



ASIAN SANITATION

DATA BOOK 2013

ACHIEVING SANITATION FOR ALL

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December 2013

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ABBREVIATIONS

ADB	Asian Development Bank
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
HH	Household
PCB	Polychlorinated Biphenyl
UN-Habitat	United Nations Human Settlements Programme

MEASUREMENT UNIT AND SYMBOLS

\$/cap	dollar per capita
\$/con	dollar per connection
\$/ST	dollar per septic tank
#	number
CFU	colony forming unit
ha	hectare
Hg	mercury
l	liter
lpcd	liters per capita per day
mg	milligrams
ml	milliliter
m ³	cubic meter
m ³ /d	cubic meter per day
mg/l	milligram per liter
MPN	most probable number
Pb	lead

NOTE

In this report, "\$" refers to US dollars (USD)

LIST OF PARTICIPATING CITIES AND/ OR MUNICIPALITIES

South Asia

Bangladesh

1. Dhaka*

India

2. Bhopal
3. Dewas
4. Gwalior
5. Indore
6. Jabalpur
7. Mangalore
8. Nasrullahganj

Nepal

9. Bharatpur
10. Hetauda
11. Kathmandu
12. Lekhnath
13. Pokhara

Sri Lanka

14. Colombo*
15. Negombo*

South East Asia

Indonesia

16. Banda Aceh*

Lao People's Democratic Republic

17. Phine
18. Sayabouly
19. Xieng Ngeun

Philippines

20. Calbayog*
21. Makati*
22. San Fernando*

Viet Nam

23. Cam Ranh
24. Ho Chi Minh*
25. Hue*
26. Song Cau
27. Thap Cham

East Asia

People's Republic of China

28. Jinghong
29. Kunming
30. Puer

* Indicates areas where survey responses were facilitated by CITYNET

PART I: SUMMARY OF FINDINGS

Introduction

The information presented in this publication, Asian Sanitation Data Book 2013 – Achieving Sanitation for All, comes from a fresh survey of 30 cities that are members of CITYNET and participants in the Water for Asian Cities Programme of the United Nations Human Settlements Programme (UN-Habitat) and Asian Development Bank (ADB) as the programme partner. Gathering of survey data was facilitated by UN-Habitat and CITYNET. Information contained in the returned survey forms was not complete, so analysis may not be as extensive (see Table 1). However, a number of conclusions may be drawn from the data.

Of the 30 cities, 1 is in Bangladesh, 3 are in the People’s Republic of China, 7 are in India, 1 in Indonesia, 3 in the Lao People’s Democratic Republic (Lao PDR), 5 in Nepal, 3 are in the Philippines, 2 in Sri Lanka, and 5 in Viet Nam (see Figure-I).

What does good sanitation mean? For UN-Habitat, it refers to good health and environmental outcomes and therefore encompasses personal hygiene and care for the environment. It means dealing with both human and water wastes from households and commercial and industrial enterprises. Good sanitation is best judged by health and environmental outcomes as shown in Figure-II.

The overall city sanitation picture is not bright. Sanitation has not been given sufficient priority and certainly lags behind provision of drinking water. Based on this survey, the key findings are the following:

- Lack of sanitation and household wastewater treatment facilities is polluting ground and surface waters.

- Sustaining public health is an expected outcome of having adequate sanitation, but over half of the cities were unable to report key health statistics. Those that did reveal increasing diarrheal cases when the share of household wastewater increases.
- Far too many cities still have incidences of open defecation (ranging from 10%–40%) and sanitation coverage depends on private householders investing in toilets and septic tank systems.
- Although almost all cities are aware of their sanitation problems, only 40% of responding cities have sanitation plans for their cities, and few were able to provide information on capital expenditure and operations and maintenance costs.
- Most cities that provide sanitation services rely on government funding to pay for capital and operating costs, with only 10% indicating that sanitation fees and charges can cover their costs.
- Multiple agencies have responsibilities for some aspects of sanitation. However, local government seems to be the primary organization. These organizations were operating under at least several national laws and one local law. These institutional arrangements may frustrate action and reduce accountability.

This information may not come as any surprise to those closely involved in public health and water and sanitation utilities. The findings, despite qualifications about data quality, point to priority actions required to increase sanitation coverage and



improve health and environmental conditions. Based on this survey, governments, in coordination with various stakeholders, must undertake the following priority actions:

- Initiate city sanitation plans, including setting targets for sanitation outcomes and coverage.
- Simplify institutional arrangements to strengthen accountability and avoid multiple-agency involvement that can cause delays in taking action; set in place a coordinating mechanism.
- Review operation and maintenance expenditures and cost recovery policies to ensure sanitation providers can sustain operations and extend services.
- Improve sanitation benchmark indicators and set in place a sanitation information management system that will be regularly updated to help planners and decision makers make investment and operations decisions.
- As significant investment is needed, consider sourcing funds from beyond government sources – such as the private sector and user fees; and other revenue-generating mechanisms.

Outcomes on the Key Indicators

(a) Good Health and Environmental Outcomes

Based on the results of the survey, wastewater, particularly from households, is slowly polluting the groundwater and surface water sources of the respondent cities. Twenty one out of 30 participating cities monitored their groundwater and surface water quality and about 40% of the water pollution came from household liquid waste. About 70% of the wastewater was discharged to bodies of water without treatment. Four cities reported that their rivers were “heavily” polluted, three cities’ rivers pollution load was high, while the rest reported that the pollution levels of their rivers were “medium” or “low.”

Many cities are adjacent to each other and are expected to work cooperatively to address sanitation and wastewater issues. However, only three cities reported that they were working cooperatively with neighboring towns and/or cities on pollution problems. The rest were tackling the issue independently.

Monitoring water quality should be expected in cities. Only 6 out of 30 cities have reported groundwater quality monitoring results and one city violated the standards on total coliform. Alarmingly, most cities have a pollution load two to eight times their surface water quality standards.

Figure I: Location of Participating Cities/ Countries

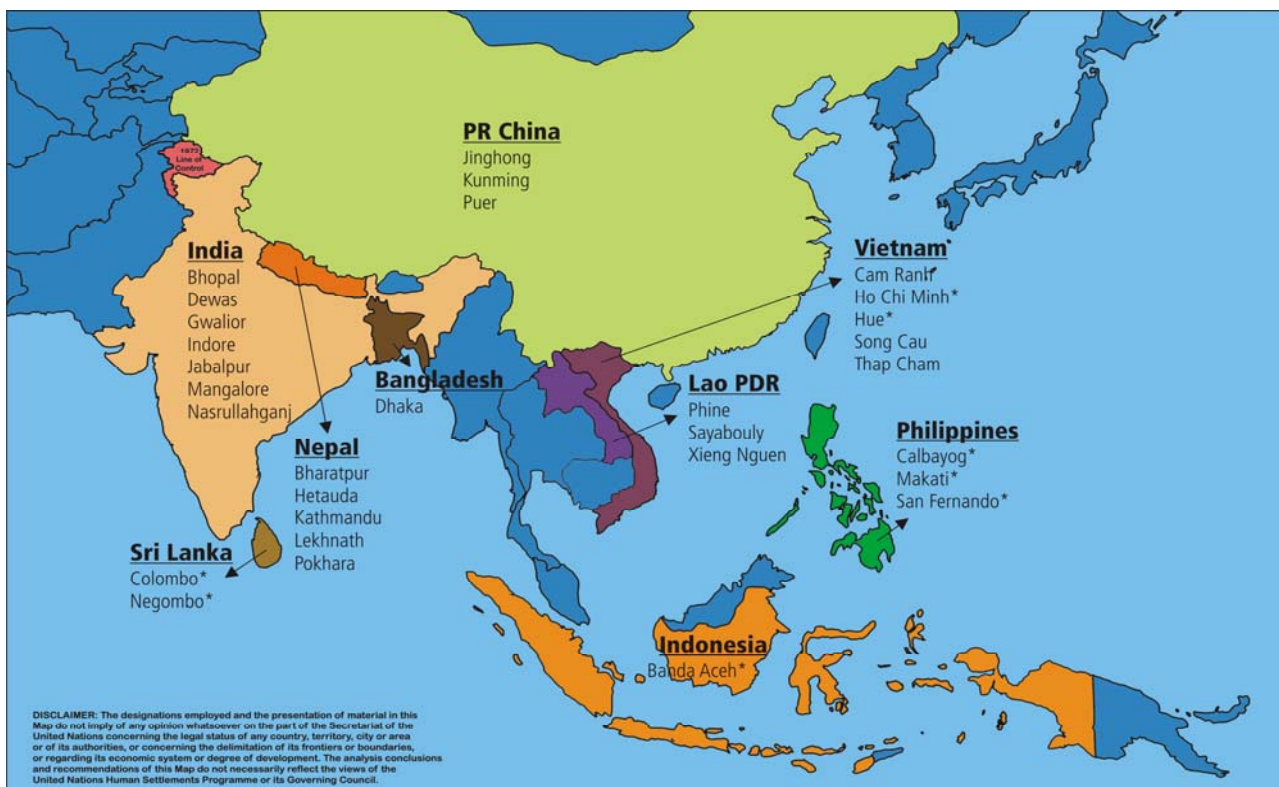
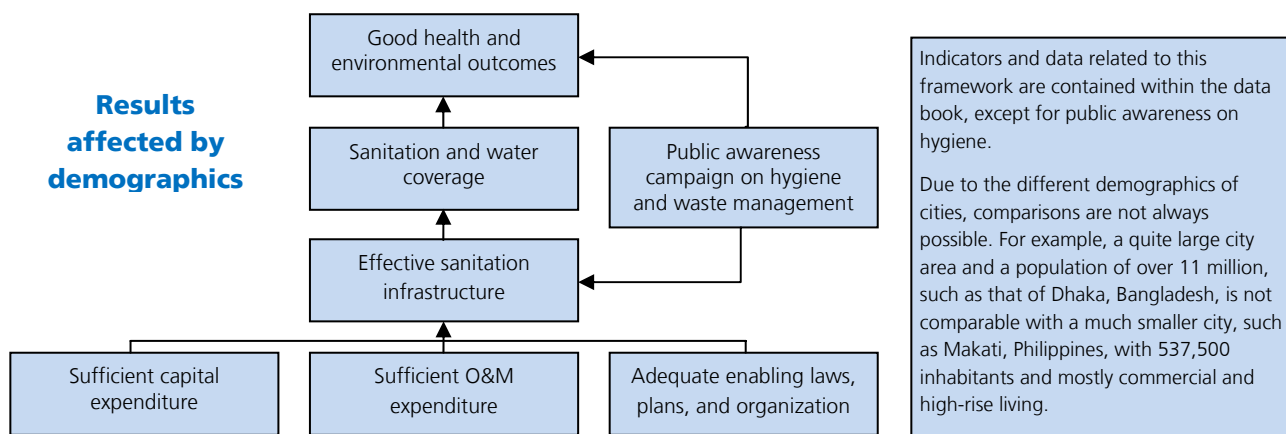


Figure II: Indicators of Health and Environmental Outcomes



Monitoring health outcomes is equally important. However, of the 30 respondents, only 9 cities (30%) reported their health statistics. Nevertheless, data show that the incidence of reported cases of diarrhea increases as the share of the household solid and liquid wastes rises.

If better public health and environmental conditions were a government priority, then provision of sanitation infrastructure facilities, particularly wastewater treatment facilities, and efficient surface and groundwater quality monitoring are imperative. The cost of cleaning up polluted rivers and lakes would be more expensive than the cost of providing sanitation infrastructure facilities. However, managing water resources on a long-term sustainable basis calls for reliable and up-to-date data.

Which cities then appear to show the best results in terms of overall practices, environment, and health?

Overall best sanitation practices: Based on the data gathered and due to most cities' lack of available information in some parameters, it is difficult to choose the city with the best sanitation practices.

Environmental statistics: Most cities failed to meet nearly all of the standards (Table 2). In terms of total

coliform, Gwalior (India), Phine (Lao PDR), and Xieng Ngeun (Lao PDR) have <1 #/ml, meeting the standard for this parameter. All the cities except Phine have biochemical oxygen demand (BOD) levels higher than four. Except for Jabalpur, India, and Sayabouly, Lao PDR, the surface water quality in the respondent cities indicated very high levels of total suspended solids.

Health statistics: Colombo, Sri Lanka, has the lowest cases of diarrhea at 0.75 per 10,000 population, followed by Negombo with 3.30. Ho Chi Minh, Vietnam has very low hepatitis and malaria cases, which stand at 0.22 and 0.09 cases per 10,000 population. Calbayog City, Philippines, and Lekhnath, Nepal have no cases of hepatitis, trachoma, or malaria. However, Lekhnath has a high incidence of diarrhea at 194.11 cases per 10,000 population. Survey results show that Negombo has the best health indicators, followed by Colombo (Table 3).

(b) Adequate Sanitation and Water Coverage

The survey results show that sanitation is not a government priority. Because of poverty, many cities still have open defecation areas. Of 30 cities, as many as 19 cities reported open defecation with six cities (almost 20%) indicating that between 10% - 61% of their households still practice open defecation.



In contrast, provision of water supply is a priority for all respondent cities. All have a central water supply system and some have water treatment facilities – although with low coverage. All respondent cities have a central water supply system serving 4%–100% of households. In this central supply system type, all cities have in-house piped water supply connection and 15 cities use communal sources. The central water supply system served about 11.5% of the total city area, serving 71% of the total respondents' city population.

Of the 15 cities with communal water supply source, 6 cities have more than 11%–44% of their households relying on this water source.

Of the cities, 15 still use boreholes as water supply source. Of these, 10 cities have more than 20% of households relying on boreholes as their major water source.

Of the cities, 22 have water treatment plants with capacities ranging from 1.4 to 137 liters per capita per day (lpcd) and averaging 25 lpcd. Due to poor water quality, 25%–80% of the population in six cities indicated they buy bottled water.

Most cities still need to boost their investment in water supply to provide potable water to all their households. However, a large investment that requires partnerships between government, the private sector, and external support agencies is needed.



Increasing the coverage of water supply exacerbates the sanitation situation as more wastewater volumes are generated for disposal. However, the necessary wastewater facilities are not being provided. Investments in water supply could be undermined without investing in improved sanitation.

Which cities have high sanitation and water supply coverage?

Sanitation coverage: Among the 30 cities, Kunming, People's Republic of China, and Thap Cham, Viet Nam, both ranked first in providing improved sanitation facilities, with 100% of their population having individual toilets that are connected to centralized sewerage system with treatment facilities. Gwalior, India, ranked second, with 86% of the population having individual toilets connected to a sewerage system, and Colombo, Sri Lanka, third – with 80% of its population having individual toilets connected to a sewerage system. Both Gwalior and Colombo have no sewage treatment plants.

Water supply coverage: Among the 30 cities, Kathmandu, Nepal, ranked first in terms of water supply coverage, with 100% of the households connected to a central water supply system. Makati City, Philippines ranked second, with 100% of the city land area served by the central water supply system and 99.7% of its population connected. Makati City also has a water treatment facility with a capacity of 137.2 lpcd, the highest among the 30 cities. Ranking as second is Colombo's facility, with a capacity of 105.2 lpcd.

(c) Adequate Sanitation Infrastructure

Without adequate private and public infrastructure, health and environmental outcomes will not materialize. Collection of waste is one important facet, but another is treatment, which is a neglected area. Household human waste in cities can be collected and treated in various ways but respondents in the survey showed overreliance on individual household's providing their own sanitation facilities. Twenty-two cities rely on individual toilet with a septic tank system, but only four cities (less than 20%) reported having a septage treatment plant.

Fifteen cities out of 30 respondents have a central sewerage system, yet 11 of the 15 sewered cities still need to cover 70% of their population. Of these, eight cities (30%) have reported having a wastewater treatment plant (Table 4).

Thap Cham (Viet Nam) reported 98% of its area being served by a central sewerage system, with 100% connection and 99% of its wastewater is treated. However, no information is given on the quality of surface water. Another city, Kunming (People's Republic of China), also has 100% connection, but only 0.4% of its area is served by a central sewerage system.

Newer techniques for dealing with human waste, such as technologies involving no water, have been advocated in recent years. One such technology is the “eco-san” toilet that separates solid from liquid human wastes and requires no running water. Despite nongovernment organizations’ strong advocacy of such technologies, only two cities have adopted the eco-san toilets.

Key messages that can be deduced here are (i) all cities need to boost their investment in sanitation, starting with toilets, followed by a sewage collection, treatment, and disposal system; (ii) regular desludging services and septage treatment facilities should be provided for cities with a high proportion of households having septic tanks; and (iii) increasing water supply coverage should go hand-in-hand with a complementary investment plan to deal effectively with the additional wastewater to achieve the targeted health benefits.

(d) Sufficient Capital and Operation and Maintenance Expenditure

Infrastructure needs to be renewed, expanded, and maintained. Survey results show only few cities know and could provide information on their annual investment requirement and/or the operation and maintenance (O&M) cost. Eight cities indicated their annual capital investment program. On average, the funding sources for the proposed capital investments were from local government (44%), national government (31%), loans (17%), and others – mostly grant (12%). Ten cities indicated their sources of capital investment, but not the amount.

In this group, the funding sources were from local government (23%), loans (24%), and others (37%). No city has indicated tariff revenue as a source for capital investment.

Some responses showed that with proper design and planning, tariff revenues can cover the O&M costs. Eleven cities indicated their O&M expenditure requirement ranges from \$0.08–\$8.3 per capita, and about 75% of them have O&M costs below \$1.0 per capita. On average, the funding sources for O&M costs were local government (70%), tariff revenues (20%), loans (9%), and national government (1%).

Only four cities (under 20%) reported having separate sanitation revenues. Three of the four cities that have sanitation revenues indicated their revenues can more than cover the sanitation O&M costs. Only 5 out of the 15 cities that have a central sewer system stated they have a sewer tariff rate. Desludging services for septic tanks are carried out

by government (49%) and private firms (51%), indicating private sector involvement in sanitation. Desludging fees of the private firms range from \$4–\$133 per septic tank, with 70% of them charging below \$35, whereas government agencies charged from \$3.5 to \$30 per septic tank, with 60% of them charging below \$20.

The current financial situation of some cities prevents them from adequately funding their sanitation investment program. Furthermore, most cities need to review their O&M protocol, and compare this with other cities.

Which cities have developed financing mechanism for sanitation?

Capital investment: Colombo (Sri Lanka) ranked first in this category with an annual capital investment of \$27.9 per capita, where 47% is subsidized by the national government and the remaining 53% sourced through loans. Coming close at second is Jabalpur (India) with an annual capital investment of \$22.5 per capita, with funding sourced from national government (50%), local government (20%), and loans (30%).

O&M expenditures: Only 11 cities have data on O&M expenditures for sanitation facilities. Out of the 11, only 6 have sewered areas. O&M aggregate cost (2007 data) ranges from \$7,200 to \$6,250,000. Sanitation O&M cost per hectare (ha) of the six sewered cities ranges from \$35.71/ha to \$1,812.61/ha.



(e) Adequate Enabling Laws, Plans, and Organization

Having the infrastructure is not a guarantee of excellent sanitation services and achievement of health and environmental outcomes. Accountable and properly staffed organizations, ably supported by appropriate laws and regulations, are also needed.

The survey shows that sanitation services involve more than just the city government. Other national and local government agencies are involved, and several laws on sanitation per city exist. On average, four organizations – mostly government agencies – were involved in sanitation. Four cities reported that both national and local government agencies were involved in sanitation in their cities. One city indicated that mainly national government agencies were involved in sanitation, while 21 cities indicated that mainly local government agencies – ranging from 1 to 4 local offices – were responsible for sanitation.

On the other hand, 11 cities reported that their sanitation facilities were being managed by government-controlled utilities, of which three cities had two government-owned utilities. Only one city indicated that a private water utility was involved in providing sanitation services.

Seventeen cities indicated very few personnel involved in sanitation. Only a quarter of the cities have more than 20 staff per 10,000 population engaged in sanitation, but personnel numbers may be understated since other agencies are often involved. The cities operate, on average, under two national laws and one local law on sanitation. This mix of organizations and laws suggests that institutional arrangements and organizational structure should be simplified, with proper accountability and coordinating mechanisms. Governments should review the institutional setup for city sanitation and the corresponding laws that have to be enacted. Provision of sanitation facilities

and services is generally the mandate of local governments. However, some cities need assistance in policy and legal and institutional reforms for more effective delivery of sanitation services.

Regarding planning, only 40% of respondents have a sanitation plan—reinforcing the belief that sanitation has a low priority in city governments' agenda. Nevertheless, having a plan is not enough. The comprehensiveness and quality of sanitation plans need to be improved. Eleven cities reported having a sanitation plan, but only one indicated the year the plan was made. That means more than half of all cities have no formal plans or the plans may be old and no longer appropriate. Almost all cities (20) were aware of their sanitation problems, but only two indicated a definite project to resolve them, complete with funding requirement and sources. Some local governments might require technical and financial assistance in developing their sanitation plans.

Cities preparing sanitation plans now or in the near term should be collecting, monitoring, and analyzing important sanitation benchmark data. Some parameters and indicators used in this data book have to be improved or changed. City governments should consider setting up a water and sanitation information management system, with regular data collection, and updating of the database. This would help them identify priority areas of concern; set targets; determine costs, funding, and capacity requirements; formulate policies and guidelines; monitor progress; and recognize good practices.



Table I: City Data Availability per Population Range

Population	Number	Urban Poor (%)	Availability of Environment Results (%)	Availability of Health Results (%)	Enabling Environment (%)
Over 10 million	1	36	100	0	67
Between 5 and 10 million	2	1-4	50	50	100
Between 2 and 5 million	1	16	100	0	100
Between 1 and 2 million	3	26	100	0	67
Between 0.5 and 1 million	3	0-40	75	75	84
Between 100-500 thousand	13	0-48	40	70	80
Under 100 thousand	7	2-42	43	14	76
Total	30	Average 14.6			

Table II: Surface Water Quality of Respondent Cities

City/Country	Total Coliform	BOD* (mg/l)	COD (mg/l)	Total Suspended Solids (mg/l)	Heavy Metals (mg/l)
Ho Chi Minh, Viet Nam	22,000 MPN/100 ml	4.5	10.8	261.0	–
Jabalpur, India	<200 #/ml	4.5	50.0	1.0	0.25
Banda Aceh, Indonesia		4.7	17.5	61.0	0.30
Phine, Lao PDR	<1#/ml	5.0	50.0	–	–
Sayabouly, Lao PDR	10#/ml	5.0	50.0	1.8	–
Xieng Ngeun, Lao PDR	<1#/ml	5.0	50.0	–	–
Bhopal, India	30 #/ml	6.0	50.0	200.0	0.25
Gwalior, India	<1#/ml	6.0	50.0	200.0	0.25
Indore, India	30 #/ml	6.0	50.0	200.0	0.25
Negombo, Sri Lanka	10,200 MPN/100 ml	6.0	22.0	–	–
Kunming, PRC		10.7	67.4	–	–
Hue, Viet Nam	5,000 MPN/100 ml	15.0	7.1	60.0	0.03
Pokhara, Nepal	291 CFU/100 ml	22.5	95.0	61.0	–
Dhaka, Bangladesh	11,450 MPN/100 ml	30.0	80.0	30.0	–
Kathmandu, Nepal	2,400,000 #/ml	36.0	207.0	–	0.05
Colombo, Sri Lanka	5,000 MPN/100 ml	48.0	75.0	83.3	16.7
Calbayog, Philippines	–	168.0	973.0	75.0	–
Jinghong, PRC	40 #/ml	180.0	360.0	250.0	–

BOD = biochemical oxygen demand, COD = chemical oxygen demand, # = number, CFU = colony forming unit, Lao PDR = Lao People's Democratic Republic, mg/l = milligram per liter, ml = milliliter, MPN = most probable number, PRC = People's Republic of China.

Note: "–" means data not available.

* Table sorted per BOD in ascending order—only 18 cities out of 30 provided data

Water Quality Standards	Total Coliform	BOD	COD	Total Suspended Solids	Heavy Metals
WHO Guidelines for Drinking Water Quality ^a	0/100 ml of sample				Pb = 0.01 mg/l Hg = 0.006 mg/l
Viet Nam TCVN 5942 -1995 Column A ^b	5,000 MPN/100 ml	<4 mg/l	<10 mg/l	20 mg/l	Pb = 0.05 mg/l Hg = 0.001 mg/l
PRC Standard for Water Quality - Category III ^c	10,000 #/l	4 mg/l	15 mg/l		Pb = 0.05 mg/l Hg = 0.05 mg/l
Philippines Water Quality Criteria - Class Ad (DAO 34, Series of 1990)	1,000 MPN/100 ml 100 MPN/100 ml (fecal coliform)	5 mg/l		50 mg/l	Pb = 0.05 mg/l Hg = 0.002 mg/l
Philippines National Standards for Drinking Water ^e	0 #/100 ml (fecal coliform)				

DAO = DENR Administrative Order, DENR = Department of Environment and Natural Resources (Philippines), Hg = Mercury, mg/l = milligram per liter, ml = milliliter, MPN = most probable number, Pb = lead, PRC = People's Republic of China, TCVN = Viet Nam Standards, WHO = World Health Organization.

Source:

a. World Health Organization. 2008. Guidelines for Drinking Water Quality incorporating 1st and 2nd addenda, Vol. 1, Recommendations. 3rd ed. Geneva: WHO.

b. Viet Nam Surface Water Quality Standards (TCVN 5942-1995).

c. PRC Environmental Quality Standards—Surface Water (GB 3838-2002).

- d. Philippine Department of Environment and Natural Resources Administrative Order (DAO) no. 34, Series of 1990.
e. Philippine Department of Health.

Table III: Health Statistics of Respondent Cities

City/Country	Reported Cases (per 10,000 population)		Death (Children under 5 years of age) (per 10,000 population)
	Diarrhea	Acute Lower Respiratory Infection	
Negombo, Sri Lanka	3.3	–	–
Colombo, Sri Lanka	0.75	0.4	–
Hue, Viet Nam	7.2	3.2	0.03
Ho Chi Minh, Viet Nam	10.1	507.8	–
Calbayog, Philippines	27.7	46.1	0.47
Makati, Philippines	4.71	78.78	0.11
San Fernando, Philippines	58.9	250.8	–
Kathmandu, Nepal	142.2	180.7	0.03
Banda Aceh, Indonesia	278.9	–	–
Pokhara, Nepal	179.5	409.6	–
Leknath, Nepal	194.1	496.5	–
Bharatpur, Nepal	594.1	294.6	–

Note: Table sorted per diarrhea incidence in ascending order—12 out of 30 cities.
"–" means data not available

Table IV: Central Sewerage System Coverage and Wastewater Treatment Capacity

City/Country	Household Coverage (%)	Wastewater Treatment Capacity	Averaged Water Consumption (lpcd)
Kunming, PRC	100	95	–
Thap Cham, Viet Nam	100	–	120
Gwalior, India	86	–	130
Colombo, Sri Lanka	30	–	160
Kathmandu, Nepal	70	34	90
Puer, PRC	57	132	–
Indore, India	55	75	80
Hue, Viet Nam	50	–	–
Bhopal, India	42	103	160
Xieng Ngeun, Lao PDR	27	–	80
Phine, Lao PDR	60	–	86
Makati, Philippines	23	353	–
Dhaka, Bangladesh	20	55	140
Sayabouly, Lao PDR	60	–	80
Jinghong, PRC	4	1,650	–

Lao PDR = Lao People's Democratic Republic, lpcd = liters per capita per day, PRC = People's Republic of China.

Note: a Based on served population.

Table sorted per household coverage in descending order—15 out of 30 cities.

Based on 2007 data of the cities.

"–" means data not available.

PART II: SANITATION COMPARISON

2.1. Demographic Indicators

S.No.	City (Year)	Population Number	Growth Rate	Number of Households	Average HH Size	Floating Pop'n	Urban Poor
		('000)	%	('000)	Number	%	%
1.	Banda Aceh* (2012)	238.0	4.47	58.50	4.0(4.0)	4.2	8.5
2.	Bharatpur (2011)	143.8	5.03	36.93	3.9 (4.5)	0	9.46
3.	Bhopal (2011)	1,883.3	3.50	258.58	5.9 (5.9)	3.5	22.68
4.	Calbayog* (2007)	169.8	1.79	28.91	5.2 (5.0)	1.7	4.18
5.	Cam Ranh (2010)	215.8	1.80	47.96	4.5(4.5)	0	15.03
6.	Colombo*(2012)	665.0	0.35	117.33	6.0 (6.0)	60.1	13.5
7.	Dewas (2011)	281.0	4.1	43.90	6.4	7.1	39.6
8.	Dhaka* (2007)	11,000.0	5.00	2,301.26	4.8 (4.8)	9.1	36.36
9.	Gwalior (2011)	1,053.0	2.70	175.97	5.9 (5.9)	0.5	10.40
10.	Hetauda (2012)	84.7	2.51	19.85	4.2 (4.2)	1.5	10.60
11.	Ho Chi Minh* (2007)	6,651.0	3.20	1,602.64	4.2 (4.1)	0	3.75
12.	Hue* (2007)	327.8	1.25	64.20	5.1 (5.1)	20.0	30.00
13.	Indore (2011)	2,171.4	4.80	330.00	5.0 (5.0)	6.1	15.86
14.	Jabalpur (2011)	1,267.0	2.80	173.65	6.2 (6.2)	4.8	31.12
15.	Jinghong (2007)	379.0	0.40	125.33	3.0 (3.0)	10.6	0
16.	Kathmandu (2011)	1,003.3	4.04	254.76	3.9(3.9)	–	–
17.	Kunming (2007)	6,155.6	0.62	1,531.94	4.0 (4.0)	18.1	1.34
18.	Lekhath (2011)	58.8	2.90	14.93	3.9(3.9)	0	1.56
19.	Makati*(2011)	537.5	1.60	123.98	4.2 (4.2)	844.1	0.30
20.	Mangalore (2011)	463.3	1.05	92.66	5.0	–	1.8
21.	Nasrullahganj (2011)	21.7	2.64	2.86	7.6	2.0	48.0
22.	Negombo* (2013)	150.80	2.48	30.17	5.0 (5.0)	11.9	10.00
23.	Phine (2012)	54.9	2.90	8.32	6.6 (6.6)	0	23.0
24.	Pokhara (2011)	255.4	5.27	68.23	3.7 (3.7)	–	4.00
25.	Puer (2007)	265.6	0.60	78.90	3.2 (3.3)	5.7	2.69
26.	San Fernando* (2007)	114.8	1.63	24.85	4.6 (4.6)	25.0	32.84
27.	Sayabouly (2012)	75.2	2.80	12.53	6.0 (6.0)	0	22.40
28.	Song Cau (2011)	125.3	1.40	25.00	5.0 (5.0)	0	1.66
29.	Thap Cham (2011)	161.7	1.50	32.35	5.0 (5.0)	0	10.36
30.	Xieng Ngeun (2011)	35.8	2.80	5.97	6.0 (6.0)	0	28.17
	Top Value	11,000.0	7.10	2,301.30	7.6	844.1	48.0
	Range	21.7 – 11,000.0	0.35–7.10	2.86 – 2,301.26	3.2–7.6	0–844.1	0–48.0
	Average	1200.3	2.6	256.4	4.9	34.5	14.6

pop'n = population, HH = households.

Note: Value in () is the computed household size.

"–" means data not available

* Indicates areas where survey responses were facilitated by CITYNET

2.2. City Area

S.No.	City	City Area	Urban Core	Secondary Urban Core	Urban Fringe	Peri-Urban	Slum Area
		(ha) ('000)	%	%	%	%	%
1.	Banda Aceh*	6.1	0.03	0.3	47.7	48.5	–
2.	Bharatpur	7.7	11.0	22.0	3.2	58.2	5.56
3.	Bhopal	28.5	9.8	11.9	20.0	50.2	8.07
4.	Calbayog*	90.3	51.4	46.6	0.0	2.0	0.01
5.	Cam Ranh	31.6	30.0	–	–	70.0	–
6.	Colombo*	3.7	–	–	–	–	–
7.	Dewas	10.0	10.0	20.0	–	49.0	11.0
8.	Dhaka*	36.0	40.3	59.7	0.0	0.0	–
9.	Gwalior	17.7	10.3	11.3	19.7	50.8	7.91
10.	Hetauda	4.6	9.0	11.0	57.0	21.0	2.00
11.	Ho Chi Minh*	209.5	23.4	0.0	0.0	76.4	0.16
12.	Hue*	7.1	69.7	14.1	9.1	6.4	0.70
13.	Indore	13.4	10.4	11.9	20.1	49.3	8.21
14.	Jabalpur	12.9	10.1	11.8	20.1	50.3	7.74
15.	Jinghong	700.3	0.3	0.0	99.7	0.0	–
16.	Kathmandu	5.07	5.4	14.2	43.7	36.7	–
17.	Kunming	2,101.2	0.5	1.0	0.0	98.5	–
18.	Lekhath	7.9	40.6	24.7	0.0	0.0	35.96
19.	Makati*	2.7	21.8	16.6	61.3	0.0	0.16
20.	Mangalore	13.2	3.0	23.3	72.7	–	0.13
21.	Nasrullahganj	0.8	60.0	10.0	–	–	30.0
22.	Negombo*	3.1	–	–	–	–	–
23.	Phine	26.9	20.0	36.0	10.0	39.0	–
24.	Pokhara	5.6	20.0	35.0	20.0	15.0	9.9
25.	Puer	22.7	16.7	17.7	44.4	21.1	–
26.	San Fernando*	10.5	21.5	0.0	0.0	78.5	–
27.	Sayabouly	3.91	10.0	0.8	15.0	74.2	–
28.	Song Cau	46.2	40.3	–	–	59.7	–
29.	Thap Cham	7.9	94.5	–	–	5.7	–
30.	Xieng Ngeun	1.21	6.6	4.1	2.5	86.8	–
	Top Value	2,101.2	94.5	59.7	99.7	98.5	35.96
	Range	2.7–2,101.2	0.3–94.5	0–59.7	0–99.7	0–98.5	0–35.96
	Average	114.6	21.6	13.5	18.9	34.9	4.3

Note: "–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET

2.3. Population Density

S.No.	City (year)	Ave.City	Urban	Secondary	Urban	Peri-	Slum Area
		Density	Core	Urban Area	Fringe	Urban	
		#/ha	#/ha	#/ha	#/ha	#/ha	#/ha
1.	Banda Aceh*	38.8	–	–	–	–	–
2.	Bharatpur	18.6	35.0	20.0	5.0	10.0	20.0
3.	Bhopal	66.0	153.0	75.0	55.0	20.0	62.0
4.	Calbayog*	1.7	11.2	6.0	–	1.2	627.0
5.	Cam Ranh	6.8	13.2	–	–	4.0	–
6.	Colombo*	174.7	–	–	–	–	–
7.	Dewas	28.0	65.7	38.8	–	4.3	122.7
8.	Dhaka*	305.6	–	–	–	–	–
9.	Gwalior	47.6	138.0	75.0	52.0	18.0	59.0
10.	Hetauda	19.0	74.5	39.0	4.7	8.0	110.0
11.	Ho Chi Minh*	31.7	108.0	–	–	7.0	732.0
12.	Hue*	46.1	60.0	50.0	20.0	30.0	40.0
13.	Indore	122.3	350.0	184.0	133.0	50.0	149.0
14.	Jabalpur	72.1	215.0	111.0	79.0	29.0	93.0
15.	Jinghong	0.5	76.7	–	–	0.3	–
16.	Kathmandu	198.0	(426.0)	(138.0)	(113.0)	(110.0)	–
17.	Kunming	2.9	163.0	24.0	–	1.9	–
18.	Lekhath	7.4	11.0	5.1	–	–	–
19.	Makati*	196.4	–	–	–	–	1,519.4
20.	Mangalore	39.5	134.3	73.6	25.9	–	47.7
21.	Nasrullahganj	26.9	–	–	–	–	–
22.	Negombo*	48.8	–	–	–	–	–
23.	Phine	2.0	6.0	4.0	3.0	2.0	–
24.	Pokhara	45.9	67.0	33.0	29.0	26.0	39.0
25.	Puer	11.3	39.0	–	–	–	–
26.	San Fernando*	10.9	37.0	–	–	4.0	–
27.	Sayabouly	19.2	–	–	–	–	–
28.	Song Cau	2.7	–	–	–	–	–
29.	Thap Cham	20.5	20.5	–	–	20.5	–
30.	Xieng Ngeun	29.6	–	–	–	–	–
	Top Value	305.6	426.0	184.0	133.0	110.0	1,519.4
	Range	0.5–305.6	6–426	4.0–184.0	3.0–133.0	0.3–110.0	20.0–1,519.4
	Average	54.7	73.5	29.2	17.3	11.5	120.7

Ave. = average, ha = hectare, # = number.

Note:

"–" means data not available.

"(xxxx)" means data from 2007 year.

* Indicates areas where survey responses were facilitated by CITYNET.

2.4. Environmental Statistics

S.No.	City	Surface Water				
		Total Coli form	BOD	COD	Total Suspended Solids	Heavy Metal
			mg/l	mg/l	mg/l	mg/l
1.	Banda Aceh*	1575#/100ml	9.9	24.3	68.8	–
2.	Bharatpur	–	–	–	–	–
3.	Bhopal	30 #/ml	6.0	50.0	200.0	0.25
4.	Calbayog*	–	168.0	973.0	75.0	–
5.	Cam Ranh	14/100ml	1.28	–	–	–
6.	Colombo*	(5000 / 100ml)	48.0	75.0	80.0	16.70
7.	Dewas	–	–	–	–	–
8.	Dhaka*	11450 MPN/100ml	30.0	80.0	30.0	–
9.	Gwalior	<1 #/ml	6.0	50.0	200.0	0.25
10.	Hetauda	–	–	–	–	–
11.	Ho Chi Minh*	22000 MPN/100ml	4.5	10.8	261.0	–
12.	Hue*	5000 MPN/100ml	15.0	7.1	60.0	0.03
13.	Indore	30 #/ml	6.0	50.0	200.0	0.25
14.	Jabalpur	<200 #/ml	4.5	50.0	1.0	0.25
15.	Jinghong	40 #/l	180.0	360.0	250.0	–
16.	Kathmandu	(2,400,000/ ml)	(36.0)	(207.0)	–	(0.05)
17.	Kunming	–	10.7	67.4	–	–
18.	Lekhath	–	–	–	–	–
19.	Makati*	–	–	–	–	–
20.	Mangalore	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–
22.	Negombo*	10200 MPN/100ml	6.0	22.0	–	–
23.	Phine	<1 #/ml	<3.0	<50.0	–	–
24.	Pokhara	(291CFU/ 100ml)	(22.5)	(95.0)	(61.0)	–
25.	Puer	–	–	–	–	–
26.	San Fernando*	–	–	–	–	–
27.	Sayabouly	5– 10 #/ml	<5.0	<50.0	1.8	–
28.	Song Cau	–	1.28	–	–	–
29.	Thap Cham	–	–	–	–	–
30.	Xieng Ngeun	<1 #/ml	5.0	50.0	–	–
	Top Value	22000#/100ml	180.0	973.00	261.0	16.7
	Range	<1– 22000	1.28–180.0	7.1–973.0	1.0–261.0	0.25–16.7
	Average	–	18.7	72.4	49.6	0.6

BOD = biochemical oxygen demand, CFU = colony forming unit, COD = chemical oxygen demand, mg/l = milligram per liter, ml = milliliter, MPN = most probable number.

Note:

“–” means data not available.

“(xxxx)” means data from 2007 year.

* Indicates areas where survey responses were facilitated by CITYNET.

2.5a. Health Statistics – I

S.No.	City	Reported Cases (number per 10,000 population)					
		Diarrhea	Hepatitis A & B	Trachoma	Acute Lower Respiratory Infection	Measles	Malaria
		#	#	#	#	#	#
1.	Banda Aceh*	278.9	–	–	(1,559.01)	–	–
2.	Bharatpur	594.14	–	294.55	(1,084.04)	–	–
3.	Bhopal	–	–	–	–	–	–
4.	Calbayog*	27.67	0	0	46.13	0	0
5.	Cam Ranh	–	–	–	–	–	–
6.	Colombo*	0.75	0.60	–	(0.36)	–	–
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	–	–	–	–	–	–
9.	Gwalior	–	–	–	–	–	–
10.	Hetauda	–	–	–	–	–	–
11.	Ho Chi Minh*	10.10	0.22	0.30	507.79	0	0.09
12.	Hue*	7.23	6.86	3.51	3.23	4.45	3.54
13.	Indore	–	–	–	–	–	–
14.	Jabalpur	–	–	–	–	–	–
15.	Jinghong	–	–	–	–	–	–
16.	Kathmandu	(142.23)	(23.79)	(0.01)	(180.66)	(0.60)	(7.56)
17.	Kunming	–	–	–	–	–	–
18.	Lekhnath	(194.11)	0	0	(496.51)	(0.48)	0
19.	Makati*	4.71	0.13	–	78.78	–	(9.07)
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	3.30	0.66	–	–	–	(0.13)
23.	Phine	–	–	–	–	–	–
24.	Pokhara	(179.49)	(53.88)	(305.47)	(409.58)	(1.36)	(0.23)
25.	Puer	–	–	–	–	–	–
26.	San Fernando*	58.88	2.35	0	250.84	0.61	0
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	–	–	–	–	–	–
29.	Thap Cham	–	0.25	–	–	–	0.12
30.	Xieng Ngeun	–	–	–	–	–	–
	Top Value	594.14	6.86	294.55	507.79	4.45	3.54
	Range	0.75–594.14	0.13– 6.86	0–294.55	0.32–507.79	0–4.45	0–3.54
	Average	50.1	3.0	20.1	153.9	0.3	0.7

= number.

Note:

“–” means data not available.

“(xxxx)” means data from 2007 year.

* Indicates areas where survey responses were facilitated by CITYNET.

2.5b. Health Statistics – II

S.No.	City	Death (Children under five years of age) (number per 10,000 population)					
		Diarrhea	Hepatitis A & B	Trachoma	Acute Lower Respiratory Infection	Measles	Malaria
		#	#	#	#	#	#
1.	Banda Aceh*	–	–	–	6.3	–	1.0
2.	Bharatpur	–	–	–	–	–	–
3.	Bhopal	–	–	–	–	–	–
4.	Calbayog*	0.47	0	0	0.27	0	0
5.	Cam Ranh	–	–	–	–	–	14.2
6.	Colombo*	–	–	–	–	–	–
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	–	–	–	–	–	–
9.	Gwalior	–	–	–	–	–	–
10.	Hetauda	–	–	–	–	–	–
11.	Ho Chi Minh*	0	0	0	0.01	0	0
12.	Hue*	0.03	0	0	0	0.03	0
13.	Indore	–	–	–	–	–	–
14.	Jabalpur	–	–	–	–	–	–
15.	Jinghong	–	–	–	–	–	–
16.	Kathmandu	(0.03)	(1.18)	(0)	(0)	(0.01)	(0.07)
17.	Kunming	–	–	–	–	–	–
18.	Lekhath	0	0	0	0	0	0
19.	Makati*	0.11	0	0	0.35	–	(0.04)
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	–	–	–	–	1.3	–
23.	Phine	–	–	–	–	–	–
24.	Pokhara	–	–	–	–	–	–
25.	Puer	–	–	–	–	–	–
26.	San Fernando*	–	–	–	–	–	–
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	–	–	–	–	–	1.84
29.	Thap Cham	–	0.25	–	–	–	0.12
30.	Xieng Ngeun	–	–	–	–	–	–
	Top Value	0.47	0.25	0	6.3	1.3	14.2
	Range	0–0.47	0–0.25	0	0–6.3	0–1.3	0–14.2
	Average	0.0	0.0	0.0	0.2	0.0	0.6

= number.

Note:

"–" means data not available.

"(xxxx)" means data from 2007 year.

* Indicates areas where survey responses were facilitated by CITYNET.

2.6. Sanitation Coverage and Water Coverage

S.No.	City	City Land Area	Central Sewerage System Area Coverage	Central Water Supply System Area Coverage	City Population (as reported)	Central Sewerage System Service Coverage	Central Water Supply System Service Coverage
		('000) ha	%	%	('000)	%	%
1.	Banda Aceh*	6.14	0	100.0	238.00	0	69.0
2.	Bharatpur	7.73	7.8	58.2	143.83	4.5	61.2
3.	Bhopal	28.50	50.0	70.0	1883.30	42.0	45.3
4.	Calbayog*	90.30	–	0.5	150.00	0	72.6
5.	Cam Ranh	31.6	–	50.0	215.82	0	41.0
6.	Colombo*	3.72	80.0	95.0	665.00	29.7	99.4
7.	Dewas	10.0	10.0	50.0	281.0	20.0	50.0
8.	Dhaka*	36.00	30.6	97.2	11,000.00	20.0	80.0
9.	Gwalior	17.70	79.1	85.9	1,053.00	85.7	79.0
10.	Hetauda	4.55	11.2	11.0	84.67	5.3	61.9
11.	Ho Chi Minh*	209.50	31.0	45.6	6,651.00	–	37.5
12.	Hue*	7.11	100.0	84.3	327.80	49.8	98.0
13.	Indore	13.40	44.8	48.5	2171.40	55.0	98.5
14.	Jabalpur	12.92	–	92.9	1267.00	0	84.8
15.	Jinghong	700.31	0.3	0.3	376.00	3.6	3.6
16.	Kathmandu	5.07	92.0	100.0	1,003.28	69.9	100.0
17.	Kunming	2,101.20	0.4	0.9	6,080.00	100.0	90.8
18.	Lekhnath	7.89	–	65.1	58.81	0	99.6
19.	Makati*	2.74	21.7	99.9	537.50	22.5	99.7
20.	Mangalore	13.2	–	–	–	–	–
21.	Nasrullahganj	0.8	–	100.0	21.7	–	90.0
22.	Negombo*	3.09	–	89.9	150.84	88.9	88.8
23.	Phine	26.9	20.0	50.1	54.96	59.9	80.0
24.	Pokhara	5.56	–	89.9	255.46	0	95.5
25.	Puer	22.70	18.5	9.6	256.23	57.2	57.2
26.	San Fernando*	10.53	–	25.7	114.81	0	47.9
27.	Sayabouly	3.91	50.0	84.2	75.20	59.9	79.9
28.	Song Cau	46.25	61.9	50.0	125.31	70.0	65.8
29.	Thap Cham	7.89	(98.0)	(90.0)	161.78	(100.0)	69.9
30.	Xieng Ngeun	1.21	–	80.0	35.83	–	80.1
	Top Value	2,101.20	100.0	100.0	11,000.00	100.0	99.7
	Range	0.8–2,101.20	0–100.0	0.5–100.0	21.7–11,000.00	0–100.0	3.6–99.7
	Average	114.6	26.9	60.8	1,181.3	31.5	70.9

ha = hectare, # = number.

Note:

“–” means data not available.

“(xxxx)” means data from 2007 year.

* Indicates areas where survey responses were facilitated by CITYNET.

2.7. Coverage by Sanitation System

S.No.	City	Central Sewerage System	Individual Toilet with Septic Tank	Communal Toilet with Septic Tank	Pit Latrine	EcoSan	Open Defecation
		%	%	%	%	%	%
1.	Banda Aceh*	0	97.0	0	2.0	0	1.0
2.	Bharatpur	4.5	40.6	–	52.4	0	2.5
3.	Bhopal	42.0	31.3	2.1	2.1	0	22.5
4.	Calbayog*	0	38.9	0	0.1	0	61.0
5.	Cam Ranh	0	62.0	0	25.0	0	13.0
6.	Colombo*	29.7	–	–	–	–	–
7.	Dewas	7.0	76.0	2.0	6.0	–	9.0
8.	Dhaka*	20	45.0	0	20.0	0	1.0
9.	Gwalior	56.4	5.5	2.0	29.1	0	7.0
10.	Hetauda	5.3	75.5	2.5	16.5	0	–
11.	Ho Chi Minh*	0	0	0	0	0	0
12.	Hue*	50	37.6	0.1	0	0	12.0
13.	Indore	55	20.7	3.5	12.2	0	8.6
14.	Jabalpur	0	49.2	0.8	17.0	0	33.0
15.	Jinghong	4	0	0	0	0	0
16.	Kathmandu	69.9	28.1	0	0	0	1.8
17.	Kunming	100	0	0	0	0	0
18.	Lekhath	0	67.9	0.1	31.9	0	0
19.	Makati*	8.92	90.7	0.3	0	0	0
20.	Mangalore	31.1	67.79	0.33	0.69	–	0.05
21.	Nasrullahganj	–	68.9	2.0	26.5	–	2.5
22.	Negombo*	88.9	–	–	–	–	–
23.	Phine	59.9	32.5	–	–	–	7.6
24.	Pokhara	0	100.0	0	0	0	0
25.	Puer	57	42.8	0.1	0	0	0
26.	San Fernando*	0	47.1	10.5	41.2	0.9	0
27.	Sayabouly	59.9	59.9	–	–	–	7.8
28.	Song Cau	70.0	70.0	0	25.0	0	5.0
29.	Thap Cham	–	29.9	–	50.0	–	20.0
30.	Xieng Ngeun	–	36.0	–	59.9	–	2.6
	Top Value	100	100.0	10.5	59.9	0.9	61.0
	Range	0–100	0–100.0	0–10.5	0–59.9	0–0.9	0–61
	Average	27.3	44.0	0.9	13.9	0.0	7.3

EcoSan = ecological sanitation.

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.8a. Coverage by Toilet System – I

S.No.	City	Toilet System Type ^a					
		Individual Toilet with Sewered Line		Individual Toilet with Septic Tank		Communal Toilet with Septic Tank	
		Type I	Type Ia	Type II	Type IIa	Type III	Type IIIa
		%	%	%	%	%	%
1.	Banda Aceh*	–	–	93.1	3.9	–	0
2.	Bharatpur	–	4.5	0	40.6	0	–
3.	Bhopal	42	0	–	31.3	–	2.1
4.	Calbayog*	–	–	0	38.9	0	61
5.	Cam Ranh	–	–	0	62.0	–	–
6.	Colombo*	0	29.7	–	–	–	–
7.	Dewas	–	7.0	–	76.0	–	2.0
8.	Dhaka*	20	0	0	45	–	–
9.	Gwalior	33	27	–	6.0	2.0	–
10.	Hetauda	–	5.3	0	75.5	0	2.5
11.	Ho Chi Minh*	–	–	–	–	–	–
12.	Hue*	24	26	15.0	22.6	0.1	0
13.	Indore	55	0	–	20.7	–	3.5
14.	Jabalpur	–	–	0	49.2	0	0.8
15.	Jinghong	0	4	47	–	–	–
16.	Kathmandu	0	69.9	–	28.1	–	–
17.	Kunming	100	0	–	–	–	–
18.	Lekhnath	–	–	0	67.9	0	0.1
19.	Makati*	8.7	0.2	11.5	79.2	0.3	–
20.	Mangalore	31.1	–	67.7	–	0.33	–
21.	Nasrullahganj	–	–	–	68.9	–	2.0
22.	Negombo*	–	88.9	–	–	–	–
23.	Phine	41.5	17.7	–	32.5	–	–
24.	Pokhara	–	–	0	100	–	–
25.	Puer	57	0	42.8	0	0.1	0
26.	San Fernando*	–	–	0	47.1	0	10.5
27.	Sayabouly	–	–	–	35.9	–	–
28.	Song Cau	–	–	70.0	–	–	–
29.	Thap Cham	–	–	29.9	–	–	–
30.	Xieng Ngeun	–	–	–	36.0	–	–
	Top Value	100	88.9	93.1	100	2	61
	Range	0–100	0–88.9	0–93.1	0–100	0–2	0–61
	Average	13.7	9.3	12.6	32.2	0.1	2.8

Note: a See Appendix, Note 1: Range of Sanitation Type.

"–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.8b. Coverage by Toilet System – II

S.No.	City	Toilet System Type ^a					
		Pit Latrine		EcoSan		Open Defecation	
		Type IV	Type IVa	Type V	Type Va	Type VI & VIa	Type VIb
		%	%	%	%	%	%
1.	Banda Aceh*	2.0	0	–	–	1.0	0
2.	Bharatpur	52.4	0	–	40.6	2.5	0
3.	Bhopal	2.1	–	–	–	22.5	0
4.	Calbayog*	38.9	–	–	–	61	0
5.	Cam Ranh	–	25.0	–	–	12.0	0
6.	Colombo*	–	–	–	–	–	–
7.	Dewas	2.0	4.0	–	–	9.0	–
8.	Dhaka*	20	0	–	–	15	0
9.	Gwalior	–	29.1	–	–	7.0	0
10.	Hetauda	0	16.5	–	–	0	0
11.	Ho Chi Minh*	–	–	–	–	–	–
12.	Hue*	–	–	–	–	0	12
13.	Indore	12.2	–	–	–	8.6	–
14.	Jabalpur	17.0	–	–	–	33	–
15.	Jinghong	25	21	–	–	5	–
16.	Kathmandu	–	–	–	–	1.8	–
17.	Kunming	–	–	–	–	–	–
18.	Lekhath	0	31.9	–	–	0	0
19.	Makati*	–	–	–	–	–	–
20.	Mangalore	–	0.69	–	–	0.05	–
21.	Nasrullahganj	–	26.5	–	–	2.5	–
22.	Negombo*	6.0	5.1	–	–	–	–
23.	Phine	–	–	–	–	8.3	–
24.	Pokhara	–	–	–	–	–	–
25.	Puer	–	–	–	–	–	–
26.	San Fernando*	33.7	7.74	–	0	0	0
27.	Sayabouly	59.9	–	–	–	7.8	–
28.	Song Cau	25.0	0	–	–	5.0	0
29.	Thap Cham	59.9	–	–	–	20.0	–
30.	Xieng Ngeun	59.9	–	–	–	2.6	–
	Top Value	59.9	31.9	–	40.6	22.5	12
	Range	0–59.9	0–31.9	–	0–40.6	0–22.5	0–12
	Average	13.9	5.6	0.0	1.4	7.5	0.4

EcoSan = ecological sanitation.

Note: a See Appendix, Note 1: Range of Sanitation Type.

“–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.9. Wastewater and Septage Treatment Facility

S.No.	City	Treatment Facilities			Treatment Facility Provider		
		Wastewater	Septage	Desludging Frequency	Local Gov't.	National Gov't.	Private
		m ³ /day/10,000	m ³ /day	Year	%	%	%
1.	Banda Aceh*	–	135	–	100	–	–
2.	Bharatpur	–	–	–	30	62	8
3.	Bhopal	534.1	–	–	100	–	–
4.	Calbayog*	–	–	–	100	–	–
5.	Cam Ranh	0.4	–	–	100	–	–
6.	Colombo*	–	–	–	–	–	–
7.	Dewas	–	–	–	100	–	–
8.	Dhaka*	109.1	–	–	–	100	–
9.	Gwalior	476.1	–	–	100	–	–
10.	Hetauda	–	–	–	–	–	–
11.	Ho Chi Minh*	212	–	–	100	–	–
12.	Hue*	–	–	–	–	–	–
13.	Indore	549.1	–	–	100	–	–
14.	Jabalpur	–	–	–	–	–	–
15.	Jinghong	664.9	–	–	100	–	–
16.	Kathmandu	199.4	50	–	–	100	–
17.	Kunming	962.2	–	–	100	–	–
18.	Lekhath	–	–	–	–	–	–
19.	Makati*	–	–	–	–	–	92.7
20.	Mangalore	1190.0	–	–	100	–	–
21.	Nasrullahganj	–	–	–	100	–	–
22.	Negombo*	–	–	–	–	–	–
23.	Phine	–	–	–	–	–	–
24.	Pokhara	–	–	–	100	–	–
25.	Puer	780.5	–	12	100	–	–
26.	San Fernando*	17.4	–	–	100	–	–
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	–	–	5	50	–	20
29.	Thap Cham	217.3	–	–	50	–	20
30.	Xieng Ngeun	126.3	–	–	100	–	–
	Top Value	1190	135	12	100	100	92.7
	Range	0.4–1190	50–135	0–12	0–100	0–100	0–92.7
	Average	201.3	6.2	0.6	57.7	8.7	4.7

Gov't. = government, m³ = cubic meter.

“–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.10a. Water Supply Facility – I

S.No.	City	Household Water Supply Source					
		Central Water Supply System		Borehole	Protected Spring/Well	Rainwater	Water Vendor
		In- house	Communal				
%	%	%	%	%	%		
1.	Banda Aceh*	69.0	0	31.0	0	0	–
2.	Bharatpur	59.5	1.6	0	37.9	0.1	0
3.	Bhopal	43.3	1.9	54.5	0.2	0	0
4.	Calbayog*	25.9	46.7	30.6	0	0	0
5.	Cam Ranh	40.0	8	40.0	–	–	12.0
6.	Colombo*	99.4	–	0.5	0.01	0	0
7.	Dewas	42.0	15.0	36.0	–	–	7.0
8.	Dhaka*	80.0	0	0	20	0	0
9.	Gwalior	57.1	11.4	28.6	2.9	0	0
10.	Hetauda	60.4	1.5	1.0	36.2	0	0
11.	Ho Chi Minh*	37.5	–	–	–	–	–
12.	Hue*	91.9	6.1	2	0	0	0
13.	Indore	59.0	29.5	5.0	1.5	0	5.0
14.	Jabalpur	65.0	17.9	11.9	3.3	0	2.0
15.	Jinghong	3.6	0	0	96.4	0	0
16.	Kathmandu	61.1	0.5	0.1	6.0	0	0
17.	Kunming	90.8	0	0	9.2	0	0
18.	Lekhath	44.3	8.3	4.5	41.1	0	0
19.	Makati*	97.7	2.1	0	0.3	8.4	100
20.	Mangalore	62.9	4.9	–	32.2	–	–
21.	Nasrullahganj	90.0	10.0	–	–	–	–
22.	Negombo*	80.7	0	1.9	6.4	0	0
23.	Phine	79.0	–	21.0	–	20	–
24.	Pokhara	95.0	0.5	2.6	0	0	1.9
25.	Puer	57.2	0	42.8	0	0	0
26.	San Fernando*	47.9	0	49.2	3	0	0
27.	Sayabouly	79.9	0	–	12.6	7.0	11.5
28.	Song Cau	65.8	0	34.2	–	–	–
29.	Thap Cham	69.9	0	25.0	–	–	5.0
30.	Xieng Ngeun	80.1	–	0	–	19.0	9.2
	Top Value	95.0	46.7	54.5	96.4	20.0	35
	Range	3.60–95.0	0–46.7	0–54.5	0–96.4	0–20.0	0–35.00
	Average	64.5	5.5	14.1	10.3	1.8	5.1

“–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.10b. Water Supply Facility – II

S.No.	City	Population Buying Bottled Water	Average Water Consumption	Water Treatment Facilities	Water Treatment Provider		
					Local Gov't.	National Gov't.	Private Concessionaire
		%	lpcd	Lpcd	%	%	%
1.	Banda Aceh*	50	90	27	100	0	0
2.	Bharatpur	–	50	1.8	30.0	62.0	8.0
3.	Bhopal	–	160	17.1	100	0	0
4.	Calbayog*	10	75	1.5	95	0	5
5.	Cam Ranh	–	100	139.0	0	100	0
6.	Colombo*	<1	160	300.0	100	–	0
7.	Dewas	–	135	135	100	–	–
8.	Dhaka*	5	140	16.4	0	100	0
9.	Gwalior	–	130	17.5	100	0	0
10.	Hetauda	–	40	11.0	0	100	0
11.	Ho Chi Minh*	–	150	18.6	–	–	–
12.	Hue*	15	–	45.8	–	–	–
13.	Indore	10	80	11.7	100	0	0
14.	Jabalpur	5	64	4.5	100	0	0
15.	Jinghong	–	–	13.3	100	0	0
16.	Kathmandu	30	90	181.4	0	–	100
17.	Kunming	–	–	19.7	100	0	0
18.	Lekhnath	–	70	12.1	0	50	50
19.	Makati*	–	–	–	–	–	–
20.	Mangalore	7	120	137.2	0	0	100
21.	Nasrullahganj	–	29	29	100	–	–
22.	Negombo*	25	–	–	0	84	16
23.	Phine	80	80	32.9	–	100	–
24.	Pokhara	–	40	–	–	–	–
25.	Puer	–	–	13.7	100	0	0
26.	San Fernando*	–	–	–	–	–	–
27.	Sayabouly	80	80	39.9	–	100	–
28.	Song Cau	–	80	23.9	100	–	0
29.	Thap Cham	–	120	321.5	100	0	0
30.	Xieng Ngeun	70	80	97.7	–	100	–
	Top Value	80	160	321.5	100	100	100
	Range	0–80	29–160	1.5–321.5	0–100	0–100	0–100
	Average	12.9	72.1	55.6	47.5	26.5	9.3

Gov't. = government, lpcd = liters per capita per day.

Note: "–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.11. Capital Investment

S.No.	City	Annual Amount	Source of Funds				
			National Government	Local Government	Loans	Tariff Revenues	Others
			\$/capita	%	%	%	%
1.	Banda Aceh*	–	90	10	0	0	–
2.	Bharatpur	–	8	62	30	0	0
3.	Bhopal	12.5	70	12	18	0	0
4.	Calbayog*	–	–	–	–	–	–
5.	Cam Ranh	–	60	40	–	–	–
6.	Colombo*	168	0	0.06	99	0	0
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	–	20	0	80	0	0
9.	Gwalior	18.9	50	20	30	–	–
10.	Hetauda	–	8	62	30	0	0
11.	Ho Chi Minh*	–	0	0	0	0	100
12.	Hue*	3.7	0	0	0	0	100
13.	Indore	43.0	50	10	40	0	0
14.	Jabalpur	32.1	50	20	30	0	0
15.	Jinghong	–	–	–	60	–	–
16.	Kathmandu	–	–	–	–	–	–
17.	Kunming	–	0	30	0	0	70
18.	Lekhath	1.0	80	20	0	0	0
19.	Makati*	–	–	–	–	–	–
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	–	–	–	–	–	–
23.	Phine	–	–	–	–	–	–
24.	Pokhara	0.5	0	100	0	0	0
25.	Puer	27.9	47	0	53	0	0
26.	San Fernando*	1.2	0	100	0	0	0
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	–	–	–	–	–	–
29.	Thap Cham	–	60	40	–	–	–
30.	Xieng Ngeun	–	70	30	0	0	0
	Top Value	168	90	100	99	0	100
	Range	0.5–168	0–90	0–100	0–99	0	0–100
	Average	10.3	22.1	18.5	15.7	0.0	9.0

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.12. Operations and Maintenance Expenditures

S.No.	City	Annual Amount	Source of Funds				
			National Government	Local Government	Loans	Tariff Revenues	Others
			\$/capita	%	%	%	%
1.	Banda Aceh*	0.07	0	32	–	68	0
2.	Bharatpur	0.7	0	50	0	50	0
3.	Bhopal	–	0	100	0	0	0
4.	Calbayog*	–	–	–	–	–	–
5.	Cam Ranh	–	30	70	–	–	–
6.	Colombo*	8.3	0	100	0	0	0
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	–	0	0	0	100	0
9.	Gwalior	0.6	0	100	0	0	0
10.	Hetauda	0.9	0	50	0	50	0
11.	Ho Chi Minh*	0.9	0	100	0	0	0
12.	Hue*	3.7	10	10	50	30	0
13.	Indore	–	0	100	0	0	0
14.	Jabalpur	5.4	0	100	0	0	0
15.	Jinghong	–	–	–	–	–	–
16.	Kathmandu	<0.01	–	–	–	–	–
17.	Kunming	–	0	10	0	90	0
18.	Lekhnath	0.2	0	60	0	40	0
19.	Makati*	–	–	–	–	–	–
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	–	–	–	–	–	–
23.	Phine	–	–	–	–	–	–
24.	Pokhara	0.1	0	100	0	0	0
25.	Puer	–	47	0	53	0	0
26.	San Fernando*	0.1	0	100	0	0	0
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	–	30	70	–	–	–
29.	Thap Cham	–	30	70	–	–	–
30.	Xieng Ngeun	–	–	–	–	–	–
	Top Value	8.3	47	100	53	100	0
	Range	0.01–8.3	0–47	0–100	0–53	0–100	0
	Average	0.7	4.9	40.7	3.4	14.3	0.0

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.13. Revenues and Fees for Services

S.No.	City	Total Revenue	Sewered Area		Desludging Fee Septic Tanks			
			Connection Charges	Tariff Rate	Private		Government	
					\$/capita	\$/Connection	\$/m ³	\$
1.	Banda Aceh*	0.03	–	–	7.5	45	7.5	55
2.	Bharatpur	–	80.0	0.8	–	–	–	–
3.	Bhopal	–	50.0	30–90	–	–	–	–
4.	Calbayog*	–	–	–	–	–	–	–
5.	Cam Ranh	–	100	0.015	25	100	0	0
6.	Colombo*	–	–	–	–	–	–	–
7.	Dewas	–	–	–	–	–	–	–
8.	Dhaka*	–	18.3	6	–	–	–	–
9.	Gwalior	–	–	–	–	–	–	–
10.	Hetauda	–	80.0	0.8	–	–	–	–
11.	Ho Chi Minh*	–	–	–	–	–	–	–
12.	Hue*	9.2	–	–	4.0	1	3.5	99
13.	Indore	–	50.0	30–90***	–	–	–	–
14.	Jabalpur	15.0	–	–	0	0	30	100
15.	Jinghong	–	–	–	0	–	–	100
16.	Kathmandu	–	–	–	30.0	70	20	30
17.	Kunming	–	–	–	–	0	–	100
18.	Lekhnath	–	–	–	–	–	–	–
19.	Makati*	–	–	–	–	100	–	0
20.	Mangalore	–	–	–	–	–	–	–
21.	Nasrullahganj	0.03	0.6	–	–	–	20	100
22.	Negombo*	–	–	–	0.0	0	10	100
23.	Phine	–	–	–	–	–	–	–
24.	Pokhara	–	–	–	–	–	–	–
25.	Puer	3.2	–	–	0.0	0	–	0
26.	San Fernando*	–	–	–	133.0	100	0	–
27.	Sayabouly	–	–	–	18.0	–	–	–
28.	Song Cau	–	110	0.015	25.0	100	–	–
29.	Thap Cham	–	110	0.015	25.0	100	–	0
30.	Xieng Ngeun	–	–	–	30.0	100	18	30
	Top Value	15.0	110	90	133	100	30	100
	Range	0.03–15.0	0.6–110	0.015–90	4–133	0–100	0–30	0–100
	Average	0.9	20.0	0.3	9.9	23.9	3.6	23.8

Note: "–" means data not available, m³ = cubic meter.

* Indicates areas where survey responses were facilitated by CITYNET.

** Environmental charge added to water tariff.

*** Proposed tariff.

2.14a. Environmental Situation – I

S.No.	City	Monitoring Water Quality	Source of Water Pollution				
			Household Solid Waste	Household Liquid Waste	Industrial Waste	Commercial Waste	Hospital Waste
			Y/N	%	%	%	%
1.	Banda Aceh*	Y	5	50	10	35	0
2.	Bharatpur	N	50	50	0	0	0
3.	Bhopal	Y	10	60	10	15	5
4.	Calbayog*	N	45	35	2	15	3
5.	Cam Ranh	Y	10	32	12	20	10
6.	Colombo*	Y	10	20	38	15	17
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	Y	15	40	30	10	5
9.	Gwalior	Y	10	60	10	15	5
10.	Hetauda	Y	30	60	10	0	0
11.	Ho Chi Minh*	Y	5	60	25	5	5
12.	Hue*	Y	50	36	5	5	4
13.	Indore	Y	10	60	10	15	5
14.	Jabalpur	Y	10	70	0	18	2
15.	Jinghong	Y	12	38	34	11	5
16.	Kathmandu	N	20	80	0	0	0
17.	Kunming	Y	0	50	10	0	0
18.	Lekhath	Y	50	50	0	0	0
19.	Makati*	Y	5	71	<1	20	<1
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	N	67	15	3	15	0
23.	Phine	Y	50	50	–	–	–
24.	Pokhara	N	50	40	10	–	–
25.	Puer	Y	–	–	–	–	–
26.	San Fernando*	Y	–	–	–	–	–
27.	Sayabouly	Y	50	50	–	–	–
28.	Song Cau	Y	10	32	20	10	10
29.	Thap Cham	Y	26	30	13	31	0
30.	Xieng Ngeun	–	50	50	0	0	–
	Top Value	–	67	80	38	35	17
	Range	–	0–67	15–80	0–38	0–35	0–17
	Average	–	21.7	39.6	8.4	8.5	2.5

Y = yes, N = no.

Note: "–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.14b. Environmental Situation – II

S.No.	City	Required to Treat Own Wastewater	Wastewater Treatment				Description
			Own Treatment Plant	Central Sewer System	No Treatment	Others	
		Y/N	%	%	%	%	
1.	Banda Aceh*	Y	–	–	–	–	through septic tank
2.	Bharatpur	Y	0	0	100	0	through septic tank
3.	Bhopal	Y	0	30	30	40	through septic tank
4.	Calbayog*	–	0	0	99	1	anaerobic baffled reactor
5.	Cam Ranh	Y	–	35	22	43	through septic tank
6.	Colombo*	Y	–	–	–	–	through septic tank
7.	Dewas	Y	–	–	70	30	through septic tank
8.	Dhaka*	Y	–	–	–	–	–
9.	Gwalior	Y	0	0	50	50	through septic tank
10.	Hetauda	Y	0	0	95	5	through septic tank
11.	Ho Chi Minh*	Y	80	0	20	0	–
12.	Hue*	Y	7	23	60	10	–
13.	Indore	Y	0	30	30	40	through septic tank
14.	Jabalpur	Y	0	0	50	50	through septic tank
15.	Jinghong	Y	–	–	–	–	–
16.	Kathmandu	Y	0	0	100	0	through septic tank
17.	Kunming	Y	100	0	0	0	–
18.	Lekhath	Y	0	0	100	0	through septic tank
19.	Makati*	Y	87	12	<1	0	through septic tank & STP
20.	Mangalore	Y	–	–	–	–	through septic tank & STP
21.	Nasrullahganj		–	–	–	–	through septic tank
22.	Negombo*	Y	1	–	10	–	–
23.	Phine	N	–	–	–	–	–
24.	Pokhara	Y	0	0	100	0	–
25.	Puer	Y	0	29	71	0	–
26.	San Fernando*	Y	–	–	–	–	–
27.	Sayabouly	–	–	–	–	–	–
28.	Song Cau	Y	35	0	22	43	through septic tank
29.	Thap Cham	Y	0	35	65	0	through septic tank
30.	Xieng Ngeun	–	–	–	–	–	–
	Top Value	–	100	35	100	50	
	Range	–	0–100	0–35	0–100	0–50	
	Average	–	10.3	6.5	36.5	10.4	

Y = yes, N = no.

Note: "–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.14c. Environmental Situation – III

S.No.	City	Located in	River Basin		Adjoining Town		
		River Basin	River/Basin Name	Basin Area	City Location	Pollution Load	Sanitation Work/Plan
		Y/N	Name	Ha			
1.	Banda Aceh*	Y	Krueng Aceh	75.15	Downstream	Low	Individual
2.	Bharatpur	Y	Narayani	–	Midstream	–	–
3.	Bhopal	Y	Kolans	36,500	Downstream	–	–
4.	Calbayog*	N	–	–	–	Medium	–
5.	Cam Ranh	N	–	–	–	–	–
6.	Colombo*	Y	Kelani River	–	Downstream	Heavy	Cooperative
7.	Dewas	Y	Kshipra River	–	Mid stream	High	–
8.	Dhaka*	Y	Sitalakhay, Buriganga, Turag, Tha Balu	–	Midstream	Medium	Cooperative
9.	Gwalior	Y	Swama Rekha	2,000	Midstream	High	–
10.	Hetauda	Y	Rapti and Karra	–	Downstream	–	–
11.	Ho Chi Minh*	Y	Sai Gon– Dong Nai	4,826,800	Downstream	Heavy	Individual
12.	Hue*	Y	Perfume River	5,000	Midstream	–	–
13.	Indore	Y	Khan and Saraswati	–	Midstream	–	–
14.	Jabalpur	Y	Narmada	4,939,800	Midstream	–	–
15.	Jinghong	Y	Lancang River, Liusha River	709,300	Downstream	Medium	–
16.	Kathmandu	Y	Bagmati, Bishnumati, Dhobikhola	–	Midstream	Heavy	Individual
17.	Kunming	Y	Jinsha River	292,000	Upstream	Medium	–
18.	Lekhnath	Y	Seti Gandakii	–	Upstream	Heavy	Individual
19.	Makati*	Y	Pamarisan River	556	Midstream	Medium	Cooperative
20.	Mangalore	Y	Gurupur & Netravathi Rivers	–	Upstream	High	–
21.	Nasrullahganj	N	–	–	–	–	–
22.	Negombo*	Y	Maha Oya	–	Downstream	Medium	–
23.	Phine	Y	Sedon River	–	Upstream	Medium	–
24.	Pokhara	Y	Seti Gandakii	–	–	Low	–
25.	Puer	Y	Langcang River	5,000	Midstream	Medium	Individual
26.	San Fernando*	N	–	–	–	Medium	Individual
27.	Sayabouly	Y	Houng River	–	Upstream	–	–
28.	Song Cau	N	–	–	–	–	–
29.	Thap Cham	N	–	–	–	Low	Individual
30.	Xieng Ngeun	Y	Khan River	–	Upstream	Medium	Individual
	Top Value	–	–	4,939,800	–	–	–
	Range	–	–	75.15– 4,939,800	–	–	–
	Average	–	–	360,567.7	–	–	–

Y = yes, N = no.

Note: "–" means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.15a. Sanitation Planning – I

S.No.	City	Existing Sanitation Plan		Planned Sanitation Strategy			
		With Sanitation Plan	Year Made	Planned Year	Total Amount	Amount per Capita	Source of Fund
		Y/N	Year	Year	\$(M)	\$/capita	Name
1.	Banda Aceh*	N	–	–	–	–	–
2.	Bharatpur	N	–	–	–	–	–
3.	Bhopal	N	–	–	–	9.6	Other agency
4.	Calbayog*	N	–	–	–	0.7	General Fund, City Government
5.	Cam Ranh	N	–	2015	–	–	–
6.	Colombo*	Y	–	–	–	–	–
7.	Dewas	Y	2011	–	24.1	85.9	Grants & revenues
8.	Dhaka*	N	–	–	–	–	World Bank
9.	Gwalior	Y	2011	–	49.5	46.5	Other agency
10.	Hetauda	Y	–	–	–	–	–
11.	Ho Chi Minh*	Y	–	–	–	–	–
12.	Hue*	N	–	–	250.00	762.7	JBIC
13.	Indore	Y	2006	–	13.00	7.9	Other agency
14.	Jabalpur	N	–	–	37.00	39.7	Other agency
15.	Jinghong	Y	–	–	–	–	–
16.	Kathmandu	N	–	2015	–	–	–
17.	Kunming	Y	–	–	–	–	–
18.	Lekhath	N	–	–	–	–	–
19.	Makati*	Y	–	–	–	–	–
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	Y	2011	–	1.9	9.44	Government Grants
22.	Negombo*	N	–	–	–	–	–
23.	Phine	N	–	2020	–	–	–
24.	Pokhara	N	–	–	–	–	–
25.	Puer	Y	–	–	–	–	–
26.	San Fernando*	Y	–	–	–	–	–
27.	Sayabouly	N	–	2020	–	–	–
28.	Song Cau	N	–	–	–	–	–
29.	Thap Cham	N	–	–	–	–	–
30.	Xieng Ngeun	Y	2007	–	–	–	–
Top Value		–	2006	2020	250.0	762.7	–
Range			2006–2011	2015–2020	1.9–250.0	0.7–762.7	–
Average		–	2009	2018	12.5	32.1	–

JBIC = Japan Bank for International Cooperation, Y = yes, N = no.

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.15b. Sanitation Planning – II

S.No.	City	Major Sanitation Problem	Future Programs/ Projects List	Indicator	Funding Amount \$(M)	Source of Fund
1.	Banda Aceh*	Disposal of wastes without treatment	Sanitation Master Plan	–	–	–
2.	Bharatpur	Lack of sanitary urban facilities	Make the city open defecation free	open defecation	–	–
3.	Bhopal	There are still open defecation	Making the city “open defecation free.”	open defecation	–	–
4.	Calbayog*	Pollution of bodies of water (e.g., rivers, sea, swamps) of wastewater	–	–	–	–
5.	Cam Ranh	Pollution due to disposal of untreated wastes	–	Open disposal	–	–
6.	Colombo*	100– year– old sewer system needs rehabilitation	Rehabilitation of main sewer lines	–	–	ADB
7.	Dewas	Pollution due to disposal of untreated wastes	Construction of sanitation system	Open defecation	24.1	Various sources
8.	Dhaka*	Unprecedented increase in population, Upland urbanization	North Dhaka East Sewerage treatment plant and associated works	–	–	World Bank/ PR China
9.	Gwalior	Missing sewer links, insufficient community toilet	Make the city open defecation free	open defecation	–	–
10.	Hetauda	Poor cannot afford basic sanitation services	Make municipality open defecation free	open defecation	–	–
11.	Ho Chi Minh*	Wastewater discharged into canals and rivers	–	–	–	–
12.	Hue*	Rivers/lakes water pollution	–	–	–	–
13.	Indore	Missing sewer links, insufficient community toilet	Open defecation free and totally sewerred	open defecation	–	–
14.	Jabalpur	Absence of sewer system	Slum improvement and sewerage system	open defecation	–	GOI, ADB Municipal Corporation, Jabalpur
15.	Jinghong	Increase in pollution due to increased	–	–	–	–
16.	Kathmandu	Wastewater directly discharged into the river.	–	–	–	–
17.	Kunming	Rate of wastewater treatment cannot meet the requirements	Improvement of water supply, sanitation, and treatment	–	1.79	Kunming Government, UN– HABITAT
18.	Lekhnath	No sewer and waste water treatment facilities	Open defecation– free city	open defecation	–	–
19.	Makati*	Lack of understanding and appreciation of local pollution laws.	Capacity building of deputized barangay officials	–	–	–
20.	Mangalore	Inadequate treatment of waste	Implementation of sanitation Plan	Disposal of treated	1.9	grants

S.No.	City	Major Sanitation Problem	Future Programs/ Projects List	Indicator	Funding Amount \$(M)	Source of Fund
				wastes		
21.	Nasrullahganj	Pollution due to disposal of untreated wastes				
22.	Negombo*	No septage/sewage treatment facility	Construction of septage/ sewage treatment plants	–	–	–
23.	Phine	Uncontrolled disposal of waste	Improving access to sanitation facilities	–	–	–
24.	Pokhara	No waste water treatment facilities		–	–	–
25.	Puer	–	–	–	–	–
26.	San Fernando*	Contamination of ground, surface, and coastal water	Provision of sanitary toilets and sanitation promotion	Reduced water-borne diseases	0.96	City government and loan
27.	Sayabouly	No wastewater system in the town	–	–	–	–
28.	Song Cau	Uncontrolled disposal of waste	Improving access to sanitation facilities	–	–	–
29.	Thap Cham	Unhygienic sanitary facilities	–	–	–	–
30.	Xieng Ngeun	Uncontrolled disposal of waste	Improving access to sanitation facilities	–	–	–
	Top Value	–	–	–	24.1	–
	Range	–	–	–	0.96– 24.1	–
	Average	–	–	–	1.0	–

ADB = Asian Development Bank, GOI = Government of India.

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.16. Organizational Arrangement

S.No.	City	Number of Institutions Involved in Sanitation					NGO
		Government			Private		
		National	Local	Utility	Water Utility	Enterprise	
1.	Banda Aceh*	3	1	–	–	–	–
2.	Bharatpur	–	1	2	–	–	–
3.	Bhopal	–	2	–	–	–	–
4.	Calbayog*	–	3	–	–	–	–
5.	Cam Ranh	–	–	1	–	–	–
6.	Colombo*	–	1	–	–	–	–
7.	Dewas	–	–	–	–	–	–
8.	Dhaka*	–	1	1	–	–	–
9.	Gwalior	–	2	–	–	–	–
10.	Hetauda	–	–	1	–	–	1
11.	Ho Chi Minh*	6	1	–	–	–	–
12.	Hue*	–	1	1	–	–	–
13.	Indore	–	2	–	–	–	–
14.	Jabalpur	–	2	–	–	–	–
15.	Jinghong	–	1	2	–	–	–
16.	Kathmandu	1	2	–	1	1	2
17.	Kunming	–	3	1	–	–	–
18.	Lekhath	–	–	1	–	–	–
19.	Makati*	3	2	–	2	–	–
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	–	–	–	–	–	–
22.	Negombo*	1	1	–	–	–	–
23.	Phine	–	1	–	–	–	–
24.	Pokhara	–	1	–	–	–	–
25.	Puer	–	2	2	–	–	–
26.	San Fernando*	–	4	–	–	–	–
27.	Sayabouly	–	2	–	–	–	–
28.	Song Cau	–	–	1	–	–	–
29.	Thap Cham	–	–	1	–	1	–
30.	Xieng Ngeun	–	2	–	–	–	–
	Top Value	6	4	2	2	1	2
	Range	1–6	1–4	1–2	1–2	1–2	1–2
	Average	0.5	1.3	0.5	0.1	0.1	0.1

NGO = nongovernment organization.

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

2.17. Personnel Complement

S.No.	City	Government				Private	
		Total Personnel	Planning & Monitoring	Construction	Operations & Maintenance	Total Personnel	Operations & Maintenance
		#/10,000 pop'n	%	%	%	#/10,000 pop'n	%
1.	Banda Aceh*	2.14	100	100	100	–	–
2.	Bharatpur	5.15	–	–	–	–	–
3.	Bhopal	11.95	–	–	–	–	–
4.	Calbayog*	9.8	–	–	–	–	–
5.	Cam Ranh	–	–	–	–	–	–
6.	Colombo*	6.01	100	100	100	–	–
7.	Dewas	6.0	–	–	–	–	–
8.	Dhaka*	0.73	–	–	–	–	–
9.	Gwalior	20.56	–	–	–	–	–
10.	Hetauda	–	–	–	–	–	–
11.	Ho Chi Minh*	–	–	–	–	–	–
12.	Hue*	36.3	43.7	–	–	–	–
13.	Indore	14.03	–	–	–	–	–
14.	Jabalpur	21.67	–	–	–	–	–
15.	Jinghong	9.76	23.4	–	76.6	–	–
16.	Kathmandu	0.46	–	–	–	12.3	–
17.	Kunming	–	–	–	–	–	–
18.	Lekhath	3.14	–	–	–	–	–
19.	Makati*	–	–	–	–	30.96	–
20.	Mangalore	–	–	–	–	–	–
21.	Nasrullahganj	47	5	6	89	–	–
22.	Negombo*	13.3	50	–	50	–	–
23.	Phine	–	–	–	–	–	–
24.	Pokhara	6.26	–	–	–	–	–
25.	Puer	10.15	12.7	–	87.3	–	–
26.	San Fernando*	2.09	–	–	–	–	–
27.	Sayabouly	0.4	–	–	–	–	–
28.	Song Cau	16	10	30	60	–	–
29.	Thap Cham	10.5	10	30	60	–	–
30.	Xieng Ngeun	17.1	–	–	84.4	–	–
	Top Value	21.67	100	100	100.0	30.96	–
	Range	0.4–21.67	5– 100	6– 100	50–100.0	12.3–30.96	–
	Average	9.0	11.8	8.9	23.6	1.4	–

Pop'n = population.

Note: "–" means data not available.

* Indicates areas whose survey responses were facilitated by CITYNET.

2.18. Legal Framework

S.No.	City	Number of Laws on Sanitation		Year Enacted		Law on Collecting Fees for Sanitation Service	
		National	Local	Oldest	Latest	With Law?	Year Enacted
						Y/N	
1.	Banda Aceh*	1	–	1947	–	Y	1947
2.	Bharatpur	1	–	1996	1996	Y	1999
3.	Bhopal	–	1	1956	1956	Y	1956
4.	Calbayog*	2	–	2000	2002	N	–
5.	Cam Ranh	2	1	2003	2006	Y	2003 & 2004
6.	Colombo*	1	1	1947	1980	–	–
7.	Dewas	1	1	1956	2000	Y	2000
8.	Dhaka*	3	1	1983	1998	Y	1996
9.	Gwalior	–	2	1956	2000	Y	2000
10.	Hetauda	1	–	1993	2011	Y	1999
11.	Ho Chi Minh*	1	3	2006	2007	Y	2003
12.	Hue*	1	–	2005	2005	Y	2007
13.	Indore	–	1	1956	1956	Y	1956
14.	Jabalpur	–	1	1956	1956	Y	1956
15.	Jinghong	3	–	2001	2005	N	–
16.	Kathmandu	4	–	1996	2011	Y	1990
17.	Kunming	3	1	1984	2002	Y	2002
18.	Lekhnath	1	–	1993	1993	Y	1999
19.	Makati*	7	2	1974	2011	Y	1997
20.	Mangalore	2	1	–	2000	Y	2000
21.	Nasrullahganj	1	1	1956	2000	Y	2000
22.	Negombo*	–	–	–	–	N	–
23.	Phine	2	–	1991	1999	–	–
24.	Pokhara	–	–	–	–	–	–
25.	Puer	1	1	1994	2002	N	–
26.	San Fernando*	4	2	1972	2006	N	–
27.	Sayabouly	1	1	1999	2007	N	–
28.	Song Cau	2	1	2003	2007	Y	2003
29.	Thap Cham	2	1	2003	2007	Y	2003
30.	Xieng Ngeun	–	–	–	–	N	–
	Top Value	7	3	2007	2007	–	2007
	Range	1–4	1–3	1947–2007	1956–2011	–	1947–2007
	Average	1.6	0.8	1985	1995	–	1985

Y = yes, N = no.

Note: “–” means data not available.

* Indicates areas where survey responses were facilitated by CITYNET.

PART III: CITY SANITATION PROFILE

1. Dhaka, Bangladesh

Dhaka		For All Surveyed Cities and Municipalities
Coordinator	Md. Golam Mostofa, Secretary	
Office	Dhaka City Corporation	
Address	5, Hafezi Huzur Road, Fulbaria, Dhaka, Bangladesh	
Fax	88029565979	
Telephone	88029563507	
E-mail address	mayordhaka@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	11,000.00	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	5.00	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	2,301.26	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.78	7.6	3.2 – 7.6	4.9	
Floating Population	%	9.10	844.1	0 – 844.1	34.5	
Urban Poor	%	36.36	48.0	0 – 48.0	14.6	
City Area	ha (000)	36.00	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%		94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	59.72	59.7	0 – 59.7	13.5	
Urban Fringe	%	0	99.7	0 – 99.7	18.9	
Peri-Urban	%	0	98.5	0 – 98.5	34.9	
Slum Area	%	0	35.96	0 – 35.96	4.3	
Average City Density	#/ha	305.60	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	36.00	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	30.6	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	97.2	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	11,000.00	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	20.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	80.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	20	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	45	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	20.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	1.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	20	100.0	0–100.0	13.7
	Type Ia	%	0	88.9	0–88.9	9.3
	Type II	%	0	93.1	0–93.1	12.6
	Type IIa	%	45	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	20	59.9	0–59.9	13.9
	Type IVa	%	0	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	15	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	109.1	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	80.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	20.0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	5	80.0	0–80.0	12.9
Average Water Consumption	lpcd	140.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	16.4	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	0.73	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	3	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1983	2007	1947-2007	1985
Latest	year	1998	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1996	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund	list	World Bank			
Sanitation Problem	Major Sanitation Problem	Unprecedented increase in population, Upland urbanization			
	Future Programs/Projects	North Dhaka East Sewerage treatment plant and associated works			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	list	World Bank/ PR China		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	20	90.0	0.0-90.0	22.1
Local Government	%	0	100.0	0.0-100.0	18.5
Loans	%	80	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	0	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	100	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	18.3	110	0.6-110.0	20.0
Tariff Rate	\$/m ³	6	90	0.015-90	0.3

Septic Tank Desludging Fee					
Private	\$/ST	–	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	15	67	0–67	21.7
Household Liquid Waste	%	40	80	15–80	39.6
Industrial Waste	%	30	38	0–38	8.4
Commercial Waste	%	10	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	List	–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Sitalakhay, Buriganga, Turag, Tha Balu				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	Cooperative			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	11450 MPN/100ml	22000#/100ml	<1– 22000	
BOD	mg/l	30.0	180	1.28–180.0	18.7
COD	mg/l	80.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	30.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

2. Bhopal, India

Bhopal		For All Surveyed Cities and Municipalities
Coordinator	Mr. Rajesh Bisaria, Project Manager	
Office	Project Implementation Unit UWSEIP, Municipal Corporation	
Address	Harshvardhan, Block-II, Matamandir, Bhopal, India	
Fax	917554252517	
Telephone	917552701411	
E-mail address	pmpiubbhopal@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	1,883.3	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	3.50	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	258.58	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.9	7.6	3.2 – 7.6	4.9	
Floating Population	%	3.5	844.1	0 – 844.1	34.5	
Urban Poor	%	22.68	48.0	0 – 48.0	14.6	
City Area	ha (000)	28.5	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	9.8	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	11.9	59.7	0 – 59.7	13.5	
Urban Fringe	%	20.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	50.2	98.5	0 – 98.5	34.9	
Slum Area	%	8.07	35.96	0 – 35.96	4.3	
Average City Density	#/ha	66.0	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	153.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	75.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	55.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	20.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	62.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	28.50	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	50.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	70.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	1,883.3	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	42.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	45.3	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	42.0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	31.3	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	2.1	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	2.1	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	22.5	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	42	100.0	0–100.0	13.7	
Type Ia	%	0	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	31.3	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	2.1	61.0	0–61.0	2.8	
Type IV	%	2.1	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	22.5	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	534.1	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100.0	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	43.3	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	1.9	46.7	0.0–46.7	5.5
Borehole	%	54.5	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0.2	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	160.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	17.1	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	11.95	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	1956	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1956	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	9.6	762.7	0.7-762.7	32.1
Source of Fund	list	Other Agency			
Sanitation Problem	Major Sanitation Problem	There are still open defecation			
	Future Programs/Projects	Making the city "open defecation free"			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	list	-		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	12.5	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	70	90.0	0.0-90.0	22.1
Local Government	%	12	100.0	0.0-100.0	18.5
Loans	%	18	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	50.0	110	0.6-110.0	20.0
Tariff Rate	\$/m3	30-90	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	60	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	30	35	0–35	6.5
No Treatment	%	30	100	0–100	36.5
Others	%	40	50	0–50	10.4
Description	through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Kolans				
Basin Area	ha	36,500	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	30 #/ ml	22000#/100ml	<1– 22000	
BOD	mg/l	6.0	180	1.28–180.0	18.7
COD	mg/l	50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	200.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.25	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

3. Dewas, India

Dewas		For All Surveyed Cities and Municipalities				
Coordinator						
Office						
Address						
Fax						
Telephone						
E-mail address						
Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	281.00	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	4.1	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	43.90	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.4	7.6	3.2 – 7.6	4.9	
Floating Population	%	7.1	844.1	0 – 844.1	34.5	
Urban Poor	%	39.6	48.0	0 – 48.0	14.6	
City Area	ha (000)	10.0	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	10.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	20.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	49.0	98.5	0 – 98.5	34.9	
Slum Area	%	11.0	35.96	0 – 35.96	4.3	
Average City Density	#/ha	28.0	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	65.7	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	38.8	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	4.3	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	122.7	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	10.0	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	10.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	50.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	281.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	20.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	50.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	7.0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	76.0	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	2.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	6.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	9.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	7.0	88.9	0–88.9	9.3
	Type II	%	–	93.1	0–93.1	12.6
	Type IIa	%	76.0	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	2.0	61.0	0–61.0	2.8
	Type IV	%	2.0	59.9	0–59.9	13.9
	Type IVa	%	4.0	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	9.0	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	42.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	15.0	46.7	0.0–46.7	5.5
Borehole	%	36.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	7.0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	135.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	135.0	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	6.0	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	2000	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	2000	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	2011	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	24.1	250	1.9-250.0	12.5
Amount per Capita	\$/capita	85.9	762.7	0.7-762.7	32.1
Source of Fund					
Sanitation Problem	Major Sanitation Problem				
	Future Programs/Projects				
	Funding Amount	24.1	24.1	0.96-24.1	1.0
	Funding Source	List			
		Various sources			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	–			
Sources of Water Pollution					
Household Solid Waste	%	–	67	0–67	21.7
Household Liquid Waste	%	–	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	70	100	0–100	36.5
Others	%	30	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Shipra river				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

4. Gwalior, India

Gwalior		For All Surveyed Cities and Municipalities
Coordinator	Mr. Balbir Singh Sikarwar, Assistant Project Manager	
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E-mail address	piugwalior@yahoo.com.in	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	1,053.00	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.70	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	175.97	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.9	7.6	3.2 – 7.6	4.9	
Floating Population	%	0.5	844.1	0 – 844.1	34.5	
Urban Poor	%	10.40	48.0	0 – 48.0	14.6	
City Area	ha (000)	17.7	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	10.3	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	11.3	59.7	0 – 59.7	13.5	
Urban Fringe	%	19.7	99.7	0 – 99.7	18.9	
Peri-Urban	%	50.8	98.5	0 – 98.5	34.9	
Slum Area	%	7.91	35.96	0 – 35.96	4.3	
Average City Density	#/ha	47.6	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	138.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	75.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	52.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	18.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	59.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	17.70	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	79.1	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	85.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	1,053.00	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	85.7	100.0	0 – 100.0	31.5	
Central Water Supply System	%	79.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	56.4	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	5.5	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	2.0	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	29.1	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	7.0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	33	100.0	0–100.0	13.7	
Type Ia	%	27	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	6	100.0	0–100.0	32.2	
Type III	%	2	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	29.1	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	7.0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	476.1	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	57.1	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	11.4	46.7	0.0–46.7	5.5
Borehole	%	28.6	54.5	0.0–54.5	14.1
Protected Spring/Well	%	2.9	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	130.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	17.5	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	20.56	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	2	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	2000	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	2000	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	2011	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	49.5	250	1.9-250.0	12.5
Amount per Capita	\$/capita	46.5	762.7	0.7-762.7	32.1
Source of Fund		Other agency			
Sanitation Problem	Major Sanitation Problem	Missing sewer links, insufficient community toilet			
	Future Programs/Projects	Make the city open defecation free			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	List	-		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	18.9	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	50	90.0	0.0-90.0	22.1
Local Government	%	20	100.0	0.0-100.0	18.5
Loans	%	30	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	0.6	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	60	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	50	100	0–100	36.5
Others	%	50	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Swama Rekha				
Basin Area	ha	2,000	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	<1 #/ ml	22000#/100ml	<1– 22000	
BOD	mg/l	6.0	180	1.28–180.0	18.7
COD	mg/l	50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	200.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.25	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

5. Indore, India

Indore		For All Surveyed Cities and Municipalities
Coordinator	Mr. Prabhas Sankhla, Project Manager	
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Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	2,171.40	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	4.80	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	330.0	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	6.1	844.1	0 – 844.1	34.5	
Urban Poor	%	15.86	48.0	0 – 48.0	14.6	
City Area	ha (000)	13.4	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	10.4	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	11.9	59.7	0 – 59.7	13.5	
Urban Fringe	%	20.1	99.7	0 – 99.7	18.9	
Peri-Urban	%	49.3	98.5	0 – 98.5	34.9	
Slum Area	%	8.21	35.96	0 – 35.96	4.3	
Average City Density	#/ha	122.3	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	350.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	184.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	133.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	50.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	149.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	13.40	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	44.8	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	48.5	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	2,171.40	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	55.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	98.5	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	55	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	20.7	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	3.5	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	12.2	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	8.6	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	55	100.0	0–100.0	13.7
	Type Ia	%	0	88.9	0–88.9	9.3
	Type II	%	–	93.1	0–93.1	12.6
	Type IIa	%	20.7	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	3.5	61.0	0–61.0	2.8
	Type IV	%	12.2	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	8.6	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	549.1	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	59.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	29.5	46.7	0.0–46.7	5.5
Borehole	%	5.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	1.5	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	5.0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	10	80.0	0–80.0	12.9
Average Water Consumption	lpcd	80	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	11.7	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	14.03	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	1956	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1956	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	2006	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	Year	-	2020	2015-2020	2018
Estimated Cost	\$	13.0	250	1.9-250.0	12.5
Amount per Capita	\$/capita	7.9	762.7	0.7-762.7	32.1
Source of Fund					
Source of Fund					
Source of Fund					
Source of Fund					
Source of Fund					
Sanitation Problem	Major Sanitation Problem	Missing sewer links, insufficient community toilet			
	Future Programs/Projects	Open defecation free and totally sewerred			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	List	-		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	43.0	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	50	90.0	0.0-90.0	22.1
Local Government	%	10	100.0	0.0-100.0	18.5
Loans	%	40	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	50.0	110	0.6-110.0	20.0
Tariff Rate	\$/m3	30-90	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	60	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	30	35	0–35	6.5
No Treatment	%	30	100	0–100	36.5
Others	%	40	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Khan and Saraswati				
Basin Area	Ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	30 #/ ml	22000#/100ml	<1– 22000	
BOD	mg/l	6.0	180	1.28–180.0	18.7
COD	mg/l	50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	200.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.25	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

6. Jabalpur, India

Jabalpur		For All Surveyed Cities and Municipalities
Coordinator	Mr. Ashish Shrivastav, Project Manager	
Office	Municipal Corporation, Jabalpur	
Address	Manas Bhawan, Jabalpur, India	
Fax	917612410892	
Telephone	917612411077	
E-mail address	piuadb_jbp@yahoo.co.in	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	1,267.00	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.80	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	173.65	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	4.8	844.1	0 – 844.1	34.5	
Urban Poor	%	31.12	48.0	0 – 48.0	14.6	
City Area	ha (000)	12.9	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	10.1	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	11.8	59.7	0 – 59.7	13.5	
Urban Fringe	%	20.1	99.7	0 – 99.7	18.9	
Peri-Urban	%	50.3	98.5	0 – 98.5	34.9	
Slum Area	%	7.74	35.96	0 – 35.96	4.3	
Average City Density	#/ha	72.1	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	215.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	111.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	79.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	29.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	93.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	12.92	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	92.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	1,267.00	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	84.8	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	49.2	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0.8	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	17.0	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	33.0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	0	93.1	0–93.1	12.6	
Type IIa	%	49.2	100.0	0–100.0	32.2	
Type III	%	0	2.0	0–2.0	0.1	
Type IIIa	%	0.8	61.0	0–61.0	2.8	
Type IV	%	17.0	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	33	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	65.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	17.9	46.7	0.0–46.7	5.5
Borehole	%	11.9	54.5	0.0–54.5	14.1
Protected Spring/Well	%	3.3	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	2.0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	5.0	80.0	0–80.0	12.9
Average Water Consumption	lpcd	64.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	4.5	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	21.67	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	1956	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1956	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	37.0	250	1.9-250.0	12.5
Amount per Capita	\$/capita	39.7	762.7	0.7-762.7	32.1
Source of Fund	Other agency				
Sanitation Problem	Major Sanitation Problem	Absence of sewer system			
	Future Programs/Projects	Slum improvement and sewerage system			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	GOI, ADB Municipal Corporation, Jabalpur			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	32.1	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	50	90.0	0.0-90.0	22.1
Local Government	%	20	100.0	0.0-100.0	18.5
Loans	%	30	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	5.4	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	15.0	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	0	133	4-133	9.9

Government	\$/ST	30	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	70	80	15–80	39.6
Industrial Waste	%	0	38	0–38	8.4
Commercial Waste	%	18	35	0–35	8.5
Hospital Waste	%	2	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	50	100	0–100	36.5
Others	%	50	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Narmada				
Basin Area	ha	4,939,800	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	< 200 #/ ml	22000#/100ml	<1– 22000	
BOD	mg/l	4.5	180	1.28–180.0	18.7
COD	mg/l	50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	1.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.25	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

7. Mangalore, India

Mangalore	For All Surveyed Cities and Municipalities
Coordinator	
Office	
Address	
Fax	
Telephone	
E-mail address	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	463.30	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.05	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	92.66	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	–	844.1	0 – 844.1	34.5	
Urban Poor	%	1.8	48.0	0 – 48.0	14.6	
City Area	ha (000)	13.2	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	3.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	23.3	59.7	0 – 59.7	13.5	
Urban Fringe	%	72.7	99.7	0 – 99.7	18.9	
Peri-Urban	%	–	98.5	0 – 98.5	34.9	
Slum Area	%	0.13	35.96	0 – 35.96	4.3	
Average City Density	#/ha	39.5	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	134.3	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	73.6	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	25.9	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	47.7	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	13.2	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	–	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	–	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	–	100.0	0 – 100.0	31.5	
Central Water Supply System	%	–	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	31.1	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	67.79	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.33	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0.69	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0.05	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	31.1	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	67.7	93.1	0–93.1	12.6
	Type IIa	%	–	100.0	0–100.0	32.2
	Type III	%	0.33	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	0.69	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	0.05	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	1,190.0	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	62.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	4.9	46.7	0.0–46.7	5.5
Borehole	%	–	54.5	0.0–54.5	14.1
Protected Spring/Well	%	32.2	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	7	80.0	0–80.0	12.9
Average Water Consumption	lpcd	120.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	137.2	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	100.0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	2	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	-	2007	1947-2007	1985
Latest	year	2000	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	Year	2000	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	-	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Inadequate treatment of waste			
	Future Programs/Projects	Implementation of sanitation Plan			
	Funding Amount	\$/capita	1.9	24.1	0.96-24.1
	Funding Source	Grants			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9
Government	\$/ST	-	100	0-100	23.9

Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	–			
Sources of Water Pollution					
Household Solid Waste	%	–	67	0–67	21.7
Household Liquid Waste	%	–	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	Through septic tank and STP				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Gurupur & Netravathi Rivers				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

8. Nasrullahganj, India

Nasrullahganj		For All Surveyed Cities and Municipalities
Coordinator	Mr. Noushad Ahamad Lari	
Office	Chief Municipal Officer, Nagar Panchayat Nasrullahganj	
Address	District Sehore, India	
Fax	91 7563-276062	
Telephone	91 7563-276062	
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	21.7	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.64	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	2.86	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	7.6	7.6	3.2 – 7.6	4.9	
Floating Population	%	2.0	844.1	0 – 844.1	34.5	
Urban Poor	%	48.0	48.0	0 – 48.0	14.6	
City Area	ha (000)	0.8	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	60.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	10.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	–	98.5	0 – 98.5	34.9	
Slum Area	%	30.0	35.96	0 – 35.96	4.3	
Average City Density	#/ha	26.9	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	0.8	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	100.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	21.7	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	–	100.0	0 – 100.0	31.5	
Central Water Supply System	%	90.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	–	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	68.9	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	2.0	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	26.5	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	2.5	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	68.9	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	2.0	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	26.5	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	2.5	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	90.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	10.0	46.7	0.0–46.7	5.5
Borehole	%	–	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	29.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	29.0	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	47	21.67	0.4–21.67	9.0
Planning and Monitoring	%	5	100	5–100	11.8
Construction	%	6	100	6–100	8.9
Operations and Maintenance	%	89	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1956	2007	1947-2007	1985
Latest	year	2000	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	2000	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	2011	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	Year	-	2020	2015-2020	2018
Estimated Cost	\$	1.9	250	1.9-250.0	12.5
Amount per Capita	\$/capita	9.44	762.7	0.7-762.7	32.1
Source of Fund					
Source of Fund					
Source of Fund					
Sanitation Problem	Major Sanitation Problem	Pollution due to disposal of untreated wastes			
	Future Programs/Projects				
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source				
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	0.03	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	0.6	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	20	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	–			
Sources of Water Pollution					
Household Solid Waste	%	–	67	0–67	21.7
Household Liquid Waste	%	–	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	–			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	N			
River Basin/Major River Name	–				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

9. Bharatpur, Nepal

Bharatpur		For All Surveyed Cities and Municipalities
Coordinator	Birat Ghimire/ Januka K.C, Section Head	
Office	Environment Section/ Bharatpur Municipality Office	
Address	Bharatpur-10, Chitwan Nepal	
Fax	977-56520014	
Telephone	977-56521013/ 525305	
E-mail address	bmc@ntc.net.np	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	143.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	5.00	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	36.93	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.9	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	9.46	48.0	0 – 48.0	14.6	
City Area	ha (000)	7.7	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	11.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	22.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	3.2	99.7	0 – 99.7	18.9	
Peri-Urban	%	58.2	98.5	0 – 98.5	34.9	
Slum Area	%	5.56	35.96	0 – 35.96	4.3	
Average City Density	#/ha	18.6	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	35.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	20.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	5.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	10.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	20.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	7.73	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	7.8	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	58.2	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	143.83	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	4.5	100.0	0 – 100.0	31.5	
Central Water Supply System	%	61.2	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	4.5	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	40.6	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	52.4	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	2.5	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	4.5	88.9	0–88.9	9.3	
Type II	%	0	93.1	0–93.1	12.6	
Type IIa	%	40.6	100.0	0–100.0	32.2	
Type III	%	0	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	52.4	59.9	0–59.9	13.9	
Type IVa	%	0	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	40.6	40.6	0–40.6	1.4	

Type VI & VIa	%	2.5	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	30	100.0	0–100.0	57.7
National Government	%	62	100.0	0–100.0	8.7
Private	%	8	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	30	100.0	0–100.0	57.7
National Government	%	62	100.0	0–100.0	8.7
Private	%	8	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	59.5	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	1.6	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	37.9	96.4	0.0–96.4	10.3
Rainwater	%	0.1	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	50.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	1.8	321.5	1.5–321.5	55.6
Local Government	%	30.0	100.0	0–100.0	47.5
National Government	%	62.0	100.0	0–100.0	26.5
Private Concessionaire	%	8.0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	2	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	5.15	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	1996	2007	1947-2007	1985
Latest	year	1996	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1999	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Lack of sanitary urban facilities			
	Future Programs/Projects	Make the city open defecation free			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source		-		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	8	90.0	0.0-90.0	22.1
Local Government	%	62	100.0	0.0-100.0	18.5
Loans	%	30	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	0.7	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	50	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	50	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	80.0	110	0.6-110.0	20.0
Tariff Rate	\$/m ³	0.8	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9
Government	\$/ST	-	100	0-100	23.9

Other Fees	\$	-	30	0-30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	N			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0-67	21.7
Household Liquid Waste	%	50	80	15-80	39.6
Industrial Waste	%	0	38	0-38	8.4
Commercial Waste	%	0	35	0-35	8.5
Hospital Waste	%	0	17	0-17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0-100	10.3
Central Sewer System	%	0	35	0-35	6.5
No Treatment	%	100	100	0-100	36.5
Others	%	0	50	0-50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Narayani				
Basin Area	ha	-	4,939,800	75.15-4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh-vl	-			
Sanitation Work/Plan	i/c	-			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	-	22000#/100ml	<1- 22000	
BOD	mg/l	-	180	1.28-180.0	18.7
COD	mg/l	-	973	7.1-973.0	72.4
Total Suspended Solids	mg/l	-	261	1.0-261.0	49.6
Heavy Metals	mg/l	-	16.7	0.25-16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	594.14	594.14	0.75-594.14	50.1
Hepatitis A & B	#	-	6.83	0.13-6.86	3.0
Trachoma	#	294.55	294.55	0.00-294.55	20.1
Acute Lower Respiratory Infection	#	1,084.04	507.79	0.32-507.79	153.9
Measles	#	-	4.45	0.00-4.45	0.3
Malaria	#	-	-	0.0-3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	-	0.47	0.0-0.47	0.0
Hepatitis A & B	#	-	0.25	0.0-0.25	0.0
Trachoma	#	-	0	0-0	0.0
Acute Lower Respiratory Infection	#	-	6.3	0.00-6.3	0.2
Measles	#	-	1.3	0.00-1.3	0.0
Malaria	#	-	14.2	0.00-14.2	0.6

10. Hetauda, Nepal

Hetauda		For All Surveyed Cities and Municipalities
Coordinator	Mr. Dhurba Bahadur Bhujel, Section Officer	
Office	Social Welfare Hetauda Municipality	
Address	Hetauda Municipality, Hetauda Makwanpur, Nepal	
Fax	977(0)57-520044	
Telephone	977(0)57-520433	
E-mail address	drb_bhu62@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2012)	#(000)	84.7	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.51	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	19.85	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	1.5	844.1	0 – 844.1	34.5	
Urban Poor	%	10.60	48.0	0 – 48.0	14.6	
City Area	ha (000)	4.6	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	9.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	11.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	57.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	21.0	98.5	0 – 98.5	34.9	
Slum Area	%	2.0	35.96	0 – 35.96	4.3	
Average City Density	#/ha	19.0	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	74.5	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	39.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	4.7	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	8.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	110.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	4.55	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	11.2	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	11.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	84.67	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	5.3	100.0	0 – 100.0	31.5	
Central Water Supply System	%	61.9	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	5.3	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	75.5	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	2.5	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	16.5	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	–	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	5.3	88.9	0–88.9	9.3	
Type II	%	0	93.1	0–93.1	12.6	
Type IIa	%	75.5	100.0	0–100.0	32.2	
Type III	%	0	2.0	0–2.0	0.1	
Type IIIa	%	2.5	61.0	0–61.0	2.8	
Type IV	%	0	59.9	0–59.9	13.9	
Type IVa	%	16.5	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	60.4	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	1.5	46.7	0.0–46.7	5.5
Borehole	%	1.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	36.2	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	40.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	11.0	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	1	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	1993	2007	1947-2007	1985
Latest	year	2011	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1999	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Poor cannot afford basic sanitation services			
	Future Programs/Projects	Make municipality open defecation free			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source				
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	8	90.0	0.0-90.0	22.1
Local Government	%	62	100.0	0.0-100.0	18.5
Loans	%	30	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	0.9	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	50	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	50	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	80.0	110	0.6-110.0	20.0
Tariff Rate	\$/m3	0.8	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	30	67	0–67	21.7
Household Liquid Waste	%	60	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	0	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	95	100	0–100	36.5
Others	%	5	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Rapti and Karra				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

11. Kathmandu, Nepal

Kathmandu		For All Surveyed Cities and Municipalities			
Coordinator	Rabin Man Shrestha, Chief and Senior Environmental Engineer				
Office	Environment Management Division				
Address	P.O. Box: 8416, Teku				
Fax	977-1-4268509				
Telephone	977-1-4247024				
E-mail address	rms916@hotmail.com				

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	1,003.3	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	4.04	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	254.76	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.9	7.6	3.2 – 7.6	4.9	
Floating Population	%	–	844.1	0 – 844.1	34.5	
Urban Poor	%	–	48.0	0 – 48.0	14.6	
City Area	ha (000)	5.07	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	5.4	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	14.2	59.7	0 – 59.7	13.5	
Urban Fringe	%	43.7	99.7	0 – 99.7	18.9	
Peri-Urban	%	36.7	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	198.0	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	426.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	138.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	113.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	110.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	5.07	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	92.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	100.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	1,003.28	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	69.9	100.0	0 – 100.0	31.5	
Central Water Supply System	%	100.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	69.9	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	28.1	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	1.8	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	0	100.0	0–100.0	13.7
	Type Ia	%	69.9	88.9	0–88.9	9.3
	Type II	%	–	93.1	0–93.1	12.6
	Type IIa	%	28.1	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	1.8	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	199.4	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	50	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	61.1	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0.5	46.7	0.0–46.7	5.5
Borehole	%	0.1	54.5	0.0–54.5	14.1
Protected Spring/Well	%	6.0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	30	80.0	0–80.0	12.9
Average Water Consumption	lpcd	90	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	181.4	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	100	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	1	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	1	2	0–2	0.1
Enterprise	#	1	1	0–2	0.1
Nongovernment Organization	#	2	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	0.46	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	12.3	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	4	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	1996	2007	1947-2007	1985
Latest	year	2011	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1990	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	Year	2015	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Wastewater directly discharged into the river.			
	Future Programs/Projects	-			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source	-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	< 0.01	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	30	133	4-133	9.9

Government	\$/ST	20	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	N			
Sources of Water Pollution					
Household Solid Waste	%	20	67	0–67	21.7
Household Liquid Waste	%	80	80	15–80	39.6
Industrial Waste	%	0	38	0–38	8.4
Commercial Waste	%	0	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	100	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Bagmati, Bishnumati, Dhobikhola				
Basin Area	Ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	(2,400,000/ml)	22000#/100ml	<1– 22000	
BOD	mg/l	36.0	180	1.28–180.0	18.7
COD	mg/l	207.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.05	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	142.23	594.14	0.75–594.14	50.1
Hepatitis A & B	#	23.79	6.83	0.13–6.86	3.0
Trachoma	#	0.01	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	180.66	507.79	0.32–507.79	153.9
Measles	#	0.60	4.45	0.00–4.45	0.3
Malaria	#	7.56	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	0.03	0.47	0.0–0.47	0.0
Hepatitis A & B	#	1.18	0.25	0.0–0.25	0.0
Trachoma	#	0	0	0–0	0.0
Acute Lower Respiratory Infection	#	0	6.3	0.00–6.3	0.2
Measles	#	0.01	1.3	0.00–1.3	0.0
Malaria	#	0.07	14.2	0.00–14.2	0.6

12. Lekhnath, Nepal

Lekhnath		For All Surveyed Cities and Municipalities
Coordinator	Mr. Bodhraj Lamichane, Chairperson	
Office	Lekhnath Water Supply and sanitation Users Committee	
Address	Lekhnath Chowk-3	
Fax		
Telephone	977-9856023959	
E-mail address	leknathwatersupply@gmail.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	58.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.90	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	14.93	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.9	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	1.56	48.0	0 – 48.0	14.6	
City Area	ha (000)	7.9	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	40.6	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	24.7	59.7	0 – 59.7	13.5	
Urban Fringe	%	0	99.7	0 – 99.7	18.9	
Peri-Urban	%	0	98.5	0 – 98.5	34.9	
Slum Area	%	35.96	35.96	0 – 35.96	4.3	
Average City Density	#/ha	7.4	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	11.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	5.1	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	7.89	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	65.1	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	58.81	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	99.6	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	67.9	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0.1	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	31.9	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	0.0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	0	93.1	0–93.1	12.6	
Type IIa	%	67.9	100.0	0–100.0	32.2	
Type III	%	0	2.0	0–2.0	0.1	
Type IIIa	%	0.1	61.0	0–61.0	2.8	
Type IV	%	0	59.9	0–59.9	13.9	
Type IVa	%	31.9	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	44.3	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	8.3	46.7	0.0–46.7	5.5
Borehole	%	4.5	54.5	0.0–54.5	14.1
Protected Spring/Well	%	41.1	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	70	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	12.1	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	50.0	100.0	0–100.0	26.5
Private Concessionaire	%	50.0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	3.14	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	1993	2007	1947-2007	1985
Latest	year	1993	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	1999	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	No sewer and waste water treatment facilities			
	Future Programs/Projects	Open defecation free city			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source				
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	1.0	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	80	90.0	0.0-90.0	22.1
Local Government	%	20	100.0	0.0-100.0	18.5
Loans	%	0	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	0.2	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	60	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	40	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0–67	21.7
Household Liquid Waste	%	50	80	15–80	39.6
Industrial Waste	%	0	38	0–38	8.4
Commercial Waste	%	0	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	100	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Seti Gandakii				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	194.11	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0	6.83	0.13–6.86	3.0
Trachoma	#	0	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	496.51	507.79	0.32–507.79	153.9
Measles	#	0.48	4.45	0.00–4.45	0.3
Malaria	#	0	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

13. Pokhara, Nepal

Pokhara		For All Surveyed Cities and Municipalities
Coordinator	Sarad Mohan Kaphle, Senior Engineer Technical Chief	
Office	Pokhara sub-Metropolitan City Office	
Address	Kaski, Pokhara, New Road-8	
Fax	977-061-520600	
Telephone	977-061-50064	
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	255.4	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	5.27	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	68.23	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.7	7.6	3.2 – 7.6	4.9	
Floating Population	%	–	844.1	0 – 844.1	34.5	
Urban Poor	%	4.00	48.0	0 – 48.0	14.6	
City Area	ha (000)	5.6	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	20.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	35.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	20.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	15.0	98.5	0 – 98.5	34.9	
Slum Area	%	9.9	35.96	0 – 35.96	4.3	
Average City Density	#/ha	45.9	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	67.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	33.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	29.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	26.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	39.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	5.56	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	89.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	255.46	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	95.5	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	100	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	0	93.1	0–93.1	12.6
	Type IIa	%	100	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	95.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0.5	46.7	0.0–46.7	5.5
Borehole	%	2.6	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	1.9	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	40	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	–	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	6.26	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	Year	-	2007	1947-2007	1985
Latest	Year	-	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	-	17	7-17	-
Year Enacted	Year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	No waste water treatment facilities			
	Future Programs/Projects	-			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source	-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	0.5	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	0	90.0	0.0-90.0	22.1
Local Government	%	100	100.0	0.0-100.0	18.5
Loans	%	0	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	0.1	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m ³	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9
Government	\$/ST	-	100	0-100	23.9

Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	N			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0–67	21.7
Household Liquid Waste	%	40	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	100	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Seti Gandakii				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	High			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	(291CFU/100ml)	22000#/100ml	<1– 22000	
BOD	mg/l	22.5	180	1.28–180.0	18.7
COD	mg/l	95.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	61.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	179.49	594.14	0.75–594.14	50.1
Hepatitis A & B	#	53.88	6.83	0.13–6.86	3.0
Trachoma	#	305.47	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	409.58	507.79	0.32–507.79	153.9
Measles	#	1.36	4.45	0.00–4.45	0.3
Malaria	#	0.23	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

14. Colombo, Sri Lanka

Colombo		For All Surveyed Cities and Municipalities
Coordinator	M.I.M Salim, Director Engineering (Water Supply and Drainage)	
Office	Water Supply and Drainage Department	
Address	Ananda Mawatha, Maligakanda, Colombo 10, Sri Lanka	
Fax	094112692696	
Telephone	094112674809	
E-mail address	mimsalimseprojects@yahoo.com [and] munici@slt.lk	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2012)	#(000)	665.0	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	0.35	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	117.33	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	60.1	844.1	0 – 844.1	34.5	
Urban Poor	%	13.5	48.0	0 – 48.0	14.6	
City Area	ha (000)	3.7	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	–	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	–	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	–	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	174.7	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	3.72	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	80.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	95.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	665.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	29.7	100.0	0 – 100.0	31.5	
Central Water Supply System	%	99.4	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	29.7	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	–	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	–	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	–	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	0	100.0	0–100.0	13.7	
Type Ia	%	29.7	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	–	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	99.4	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	–	46.7	0.0–46.7	5.5
Borehole	%	0.5	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0.01	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	<1	80.0	0–80.0	12.9
Average Water Consumption	lpcd	160.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	300.0	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	6.01	21.67	0.4–21.67	9.0
Planning and Monitoring	%	100	100	5–100	11.8
Construction	%	100	100	6–100	8.9
Operations and Maintenance	%	100	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1947	2007	1947-2007	1985
Latest	year	1980	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	-	17	7-17	-
Year Enacted	year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	100- year- old sewer system needs rehabilitation			
	Future Programs/Projects	Rehabilitation of main sewer lines			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source	ADB			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	168	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	0	90.0	0.0-90.0	22.1
Local Government	%	0.06	100.0	0.0-100.0	18.5
Loans	%	99	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	8.3	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	0	47.0	0-47	4.9
Local Government	%	100	100.0	0-100	40.7
Loans	%	0	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	20	80	15–80	39.6
Industrial Waste	%	38	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	17	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Kelani river				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	Heavy			
Sanitation Work/Plan	i/c	Cooperative			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	(5000/100ml)	22000#/100ml	<1– 22000	
BOD	mg/l	48.0	180	1.28–180.0	18.7
COD	mg/l	75.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	80.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	16.70	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	0.75	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0.60	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	0.36	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

15. Negombo, Sri Lanka

Negombo		For All Surveyed Cities and Municipalities
Coordinator	Mr. S.A.D.L. Wasantha, Supervising Public Health Inspector (SPHI)	
Office	Municipal Council Negombo	
Address	221/c/1, Seeduwa, Kodagoda, Negombo	
Fax	0312222420	
Telephone	031222275 Ext. 224	
E-mail address	wsolangarachchi@gmail.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2013)	#(000)	150.80	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.48	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	30.17	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	11.9	844.1	0 – 844.1	34.5	
Urban Poor	%	10.0	48.0	0 – 48.0	14.6	
City Area	ha (000)	3.1	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	–	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	–	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	–	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	48.8	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	3.09	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	89.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	150.84	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	88.9	100.0	0 – 100.0	31.5	
Central Water Supply System	%	88.8	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	88.9	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	–	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	–	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	–	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	88.9	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	–	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	6.0	59.9	0–59.9	13.9	
Type IVa	%	5.1	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	80.7	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	1.9	54.5	0.0–54.5	14.1
Protected Spring/Well	%	6.4	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	25	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	–	321.5	1.5–321.5	55.6
Local Government	%	0	100.0	0–100.0	47.5
National Government	%	84	100.0	0–100.0	26.5
Private Concessionaire	%	16	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	1	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	13.3	21.67	0.4–21.67	9.0
Planning and Monitoring	%	50	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	50	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	-	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	-	2007	1947-2007	1985
Latest	year	-	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	N	17	7-17	-
Year Enacted	year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	No septage/sewage treatment facility			
	Future Programs/Projects	Construction of septage/ sewage treatment plants			
Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	0.0	133	4-133	9.9

Government	\$/ST	10	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	N			
Sources of Water Pollution					
Household Solid Waste	%	67	67	0–67	21.7
Household Liquid Waste	%	15	80	15–80	39.6
Industrial Waste	%	3	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	1	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	10	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Maha Oya				
Basin Area	Ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	10200 MPN/100ml	22000#/100ml	<1– 22000	
BOD	mg/l	6.0	180	1.28–180.0	18.7
COD	mg/l	22.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	3.30	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0.66	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	0.13	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	1.3	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

16. Banda Aceh, Indonesia

Banda Aceh		For All Surveyed Cities and Municipalities			
Coordinator	Mr. Mirzayanto, ST				
Office	Sanitation and Beautification Department				
Address	Jl. Pocut Baren 30, Banda Aceh				
Fax	62651-21019				
Telephone	62651-31217				
E-mail address	mirza_dkp@yahoo.com				

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2012)	#(000)	238.0	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	4.47	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	58.50	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	4.2	844.1	0 – 844.1	34.5	
Urban Poor	%	8.5	48.0	0 – 48.0	14.6	
City Area	ha (000)	6.1	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	0.03	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	0.3	59.7	0 – 59.7	13.5	
Urban Fringe	%	47.7	99.7	0 – 99.7	18.9	
Peri-Urban	%	48.5	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	38.8	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	6.14	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	100.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	238.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	69.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	97.0	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	2.0	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	1.0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	93.1	93.1	0–93.1	12.6	
Type IIa	%	3.9	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	0	61.0	0–61.0	2.8	
Type IV	%	2.0	59.9	0–59.9	13.9	
Type IVa	%	0	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	1.0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	135	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	69.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	31.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	.0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	50.0	80.0	0–80.0	12.9
Average Water Consumption	lpcd	90.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	27.0	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	3	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	2.14	21.67	0.4–21.67	9.0
Planning and Monitoring	%	100	100	5–100	11.8
Construction	%	100	100	6–100	8.9
Operations and Maintenance	%	100	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-	
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
National	#	1	7	1-4	1.9	
Local	#	-	3	1-3	1.2	
Year Enacted						
Oldest	year	1947	2007	1947-2007	1985	
Latest	year	-	2007	1956-2007	1993	
Sanitation Service Charges						
Law on Collecting Fees	Y/N	Y	17	7-17	-	
Year Enacted	year	1947	2007	1947-2007	1985	
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
With Sanitation Plan	Y/N	N	11	11-27		
When Prepared	year	-	2007	2006-2011	2009	
New Sanitation Plan						
Will Prepare Sanitation Plan	Y/N	-				
Preparation Year	year	-	2020	2015-2020	2018	
Estimated Cost	\$	-	250	1.9-250.0	12.5	
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1	
Source of Fund		-				
Sanitation Problem	Major Sanitation Problem	Disposal of wastes without treatment				
	Future Programs/Projects	Sanitation Master Plan				
	Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
	Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3	
Source of Fund						
National Government	%	90	90.0	0.0-90.0	22.1	
Local Government	%	10	100.0	0.0-100.0	18.5	
Loans	%	0	99.0	0.0-99.0	15.7	
Tariff Revenue	%	0	0	0-0	0	
Others	%	-	100.0	0.0-100.0	9.0	
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
Annual Amount	\$/capita	0.07	8.3	0.01-8.3	0.7	
Source of Fund						
National Government	%	0	47.0	0-47	4.9	
Local Government	%	32	100.0	0-100	40.7	
Loans	%	-	53.0	0-53	3.4	
Tariff Revenue	%	68	100.0	0-100	14.3	
Others	%	0	0	0	0	
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
Total Revenue	\$/capita	0.03	15	0.3-15.0	0.9	
Sewered Area Charges						
Connection Charge	\$/connection	-	110	0.6-110.0	20.0	
Tariff Rate	\$/m3	-	90	0.015-90	0.3	
Septic Tank Desludging Fee						
Private	\$/ST	7.5	133	4-133	9.9	

Government	\$/ST	7.5	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	5	67	0–67	21.7
Household Liquid Waste	%	50	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	35	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Krueng Aceh				
Basin Area	ha	75.15	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	Low			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	1575 #/100ml	22000#/100ml	<1– 22000	
BOD	mg/l	9.9	180	1.28–180.0	18.7
COD	mg/l	24.3	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	68.8	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	278.9	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	1,559.01	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	6.3	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	1.0	14.2	0.00–14.2	0.6

17. Phine, Lao PDR

Phine		For All Surveyed Cities and Municipalities
Coordinator	Dr. Ounhuan Suthchalern, Head of Public Health	
Office	Head of Public Health	
Address	Phine District, Savannakhet Province	
Fax		
Telephone	856-020-5642497, 856-020-2405453	
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2012)	#(000)	54.9	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.90	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	8.32	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.6	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	23.0	48.0	0 – 48.0	14.6	
City Area	ha (000)	26.9	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	20.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	36.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	10.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	39.0	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	2.0	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	6.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	4.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	3.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	2.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	26.9	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	20.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	50.1	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	54.96	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	59.9	100.0	0 – 100.0	31.5	
Central Water Supply System	%	80.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	59.9	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	32.5	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	–	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	7.6	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	41.5	100.0	0–100.0	13.7
	Type Ia	%	17.7	88.9	0–88.9	9.3
	Type II	%	–	93.1	0–93.1	12.6
	Type IIa	%	32.5	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	8.3	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	79.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	–	46.7	0.0–46.7	5.5
Borehole	%	21.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	20.0	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	80.0	80.0	0–80.0	12.9
Average Water Consumption	lpcd	80.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	32.9	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	2	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	1991	2007	1947-2007	1985
Latest	year	1999	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	-	17	7-17	-
Year Enacted	year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	2020	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Uncontrolled disposal of waste			
	Future Programs/Projects	Improving access to sanitation facilities			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source		-		
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	-	133	4-133	9.9

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0–67	21.7
Household Liquid Waste	%	50	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	N			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Sedon river				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	< 1#/ ml	22000#/ 100ml	<1– 22000	
BOD	mg/l	<3.0	180	1.28–180.0	18.7
COD	mg/l	<50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

18. Sayabouly, Lao PDR

Sayabouly		For All Surveyed Cities and Municipalities
Coordinator	Mr. Laksana Keosengthith, Office Manager	
Office	Water Supply Office	
Address	Sayabouly Water Supply State Enterprise	
Fax	074-211056	
Telephone	074-211056	
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2012)	#(000)	75.2	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.80	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	12.53	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	22.40	48.0	0 – 48.0	14.6	
City Area	ha (000)	3.91	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	10.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	0.8	59.7	0 – 59.7	13.5	
Urban Fringe	%	15.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	74.2	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	19.2	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	3.91	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	50.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	84.2	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	75.20	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	59.9	100.0	0 – 100.0	31.5	
Central Water Supply System	%	79.9	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	59.9	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	59.9	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	–	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	7.8	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	35.9	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	59.9	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	7.8	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	79.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	–	54.5	0.0–54.5	14.1
Protected Spring/Well	%	12.6	96.4	0.0–96.4	10.3
Rainwater	%	7.0	20.0	0.0–20.0	8.1
Water Vendor	%	11.5	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	80.0	80.0	0–80.0	12.9
Average Water Consumption	lpcd	80.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	39.9	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	0.4	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1999	2007	1947-2007	1985
Latest	year	2007	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	N	17	7-17	-
Year Enacted	year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	Year	2020	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	No wastewater system in the town			
	Future Programs/Projects	-			
	Funding Amount	\$/capita	-	24.1	0.96-24.1
	Funding Source	-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	-	90.0	0.0-90.0	22.1
Local Government	%	-	100.0	0.0-100.0	18.5
Loans	%	-	99.0	0.0-99.0	15.7
Tariff Revenue	%	-	0	0-0	0
Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	-	47.0	0-47	4.9
Local Government	%	-	100.0	0-100	40.7
Loans	%	-	53.0	0-53	3.4
Tariff Revenue	%	-	100.0	0-100	14.3
Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m ³	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	18.0	133	4-133	9.9
Government	\$/ST	-	100	0-100	23.9

Other Fees	\$	-	30	0-30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0-67	21.7
Household Liquid Waste	%	50	80	15-80	39.6
Industrial Waste	%	-	38	0-38	8.4
Commercial Waste	%	-	35	0-35	8.5
Hospital Waste	%	-	17	0-17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	-			
Current Wastewater Disposal					
Own Treatment Plant	%	-	100	0-100	10.3
Central Sewer System	%	-	35	0-35	6.5
No Treatment	%	-	100	0-100	36.5
Others	%	-	50	0-50	10.4
Description	List	-			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Huong river				
Basin Area	ha	-	4,939,800	75.15-4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh-vl	-			
Sanitation Work/Plan	i/c	-			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	5-10 #/ ml	22000#/100ml	<1- 22000	
BOD	mg/l	<5.0	180	1.28-180.0	18.7
COD	mg/l	<50.0	973	7.1-973.0	72.4
Total Suspended Solids	mg/l	1.8	261	1.0-261.0	49.6
Heavy Metals	mg/l	-	16.7	0.25-16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	-	594.14	0.75-594.14	50.1
Hepatitis A & B	#	-	6.83	0.13-6.86	3.0
Trachoma	#	-	294.55	0.00-294.55	20.1
Acute Lower Respiratory Infection	#	-	507.79	0.32-507.79	153.9
Measles	#	-	4.45	0.00-4.45	0.3
Malaria	#	-	-	0.0-3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	-	0.47	0.0-0.47	0.0
Hepatitis A & B	#	-	0.25	0.0-0.25	0.0
Trachoma	#	-	0	0-0	0.0
Acute Lower Respiratory Infection	#	-	6.3	0.00-6.3	0.2
Measles	#	-	1.3	0.00-1.3	0.0
Malaria	#	-	14.2	0.00-14.2	0.6

19. Xieng Ngeun, Lao PDR

Xieng Ngeun		For All Surveyed Cities and Municipalities
Coordinator	Mr. Kongsine Soulith, Toilet and water provider	
Office	District Public Health Office, (District Public Health)	
Address	Xieng Ngeun District, Luang Prabang Province	
Fax		
Telephone	856-071-253589	
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	35.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	2.80	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	5.97	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	6.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	28.17	48.0	0 – 48.0	14.6	
City Area	ha (000)	1.21	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	6.6	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	4.1	59.7	0 – 59.7	13.5	
Urban Fringe	%	2.5	99.7	0 – 99.7	18.9	
Peri-Urban	%	86.8	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	29.6	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	1.21	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	80.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	35.83	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	–	100.0	0 – 100.0	31.5	
Central Water Supply System	%	80.1	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	–	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	36.0	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	59.9	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	2.6	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	36.0	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	59.9	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	2.6	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	126.3	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	80.1	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	–	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	19.0	20.0	0.0–20.0	8.1
Water Vendor	%	9.2	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	70	80.0	0–80.0	12.9
Average Water Consumption	lpcd	80	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	97.7	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	17.1	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	84.4	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-	
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
National	#	-	7	1-4	1.9	
Local	#	-	3	1-3	1.2	
Year Enacted						
Oldest	Year	-	2007	1947-2007	1985	
Latest	Year	-	2007	1956-2007	1993	
Sanitation Service Charges						
Law on Collecting Fees	Y/N	N	17	7-17	-	
Year Enacted	year	-	2007	1947-2007	1985	
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
With Sanitation Plan	Y/N	Y	11	11-27		
When Prepared	Year	2007	2007	2006-2011	2009	
New Sanitation Plan						
Will Prepare Sanitation Plan	Y/N	-				
Preparation Year	Year	-	2020	2015-2020	2018	
Estimated Cost	\$	-	250	1.9-250.0	12.5	
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1	
Source of Fund		-				
Sanitation Problem	Major Sanitation Problem	Uncontrolled disposal of waste				
	Future Programs/Projects	Improving access to sanitation facilities				
	Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
	Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3	
Source of Fund						
National Government	%	70	90.0	0.0-90.0	22.1	
Local Government	%	30	100.0	0.0-100.0	18.5	
Loans	%	0	99.0	0.0-99.0	15.7	
Tariff Revenue	%	0	0	0-0	0	
Others	%	0	100.0	0.0-100.0	9.0	
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7	
Source of Fund						
National Government	%	-	47.0	0-47	4.9	
Local Government	%	-	100.0	0-100	40.7	
Loans	%	-	53.0	0-53	3.4	
Tariff Revenue	%	-	100.0	0-100	14.3	
Others	%	-	0	0	0	
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
Total Revenue	\$/capita	-	15	0.3-15.0	0.9	
Sewered Area Charges						
Connection Charge	\$/connection	-	110	0.6-110.0	20.0	
Tariff Rate	\$/m3	-	90	0.015-90	0.3	
Septic Tank Desludging Fee						
Private	\$/ST	30	133	4-133	9.9	

Government	\$/ST	18	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	–			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0–67	21.7
Household Liquid Waste	%	50	80	15–80	39.6
Industrial Waste	%	0	38	0–38	8.4
Commercial Waste	%	0	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	–			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Khan river				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	<1 #/ml	22000#/100ml	<1– 22000	
BOD	mg/l	5.0	180	1.28–180.0	18.7
COD	mg/l	50.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

20. Calbayog, Philippines

Calbayog		For All Surveyed Cities and Municipalities
Coordinator	Oscar M. Hugo, City Engineer	
Office	City Engineering Office	
Address	City Hall, JD Avelino St., Calbayog City, Philippines	
Fax	63552091725	
Telephone	63552094478	
E-mail address	omhugo_linaw@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	169.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.79	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	28.91	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	1.7	844.1	0 – 844.1	34.5	
Urban Poor	%	4.18	48.0	0 – 48.0	14.6	
City Area	ha (000)	90.30	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	51.4	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	46.63	59.7	0 – 59.7	13.5	
Urban Fringe	%	0	99.7	0 – 99.7	18.9	
Peri-Urban	%	2.00	98.5	0 – 98.5	34.9	
Slum Area	%	0.01	35.96	0 – 35.96	4.3	
Average City Density	#/ha	1.70	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	11.20	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	6.00	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	1.20	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	627.00	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	90.30	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	0.5	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	150.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	72.6	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	38.9	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0.1	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	61.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	0	93.1	0–93.1	12.6
	Type IIa	%	38.9	100.0	0–100.0	32.2
	Type III	%	0	2.0	0–2.0	0.1
	Type IIIa	%	61	61.0	0–61.0	2.8
	Type IV	%	38.9	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0
	Type Va	%	–	40.6	0–40.6	1.4

Type VI & VIa	%	61	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	25.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	46.7	46.7	0.0–46.7	5.5
Borehole	%	30.6	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	10	80.0	0–80.0	12.9
Average Water Consumption	lpcd	75	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	1.5	321.5	1.5–321.5	55.6
Local Government	%	95	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	5	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	3	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	9.8	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance		%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
National	#	2	7	1-4	1.9	
Local	#	-	3	1-3	1.2	
Year Enacted						
Oldest	year	2000	2007	1947-2007	1985	
Latest	year	2002	2007	1956-2007	1993	
Sanitation Service Charges						
Law on Collecting Fees	Y/N	N	17	7-17	-	
Year Enacted	year	-	2007	1947-2007	1985	
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
With Sanitation Plan	Y/N	N	11	11-27		
When Prepared	year	-	2007	2006-2011	2009	
New Sanitation Plan						
Will Prepare Sanitation Plan	Y/N	-				
Preparation Year	year	-	2020	2015-2020	2018	
Estimated Cost	\$	-	250	1.9-250.0	12.5	
Amount per Capita	\$/capita	0.7	762.7	0.7-762.7	32.1	
Source of Fund	General fund, City Government					
Sanitation Problem						
Major Sanitation Problem	Pollution of bodies of water (e.g., rivers, sea, swamps) of wastewater					
Future Programs/Projects	North Dhaka East Sewerage treatment plant and associated works					
Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0	
Funding Source						
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3	
Source of Fund						
National Government	%	-	90.0	0.0-90.0	22.1	
Local Government	%	-	100.0	0.0-100.0	18.5	
Loans	%	-	99.0	0.0-99.0	15.7	
Tariff Revenue	%	-	0	0-0	0	
Others	%	-	100.0	0.0-100.0	9.0	
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7	
Source of Fund						
National Government	%	-	47.0	0-47	4.9	
Local Government	%	-	100.0	0-100	40.7	
Loans	%	-	53.0	0-53	3.4	
Tariff Revenue	%	-	100.0	0-100	14.3	
Others	%	-	0	0	0	
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
Total Revenue	\$/capita	-	15	0.3-15.0	0.9	
Sewered Area Charges						
Connection Charge	\$/connection	-	110	0.6-110.0	20.0	
Tariff Rate	\$/m ³	-	90	0.015-90	0.3	
Septic Tank Desludging Fee						

Private	\$/ST	–	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	N			
Sources of Water Pollution					
Household Solid Waste	%	45	67	0–67	21.7
Household Liquid Waste	%	35	80	15–80	39.6
Industrial Waste	%	2	38	0–38	8.4
Commercial Waste	%	15	35	0–35	8.5
Hospital Waste	%	3	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	–			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	99	100	0–100	36.5
Others	%	1	50	0–50	10.4
Description	anaerobic baffled reactor				
Within River Basin	Y/N	N			
River Basin/Major River Name	–				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	168.0	180	1.28–180.0	18.7
COD	mg/l	973.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	75.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	27.67	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0	6.83	0.13–6.86	3.0
Trachoma	#	0	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	46.13	507.79	0.32–507.79	153.9
Measles	#	0	4.45	0.00–4.45	0.3
Malaria	#	0	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	0.47	0.47	0.0–0.47	0.0
Hepatitis A & B	#	0	0.25	0.0–0.25	0.0
Trachoma	#	0	0	0–0	0.0
Acute Lower Respiratory Infection	#	0.27	6.3	0.00–6.3	0.2
Measles	#	0	1.3	0.00–1.3	0.0
Malaria	#	0	14.2	0.00–14.2	0.6

21. Makati, Philippines

Makati		For All Surveyed Cities and Municipalities
Coordinator	Diana Jocelyn L. Vaño, M.D. (Makati Health Department) Danilo V. Villas (Department of Environmental Services) Officer-In-Charge	
Office	Makati Health Department	
Address	7/F New Makati City Hall Bldg., Jp Rizal St., Makati City	
Fax	632-8998916 / 8701783	
Telephone	632-8958962	
E-mail address	health@makati.gov.ph upd@makati.gov.ph des_makati@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	537.5	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.60	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	123.98	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	844.1	844.1	0 – 844.1	34.5	
Urban Poor	%	0.30	48.0	0 – 48.0	14.6	
City Area	ha (000)	2.7	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	21.8	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	16.6	59.7	0 – 59.7	13.5	
Urban Fringe	%	61.3	99.7	0 – 99.7	18.9	
Peri-Urban	%	0.0	98.5	0 – 98.5	34.9	
Slum Area	%	0.16	35.96	0 – 35.96	4.3	
Average City Density	#/ha	196.4	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	1,519.4	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	2.74	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	21.7	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	99.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	537.5	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	22.5	100.0	0 – 100.0	31.5	
Central Water Supply System	%	99.7	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	8.92	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	90.7	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.3	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	8.7	100.0	0–100.0	13.7
	Type Ia	%	0.2	88.9	0–88.9	9.3
	Type II	%	11.5	93.1	0–93.1	12.6
	Type IIa	%	79.2	100.0	0–100.0	32.2
	Type III	%	0.3	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9

Type IVa	%	–	31.9	0–31.9	5.6
Type V	%	–	–	–	0.0
Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	92.7	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	92.7	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	92.7	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	97.7	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	2.1	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0.3	96.4	0.0–96.4	10.3
Rainwater	%	8.4	20.0	0.0–20.0	8.1
Water Vendor	%	100	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	–	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	3	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	2	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6

Private Sector						
Total Personnel (per 10,000 pop,n)	#	30.96	30.96	12.3–30.96	1.4	
Operations and Maintenance	%	–	–	–	–	
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
National	#	7	7	1–4	1.9	
Local	#	2	3	1–3	1.2	
Year Enacted						
Oldest	Year	1974	2007	1947–2007	1985	
Latest	year	2011	2007	1956–2007	1993	
Sanitation Service Charges						
Law on Collecting Fees	Y/N	Y	17	7–17	–	
Year Enacted	year	1997	2007	1947–2007	1985	
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
With Sanitation Plan	Y/N	Y	11	11–27		
When Prepared	year	–	2007	2006–2011	2009	
New Sanitation Plan						
Will Prepare Sanitation Plan	Y/N	–				
Preparation Year	year	–	2020	2015–2020	2018	
Estimated Cost	\$	–	250	1.9–250.0	12.5	
Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1	
Source of Fund		–				
Sanitation Problem	Major Sanitation Problem	Lack of understanding and appreciation of local pollution laws.				
	Future Programs/Projects	Capacity building of deputized barangay officials				
	Funding Amount	\$/capita	–	24.1	0.96–24.1	1.0
	Funding Source		–			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
Annual Amount	\$/capita	–	168.0	0.5–168.0	10.3	
Source of Fund						
National Government	%	–	90.0	0.0–90.0	22.1	
Local Government	%	–	100.0	0.0–100.0	18.5	
Loans	%	–	99.0	0.0–99.0	15.7	
Tariff Revenue	%	–	0	0–0	0	
Others	%	–	100.0	0.0–100.0	9.0	
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
Annual Amount	\$/capita	–	8.3	0.01–8.3	0.7	
Source of Fund						
National Government	%	–	47.0	0–47	4.9	
Local Government	%	–	100.0	0–100	40.7	
Loans	%	–	53.0	0–53	3.4	
Tariff Revenue	%	–	100.0	0–100	14.3	
Others	%	–	0	0	0	
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
Total Revenue	\$/capita	–	15	0.3–15.0	0.9	
Sewered Area Charges						

Connection Charge	\$/connection	–	110	0.6–110.0	20.0
Tariff Rate	\$/m ³	–	90	0.015–90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	–	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	5	67	0–67	21.7
Household Liquid Waste	%	71	80	15–80	39.6
Industrial Waste	%	<1	38	0–38	8.4
Commercial Waste	%	20	35	0–35	8.5
Hospital Waste	%	<1	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	87	100	0–100	10.3
Central Sewer System	%	12	35	0–35	6.5
No Treatment	%	<1	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	Through septic tank and STP				
Within River Basin	Y/N	Y			
River Basin/Major River Name	Pamarisan river				
Basin Area	Ha	556	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	Cooperative			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	4.71	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0.13	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	78.78	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	9.07	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	0.11	0.47	0.0–0.47	0.0
Hepatitis A & B	#	0	0.25	0.0–0.25	0.0
Trachoma	#	0	0	0–0	0.0
Acute Lower Respiratory Infection	#	0.35	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	0.04	14.2	0.00–14.2	0.6

22. San Fernando, Philippines

San Fernando		For All Surveyed Cities and Municipalities
Coordinator	Valmar M. Valdez / Dr. Eduardo Posadas, City Environment and Natural Resources Officer	
Office	City Environment and Natural Resources Office	
Address	1st Flr, Marcos Building, City of San Fernando, La Union, Philippines	
Fax	630728886907	
Telephone	630728886901	
E-mail address	valmar_valdez@yahoo.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	114.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.63	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	24.85	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.6	7.6	3.2 – 7.6	4.9	
Floating Population	%	25.0	844.1	0 – 844.1	34.5	
Urban Poor	%	32.84	48.0	0 – 48.0	14.6	
City Area	ha (000)	10.5	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	21.5	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	0.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	0.0	99.7	0 – 99.7	18.9	
Peri-Urban	%	78.5	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	10.9	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	37.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	4.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	10.53	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	25.7	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	114.81	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	47.9	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	47.1	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	10.5	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	41.2	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.9	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	0	93.1	0–93.1	12.6
	Type IIa	%	47.1	100.0	0–100.0	32.2
	Type III	%	0	2.0	0–2.0	0.1
	Type IIIa	%	10.5	61.0	0–61.0	2.8
	Type IV	%	33.7	59.9	0–59.9	13.9
	Type IVa	%	7.74	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	0	40.6	0–40.6	1.4
Type VI & VIa	%	0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	17.4	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100.0	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100.0	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	100.0	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	47.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	49.2	54.5	0.0–54.5	14.1
Protected Spring/Well	%	3	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	–	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	4	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	2.09	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	–	–	–	–
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	4	7	1–4	1.9
	Local	#	2	3	1–3	1.2
Year Enacted						
	Oldest	year	1972	2007	1947–2007	1985
	Latest	year	2006	2007	1956–2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	N	17	7–17	–
	Year Enacted	year	–	2007	1947–2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	Y	11	11–27	
	When Prepared	year	–	2007	2006–2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	–			
	Preparation Year	year	–	2020	2015–2020	2018
	Estimated Cost	\$	–	250	1.9–250.0	12.5
	Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1
	Source of Fund		–			
Sanitation Problem	Major Sanitation Problem	Contamination of ground, surface, and coastal water				
	Future Programs/Projects	Provision of sanitary toilets and sanitation promotion				
	Funding Amount	\$/capita	0.96	24.1	0.96–24.1	1.0
	Funding Source	City government and loan				
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	1.2	168.0	0.5–168.0	10.3
Source of Fund						
	National Government	%	0	90.0	0.0–90.0	22.1
	Local Government	%	100	100.0	0.0–100.0	18.5
	Loans	%	0	99.0	0.0–99.0	15.7
	Tariff Revenue	%	0	0	0–0	0
	Others	%	0	100.0	0.0–100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	0.1	8.3	0.01–8.3	0.7
Source of Fund						
	National Government	%	0	47.0	0–47	4.9
	Local Government	%	100	100.0	0–100	40.7
	Loans	%	0	53.0	0–53	3.4
	Tariff Revenue	%	0	100.0	0–100	14.3
	Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	–	15	0.3–15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	–	110	0.6–110.0	20.0
	Tariff Rate	\$/m ³	–	90	0.015–90	0.3
	Septic Tank Desludging Fee					

Private	\$/ST	133	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	–	67	0–67	21.7
Household Liquid Waste	%	–	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description		–			
Within River Basin	Y/N	N			
River Basin/Major River Name		–			
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	58.88	594.14	0.75–594.14	50.1
Hepatitis A & B	#	2.35	6.83	0.13–6.86	3.0
Trachoma	#	0	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	250.84	507.79	0.32–507.79	153.9
Measles	#	0.61	4.45	0.00–4.45	0.3
Malaria	#	0	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

23. Cam Ranh, Vietnam

Cam Ranh		For All Surveyed Cities and Municipalities
Coordinator	Bui Ngoc Phuc, General Director	
Office	Cam Ranh Urban Works Join Stock Company	
Address	70 Nguyen Trong Ky, Cam Ranh City, Khanh Hoa Province, Vietnam	
Fax	84 583 855510	
Telephone	84 583 855079	
E-mail address	cadoco@gmail.com	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2010)	#(000)	215.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.80	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	47.96	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.5	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	15.03	48.0	0 – 48.0	14.6	
City Area	ha (000)	31.6	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	30.0	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	–	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	70.0	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	6.8	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	13.2	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	4.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	31.6	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	–	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	50.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	215.82	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	41.0	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	0.0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	62.0	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	25.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	13.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	0	93.1	0–93.1	12.6
	Type IIa	%	62	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	25	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	12	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	0.4	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100.0	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100.0	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	100.0	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	40.0	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	8.0	46.7	0.0–46.7	5.5
Borehole	%	40.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	12.0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	100.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	139.0	321.5	1.5–321.5	55.6
Local Government	%	0.0	100.0	0–100.0	47.5
National Government	%	100.0	100.0	0–100.0	26.5
Private Concessionaire	%	0.0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	–	–	–	–
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	2	7	1–4	1.9
	Local	#	1	3	1–3	1.2
Year Enacted						
	Oldest	year	2003	2007	1947–2007	1985
	Latest	year	2006	2007	1956–2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	Y	17	7–17	–
	Year Enacted	year	2003 & 2004	2007	1947–2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	N	11	11–27	
	When Prepared	year	–	2007	2006–2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	–			
	Preparation Year	year	2015	2020	2015–2020	2018
	Estimated Cost	\$	–	250	1.9–250.0	12.5
	Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1
	Source of Fund		–			
Sanitation Problem	Major Sanitation Problem					
	Future Programs/Projects		–			
	Funding Amount	\$/capita	–	24.1	0.96–24.1	1.0
	Funding Source		–			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	–	168.0	0.5–168.0	10.3
Source of Fund						
	National Government	%	60	90.0	0.0–90.0	22.1
	Local Government	%	40	100.0	0.0–100.0	18.5
	Loans	%	–	99.0	0.0–99.0	15.7
	Tariff Revenue	%	–	0	0–0	0
	Others	%	–	100.0	0.0–100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	–	8.3	0.01–8.3	0.7
Source of Fund						
	National Government	%	30	47.0	0–47	4.9
	Local Government	%	70	100.0	0–100	40.7
	Loans	%	–	53.0	0–53	3.4
	Tariff Revenue	%	–	100.0	0–100	14.3
	Others	%	–	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	–	15	0.3–15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	100.0	110	0.6–110.0	20.0
	Tariff Rate	\$/m3	0.015	90	0.015–90	0.3
	Septic Tank Desludging Fee					

Private	\$/ST	25	133	4–133	9.9
Government	\$/ST	0	100	0–100	23.9
Other Fees	\$	0	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	32	80	15–80	39.6
Industrial Waste	%	12	38	0–38	8.4
Commercial Waste	%	20	35	0–35	8.5
Hospital Waste	%	10	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	35	35	0–35	6.5
No Treatment	%	22	100	0–100	36.5
Others	%	43	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	N			
River Basin/Major River Name	–				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	14/ 100ml	22000#/ 100ml	<1– 22000	
BOD	mg/l	1.28	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	14.2	14.2	0.00–14.2	0.6

24. Ho Chi Minh, Vietnam

Ho Chi Minh		For All Surveyed Cities and Municipalities
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Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	6,651.0	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	3.20	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	1,602.64	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	3.75	48.0	0 – 48.0	14.6	
City Area	ha (000)	209.5	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	23.4	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	0	59.7	0 – 59.7	13.5	
Urban Fringe	%	0	99.7	0 – 99.7	18.9	
Peri-Urban	%	76.4	98.5	0 – 98.5	34.9	
Slum Area	%	0.16	35.96	0 – 35.96	4.3	
Average City Density	#/ha	31.7	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	108.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	7.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	732.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	209.50	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	31.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	45.6	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	6,651.00	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	–	100.0	0 – 100.0	31.5	
Central Water Supply System	%	37.5	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	0	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	0	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	–	100.0	0–100.0	13.7	
Type Ia	%	–	88.9	0–88.9	9.3	
Type II	%	–	93.1	0–93.1	12.6	
Type IIa	%	–	100.0	0–100.0	32.2	
Type III	%	–	2.0	0–2.0	0.1	
Type IIIa	%	–	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	212	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	37.5	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	–	46.7	0.0–46.7	5.5
Borehole	%	–	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	Lpcd	150.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	18.6	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	6	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	–	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-	
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
National	#	1	7	1-4	1.9	
Local	#	3	3	1-3	1.2	
Year Enacted						
Oldest	year	2006	2007	1947-2007	1985	
Latest	year	2007	2007	1956-2007	1993	
Sanitation Service Charges						
Law on Collecting Fees	Y/N	Y	17	7-17	-	
Year Enacted	year	2003	2007	1947-2007	1985	
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
With Sanitation Plan	Y/N	Y	11	11-27		
When Prepared	year	-	2007	2006-2011	2009	
New Sanitation Plan						
Will Prepare Sanitation Plan	Y/N	-				
Preparation Year	year	-	2020	2015-2020	2018	
Estimated Cost	\$	-	250	1.9-250.0	12.5	
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1	
Source of Fund		-				
Sanitation Problem	Major Sanitation Problem	Wastewater discharged into canals and rivers				
	Future Programs/Projects		-			
	Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
	Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3	
Source of Fund						
National Government	%	0	90.0	0.0-90.0	22.1	
Local Government	%	0	100.0	0.0-100.0	18.5	
Loans	%	0	99.0	0.0-99.0	15.7	
Tariff Revenue	%	0	0	0-0	0	
Others	%	100	100.0	0.0-100.0	9.0	
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
Annual Amount	\$/capita	0.9	8.3	0.01-8.3	0.7	
Source of Fund						
National Government	%	0	47.0	0-47	4.9	
Local Government	%	100	100.0	0-100	40.7	
Loans	%	0	53.0	0-53	3.4	
Tariff Revenue	%	0	100.0	0-100	14.3	
Others	%	0	0	0	0	
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
Total Revenue	\$/capita	-	15	0.3-15.0	0.9	
Sewered Area Charges						
Connection Charge	\$/connection	-	110	0.6-110.0	20.0	
Tariff Rate	\$/m3	-	90	0.015-90	0.3	
Septic Tank Desludging Fee						
Private	\$/ST	-	133	4-133	9.9	

Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	5	67	0–67	21.7
Household Liquid Waste	%	60	80	15–80	39.6
Industrial Waste	%	25	38	0–38	8.4
Commercial Waste	%	5	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	80	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	20	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Sai Gon– Dong Nai				
Basin Area	ha	4,826,800	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	Heavy			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	22000 MPN/100ml	22000#/100ml	<1– 22000	
BOD	mg/l	4.5	180	1.28–180.0	18.7
COD	mg/l	10.8	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	261.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	10.10	594.14	0.75–594.14	50.1
Hepatitis A & B	#	0.22	6.83	0.13–6.86	3.0
Trachoma	#	0.30	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	507.79	507.79	0.32–507.79	153.9
Measles	#	0	4.45	0.00–4.45	0.3
Malaria	#	0.09	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	0	0.47	0.0–0.47	0.0
Hepatitis A & B	#	0	0.25	0.0–0.25	0.0
Trachoma	#	0	0	0–0	0.0
Acute Lower Respiratory Infection	#	0.01	6.3	0.00–6.3	0.2
Measles	#	0	1.3	0.00–1.3	0.0
Malaria	#	0	14.2	0.00–14.2	0.6

25. Hue, Vietnam

Hue		For All Surveyed Cities and Municipalities
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Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	327.8	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.25	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	64.20	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.1	7.6	3.2 – 7.6	4.9	
Floating Population	%	20.0	844.1	0 – 844.1	34.5	
Urban Poor	%	30.0	48.0	0 – 48.0	14.6	
City Area	ha (000)	7.1	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	69.7	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	14.1	59.7	0 – 59.7	13.5	
Urban Fringe	%	9.1	99.7	0 – 99.7	18.9	
Peri-Urban	%	6.4	98.5	0 – 98.5	34.9	
Slum Area	%	0.70	35.96	0 – 35.96	4.3	
Average City Density	#/ha	46.1	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	60.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	50.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	20.0	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	30.0	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	40.0	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	209.50	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	31.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	45.6	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	6,651.00	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	–	100.0	0 – 100.0	31.5	
Central Water Supply System	%	37.5	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	50.0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	37.6	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0.1	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	0.0	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	12.0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	24	100.0	0–100.0	13.7	
Type Ia	%	26	88.9	0–88.9	9.3	
Type II	%	15	93.1	0–93.1	12.6	
Type IIa	%	22.6	100.0	0–100.0	32.2	
Type III	%	0.1	2.0	0–2.0	0.1	
Type IIIa	%	0	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	0	22.5	0–22.5	7.5
Type VIb	%	12	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	–	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	91.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	6.1	46.7	0.0–46.7	5.5
Borehole	%	2	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	15	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	45.8	321.5	1.5–321.5	55.6
Local Government	%	–	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	–	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	36.3	21.67	0.4–21.67	9.0
Planning and Monitoring	%	43.7	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	-	3	1-3	1.2
Year Enacted					
Oldest	year	2005	2007	1947-2007	1985
Latest	year	2005	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	Y	17	7-17	-
Year Enacted	year	2007	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	N	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	Year	-	2020	2015-2020	2018
Estimated Cost	\$	250.0	250	1.9-250.0	12.5
Amount per Capita	\$/capita	762.7	762.7	0.7-762.7	32.1
Source of Fund	list	JBIC			
Sanitation Problem	Major Sanitation Problem	Rivers/lakes water pollution			
	Future Programs/Projects	-			
	Funding Amount	\$/capita	24.1	0.96-24.1	1.0
	Funding Source	-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	3.7	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	0	90.0	0.0-90.0	22.1
Local Government	%	0	100.0	0.0-100.0	18.5
Loans	%	0	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	100	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	3.7	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	10	47.0	0-47	4.9
Local Government	%	10	100.0	0-100	40.7
Loans	%	50	53.0	0-53	3.4
Tariff Revenue	%	30	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	9.2	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m3	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	4.0	133	4-133	9.9
Government	\$/ST	3.5	100	0-100	23.9

Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	50	67	0–67	21.7
Household Liquid Waste	%	36	80	15–80	39.6
Industrial Waste	%	5	38	0–38	8.4
Commercial Waste	%	5	35	0–35	8.5
Hospital Waste	%	4	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	7	100	0–100	10.3
Central Sewer System	%	23	35	0–35	6.5
No Treatment	%	60	100	0–100	36.5
Others	%	10	50	0–50	10.4
Description		–			
Within River Basin	Y/N	Y			
River Basin/Major River Name		Perfume river			
Basin Area	Ha	5,000	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	5000 MPN/100ml	22000#/100ml	<1– 22000	
BOD	mg/l	15.0	180	1.28–180.0	18.7
COD	mg/l	7.1	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	60.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	0.03	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	7.23	594.14	0.75–594.14	50.1
Hepatitis A & B	#	6.86	6.83	0.13–6.86	3.0
Trachoma	#	3.51	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	3.23	507.79	0.32–507.79	153.9
Measles	#	4.45	4.45	0.00–4.45	0.3
Malaria	#	3.54	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	0.03	0.47	0.0–0.47	0.0
Hepatitis A & B	#	0	0.25	0.0–0.25	0.0
Trachoma	#	0	0	0–0	0.0
Acute Lower Respiratory Infection	#	0	6.3	0.00–6.3	0.2
Measles	#	0.03	1.3	0.00–1.3	0.0
Malaria	#	0	14.2	0.00–14.2	0.6

26. Song Cau, Vietnam

Song Cau		For All Surveyed Cities and Municipalities
Coordinator	Nguyen Phu, General Director, PMU Manager	
Office	Phu Yen Water Supply and Drainage OMLL Company	
Address	Highway no.25, Binh Ngoc commune, Tuy Hoa city, Phu Yen, Vietnam	
Fax	84 57 828388	
Telephone	84 57 825710/ 827058/ 823000	
E-mail address	bqlpy@yahoo.vn	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	125.3	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.40	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	25.00	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	1.66	48.0	0 – 48.0	14.6	
City Area	ha (000)	42.2	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	40.3	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	–	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	59.7	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	2.7	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	–	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	46.25	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	61.9	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	50.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	125.31	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	70.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	65.8	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	70.0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	70.0	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	25.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	5.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	70.0	93.1	0–93.1	12.6
	Type IIa	%	–	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	25.0	59.9	0–59.9	13.9
	Type IVa	%	0	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	5.0	22.5	0–22.5	7.5
Type VIb	%	0	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	–	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	50	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	50	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Desludging Services					
Frequency	Year	5	12.0	0–12.0	0.6
Provider					
Government	%	50	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	65.8	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	34.2	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	–	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	80	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	23.9	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	–	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	16	21.67	0.4–21.67	9.0
Planning and Monitoring	%	10	100	5–100	11.8
Construction	%	30	100	6–100	8.9
Operations and Maintenance	%	60	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	–	–	–	–
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	2	7	1–4	1.9
	Local	#	1	3	1–3	1.2
Year Enacted						
	Oldest	year	2003	2007	1947–2007	1985
	Latest	year	2007	2007	1956–2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	Y	17	7–17	–
	Year Enacted	year	2003	2007	1947–2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	N	11	11–27	
	When Prepared	year	–	2007	2006–2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	–			
	Preparation Year	year	–	2020	2015–2020	2018
	Estimated Cost	\$	–	250	1.9–250.0	12.5
	Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1
	Source of Fund		–			
Sanitation Problem	Major Sanitation Problem					
	Future Programs/Projects					
	Funding Amount	\$/capita	–	24.1	0.96–24.1	1.0
	Funding Source		–			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	–	168.0	0.5–168.0	10.3
Source of Fund						
	National Government	%	–	90.0	0.0–90.0	22.1
	Local Government	%	–	100.0	0.0–100.0	18.5
	Loans	%	–	99.0	0.0–99.0	15.7
	Tariff Revenue	%	–	0	0–0	0
	Others	%	–	100.0	0.0–100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	–	8.3	0.01–8.3	0.7
Source of Fund						
	National Government	%	30	47.0	0–47	4.9
	Local Government	%	70	100.0	0–100	40.7
	Loans	%	–	53.0	0–53	3.4
	Tariff Revenue	%	–	100.0	0–100	14.3
	Others	%	–	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	–	15	0.3–15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	110	110	0.6–110.0	20.0
	Tariff Rate	\$/m3	0.015	90	0.015–90	0.3
	Septic Tank Desludging Fee					

Private	\$/ST	25.0	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	10	67	0–67	21.7
Household Liquid Waste	%	32	80	15–80	39.6
Industrial Waste	%	20	38	0–38	8.4
Commercial Waste	%	10	35	0–35	8.5
Hospital Waste	%	10	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	35	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	22	100	0–100	36.5
Others	%	43	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	N			
River Basin/Major River Name	–				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	–			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	1.28	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	1.84	14.2	0.00–14.2	0.6

27. Thap Cham, Vietnam

Thap Cham		For All Surveyed Cities and Municipalities
Coordinator	Pham Hong Chau, General Director	
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Demographics	Unit	City Value	Top Value	Range	Average	
Population (2011)	#(000)	161.7	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	1.50	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	32.35	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	5.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	0	844.1	0 – 844.1	34.5	
Urban Poor	%	10.36	48.0	0 – 48.0	14.6	
City Area	ha (000)	7.9	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	94.5	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	–	59.7	0 – 59.7	13.5	
Urban Fringe	%	–	99.7	0 – 99.7	18.9	
Peri-Urban	%	5.7	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	20.5	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	20.5	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	20.5	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	7.89	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	98.0	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	90.0	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	161.78	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	100.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	69.9	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	–	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	29.9	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	–	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	50.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	–	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	20.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	–	100.0	0–100.0	13.7
	Type Ia	%	–	88.9	0–88.9	9.3
	Type II	%	29.9	93.1	0–93.1	12.6
	Type IIa	%	–	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	59.9	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	20.0	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	217.3	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	50	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	50	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	50	100.0	0–100.0	8.7
Private	%	20	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	69.9	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	25.0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	–	96.4	0.0–96.4	10.3
Rainwater	%	–	20.0	0.0–20.0	8.1
Water Vendor	%	5.0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	120.0	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	321.5	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	–	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	1	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	10.5	21.67	0.4–21.67	9.0
Planning and Monitoring	%	10	100	5–100	11.8
Construction	%	30	100	6–100	8.9
Operations and Maintenance	%	60	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	2	7	1-4	1.9
	Local	#	1	3	1-3	1.2
Year Enacted						
	Oldest	year	2003	2007	1947-2007	1985
	Latest	year	2007	2007	1956-2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	Y	17	7-17	-
	Year Enacted	year	2003	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	N	11	11-27	
	When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	-			
	Preparation Year	year	-	2020	2015-2020	2018
	Estimated Cost	\$	-	250	1.9-250.0	12.5
	Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
	Source of Fund		-			
Sanitation Problem	Major Sanitation Problem	Unhygienic sanitary facilities				
	Future Programs/Projects	North Dhaka East Sewerage treatment plant and associated works				
	Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
	Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	-	168.0	0.5-168.0	10.3
Source of Fund						
	National Government	%	60	90.0	0.0-90.0	22.1
	Local Government	%	40	100.0	0.0-100.0	18.5
	Loans	%	-	99.0	0.0-99.0	15.7
	Tariff Revenue	%	-	0	0-0	0
	Others	%	-	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund						
	National Government	%	30	47.0	0-47	4.9
	Local Government	%	70	100.0	0-100	40.7
	Loans	%	-	53.0	0-53	3.4
	Tariff Revenue	%	-	100.0	0-100	14.3
	Others	%	-	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	-	15	0.3-15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	110.0	110	0.6-110.0	20.0
	Tariff Rate	\$/m ³	0.015	90	0.015-90	0.3

Septic Tank Desludging Fee					
Private	\$/ST	25	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	0	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	26	67	0–67	21.7
Household Liquid Waste	%	30	80	15–80	39.6
Industrial Waste	%	13	38	0–38	8.4
Commercial Waste	%	31	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	35	35	0–35	6.5
No Treatment	%	65	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	Through septic tank				
Within River Basin	Y/N	Y			
River Basin/Major River Name	–				
Basin Area	ha	–	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	–			
Adjoining Town					
Pollution Load	vh–vl	Low			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

28. Jinghong, PR China

Jinghong		For All Surveyed Cities and Municipalities			
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Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	376.0	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	0.40	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	125.33	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	10.6	844.1	0 – 844.1	34.5	
Urban Poor	%	0	48.0	0 – 48.0	14.6	
City Area	ha (000)	700.3	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	0.3	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	0.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	99.7	99.7	0 – 99.7	18.9	
Peri-Urban	%	0.0	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	0.5	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	76.7	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	0.3	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	700.31	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	0.3	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	0.3	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	376.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	3.6	100.0	0 – 100.0	31.5	
Central Water Supply System	%	3.6	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	4	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	0	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	0	100.0	0–100.0	13.7
	Type Ia	%	4	88.9	0–88.9	9.3
	Type II	%	47	93.1	0–93.1	12.6
	Type IIa	%	–	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	25	59.9	0–59.9	13.9
	Type IVa	%	21	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	5	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	664.9	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	3.6	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	96.4	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	13.3	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	1	4	1–4	1.3
State– Owned Utility	#	2	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	9.76	21.67	0.4–21.67	9.0
Planning and Monitoring	%	23.4	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	76.6	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	–	–	–	–
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	3	7	1–4	1.9
	Local	#	–	3	1–3	1.2
Year Enacted						
	Oldest	year	2001	2007	1947–2007	1985
	Latest	year	2005	2007	1956–2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	N	17	7–17	–
	Year Enacted	year	–	2007	1947–2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	Y	11	11–27	
	When Prepared	year	–	2007	2006–2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	–			
	Preparation Year	year	–	2020	2015–2020	2018
	Estimated Cost	\$	–	250	1.9–250.0	12.5
	Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1
	Source of Fund		–			
Sanitation Problem	Major Sanitation Problem	Increase in pollution due to increased				
	Future Programs/Projects		–			
	Funding Amount	\$/capita	–	24.1	0.96–24.1	1.0
	Funding Source		–			
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	–	168.0	0.5–168.0	10.3
Source of Fund						
	National Government	%	–	90.0	0.0–90.0	22.1
	Local Government	%	–	100.0	0.0–100.0	18.5
	Loans	%	60	99.0	0.0–99.0	15.7
	Tariff Revenue	%	–	0	0–0	0
	Others	%	–	100.0	0.0–100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	–	8.3	0.01–8.3	0.7
Source of Fund						
	National Government	%	–	47.0	0–47	4.9
	Local Government	%	–	100.0	0–100	40.7
	Loans	%	–	53.0	0–53	3.4
	Tariff Revenue	%	–	100.0	0–100	14.3
	Others	%	–	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	–	15	0.3–15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	–	110	0.6–110.0	20.0
	Tariff Rate	\$/m3	–	90	0.015–90	0.3
	Septic Tank Desludging Fee					

Private	\$/ST	–	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	12	67	0–67	21.7
Household Liquid Waste	%	38	80	15–80	39.6
Industrial Waste	%	34	38	0–38	8.4
Commercial Waste	%	11	35	0–35	8.5
Hospital Waste	%	5	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	–	100	0–100	10.3
Central Sewer System	%	–	35	0–35	6.5
No Treatment	%	–	100	0–100	36.5
Others	%	–	50	0–50	10.4
Description	List	–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Lancang River, Liusha River				
Basin Area	ha	709,300	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Downstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	40 #/ ml	22000#/100ml	<1– 22000	
BOD	mg/l	180.0	180	1.28–180.0	18.7
COD	mg/l	360.0	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	250.0	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

29. Kunming, PR China

Kunming		For All Surveyed Cities and Municipalities
Coordinator	He Xingmin, Director General	
Office	Kunming Municipal Environment Protection Bureau	
Address	No 52 North of Xiyuan Road, Kunming City, Yunnan, People's Republic of China	
Fax		
Telephone		
E-mail address		

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	6,155.6	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	0.62	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	1,531.94	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	4.0	7.6	3.2 – 7.6	4.9	
Floating Population	%	18.1	844.1	0 – 844.1	34.5	
Urban Poor	%	1.34	48.0	0 – 48.0	14.6	
City Area	ha (000)	2,101.2	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	0.5	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	1.0	59.7	0 – 59.7	13.5	
Urban Fringe	%	0	99.7	0 – 99.7	18.9	
Peri-Urban	%	98.5	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	2.9	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	163.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	24.0	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	1.9	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	2,101.2	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	0.4	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	0.9	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	6,080.0	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	100.0	100.0	0 – 100.0	31.5	
Central Water Supply System	%	90.8	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
	I. Central Sewerage System	%	100.0	100.0	0.0–100.0	27.3
	II. Individual with Septic Tank	%	0.0	100.0	0.0–100.0	44.0
	III. Communal with Septic Tank	%	0.0	10.5	0.0–10.5	0.9
	IV. Pit Latrine	%	0.0	59.9	0.0–59.9	13.9
	V. Eco Sanitation	%	0.0	0.9	0.0–0.9	0.0
	VI. Open Defecation	%	0.0	61.0	0.0–61.0	7.3
	Toilet System					
	Type I	%	100.0	100.0	0–100.0	13.7
	Type Ia	%	0	88.9	0–88.9	9.3
	Type II	%	–	93.1	0–93.1	12.6
	Type IIa	%	–	100.0	0–100.0	32.2
	Type III	%	–	2.0	0–2.0	0.1
	Type IIIa	%	–	61.0	0–61.0	2.8
	Type IV	%	–	59.9	0–59.9	13.9
	Type IVa	%	–	31.9	0–31.9	5.6
	Type V	%	–	–	–	0.0

Type Va	%	–	40.6	0–40.6	1.4
Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	962.2	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	–	12.0	0–12.0	0.6
Provider					
Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	90.8	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	0	54.5	0.0–54.5	14.1
Protected Spring/Well	%	9.2	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	19.7	321.5	1.5–321.5	55.6
Local Government	%	100.0	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	3	4	1–4	1.3
State– Owned Utility	#	1	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	–	21.67	0.4–21.67	9.0
Planning and Monitoring	%	–	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	–	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000	#	–	30.96	12.3–30.96	1.4

	pop,n)					
	Operations and Maintenance	%	–	–	–	–
Legal Framework	Unit	City Value	Top Value	Range	Average	
Legal Mandate of Sanitation						
Number of Laws on Sanitation						
	National	#	3	7	1–4	1.9
	Local	#	1	3	1–3	1.2
Year Enacted						
	Oldest	year	1984	2007	1947–2007	1985
	Latest	year	2002	2007	1956–2007	1993
Sanitation Service Charges						
	Law on Collecting Fees	Y/N	Y	17	7–17	–
	Year Enacted	year	2002	2007	1947–2007	1985
Planning	Unit	City Value	Top Value	Range	Average	
Strategic Sanitation Plan						
Existing Sanitation Plan						
	With Sanitation Plan	Y/N	Y	11	11–27	
	When Prepared	year	–	2007	2006–2011	2009
New Sanitation Plan						
	Will Prepare Sanitation Plan	Y/N	–			
	Preparation Year	year	–	2020	2015–2020	2018
	Estimated Cost	\$	–	250	1.9–250.0	12.5
	Amount per Capita	\$/capita	–	762.7	0.7–762.7	32.1
	Source of Fund		–			
Sanitation Problem	Major Sanitation Problem					
	Future Programs/Projects					
	Funding Amount	\$/capita	1.79	24.1	0.96–24.1	1.0
	Funding Source					
Capital Investment	Unit	City Value	Top Value	Range	Average	
Annual Capital Investment						
	Annual Amount	\$/capita	–	168.0	0.5–168.0	10.3
Source of Fund						
	National Government	%	0	90.0	0.0–90.0	22.1
	Local Government	%	30	100.0	0.0–100.0	18.5
	Loans	%	0	99.0	0.0–99.0	15.7
	Tariff Revenue	%	0	0	0–0	0
	Others	%	70	100.0	0.0–100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average	
Annual O&M Cost						
	Annual Amount	\$/capita	–	8.3	0.01–8.3	0.7
Source of Fund						
	National Government	%	0	47.0	0–47	4.9
	Local Government	%	10	100.0	0–100	40.7
	Loans	%	0	53.0	0–53	3.4
	Tariff Revenue	%	90	100.0	0–100	14.3
	Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average	
Annual Revenues and Fees						
	Total Revenue	\$/capita	–	15	0.3–15.0	0.9
Sewered Area Charges						
	Connection Charge	\$/connection	–	110	0.6–110.0	20.0
	Tariff Rate	\$/m ³	–	90	0.015–90	0.3
	Septic Tank Desludging Fee					

Private	\$/ST	–	133	4–133	9.9
Government	\$/ST	–	100	0–100	23.9
Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	0	67	0–67	21.7
Household Liquid Waste	%	50	80	15–80	39.6
Industrial Waste	%	10	38	0–38	8.4
Commercial Waste	%	0	35	0–35	8.5
Hospital Waste	%	0	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	100	100	0–100	10.3
Central Sewer System	%	0	35	0–35	6.5
No Treatment	%	0	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	List	–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Jinsha river				
Basin Area	Ha	292,000	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Upstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	–			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	10.7	180	1.28–180.0	18.7
COD	mg/l	67.4	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

30. Puer, PR China

Puer		For All Surveyed Cities and Municipalities
Coordinator	Yin Lu	
Office	Pure Water Supply Plant	
Address		
Fax		
Telephone		
E-mail address	liren.6666@yahoo.com.cn	

Demographics	Unit	City Value	Top Value	Range	Average	
Population (2007)	#(000)	265.6	11,000.00	21.7 – 11,000.0	1200.3	
Growth Rate	%	0.60	7.10	0.35 – 7.10	2.6	
Number of Households	#(000)	78.90	2,301.30	2.86 – 2,301.26	256.4	
Average Household Size	#	3.2	7.6	3.2 – 7.6	4.9	
Floating Population	%	5.7	844.1	0 – 844.1	34.5	
Urban Poor	%	2.69	48.0	0 – 48.0	14.6	
City Area	ha (000)	22.7	2,101.20	2.7 – 2,101.2	114.6	
Urban Core	%	16.7	94.5	0.3 – 94.5	21.6	
Secondary Urban Core	%	17.7	59.7	0 – 59.7	13.5	
Urban Fringe	%	44.4	99.7	0 – 99.7	18.9	
Peri-Urban	%	21.1	98.5	0 – 98.5	34.9	
Slum Area	%	–	35.96	0 – 35.96	4.3	
Average City Density	#/ha	11.3	305.6	0.5 – 305.6	54.7	
Urban Core	#/ha	39.0	426.0	6 – 426.0	73.5	
Secondary Urban Core	#/ha	–	184.0	4.0 – 184.0	29.2	
Urban Fringe	#/ha	–	133.0	3.0 – 133.0	17.3	
Peri-Urban	#/ha	–	110.0	0.3 – 110.0	11.5	
Slum Area	#/ha	–	1,519.4	20.0 – 1,519.4	120.7	
Sanitation Coverage	Unit	City Value	Top Value	Range	Average	
Area Coverage	('000) ha	22.70	2,101.20	0.8 – 2,101.20	114.6	
Central Sewerage System	%	18.5	100.0	0.0 – 100.0	26.9	
Central Water Supply System	%	9.6	100.0	0.5 – 100.0	60.8	
Population Coverage	('000) ha	256.23	11,000.0	21.7 – 11,000.00	1,181.3	
Central Sewerage System	%	57.2	100.0	0 – 100.0	31.5	
Central Water Supply System	%	57.2	99.7	3.6 – 99.7	70.9	
Sanitation Facility	Sanitation System Type	Unit	City Value	Top Value	Range	Average
I. Central Sewerage System	%	57.0	100.0	0.0–100.0	27.3	
II. Individual with Septic Tank	%	42.8	100.0	0.0–100.0	44.0	
III. Communal with Septic Tank	%	0.1	10.5	0.0–10.5	0.9	
IV. Pit Latrine	%	0	59.9	0.0–59.9	13.9	
V. Eco Sanitation	%	0	0.9	0.0–0.9	0.0	
VI. Open Defecation	%	0	61.0	0.0–61.0	7.3	
Toilet System						
Type I	%	57	100.0	0–100.0	13.7	
Type Ia	%	0	88.9	0–88.9	9.3	
Type II	%	42.8	93.1	0–93.1	12.6	
Type IIa	%	0	100.0	0–100.0	32.2	
Type III	%	0.1	2.0	0–2.0	0.1	
Type IIIa	%	0	61.0	0–61.0	2.8	
Type IV	%	–	59.9	0–59.9	13.9	
Type IVa	%	–	31.9	0–31.9	5.6	
Type V	%	–	–	–	0.0	
Type Va	%	–	40.6	0–40.6	1.4	

Type VI & VIa	%	–	22.5	0–22.5	7.5
Type VIb	%	–	12.0	0–12.0	0.4
Treatment Facility	Unit	City Value	Top Value	Range	Average
Waste Water Treatment Plant					
Capacity (10,000 population)	m3/d	780.5	1,190.0	0.4 – 1,190.0	201.3
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Septage Treatment Plant					
Capacity	m3/d	–	135.0	50–135.0	6.2
Provider					
Local Government	%	100	100.0	0–100.0	57.7
National Government	%	–	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Desludging Services					
Frequency	year	12	12.0	0–12.0	0.6
Provider					
Government	%	100	100.0	0–100.0	8.7
Private	%	–	92.7	0–92.7	4.7
Water Supply Facility	Unit	City Value	Top Value	Range	Average
Household Water Supply Source					
Central Water Supply–Individual	%	57.2	95.0	3.60–95.0	64.5
Central Water Supply–Communal	%	0	46.7	0.0–46.7	5.5
Borehole	%	42.8	54.5	0.0–54.5	14.1
Protected Spring/Well	%	0	96.4	0.0–96.4	10.3
Rainwater	%	0	20.0	0.0–20.0	8.1
Water Vendor	%	0	35.0	0.0–35.0	5.1
Population Buying Bottled Water	%	–	80.0	0–80.0	12.9
Average Water Consumption	lpcd	–	160.0	29–160.0	72.1
Water Treatment Facilities	lpcd	13.7	321.5	1.5–321.5	55.6
Local Government	%	100	100.0	0–100.0	47.5
National Government	%	0	100.0	0–100.0	26.5
Private Concessionaire	%	0	100.0	0–100.0	9.3
Organizational Arrangement	Unit	City Value	Top Value	Range	Average
Institutions Involved in Sanitation					
Public Sector					
National Government	#	–	6	1–6	0.5
Local Government	#	2	4	1–4	1.3
State– Owned Utility	#	2	2	1–2	0.5
Private Sector					
Water Utility	#	–	2	0–2	0.1
Enterprise	#	–	1	0–2	0.1
Nongovernment Organization	#	–	2	0–2	0.1
Number of Personnel					
Public Sector					
Total Personnel (per 10,000 pop'n)	#	10.15	21.67	0.4–21.67	9.0
Planning and Monitoring	%	12.7	100	5–100	11.8
Construction	%	–	100	6–100	8.9
Operations and Maintenance	%	87.3	100	50–100.0	23.6
Private Sector					
Total Personnel (per 10,000 pop,n)	#	–	30.96	12.3–30.96	1.4

Operations and Maintenance	%	-	-	-	-
Legal Framework	Unit	City Value	Top Value	Range	Average
Legal Mandate of Sanitation					
Number of Laws on Sanitation					
National	#	1	7	1-4	1.9
Local	#	1	3	1-3	1.2
Year Enacted					
Oldest	year	1994	2007	1947-2007	1985
Latest	year	2002	2007	1956-2007	1993
Sanitation Service Charges					
Law on Collecting Fees	Y/N	N	17	7-17	-
Year Enacted	year	-	2007	1947-2007	1985
Planning	Unit	City Value	Top Value	Range	Average
Strategic Sanitation Plan					
Existing Sanitation Plan					
With Sanitation Plan	Y/N	Y	11	11-27	
When Prepared	year	-	2007	2006-2011	2009
New Sanitation Plan					
Will Prepare Sanitation Plan	Y/N	-			
Preparation Year	year	-	2020	2015-2020	2018
Estimated Cost	\$	-	250	1.9-250.0	12.5
Amount per Capita	\$/capita	-	762.7	0.7-762.7	32.1
Source of Fund		-			
Sanitation Problem					
Major Sanitation Problem		-			
Future Programs/Projects		-			
Funding Amount	\$/capita	-	24.1	0.96-24.1	1.0
Funding Source		-			
Capital Investment	Unit	City Value	Top Value	Range	Average
Annual Capital Investment					
Annual Amount	\$/capita	27.9	168.0	0.5-168.0	10.3
Source of Fund					
National Government	%	47	90.0	0.0-90.0	22.1
Local Government	%	0	100.0	0.0-100.0	18.5
Loans	%	53	99.0	0.0-99.0	15.7
Tariff Revenue	%	0	0	0-0	0
Others	%	0	100.0	0.0-100.0	9.0
Operations and Maintenance Expenditures	Unit	City Value	Top Value	Range	Average
Annual O&M Cost					
Annual Amount	\$/capita	-	8.3	0.01-8.3	0.7
Source of Fund					
National Government	%	47	47.0	0-47	4.9
Local Government	%	0	100.0	0-100	40.7
Loans	%	53	53.0	0-53	3.4
Tariff Revenue	%	0	100.0	0-100	14.3
Others	%	0	0	0	0
Revenues and Fees for Services	Unit	City Value	Top Value	Range	Average
Annual Revenues and Fees					
Total Revenue	\$/capita	3.2	15	0.3-15.0	0.9
Sewered Area Charges					
Connection Charge	\$/connection	-	110	0.6-110.0	20.0
Tariff Rate	\$/m ³	-	90	0.015-90	0.3
Septic Tank Desludging Fee					
Private	\$/ST	0	133	4-133	9.9
Government	\$/ST	-	100	0-100	23.9

Other Fees	\$	–	30	0–30	3.6
Environmental Situation	Unit	City Value	Top Value	Range	Average
Water Quality and Pollution					
Water Quality Monitored	Y/N	Y			
Sources of Water Pollution					
Household Solid Waste	%	–	67	0–67	21.7
Household Liquid Waste	%	–	80	15–80	39.6
Industrial Waste	%	–	38	0–38	8.4
Commercial Waste	%	–	35	0–35	8.5
Hospital Waste	%	–	17	0–17	2.5
<i>Polluter to Treat Own Wastewater</i>	Y/N	Y			
Current Wastewater Disposal					
Own Treatment Plant	%	0	100	0–100	10.3
Central Sewer System	%	29	35	0–35	6.5
No Treatment	%	71	100	0–100	36.5
Others	%	0	50	0–50	10.4
Description	List	–			
Within River Basin	Y/N	Y			
River Basin/Major River Name	Langcang river				
Basin Area	ha	5,000	4,939,800	75.15–4,939,800	360,567.7
City Location	u,m,d	Midstream			
Adjoining Town					
Pollution Load	vh–vl	Medium			
Sanitation Work/Plan	i/c	Individual			
Environmental Statistics	Unit	City Value	Top Value	Range	Average
Water Quality – Surface Water					
Total Coliform	#/ml	–	22000#/100ml	<1– 22000	
BOD	mg/l	–	180	1.28–180.0	18.7
COD	mg/l	–	973	7.1–973.0	72.4
Total Suspended Solids	mg/l	–	261	1.0–261.0	49.6
Heavy Metals	mg/l	–	16.7	0.25–16.7	0.6
Health Statistics	Unit	City Value	Top Value	Range	Average
Sanitation– Related Diseases					
Reported Cases (per 10,000 population)					
Diarrhea	#	–	594.14	0.75–594.14	50.1
Hepatitis A & B	#	–	6.83	0.13–6.86	3.0
Trachoma	#	–	294.55	0.00–294.55	20.1
Acute Lower Respiratory Infection	#	–	507.79	0.32–507.79	153.9
Measles	#	–	4.45	0.00–4.45	0.3
Malaria	#	–	–	0.0–3.54	0.7
Death (children under 5 years) (per 10,000 population)					
Diarrhea	#	–	0.47	0.0–0.47	0.0
Hepatitis A & B	#	–	0.25	0.0–0.25	0.0
Trachoma	#	–	0	0–0	0.0
Acute Lower Respiratory Infection	#	–	6.3	0.00–6.3	0.2
Measles	#	–	1.3	0.00–1.3	0.0
Malaria	#	–	14.2	0.00–14.2	0.6

APPENDIX

Sanitation Data Book for Asian Cities: Questionnaire

Name of City: _____

Country: _____

<i>City Demographics</i>		
<i>Land Area (ha)</i>	<i>Population</i> ... Year :	<i>Population Density (#/ha)</i>
Total City Area <i>City Area Breakdown:</i> Urban Core : Secondary Urban : Core : Urban Fringe : Peri-urban : Slum area :	Total population (000) : Growth Rate (%) : No. of Households : Average HH Size : Floating Population : (approx) <i>No. of urban poor</i> :	Urban Core Secondary Urban Core Urban Fringe Peri-urban Slum area
Note: <ul style="list-style-type: none"> The objective of the area break-up is to determine the population density and possible technology option for each area. Total of breakdown should equal total city area. It is not necessary to fill up all classes 	Note: <ul style="list-style-type: none"> Urban poor are those earning less than \$1 per day. Floating population – transient, day-time people visiting or working in the city and living in another city or town 	Note: <ul style="list-style-type: none"> Urban Core – heavily built up area, central business district Secondary urban core – suburbs, subdivisions Urban fringe – less built up area around the core Peri-urban – semi rural areas Slum area – total area even though scattered throughout the city.

<i>Water and Sanitation Facilities</i>	
<i>Sanitation Services</i>	<i>Water Supply Services</i>
<i>Service Area</i> (ha) Served Area (central sewerage system) : Unserved Area : Note: Total should equal to total city area.	<i>Service Area</i> (ha) Served Area (central water supply system) : Unserved Area : Note: Total should equal to total city area
<i>Household Sanitation</i> <i>See Note 1 (last page) for Range of Sanitation Type</i> No. of households with: <i>Individual toilet with sewerage line</i> <ul style="list-style-type: none"> Type I with treatment : Type Ia without treatment : 	<i>Household Water Supply</i> No. of households with: <ul style="list-style-type: none"> In-house connection (central WSS) : Community tap (central WSS) : Borehole (individual / communal) :

Water and Sanitation Facilities	
Sanitation Services	Water Supply Services
SANITATION COVERAGE AND FACILITY	
<p>Household Sanitation</p> <p>Individual toilet with septic tank</p> <ul style="list-style-type: none"> • Type II regular desludging & treated : • Type IIa desludged if full, not treated : <p>Communal toilet with septic tank</p> <ul style="list-style-type: none"> • Type III regular desludging & treated : • Type IIIa desludged if full, not treated : <p>Pit latrine</p> <ul style="list-style-type: none"> • Type IV ventilated improved pit : • Type IVa ordinary : <p>Eco San</p> <ul style="list-style-type: none"> • Type V off-site treatment : • Type Va on-site treatment : <p>Open defecation</p> <ul style="list-style-type: none"> • Type VI open filed : • Type VIa body of water : • Type VIb use of bucket : 	<p>Household Water Supply</p> <ul style="list-style-type: none"> • Protected spring/well : • Collected rainwater : • Vendor- provided : <p>Population buying Bottled water (%) :</p> <p>Ave. consumption (lpcd) :</p> <p>Water Provider</p> <ul style="list-style-type: none"> • Local government (%) : • National government (%) : • Private concessionaire (%) : • Individual households (%) : <p style="text-align: center;">(Total should add to 100%)</p>
Note: Total should equal to No. of Households in Demographics.	Note: Total should equal to No. of Households in Demographics.
<p>Treatment Facilities Capacity</p> <ul style="list-style-type: none"> • Wastewater treatment plant (m³/day) : • Frequency of desludging (years) : • Septage treatment plant (m³/day) : • Eco San facility (m³/day) : <p>Treatment Facility Provider</p> <ul style="list-style-type: none"> • Local government (%) : • National government (%) : • Private concessionaire (%) : • Individual households (%) : <p style="text-align: center;">(Total should add to 100%)</p>	<p>Treatment Facilities Capacity</p> <ul style="list-style-type: none"> • Water treatment plant (m³/day) : <p>Treatment Facility Provider</p> <ul style="list-style-type: none"> • Local government (%) : • National government (%) : • Private concessionaire (%) : • Individual households (%) : <p style="text-align: center;">(Total should add to 100%)</p>
<p>Please indicate treatment technology.</p> <p>Oxidation/ Waste stabilisation Ponds</p>	<p>Please indicate treatment technology:</p> <p>Rapid sand gravity filter with alum lime and chlorine</p>

ORGANIZATION	<i>Institutional Mandate and Set-up</i>				
	<i>Agencies / Organizations Involved in Sanitation</i>				
	<i>Name</i>	<i>Type*</i>	<i>Task**</i>	<i>Legal Mandate (year enacted)</i>	<i>No. of personnel***</i>
	Note: * For Type, indicate numbers as defined 1=Gov't. Line Ministry/Department; 2=Gov't Special Agency/Organization; 3=Gov't Owned Utility; 4=Private Water Utility; 5=Public- Private Utility; 6=Others (Please specify) __Urban Local Body_				
	** Example of Tasks: Planning, Construction, Collection and Treatment, etc. _____ *** Indicate total number of personnel involved in sanitation in 2013.				
ORGANIZATION	<i>Current Laws on Sanitation</i>				
	<i>Name of Law</i>	<i>Year Enacted</i>	<i>Implementing Agency</i>		
FINANCIALS	<i>Current Sanitation Status (Note: All figures are for liquid waste only, excluding solid waste.)</i>				
	Does the city have a Sanitation Plan prepared? NO ____ YES ____ (year) Please send a copy. If NO, year planned to prepare one, estimated amount and source of fund. Year ____ Amount (US\$) _____ Source of fund _____				
	Does the city have an ongoing Sanitation Information and Education Campaign? NO ____ YES ____ . If Yes, please send sample copies. What is the estimated annual budget? (US\$) 2012 ____ 2013 ____				
	Source of sanitation infrastructure construction funds: National government budget (%) ____, Local government budget (%) ____, Loans (%) ____, Tariff revenues (%) ____, Other (please specify) _____ What is the estimated annual amount? (US\$) 2012 ____ 2013 ____				
	Source of sanitation O&M funds: National government budget (%) ____, Local government budget (%) ____, Loans (%) ____, Tariff revenues (%) ____, Other (please specify) _____ What is the estimated annual amount? (US\$) 2012 ____ 2013 ____				
	For sewerage areas: What is the sewerage connection charge? (US\$/connection). _____ What is the tariff rate? Please specify unit. (US\$/unit) (Ex. \$/m ³ of water consumption) _____				
	For areas with septic tank (ST): Entity providing desludging services? Indicate estimated % share. Private (%) _____ Desludging fee (US\$/ST) _____ Government (%) ____ Desludging fee (US\$/ST) _____				
FINANCIALS	<i>Current Sanitation Status (Note: All figures are for liquid waste only, excluding solid waste.)</i>				
	What is the estimated total revenue for providing sanitation services? (US\$/year) 2012 __NAV____ 2013 __NAV____				
	Legal mandate for collecting fees? Name of law and year enacted. Year ____ Name of Law _____				
	<i>Future plans</i>				

	<p>What are the target sanitation indicators? Are there sufficient funds to meet targets?</p> <p>Please give brief description of future programs and projects, including training, procurement of equipment, formulation of own standards, etc., and sources of funds.</p>
	<p>What are the cities major sanitation problems?</p>

ENVIRONMENTAL SITUATIONER	<p><i>Extent of Water Pollution</i></p>
	<p>Is the City monitoring water quality? YES ____ If <u>NO</u>, is the City planning to monitor in the future? NO ____ YES ____ (year)</p>
	<p>What are the major sources of water pollution? Please check types?</p> <ul style="list-style-type: none"> <input type="radio"/> Household solid waste (%) : <input type="radio"/> Household liquid waste (%) : <input type="radio"/> Industrial waste (%) : ____ Type of industry: Textile, others (Please specify _____) <input type="radio"/> Commercial (%) : ____ Type of establishment : Restaurants, ____ (Please specify _____) <input type="radio"/> Hospital (%) : ____ Other sources of hazardous waste,
	<p>Are the industries, commercial establishments, hospitals, institutions required by law to treat their wastewater? YES</p> <p>How are the wastewater treated now?</p> <ul style="list-style-type: none"> <input type="radio"/> Polluter's own treatment plant (%) : <input type="radio"/> Central sewer system (%) : <input type="radio"/> No treatment, body of water (%) : <input type="radio"/> Others (%) : _____ Please describe: Through septic tank
	<p>Is the City located in a River Basin? Yes ____ If <u>YES</u>:</p> <ul style="list-style-type: none"> <input type="radio"/> Name of river basin or major river : <input type="radio"/> Basin area (ha) : <input type="radio"/> City location (Please check):
	<p>Are there adjoining towns or cities around your city? YES ____ NO ____</p> <p>If YES:</p> <ul style="list-style-type: none"> • Pollution load: Very Heavy ____ Heavy ____ Medium ____ Low ____ Very Low ____ • Sanitation work with adjoining areas: Individually ____ Cooperatively ____ How? Please describe:
	<p>Give a brief description of the City water quality and extent of pollution?</p>

Water Quality						
Parameters	Water Sources					National Standard
	Ground	River Kolar	Upper Lake on river Kolans			
Biochemical oxygen demand (BOD)						
Chemical oxygen demand (COD)						
Suspended Solids						
Coliform bacteria (#/ml)						
Polychlorinated biphenyl (PCB)						
Pesticides						
Heavy metals (specify)						
Others (specify)						
Note: Provide average readings for summer and rainy months. (# summer – low flow & # rainy – heavy flow)						

ENVIRONMENTAL STATISTICS

Sanitation and Hygiene– Related Diseases		
Year: _____	Reported Cases	Deaths (children under five years of age)
Diseases directly related to poor water and sanitation		
Diarrheal diseases		
Hepatitis A & E		
Skin Diseases		
Trachoma		
Diseases indirectly related to poor water and sanitation, via malnutrition (children under five years of age)		
Acute Lower Respiratory Infection		
Measles		
Malaria		
Indicate source:		

HEALTH STATISTICS

<i>Contact Details</i>	
Name of City (Country)	
Name of Project Coordinator	
Title / Designation	
Department / Office	
Address	
Fax	
Telephone	
Email Address	

Please send completed forms, copies of Annual / Financial Report (if any) and Sanitation Plan (if available) to:

Name: Dr. Kulwant Singh, **Title:** Regional Advisor, UN– Habitat

Email: kulwant.singh@unhabitat.org

and

Name: Mr. Toby Roycroft, **Title:** Program Officer, CITYNET

Email: programs1@citynet– ap.org

Note 1: Range of Sanitation Type

Sanitation Type	Toilet System	On– Site Treatment	On– Site Disposal / Reuse	Collection System	Off– Site Treatment	Off– Site Disposal / Reuse
I	Individual Toilet (Pour Flush or Tank Flush)	none	none	Sewer Line Combined or Conventional	Wastewater Treatment	Agricultural Use
Ia	Individual Toilet (Pour Flush or Tank Flush)	none	none	Sewer Line Combined or Conventional	none	Discharge to a Receiving Body of Water
II	Individual Toilet (Pour Flush or Tank Flush)	Septic Tank	Overflow to Drainage Pipe/Canal	Desludging by Vacuum Trucks regularly	Septage Treatment	Agricultural Use
IIa	Individual Toilet (Pour Flush or Tank Flush)	Septic Tank	Overflow to Drainage Pipe/Canal	Desludging by Vacuum Trucks when full	none	Body of Water or Burying/ Dumping Vacant Field
III	Public/ Communal Toilet (Pour Flush or Tank Flush)	Septic Tank	Overflow to Drainage Pipe/Canal	Desludging by Vacuum Trucks regularly	Septage Treatment	Agricultural Use
IIIa	Public/ Communal Toilet (Pour Flush or Tank Flush)	Septic Tank	Overflow to Drainage Pipe/Canal	Desludging by Vacuum Trucks when full	none	Body of Water or Burying/ Dumping Vacant Field
IV	Ventilated Improved Pit Latrine	na	Open another pit upon filling of pit			
Iva	Pit Latrine	na	Open another pit upon filling of pit			
V	Eco San	Storage		Cartage	Drying/ Composting/ Heating	Agricultural Use / Biogas
Va	Eco San	Hygienization by drying	Applied to garden/ plants			
VI	Open Defecation	na	Open Field			
Via	Hanging Toilet	na	Body of Water			
Vlb	Use of Bucket	na		Cartage		Open field or body of water



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