29 Pollution Load (Domestic) (Method 2: Per Capita COD (Method 1: Actual Flow) 20 Contribution) (kg/d) 21 Number of River/Streams for Wastewater Disposal 22 Number of River/Streams for Wastewater Disposal 23 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 Nah	3	Population Growth Rate as in 2011 (%)		:	12.73
6 Total Number of Household as in 2011	4	Total Number of Wards		:	44
7 Number of Household per Ward 8 Surface Water Supply (MLD) 9 Ground Water (GW) Supply (MLD) 10 Number of Bore Wells 11 Ground Water Extraction per Bore Well (MLD) 12 Number of Hand Pumps/ Tubewells 13 Ground Water Extraction per Hand Pump (lpd) 13 Ground Water Extraction per Hand Pump (lpd) 14 Number of Pumping Stations for Water Supply 15 Total Pumping Capacity (MLD) 16 Average Water Supply Rate from ULB Sources (lpcd) 17 Total Water Supply Rate from ULB Sources (MLD) 18 Average Water Supply Rate from ULB & Non-ULB Sources 19 Total Sewage Generation (MLD)** 10 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 23 Number of STPs 24 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs under GAP I & II (MLD) 26 Percentage Utilization of Installed Capacity (%) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) 29 Pollution Load (Domestic) (Method 2: Per Capita COD S37.0 COD (kg/d) 20 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Water Bodies 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 NA	5	Population per Ward (Thousands)		:	4,582
Surface Water Supply (MLD) Ground Water (GW) Supply (MLD) Supply (MLD) Ground Water (GW) Supply (MLD) Sumber of Bore Wells Surface Water Extraction per Bore Well (MLD) Number of Hand Pumps/ Tubewells Ground Water Extraction per Hand Pump (Ipd) Surface Water Extraction per Hand Pump (Ipd) Number of Pumping Stations for Water Supply NIL Sumber of Pumping Capacity (MLD) Surface Water Supply Rate from ULB Sources (Ipcd) Surface Water Supply Rate from ULB Sources (Ipcd) Surface Water Supply Rate from ULB Sources (MLD) Surface Water Supply Rate from ULB Sources (MLD) Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Supply Rate from ULB & Non-ULB Sources Surface Water Bodies Surface Water Bodies (Method 1: Actual Flow) Surface Water Bodies (Method 1: Actual Flow) Surface Water Bodies Surface Water Bodies (Hectare) Surface Water Bodies	6	Total Number of Household as in 2011		:	35000
9 Ground Water (GW) Supply (MLD) : 4.35 10 Number of Bore Wells : 13 11 Ground Water Extraction per Bore Well (MLD) : 0.33 12 Number of Hand Pumps/ Tubewells : 515 13 Ground Water Extraction per Hand Pump (lpd) : 500 14 Number of Pumping Stations for Water Supply : NIL 15 Total Pumping Capacity (MLD) : NIL 16 Average Water Supply Rate from ULB Sources (lpcd) : * 17 Total Water Supply Rate from ULB Sources (MLD) : 4.6 18 Average Water Supply Rate from ULB & Non-ULB Sources : * 19 Total Sewage Generation (MLD)** : 1.1 20 Per Capita Sewage Generation (lpcd) : * 21 Sewage Collection (MLD) : NIL 22 Percentage of Sewage Collection (%) : NIL 23 Number of STPs : NIL 24 Total Installed Capacity of STPs under GAP I & II (MLD) : NIL 25 Current Utilized Capacity of STPs (MLD) : NIL 26 Percentage Utilization of Installed Capacity (%) : NIL 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : NIL 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) : River Disposal 30 Wastewater Disposal Means : River Disposal 31 Name of River/Streams for Wastewater Disposal : 1 (major drain)* 33 Number of Water Bodies : 7 34 Gross Area of Water Bodies (Hectare) : NA	7	Number of Household per Ward		:	795
10 Number of Bore Wells 11 Ground Water Extraction per Bore Well (MLD) 12 Number of Hand Pumps/ Tubewells 13 Ground Water Extraction per Hand Pump (lpd) 13 Ground Water Extraction per Hand Pump (lpd) 14 Number of Pumping Stations for Water Supply 15 Total Pumping Capacity (MLD) 16 Average Water Supply Rate from ULB Sources (lpcd) 17 Total Water Supply Rate from ULB Sources (MLD) 18 Average Water Supply Rate from ULB Sources (MLD) 19 Total Sewage Generation (MLD)** 19 Total Sewage Generation (MLD)** 10 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 23 Number of STPs 24 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs (MLD) 26 Percentage Utilization of Installed Capacity (%) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) 30 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Drains/Nallah for Wastewater Disposal 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 30 Na	8	Surface Water Supply (MLD)		:	0
11 Ground Water Extraction per Bore Well (MLD) : 0.33 12 Number of Hand Pumps/ Tubewells : 515 13 Ground Water Extraction per Hand Pump (lpd) : 500 14 Number of Pumping Stations for Water Supply : NIL 15 Total Pumping Capacity (MLD) : NIL 16 Average Water Supply Rate from ULB Sources (lpcd) : * 17 Total Water Supply from ULB and Non-ULB Sources (MLD) : 4.6 18 Average Water Supply Rate from ULB & Non-ULB Sources : * 19 Total Sewage Generation (MLD)** : 1.1 20 Per Capita Sewage Generation (lpcd) : * 21 Sewage Collection (MLD) : NIL 22 Percentage of Sewage Collection (%) : NIL 23 Number of STPs : NIL 24 Total Installed Capacity of STPs under GAP I & II (MLD) : NIL 25 Current Utilized Capacity of STPs (MLD) : NIL 26 Percentage Utilization of Installed Capacity (%) : NIL 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL 28 Pollution Load (Domestic) (Method 1: Actual Flow)	9	Ground Water (GW) Supply (MLD)		:	4.35
12 Number of Hand Pumps/ Tubewells 13 Ground Water Extraction per Hand Pump (lpd) 14 Number of Pumping Stations for Water Supply 15 Total Pumping Capacity (MLD) 16 Average Water Supply Rate from ULB Sources (lpcd) 17 Total Water Supply from ULB and Non-ULB Sources (MLD) 18 Average Water Supply Rate from ULB & Non-ULB Sources 19 Total Sewage Generation (MLD)** 19 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 23 Number of STPs 24 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs (MLD) 26 Percentage Utilization of Installed Capacity (%) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) 30 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Water Bodies 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 Number of Water Bodies (Hectare) 36 Surces (MLD) 37 NIL 38 Surces (MLD) 39 Sources (MLD) 30 VIL 31 Surces (MLD) 30 Surces (MLD) 31 Name of Hard Pump (lpd) 32 Surces (MLD) 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 Number of Water Bodies (Hectare) 36 NIL 37 Surces (MLD) 38 Surces (MLD) 39 Sources (MLD) 30 NIL 31 Surces (MLD) 30 Surces (MLD) 30 Nill 31 Name of Water Bodies (Hectare) 31 Name of Water Bodies (Hectare) 32 Number of Water Bodies	10	Number of Bore Wells		:	13
12 Number of Hand Pumps/ Tubewells 13 Ground Water Extraction per Hand Pump (lpd) 14 Number of Pumping Stations for Water Supply 15 Total Pumping Capacity (MLD) 16 Average Water Supply Rate from ULB Sources (lpcd) 17 Total Water Supply from ULB and Non-ULB Sources (MLD) 18 Average Water Supply Rate from ULB & Non-ULB Sources 19 Total Sewage Generation (MLD)** 19 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 23 Number of STPs 24 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs (MLD) 26 Percentage Utilization of Installed Capacity (%) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) 30 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Water Bodies 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 Number of Water Bodies (Hectare) 36 Surces (MLD) 37 NIL 38 Surces (MLD) 39 Sources (MLD) 30 VIL 31 Surces (MLD) 30 Surces (MLD) 31 Name of Hard Pump (lpd) 32 Surces (MLD) 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 35 Number of Water Bodies (Hectare) 36 NIL 37 Surces (MLD) 38 Surces (MLD) 39 Sources (MLD) 30 NIL 31 Surces (MLD) 30 Surces (MLD) 30 Nill 31 Name of Water Bodies (Hectare) 31 Name of Water Bodies (Hectare) 32 Number of Water Bodies	11	Ground Water Extraction per Bore Well (MLD)		:	0.33
Number of Pumping Stations for Water Supply Total Pumping Capacity (MLD) NIL Average Water Supply Rate from ULB Sources (lpcd) Total Water Supply from ULB and Non-ULB Sources (MLD) Average Water Supply Rate from ULB & Non-ULB Sources Total Sewage Generation (MLD)** Per Capita Sewage Generation (MLD)** Sewage Collection (MLD) Percentage of Sewage Collection (%) NIL Number of STPs NIL Total Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) TKN Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) TKN 1814.4 Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Water Bodies Number of Water Bodies (Hectare) NIL NIL NIL River Disposal 1 (major drain)* NA	12	——————————————————————————————————————		:	515
Total Pumping Capacity (MLD) Average Water Supply Rate from ULB Sources (lpcd) Total Water Supply from ULB and Non-ULB Sources (MLD) Average Water Supply Rate from ULB & Non-ULB Sources Average Water Supply Rate from ULB & Non-ULB Sources Total Sewage Generation (MLD)** Per Capita Sewage Generation (lpcd) Sewage Collection (MLD) Sewage Collection (MLD) Percentage of Sewage Collection (%) Number of STPs Total Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Water Bodies Number of Water Bodies (Hectare) NIL NIL At the Actual Flow (Pollution) TKN (Pollu	13	Ground Water Extraction per Hand Pump (lpd)		:	500
Average Water Supply Rate from ULB Sources (lpcd) Total Water Supply from ULB and Non-ULB Sources (MLD) Average Water Supply Rate from ULB & Non-ULB Sources Total Sewage Generation (MLD)** Per Capita Sewage Generation (lpcd) Sewage Collection (MLD) Sewage Collection (MLD) Percentage of Sewage Collection (%) Number of STPs Total Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Water Bodies Number of Water Bodies Gross Area of Water Bodies (Hectare) ** 1.1 4.6 ** 4.6 4.6 4.6 4.6 4.6 4.6	14	Number of Pumping Stations for Water Supply		:	NIL
Average Water Supply Rate from ULB Sources (lpcd) Total Water Supply from ULB and Non-ULB Sources (MLD) Average Water Supply Rate from ULB & Non-ULB Sources Total Sewage Generation (MLD)** Per Capita Sewage Generation (lpcd) Sewage Collection (MLD) Sewage Collection (MLD) Percentage of Sewage Collection (%) Number of STPs Total Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Water Bodies Number of Water Bodies Gross Area of Water Bodies (Hectare) ** 1.1 4.6 ** 4.6 4.6 4.6 4.6 4.6 4.6	15	Total Pumping Capacity (MLD)		•	NIL
Total Water Supply from ULB and Non-ULB Sources (MLD) Average Water Supply Rate from ULB & Non-ULB Sources Total Sewage Generation (MLD)** Per Capita Sewage Generation (lpcd) Sewage Collection (MLD) Percentage of Sewage Collection (%) Number of STPs Total Installed Capacity of STPs under GAP I & II (MLD) Total Installed Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Percentage Utilization of Installed Capacity (%) Roll Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Water Bodies Name of Water Bodies (Hectare) 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	16			:	*
Average Water Supply Rate from ULB & Non-ULB Sources 19 Total Sewage Generation (MLD)** 20 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 33 Number of STPs 4 Total Installed Capacity of STPs under GAP I & II (MLD) 25 Current Utilized Capacity of STPs (MLD) 26 Percentage Utilization of Installed Capacity (%) 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) TKN 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) TKN 1814.4 30 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Drains/Nallah for Wastewater Disposal 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	17		(MLD)	:	4.6
Total Sewage Generation (MLD)** Per Capita Sewage Generation (Ipcd) Sewage Collection (MLD) Percentage of Sewage Collection (%) Number of STPs Total Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) In 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	18	= = -		:	*
Sewage Collection (MLD) : NIL 22 Percentage of Sewage Collection (%) : NIL 23 Number of STPs : NIL 24 Total Installed Capacity of STPs under GAP I & II (MLD) : NIL 25 Current Utilized Capacity of STPs (MLD) : NIL 26 Percentage Utilization of Installed Capacity (%) : NIL 27 Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL 28 Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : TKN : 29 Pollution Load (Domestic) (Method 2: Per Capita COD : 337.0 TKN : 1814.4 30 Wastewater Disposal Means : River Disposal 31 Name of River/Streams for Wastewater Disposal : Ghagra 32 Number of Drains/Nallah for Wastewater Disposal : 1 (major drain)* 33 Number of Water Bodies (Hectare) : NA	19	Total Sewage Generation (MLD)**		:	1.1
Percentage of Sewage Collection (%) Number of STPs Installed Capacity of STPs under GAP I & II (MLD) Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) NIL NIL BOD ₅ COD TKN River Disposal COD Sa37.0 TKN River Disposal Ghagra 1 (major drain)* NA	20	Per Capita Sewage Generation (lpcd)		:	*
Number of STPs Number of STPs Current Utilized Capacity of STPs (MLD) Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Current Utilized Capacity of STPs under GAP I & II (MLD) NIL NIL BOD ₅ COD TKN BOD ₅ COD 337.0 TKN 1814.4 River Disposal Ghagra 1 (major drain)* Number of Water Bodies Gross Area of Water Bodies (Hectare)	21	Sewage Collection (MLD)		:	NIL
Total Installed Capacity of STPs under GAP I & II (MLD) : NIL Current Utilized Capacity of STPs (MLD) : NIL Percentage Utilization of Installed Capacity (%) : NIL Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : TKN : Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) : BOD ₅ : COD : TKN : BOD ₅ : COD : 337.0 COD : 337.0 TKN : 1814.4 Wastewater Disposal Means : River Disposal : River Disposal : Ghagra Number of Drains/Nallah for Wastewater Disposal : 1 (major drain)* Number of Water Bodies : 7 Gross Area of Water Bodies (Hectare) : NA	22	Percentage of Sewage Collection (%)		:	NIL
Current Utilized Capacity of STPs (MLD) : NIL Percentage Utilization of Installed Capacity (%) : NIL Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : TKN : Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) : TKN : 1814.4 Wastewater Disposal Means : River Disposal : Ghagra : Chapter of Drains/Nallah for Wastewater Disposal : 1 (major drain)* Number of Water Bodies : 7 Gross Area of Water Bodies (Hectare) : NA	23	Number of STPs		:	NIL
Percentage Utilization of Installed Capacity (%) Capacity of STPs Sanctioned under JNNURM & Others (MLD) Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) NIL NIL NIL BOD ₅ COD TKN BOD ₅ COD 337.0 TKN 1814.4 River Disposal Ghagra 1 (major drain)* NA	24	Total Installed Capacity of STPs under GAP I & II (MI	LD)	:	NIL
Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : TKN : Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) : TKN : BOD ₅ : 280.8 COD : 337.0 TKN : 1814.4 Wastewater Disposal Means : River Disposal : River Disposal : Ghagra : 1 (major drain)* Number of Drains/Nallah for Wastewater Disposal : 1 (major drain)* Number of Water Bodies : 7 Gross Area of Water Bodies (Hectare) : NA	25	Current Utilized Capacity of STPs (MLD)		:	NIL
Capacity of STPs Sanctioned under JNNURM & Others (MLD) : NIL Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) : TKN : Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) : TKN : BOD ₅ : 280.8 COD : 337.0 TKN : 1814.4 Wastewater Disposal Means : River Disposal : River Disposal : Ghagra : 1 (major drain)* Number of Drains/Nallah for Wastewater Disposal : 1 (major drain)* Number of Water Bodies : 7 Gross Area of Water Bodies (Hectare) : NA	26	Percentage Utilization of Installed Capacity (%)		:	NIL
Pollution Load (Domestic) (Method 1: Actual Flow) (kg/d) Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) BOD ₅ COD : TKN : BOD ₅ : COD : COD : TKN : BOD ₅ : COD : COD : TKN : BOD ₅ : COD :	27		s (MLD)	:	NIL
28 (kg/d) 29 Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) 30 Wastewater Disposal Means 31 Name of River/Streams for Wastewater Disposal 32 Number of Drains/Nallah for Wastewater Disposal 33 Number of Water Bodies 34 Gross Area of Water Bodies (Hectare) COD TKN BOD ₅ 280.8 COD TKN 1814.4 Siver Disposal Chagra 1 (major drain)* NA				:	
Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) IRN BOD ₅ COD : 337.0 TKN : 1814.4 : River Disposal : Ghagra : 1 (major drain)* : 7	28		COD	:	
Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d) Wastewater Disposal Means Name of River/Streams for Wastewater Disposal Number of Drains/Nallah for Wastewater Disposal Number of Water Bodies Gross Area of Water Bodies (Hectare) COD TKN : 337.0 River Disposal : Ghagra : 1 (major drain)* : 7		(kg/d)	TKN	:	
Contribution) (kg/d) Contribution) (kg/d) TKN COD TKN 1814.4 181		Dellestie a Lee d (Demostie) (Mathed 2) Dea Conite	BOD_5	:	280.8
30 Wastewater Disposal Means : River Disposal 31 Name of River/Streams for Wastewater Disposal : Ghagra 32 Number of Drains/Nallah for Wastewater Disposal : 1 (major drain)* 33 Number of Water Bodies : 7 34 Gross Area of Water Bodies (Hectare) : NA	29	` ' ` I	COD	:	337.0
31Name of River/Streams for Wastewater Disposal: Ghagra32Number of Drains/Nallah for Wastewater Disposal: 1 (major drain)*33Number of Water Bodies: 734Gross Area of Water Bodies (Hectare): NA		Contribution) (kg/d)	TKN	:	1814.4
31Name of River/Streams for Wastewater Disposal: Ghagra32Number of Drains/Nallah for Wastewater Disposal: 1 (major drain)*33Number of Water Bodies: 734Gross Area of Water Bodies (Hectare): NA	30	Wastewater Disposal Means		:	River Disposal
33 Number of Water Bodies : 7 34 Gross Area of Water Bodies (Hectare) : NA	31	Name of River/Streams for Wastewater Disposal		:	Ghagra
33 Number of Water Bodies : 7 34 Gross Area of Water Bodies (Hectare) : NA				:	•
34 Gross Area of Water Bodies (Hectare) : NA	33	-		:	
·	34	Gross Area of Water Bodies (Hectare)		:	NA
35 Area of Water Bodies as % of Total Area : NA	35	Area of Water Bodies as % of Total Area		:	NA

^{*}Estimation based on one time survey by IT,BHU team on 17 Feb, 2012 from 2:00 - 5:00 PM.

City: Siwan **State: Bihar**

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S.			
No.	Items		Value
1	Total Area (sq km)	:	15.68
2	Population as in 2011/2001	:	134221/ 109919
3	Population Growth Rate as in 2011 (%)	:	22.11
4	Total Number of Wards	:	38
5	Population per Ward (Thousands)	:	3,532
6	Total Number of Household as in 2011	:	19062
7	Number of Household per Ward	:	502
8	Surface Water Supply (MLD)	:	0
9	Ground Water (GW) Supply (MLD)	:	2.84
10	Number of Bore Wells	:	8
11	Ground Water Extraction per Bore Well (MLD)	:	0.38
12	Number of Hand Pumps/ Tubewells	:	550
13	Ground Water Extraction per Hand Pump (lpd)	:	500
14	Number of Pumping Stations for Water Supply	:	NIL
15	Total Pumping Capacity (MLD)	:	NIL
16	Average Water Supply Rate from ULB Sources (lpcd	:	*
17	Total Water Supply from ULB and Non-ULB Source	s (MLD) :	3.1
	Average Water Supply Rate from ULB & Non-ULB	Sources	*
18	(lpcd)	:	•
19	Total Sewage Generation (MLD)	:	3.2
20	Per Capita Sewage Generation (lpcd)	:	*
21	Sewage Collection (MLD)	:	3.2
22	Percentage of Sewage Collection (%)	:	100
23	Number of STPs	:	NIL
24	Total Installed Capacity of STPs under GAP I & II (M	ILD) :	NIL
25	Current Utilized Capacity of STPs (MLD)	:	NIL
26	Percentage Utilization of Installed Capacity (%)	:	NIL
	Capacity of STPs Sanctioned under JNNURM & Other	ers	NIII
27	(MLD)	:	NIL
	Dellution Lead (Demostic) (Mathed 1. Actual Flow)	BOD_5 :	
28	Pollution Load (Domestic) (Method 1: Actual Flow)	COD :	
	(kg/d)	TKN :	
	Dellution Load (Domestic) (Mathed 2: Dan Conita	BOD_5 :	811.9
29	Pollution Load (Domestic) (Method 2: Per Capita	COD :	974.2
	Contribution) (kg/d)	TKN :	1208.0
30	Wastewater Disposal Means	:	River Disposal
31	Name of River/Streams for Wastewater Disposal	:	River Daha
32	Number of Drains/Nallah for Wastewater Disposal	:	<u>2**</u>
33	Number of Water Bodies	:	2
34	Gross Area of Water Bodies (Hectare)	:	NA
35	Area of Water Bodies as % of Total Area	:	NA
	*Estimation based on one time survey by IT RHII team on	27 Fab 2012	

^{*}Estimation based on one time survey by IT,BHU team on 27 Feb, 2012 at 2:00 PM.

City: Betia State: Bihar S. No. **Items** Value Total Area (sq km) 11.55 132928/ Population as in 2011/2001 2 116692 3 Population Growth Rate as in 2011 (%) 13.91 4 Total Number of Wards 39 5 Population per Ward (Thousands) 3,408 Total Number of Household as in 2011 16900 6 7 Number of Household per Ward 433 8 Surface Water Supply (MLD) 0 9 Ground Water (GW) Supply (MLD) 0.76 10 Number of Bore Wells 3 0.38 11 Ground Water Extraction per Bore Well (MLD) 12 Number of Hand Pumps/ Tubewells 80 13 Ground Water Extraction per Hand Pump (lpd) 500 14 Number of Pumping Stations for Water Supply **NIL** Total Pumping Capacity (MLD) 15 NIL Average Water Supply Rate from ULB Sources (lpcd) 16 Total Water Supply from ULB and Non-ULB Sources (MLD) 0.8 17 Average Water Supply Rate from ULB & Non-ULB Sources * 18 (lpcd) 19 Total Sewage Generation (MLD) 1.6 20 Per Capita Sewage Generation (lpcd) 21 Sewage Collection (MLD) 22 Percentage of Sewage Collection (%) 200 Number of STPs 23 **NIL** 24 Total Installed Capacity of STPs under GAP I & II (MLD) **NIL** Current Utilized Capacity of STPs (MLD) 25 **NIL** Percentage Utilization of Installed Capacity (%) 26 **NIL** Capacity of STPs Sanctioned under JNNURM & Others **NIL** 27 (MLD) BOD₅ Pollution Load (Domestic) (Method 1: Actual 28 COD Flow) (kg/d) TKN BOD₅ 403.2 Pollution Load (Domestic) (Method 2: Per Capita 29 COD : 483.8 Contribution) (kg/d) TKN : 1196.4 30 Wastewater Disposal Means River Disposal River Anri-Name of River/Streams for Wastewater Disposal 31 chunri 32 Number of Drains/Nallah for Wastewater Disposal 1** 9 33 Number of Water Bodies Gross Area of Water Bodies (Hectare) 34 NA 35 Area of Water Bodies as % of Total Area NA

^{*}Estimation based on one time survey by IT,BHU team on 29 Feb, 2012 at 2:00 - 5:00 PM.

Water Balance & Pollution Load (Domestic) Fact Sheet Dumra State: Bihar

City: Dumra

City. I	ouin a	State. I) i i i a i
S. No.	Items		Value
1	Total Area (sq km)	:	: 6
2	Population as in 2011		: 55215
3	Population Growth Rate as in 2011 (%)	;	: . <u>.</u>
4	Total Number of Wards		: 12
5	Population per Ward (Thousands)	;	: 4,601
6	Total Number of Household as in 2011		: 5200
7	Number of Household per Ward		: 433
8	Surface Water Supply (MLD)		: NIL
9	Ground Water (GW) Supply (MLD)		: 4
10	Number of Bore Wells		: 2
11	Ground Water Extraction per Bore Well (MLD)		: 2
12	Number of Hand Pumps		4000
13	Ground Water Extraction per Hand Pump (lpd)		: 500
14	Number of Pumping Stations for Water Supply		: 4
15	Total Pumping Capacity (MLD)		: NIL
16	Average Water Supply Rate from ULB Sources	(lpcd)	: 72.44
	Total Water Supply from ULB and Non-ULB S	_	6.0
17	(MLD)		6.0
	Average Water Supply Rate from ULB & Non-	ULB	108.7
18	Sources (lpcd)		: 106.7
19	Total Sewage Generation (MLD)		: 4.8
20	Per Capita Sewage Generation (lpcd)	:	: 86.9
21	Sewage Collection (MLD)		: NA
22	Percentage of Sewage Collection (%)	;	: NA
23	Number of STPs		: NA
	Total Installed Capacity of STPs under GAP I &	t II	NA
24	(MLD)	;	: IVA
25	Current Utilized Capacity of STPs (MLD)	;	: NA
26	Percentage Utilization of Installed Capacity (%))	: NA
	Capacity of STPs Sanctioned under JNNURM &	&	NA
27	Others (MLD)	;	
	Pollution Load (Domestic) (Method 1: Actual	BOD_5	: NA
28	Flow) (kg/d)	COD	: NA
	110 (1)	TKN	: NA
	Pollution Load (Domestic) (Method 2: Per	BOD_5	: 13803.8
29	Capita Contribution) (kg/d)	COD	: 16564.5
	, , ,	TKN	: 496.9
30	Wastewater Disposal Means	:	: River & Land Disposal
31	Name of River/Streams for Wastewater Disposa		: Gandak River
32	Number of Drains/Nallah for Wastewater Dispo	sal	: 13
33	Number of Water Bodies		: nil
34	Gross Area of Water Bodies (sq km)	:	: 0

: <<1.0

Water Balance & Pollution Load (Domestic) Fact Sheet				
City: Si	tamarhi Town	State:	Bihar	
S. No.	Items		Value	
1	Total Area (sq km)		: 8	
2	Population as in 2011		: 87279	
3	Population Growth Rate as in 2011 (%)		:	
4	Total Number of Wards		: 28	
5	Population per Ward (Thousands)		: 3,117	
6	Total Number of Household as in 2011		: 13720	
7	Number of Household per Ward		: 490	
8	Surface Water Supply (MLD)		: NIL	
9	Ground Water (GW) Supply (MLD)		: 5	
10	Number of Bore Wells		: 2	
11	Ground Water Extraction per Bore Well (MLD))	: 3.5	
12	Number of Hand Pumps		: 7000	
13	Ground Water Extraction per Hand Pump (lpd)		: 500	
14	Number of Pumping Stations for Water Supply	1	: 4	
15	Total Pumping Capacity (MLD)		: NIL	
16	Average Water Supply Rate from ULB Source	s	80.20256877	
16	(lpcd) Total Water Supply from ULB and Non-ULB		•	
17	Sources (MLD)		8.5	
	Average Water Supply Rate from ULB & Non-	-ULB	97.4	
18	Sources (lpcd)		:	
19	Total Sewage Generation (MLD)		: 6.8	
20	Per Capita Sewage Generation (lpcd)		: 77.9	
21	Sewage Collection (MLD)		: NA	
22	Percentage of Sewage Collection (%)		: NA	
23	Number of STPs	0. ***	: NA	
24	Total Installed Capacity of STPs under GAP I (MLD)	& II	: NA	
25	Current Utilized Capacity of STPs (MLD)		: NA	
26	Percentage Utilization of Installed Capacity (%	o)	: NA	
27	Capacity of STPs Sanctioned under JNNURM Others (MLD)	&	. NA	
2,		BOD_5	: NA	
28	Pollution Load (Domestic) (Method 1:	COD	: NA	
	Actual Flow) (kg/d)	TKN	: NA	
		BOD_5	: NA	
29	Pollution Load (Domestic) (Method 2: Per	COD	: NA	
-	Capita Contribution) (kg/d)	TKN	: NA	
30	Wastewater Disposal Means		: River & Land Disposal	
31	Name of River/Streams for Wastewater Dispos	sal	Lalakande & : Baghmati River	

32	Number of Drains/Nallah for Wastewater Disposal	:	20
33	Number of Water Bodies	:	7
34	Gross Area of Water Bodies (sq km)	:	0.167
35	Area of Water Rodies as % of Total Area		

City: Gopalganj State: Bihar

City: (City: Gopalganj State: Bihar			nar
S. No.	Items			Value
1	Total Area (sq km)		:	11.11
2	Population as in 2011/2001		:	66624/ 54418
3	Population Growth Rate as in 2011 (%)		:	22.43
4	Total Number of Wards		:	28
5	Population per Ward (Thousands)		:	2,379
6	Total Number of Household as in 2011		:	10125
7	Number of Household per Ward		:	362
8	Surface Water Supply (MLD)		:	0
9	Ground Water (GW) Supply (MLD)		:	1.25
10	Number of Bore Wells		:	2
11	Ground Water Extraction per Bore Well (MLD)		:	0.63
12	Number of Hand Pumps/ Tubewells		:	135
13	Ground Water Extraction per Hand Pump (lpd)		:	500
14	Number of Pumping Stations for Water Supply		:	NIL
15	Total Pumping Capacity (MLD)		:	NIL
16	Average Water Supply Rate from ULB Sources (lpcd	d)	:	*
17	Total Water Supply from ULB and Non-ULB Source	es (MLD)	:	1.3
	Average Water Supply Rate from ULB & Non-ULB	Sources		*
18	(lpcd)		:	·
19	Total Sewage Generation (MLD)		:	1.9
20	Per Capita Sewage Generation (lpcd)		:	*
21	Sewage Collection (MLD)		:	1.9
22	Percentage of Sewage Collection (%)		:	100
23	Number of STPs		:	NIL
24	Total Installed Capacity of STPs under GAP I & II (MLD)	:	NIL
25	Current Utilized Capacity of STPs (MLD)		:	NIL
26	Percentage Utilization of Installed Capacity (%)		:	NIL
	Capacity of STPs Sanctioned under JNNURM & Otl	ners		NIL
27	(MLD)		:	NIL
	Pollution Load (Domestic) (Method 1: Actual	BOD_5	:	
28	Flow) (kg/d)	COD	:	
	11011) (115/11)	TKN	:	
	Pollution Load (Domestic) (Method 2: Per Capita	BOD_5	:	476.1
29	Contribution) (kg/d)	COD	:	571.3
	Controllion (kg/d)	TKN	:	599.6
30	Wastewater Disposal Means		:	River Disposal
31	Name of River/Streams for Wastewater Disposal		:	R. Gandaki
32	Number of Drains/Nallah for Wastewater Disposal		:	<u>12**</u>
33	Number of Water Bodies		:	5
34	Gross Area of Water Bodies (Hectare)		:	NA

: NA

*Estimation based on one time survey by IT,BHU team on 28 Feb, 2012 from 9:00 am to 12:00 pm

Water Balance & Pollution Load (Domestic) Fact Sheet

Water Balance & Pollution Load (Domestic) Fact Sheet				
City: Motipur State: Bihar				
S. No.	Items			Value
1	Total Area (sq km)		:	12.77
2	Population as in 2011		:	26852
3	Population Growth Rate as in 2011 (%)		:	
4	Total Number of Wards		:	15
5	Population per Ward (Thousands)		:	1,790
6	Total Number of Household as in 2011		:	3657
7	Number of Household per Ward		:	244
8	Surface Water Supply (MLD)		:	NIL
9	Ground Water (GW) Supply (MLD)		:	2.47
10	Number of Bore Wells		:	2
11	Ground Water Extraction per Bore Well (MLD)		:	1.325
12	Number of Hand Pumps		:	2650
13	Ground Water Extraction per Hand Pump (lpd)		:	500
14	Number of Pumping Stations for Water Supply		:	4
15	Total Pumping Capacity (MLD)		:	NIL
16	Average Water Supply Rate from ULB Sources ():	91.98569939
	Total Water Supply from ULB and Non-ULB So	ources		3.8
17	(MLD)		:	5.0
	Average Water Supply Rate from ULB & Non-U	JLB		141.3
18	Sources (lpcd)		:	
19	Total Sewage Generation (MLD)		:	3.0
20	Per Capita Sewage Generation (lpcd)		:	113.1
21	Sewage Collection (MLD)		:	NA
22	Percentage of Sewage Collection (%)		:	NA
23	Number of STPs		:	NA
	Total Installed Capacity of STPs under GAP I &	II		NA
24	(MLD)		:	
25	Current Utilized Capacity of STPs (MLD)		:	NA
26	Percentage Utilization of Installed Capacity (%)		:	NA
2=	Capacity of STPs Sanctioned under JNNURM &			NA
27	Others (MLD)	DOD	:	
20	Pollution Load (Domestic) (Method L. Actual	BOD ₅ COD	:	NA
28	Flow) (kg/d)		:	NA
	, , ,	TKN		NA 6712.0
20	Pollution Load (Domestic) (Method 7: Per	BOD ₅	:	6713.0
29	Capita Contribution) (kg/d)	COD	:	8055.6
20	, , ,	TKN	:	241.7
30	Wastewater Disposal Means	ı		River & Land Disposal
31	Name of River/Streams for Wastewater Disposal	l	:	river

32	Number of Drains/Nallah for Wastewater Disposal	: nil
33	Number of Water Bodies	: NIL
34	Gross Area of Water Bodies (sq km)	: 0
35	Area of Water Bodies as % of Total Area	: <<1.0

Water Balance & Pollution Load (Domestic) Fact Sheet Kanti State: Bihar

City: Kanti

City: Kanu State: billar				
S. No.	Items		Value	
1	Total Area (sq km)	:	6.6	
2	Population as in 2011	:	25542	
3	Population Growth Rate as in 2011 (%)	:		
4	Total Number of Wards	:	14	
5	Population per Ward (Thousands)	:	1,824	
6	Total Number of Household as in 2011	:	4257	
7	Number of Household per Ward	:	304	
8	Surface Water Supply (MLD)	:	NIL	
9	Ground Water (GW) Supply (MLD)	:	1.58	
10	Number of Bore Wells	:	2	
11	Ground Water Extraction per Bore Well (ML	D) :	1.25	
12	Number of Hand Pumps	:	2500	
13	Ground Water Extraction per Hand Pump (lpd	d) :	500	
14	Number of Pumping Stations for Water Supp	ly :	4	
15	Total Pumping Capacity (MLD)	:	NIL	
	Average Water Supply Rate from ULB Source	es	61.85889907	
16	(lpcd)	:	01.03009907	
	Total Water Supply from ULB and Non-ULB		2.8	
17	Sources (MLD)	:	2.0	
	Average Water Supply Rate from ULB & No	n-ULB	110.8	
18	Sources (lpcd)	:		
19	Total Sewage Generation (MLD)	:	2.3	
20	Per Capita Sewage Generation (lpcd)	:	88.6	
21	Sewage Collection (MLD)	:	NA	
22	Percentage of Sewage Collection (%)	:	NA	
23	Number of STPs	:	NA	
	Total Installed Capacity of STPs under GAP	I & II	NA	
24	(MLD)	:		
25	Current Utilized Capacity of STPs (MLD)	:	NA	
26	Percentage Utilization of Installed Capacity (NA	
25	Capacity of STPs Sanctioned under JNNURN	1 &	NA	
27	Others (MLD)	:		
20	Pollution Load (Domestic) (Method 1:	BOD_5 :	NA	
28	Actual Flow) (kg/d)	COD :	NA	
	.	TKN:	NA	
20	Pollution Load (Domestic) (Method 2: Per	BOD_5 :	6385.5	
29	Capita Contribution) (kg/d)	COD :	7662.6	
	- , , , , , , , , , , , , , , , , , , ,	TKN :	229.9	

30	Wastewater Disposal Means	: River & Land Disp	osal
31	Name of River/Streams for Wastewater Disposal	: Gandak River	
32	Number of Drains/Nallah for Wastewater Disposal	: 20	
33	Number of Water Bodies	: 5	
34	Gross Area of Water Bodies (sq km)	: 0.4391	
35	Area of Water Bodies as % of Total Area	: <<1.0	

Water Balance & Pollution Load (Domestic) Fact Sheet					
City: Bairgania State: Bihar					
S. No.	Items		Value		
1	Total Area (sq km)		: 5.5		
2	Population as in 2011		: 42500		
3	Population Growth Rate as in 2011 (%)		:		
4	Total Number of Wards		: 12		
5	Population per Ward (Thousands)		: 3,542		
6	Total Number of Household as in 2011		: 3952		
7	Number of Household per Ward		: 329		
8	Surface Water Supply (MLD)		: NIL		
9	Ground Water (GW) Supply (MLD)		: 3		
10	Number of Bore Wells		: 1		
11	Ground Water Extraction per Bore Well (MLD)		: 1.5		
12	Number of Hand Pumps		: 3000		
13	Ground Water Extraction per Hand Pump (lpd)		: 500		
14	Number of Pumping Stations for Water Supply		: 4		
15	Total Pumping Capacity (MLD)		: NIL		
16	Average Water Supply Rate from ULB Sources	s (lpcd)	: 86.11780916		
	Total Water Supply from ULB and Non-ULB S	Sources	4.5		
17	(MLD)		: 4.3		
	Average Water Supply Rate from ULB & Non-	·ULB	129.2		
18	Sources (lpcd)		:		
19	Total Sewage Generation (MLD)		: 3.6		
20	Per Capita Sewage Generation (lpcd)		: 84.7		
21	Sewage Collection (MLD)		: NA		
22	Percentage of Sewage Collection (%)		: NA		
23	Number of STPs		: NA		
	Total Installed Capacity of STPs under GAP I &	& II	NA		
24	(MLD)		:		
25	Current Utilized Capacity of STPs (MLD)		: NA		
26	Percentage Utilization of Installed Capacity (%		: NA		
	Capacity of STPs Sanctioned under JNNURM	&	NA		
27	Others (MLD)	202	:		
20	Pollution Load (Domestic) (Method 1: Actual	BOD_5	: NA		
28	Flow) (kg/d)	COD	: NA		
		TKN	: NA		
29	Pollution Load (Domestic) (Method 2: Per	BOD_5	: 10625.0		
	Capita Contribution) (kg/d)	COD	: 12750.0		

	TKN	:	382.5
30	Wastewater Disposal Means	:	River & Land Disposal
31	Name of River/Streams for Wastewater Disposal	:	Gandak River
32	Number of Drains/Nallah for Wastewater Disposal	:	7
33	Number of Water Bodies	:	5
34	Gross Area of Water Bodies (sq km)	:	0.0808
35	Area of Water Bodies as % of Total Area	:	<<1.0

Water Balance & Pollution Load (Domestic) Fact Sheet City: Belsand State: Bihar

S. No.	Items			Value
1	Total Area (sq km)		:	4
2	Population as in 2011		:	20000
3	Population Growth Rate as in 2011 (%)		:	
4	Total Number of Wards		:	Nil
5	Population per Ward (Thousands)		:	Nil
6	Total Number of Household as in 2011		:	2500
7	Number of Household per Ward		:	Nil
8	Surface Water Supply (MLD)		:	NIL
9	Ground Water (GW) Supply (MLD)		:	3
10	Number of Bore Wells		:	nil
11	Ground Water Extraction per Bore Well (MLD))	:	0.85
12	Number of Hand Pumps):	1700
13	Ground Water Extraction per Hand Pump (lpd)		:	500
14	Number of Pumping Stations for Water Supply		:	4
15	Total Pumping Capacity (MLD)		:	NIL
16	Average Water Supply Rate from ULB Sources		:	50
	Total Water Supply from ULB and Non-ULB S	Sources		1.9
17	(MLD)		:	1.7
	Average Water Supply Rate from ULB & Non-	ULB		92.5
18	Sources (lpcd)		:	
19	Total Sewage Generation (MLD)		:	1.5
20	Per Capita Sewage Generation (lpcd)		:	74.0
21	Sewage Collection (MLD)		:	NA
22	Percentage of Sewage Collection (%)		:	NA
23	Number of STPs		:	NA
2.4	Total Installed Capacity of STPs under GAP I &	¢Π		NA
24	(MLD)		:	
25	Current Utilized Capacity of STPs (MLD)		:	NA
26	Percentage Utilization of Installed Capacity (%)		:	NA
27	Capacity of STPs Sanctioned under JNNURM of Others (MLD)	&	:	NA
	Pollution Load (Domestic) (Method 1: Actual	BOD_5	:	NA
28	Flow) (kg/d)	COD	:	NA
	, , ,	TKN	:	NA
29	Pollution Load (Domestic) (Method 2: Per	BOD_5	:	5000.0

	Capita Contribution) (kg/d)	COD	:	6000.0
		TKN	:	180.0
30	Wastewater Disposal Means		:	River & Land Disposal
31	Name of River/Streams for Wastewater Dispo	sal	:	Gandak River
32	Number of Drains/Nallah for Wastewater Disp	posal	:	NIL
33	Number of Water Bodies		:	Nil
34	Gross Area of Water Bodies (sq km)		:	0
35	Area of Water Bodies as % of Total Area		:	<<1.0

City: Jonakpur Road (Pupri) State: Bihar					
S. No.	Items	200000	Value		
1	Total Area (sq km)	:	5		
2	Population as in 2011		18000		
3	Population Growth Rate as in 2011 (%)	:			
4	Total Number of Wards	:	10		
5	Population per Ward (Thousands)	:	1,800		
6	Total Number of Household as in 2011	:	4000		
7	Number of Household per Ward	:	400		
8	Surface Water Supply (MLD)	:	NIL		
9	Ground Water (GW) Supply (MLD)	:	1		
10	Number of Bore Wells	:	1		
11	Ground Water Extraction per Bore Well (MLD)) :	1.5		
12	Number of Hand Pumps	:	3000		
13	Ground Water Extraction per Hand Pump (lpd)	:	500		
14	Number of Pumping Stations for Water Supply	:	4		
15	Total Pumping Capacity (MLD)	:	NIL		
16	Average Water Supply Rate from ULB Sources	s (lpcd) :	86.11780916		
	Total Water Supply from ULB and Non-ULB S	Sources	2.5		
17	(MLD)	:	2.3		
	Average Water Supply Rate from ULB & Non-	ULB	71.8		
18	Sources (lpcd)	:			
19	Total Sewage Generation (MLD)	:	2.0		
20	Per Capita Sewage Generation (lpcd)	:	111.1		
21	Sewage Collection (MLD)	:	NA		
22	Percentage of Sewage Collection (%)	:	NA		
23	Number of STPs	:	NA		
	Total Installed Capacity of STPs under GAP I &	& II	NA		
24	(MLD)	:			
25	Current Utilized Capacity of STPs (MLD)	:	NA		
26	Percentage Utilization of Installed Capacity (%	·	NA		
	Capacity of STPs Sanctioned under JNNURM	&	NA		
27	Others (MLD)	:			
• •	Pollution Load (Domestic) (Method 1: Actual	BOD_5 :	NA		
28	Flow) (kg/d)	COD :	NA		
		TKN :	NA		

29	Pollution Load (Domestic) (Method 2: Per Capita Contribution) (kg/d)	BOD_5	:	4500.0
		COD	:	5400.0
		TKN	:	162.0
30	Wastewater Disposal Means		:	River & Land Disposal
31	Name of River/Streams for Wastewater Disposal		:	Buri Gandak River
32	Number of Drains/Nallah for Wastewater Disposal		:	8
33	Number of Water Bodies		:	9
34	Gross Area of Water Bodies (sq km)		:	1.1816
35	Area of Water Bodies as % of Total Area		:	<<1.0

