APPENDIX – A42.10

Correlation Analysis of Water Supply and Sewerage Usage Survey

A42.10 Correlation Analysis of Water Supply and Sewerage Usage Survey

This section and the following sections **A42.11** to **A42.12** explain the results of Water Supply and Sewerage Usage Survey.

Although Katchi Abadis have been developed without proper planning, it is very important to incorporate the development of Katchi Abadis in Water Supply and Sewerage Master Plan for the year 2025. Because Katchi Abadis consist of a large number of population, appropriate categorization of Katchi Abadis is required to plan step-wise development (area prioritization) in the Master Plan. Effective categorization of Katchi Abadis is also important in the result presentation of the survey in order to clarify the differences within the Katchi Abadis.

To find out the most effective categorization of Katchi Abadis for the formulation of Master Plan, factors affecting the water supply and sewerage conditions of Katchi Abadis has been analyzed by using correlation analysis between possible factors (such as area size, density of buildings, percentage of leased households, average duration of stay, average household income level, etc.) and water supply and sewerage related conditions (such as WtP for improved water supply services, acceptability of water meter, etc.). Because the existing data of Katchi Abadis within CDGK are not well updated, some factors including area size, density of building of each sampled Katchi Abadi have been estimated by using high resolution satellite imageries.

Table A42.10.1 in this appendix shows the results of the correlation analysis. The coefficients of correlation between influencing factors such as income level and influenced factors such as WtP for improved water supply services are calculated using the average values of the 30 Katchi Abadis and the 56 total sampling areas.

In general, the correlation coefficient varies from +1 to -1 with 0 indicating no relationship between the variables. The sign of the correlation coefficient (+ , -) defines the direction of the relationship, either positive or negative. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice-versa. The absolute value of the correlation coefficients shows the strength of the correlations.

(1) Water-Supply-Related Conditions

As shown in **Table A42.10.1 (1/2)**, [1] In general, larger Katchi Abadis have lower water line connection rates. The reason of this tendency seems that central areas of large Katchi Abadis are more far from the surrounding planned areas where water distribution mains are installed. Therefore, many people in large Katchi Abadis need to buy more water from other water sources such as water tanker which is much more expensive than water line connection. [2] In Katchi Abadis, the correlation between water line connection rate and average total monthly household expenditure for water is high, while the correlation between water line connection rate and total monthly household income level is significantly week. These aspects are further discussed in **(1)** of **Appendix A42.12** with detailed survey results

[3] Although the sewerage connection rate of an area is often higher than water line connection rate of the same area in Karachi as explained in a later sub-section, there seems to be some tendency that the higher water connection rate, the higher sewerage rate. [4] Water consumption is higher in higher income group. The households having line connection have higher level of water consumption. [5] The table also shows the distance from the closest bulk water reservoir have some influence on water availability in the area as well as the size of area have influence on it. [6] High Income Group, which usually live in large houses, have more tank flush toilets resulting in larger water consumption.

[7]&[8] Satisfaction levels of water supply services vary significantly only among Katchi

Abadis. Satisfaction levels on water supply hours, water pressure and water quality are lower in large Katchi Abadis, where water line connection rates are low and the people are paying a lot for alternative water sources such as water tanker. [9] Satisfaction level on KW&SB's public relations is related to legal status of plot, building material and education level of household head. It can be said that uneducated people who are living in Katchi dwelling on an unleased plot are the most unsatisfied regarding KW&SB's customer services. The people of this profile are also less registered in KW&SB and less receiving and paying water bill.

[10] Area size seems to be the most influential factors to the WtP for improved water supply services among Katchi Abadis. As already explained, Katchi Abadis of large size have low water line connection rate and worse water supply service levels. They are currently paying much money for alternative water sources. Therefore, large Katchi Abadis have higher WtP for improve water supply services on average. [11] Among all the sampling areas, income level is the most influential factors to the WtP for improved water supply services. High Income Group has higher demands on water supply services, resulting in higher WtP.

[12] In larger Katchi Abadis (where average plot size is usually larger than that of small Katchi Abadis and water line connection rate is lower), more people are supporting current plot size-base water billing. [14] On the other hand, Katchi Abadis with higher connection rate support land price-based or income level-based water bill more. [13] Within all the sampling areas, the higher income they have, the less they support the land price or income level-based water bill to avoid paying extra for water. On the other hand, the support to water meter installation and water meter-based billing was quite high, which will be explained in **(3)** of **Appendix A42.12** [15] High Income Group also seems not to oppose this billing measure unlike land price/income level-based billing, judging from the result that the correlation between supporting water meter-based bill and income level is quite low. Therefore, water meter-based billing is considered to be acceptable to all the income groups.

(2) Sewerage Related Conditions

As shown in **Table A42.10.1 (2/2)**, [1] the significant differences in environmental awareness level appears only in Katchi Abadis. Average total monthly household income level of Katchi Abadis differs from about Rs. 5,000 to Rs. 15,000. The Katchi Abadis of higher income level have higher level of environmental awareness. [2]&[3] Higher education level and higher leased plot ratio is also affecting the level of environmental awareness positively in Katchi Abadis.

[4] Sewerage connection rate in an area seems to be affected by the physical conditions of the area. The higher the elevation of area is, the lower its sewerage connection rate is. The less the streets of area are developed, the less the sewerage connection rate of area is. [5] Sewerage connection rate is also correlated to the building material and education level in the sampling areas, however the sewerage connection rate doesn't have significant correlation with income level. [6] Moreover, the higher water line connection rate is, the higher the sewerage connection rate of the area is in general.

[7] It is found that among the sampling areas, the people in the area, where income level, street condition and leased plot ratio are good, are generally more satisfied with current sewerage conditions comparing to other people. [8] Within the Katchi Abadis, income level seems to be a significant factor affecting the level of WtP for new sewerage connection. [9] The current sewerage connection rate also appears to have correlation with the WtP. [10] However, the factors affecting the WtP for new sewerage connection can not be understood clearly through this correlation analysis. For example, the reason why larger Katchi Abadis are willing to pay more for new sewerage connection to improve water environment in Karachi is not clear.

[11] Toilet with tank flushing is more used in higher income group having larger plot size.

[12] The awareness on the sewerage charges (25% of water charges) is higher in Katchi Abadis of high leased plot ratio. [13] The use of domestic water treatment at home is most affected by the education level of household head. [14] The medical cost spent for water-related disease has some correlation with household income level.

[15] In the areas of bad street conditions, availability of garbage collection facilities is less both in Katchi Abadis and the other areas. [16] The awareness on conservancy fee for CDGK's garbage collection (10% of water charges) has positive correlation with leased plot ratio and education level of household head.

[17] In the areas where people are paying a lot of money for water are putting higher priority on the improvement of water supply services while there are not clear factors affecting the priorities to improve sewerage and solid waste management.

(3) Categorization of Katchi Abadis and Tabulation of the Survey Results

After the correlation analysis, four major influencing factors are chosen for the tabulation of survey results as seen in **Table A42.11.1** in **Appendix A42.11**. In this table, Katchi Abadis are categorized by four major factors having strong influences on water supply and sewerage related conditions in Katchi Abadis, which are total area size (acres), type of street alignment (1. messy, 2. semi-organized or organized with narrow lanes, 3. well organized), line water connection rate (%), and education level of Household head (% of illiterate).

As already explained, the area size of Katchi Abadi has the strongest influence on the current water supply conditions and WtP for improved water supply services. Fortunately, the area size can be used to categorize Katchi Abadis for planning purpose because it is relatively easy to know area size of each Katchi Abadis by using existing maps of Katchi Abadis, land use maps or high-resolution satellite imageries.

Type of street alignment was not analyzed in the correlation analysis because it is categorical data. However, it is recognized that street alignment is related to water supply conditions in Katchi Abadis. The types of street alignment, which are defined as messy, semi organized or organized with narrow lanes and well organized, can also be used to sub-categorization of Katchi Abadis after categorizing them by area size for detailed area prioritization. The type of street alignment is also identifiable through high-resolution satellite imagery interpretation. Many large Katchi Abadis in Orangi Town and Baldia Town have well organized street alignment.

The percentage of the households using line water connection (individual connection or shared connection) is chosen as a factor to see the relations between water supply conditions and sewerage conditions. Education level of household head is also chosen to evaluate the potential of awareness enhancement in Karachi regarding water save, revenue collection and environmental awareness.

In **Table A42.11.1**, average values of all the Katchi Abadis sampling areas are presented for the comparison with the other types of residential areas in planned areas and rural areas. The table also show the estimated average values in Karachi, which are calculated using the assumption on population percentage of each income group shown in **Table 42.1.2** of the main report. Results of Residents in Commercial Areas and Bulk Consumers were not considered when estimating the average values of whole Karachi because the population percentages of these two residential types are not clear.

The following **Appendix A42.12** explains the results shown in **Table A42.11.1** in **Appendix A42.11**. The order of result presentation in the table is basically the same as the order of

corresponding questions in the questionnaire shown in Appendixes, except for the summary table for WtP analysis at the first page of the table. The blank cells in **Table A42.11.1** mean that the number of acquired valid responses from corresponding residential type is not enough for analysis. This table also shows the number of sampling areas categorized into each residential type.

Table A42.10.1 Results of Correlation Analysis (1/2: Mainly on Water Supply)

→ **Influenced Valuables**

Legend

Coefficients Calculated Using Area Average Values Among
(1) 30 Sampling Areas of Katchi Abadis
(2) All the 56 Sampling Areas

Strength of Correlation:
■ High (0.8 > or - 0.8 >)
■ Moderate (0.5 > or - 0.5 >)

← **Influencing Valuables**

		Main Factor	Water Consumption and Tank Availability						Satisfaction Level on Water Supply Services					Registration and Billing			Willingness to Pay for Water Supply				Introduction of Water Mater and New Tariff				
		Area (Acres)	% of the Households Having Water Line Connection (Individual Connection & Shared Connection)	Water Consumption (UK Gallon/person /day)	Availability Level of Water Use (The higher, the more available)	Average Number of Toilets using Tank Flashing (Num)	% of the Households Having Receiving Tanks	% of the Households Having Overhead Tanks/Booster Pumps	Satisfaction Level Water Supply Hours (the higher, the more satisfied)	Satisfaction Level of Water Supply Pressure (the higher, the more satisfied)	Un-Satisfaction Level of Water Quality (the higher, the more un-satisfied)	Un-Satisfaction Level of Public Relations (the higher, the more un-satisfied)	% of the Households Satisfied in Terms of Frequency and Hours of Water Supply	% of the Households Registered in KW&SB Water Line Connection	% of the Households Receiving Water Bill	% of the Households Paying Water Bill	WTP for Sufficient Water Quantity and Improved Water Quality (Rs./month)	WTP More for Adequate Pressure & Improved Water Quality (Rs./month)	WTP More for 8 Hours Water Supply Service	WTP More for 24Hours Water Supply Service	% of the Household Supporting Plot Size-based Water Bill	% of the Household Feeling Land Price/Income-based Water Bill is Fair	% of the Households Saving Water	% of the Households being Aware on Suction Pump Causing Water Contamination	% of the Households Supporting Water Mater and Mater-based Bill
Only for Katchi Abadis	Area (Acres)		(1) -0.60	-0.39	-0.55	0.05	0.51	-0.41	-0.54	-0.46	0.57	0.27	-0.40	0.01	0.09	0.21	0.39	0.75	0.73	0.83	0.74	-0.32	0.06	-0.04	0.08
	Estimated Average Building Density (Num/acre)	-0.26	0.18	0.06	-0.10	0.22	-0.21	0.33	-0.20	-0.22	0.17	0.05	0.06	-0.03	-0.05	-0.06	0.08	0.07	0.14	0.18	-0.25	0.37	-0.15	-0.25	-0.47
Area-based Conditions	Elevation (Feet)	0.10	(1) -0.25	-0.03	0.02	-0.45	0.27	-0.34	-0.12	-0.08	0.14	0.27	-0.40	-0.09	-0.12	-0.15	-0.09	-0.07	-0.15	-0.25	0.26	-0.26	0.25	0.20	0.52
			(2) -0.32	-0.14	-0.25	-0.23	0.20	-0.50	0.16	0.21	-0.27	0.11	-0.26	-0.39	-0.24	-0.16	-0.15	-0.05	-0.14	-0.20	0.18	0.14	-0.06	-0.03	0.07
	Street Condition (% of Katchi)	0.20	-0.50	-0.21	0.07	-0.09	0.21	-0.45	-0.06	0.03	0.03	-0.23	-0.25	0.11	0.24	0.11	0.01	-0.12	-0.08	-0.19	0.01	-0.39	0.34	0.19	0.20
			-0.47	-0.56	-0.43	-0.54	-0.03	-0.54	-0.36	-0.29	0.33	0.45	-0.46	-0.38	-0.33	-0.48	-0.35	-0.44	-0.39	-0.46	0.04	0.14	0.05	-0.05	-0.05
	Direct Distance from the Nearest Bulk Reservoir (m)	0.07	-0.05	-0.14	-0.39	0.12	0.23	-0.13	-0.17	-0.13	0.17	-0.12	-0.17	0.36	0.12	0.10	0.26	0.19	0.25	0.11	-0.16	-0.13	0.21	0.19	0.27
			-0.28	-0.24	-0.58	-0.20	0.11	-0.53	-0.18	-0.15	0.02	0.07	-0.40	-0.22	-0.18	-0.23	-0.13	-0.12	-0.08	-0.14	-0.15	0.15	0.04	-0.48	-0.20
	Land Price of Surrounding Area (Rs./sq.yard)	-0.29	0.30	0.15	0.34	0.29	-0.28	0.35	0.32	0.32	-0.39	0.01	0.38	-0.27	-0.23	-0.20	-0.12	-0.22	-0.14	0.10	-0.24	0.15	-0.20	-0.09	-0.19
			0.16	0.39	0.38	0.52	0.02	0.35	0.35	0.32	-0.19	-0.27	0.33	0.08	0.07	0.15	0.38	0.33	0.42	0.44	-0.19	-0.23	-0.09	0.00	-0.19
Household-based Conditions	Building Material (Total % of Semi Pakka & Katcha)	0.15	-0.04	-0.49	-0.04	-0.05	-0.10	-0.33	-0.20	-0.21	0.16	0.16	-0.30	-0.02	-0.21	-0.27	0.02	-0.03	-0.07	-0.15	0.12	-0.09	0.19	0.23	0.37
			-0.47	-0.65	-0.61	-0.54	-0.18	-0.71	-0.37	-0.41	0.37	0.55	-0.42	-0.50	-0.55	-0.64	-0.39	-0.37	-0.34	-0.42	0.11	0.21	-0.05	-0.28	-0.14
	Plot Size (Sq.yard)	0.52	-0.45	-0.39	-0.33	-0.08	0.41	-0.48	-0.46	-0.37	0.44	0.53	-0.48	0.10	-0.08	-0.10	0.28	0.34	0.31	0.28	0.26	-0.35	0.35	0.01	0.27
			0.13	0.60	0.36	0.79	0.38	0.23	0.30	0.30	-0.24	-0.49	0.18	0.36	0.43	0.49	0.61	0.54	0.58	0.68	-0.03	-0.40	0.12	-0.01	0.02
	Legal Status of the Plot (% of Leased Households)	-0.36	0.42	0.09	0.30	0.36	-0.13	0.56	0.06	-0.02	-0.28	-0.41	0.08	0.49	0.46	0.40	-0.01	-0.19	-0.10	-0.04	-0.21	0.31	-0.11	0.16	-0.22
			0.42	0.41	0.48	0.57	0.00	0.58	0.21	0.16	-0.28	-0.59	0.34	0.70	0.70	0.64	0.36	0.32	0.31	0.38	-0.22	-0.11	0.01	0.25	0.09
	Education Level of Family Head (% of Illiterate)	0.00	-0.41	-0.24	0.21	-0.06	0.06	-0.37	-0.09	0.01	-0.03	0.29	-0.20	-0.08	-0.13	-0.30	0.19	-0.02	-0.01	-0.04	-0.17	-0.12	0.11	-0.01	0.05
			-0.59	-0.53	-0.50	-0.64	-0.26	-0.71	-0.25	-0.20	0.17	0.54	-0.41	-0.57	-0.60	-0.63	-0.40	-0.38	-0.35	-0.42	-0.05	0.29	-0.01	-0.20	-0.26
	Total Monthly House Income (Rs./month)	0.01	-0.11	-0.26	0.48	0.52	-0.09	-0.01	0.00	-0.03	-0.16	-0.12	0.17	0.47	0.21	0.15	0.15	0.10	0.14	0.09	-0.34	0.43	0.02	0.27	-0.26
			0.30	0.70	0.55	0.87	0.34	0.38	0.30	0.29	-0.25	-0.47	0.27	0.39	0.43	0.48	0.78	0.48	0.56	0.59	-0.08	-0.55	0.12	0.04	0.13
	Total Monthly Expenditure for All Water Use including Water Line Connection, Tanker, etc. (Rs./month)	0.63	-0.74	-0.44	-0.44	0.22	0.61	-0.37	-0.76	-0.68	0.67	0.32	-0.65	0.36	0.25	0.31	0.57	0.68	0.80	0.75	0.18	-0.28	0.12	-0.05	-0.21
			-0.06	0.40	0.22	0.54	0.34	0.08	-0.14	-0.11	0.09	-0.24	-0.14	0.27	0.28	0.28	0.70	0.49	0.61	0.82	0.01	-0.49	0.17	-0.17	-0.13
	% of Households Having Water Line Connection (Individual Connection & Shared Connection)	-0.60		0.48	0.16	-0.15	-0.47	0.63	0.52	0.42	-0.63	-0.39	0.40	-0.11	-0.10	-0.08	-0.32	-0.65	-0.58	-0.57	-0.17	0.53	-0.22	0.00	0.19
			0.52	0.49	0.31	-0.10	0.70	0.34	0.30	-0.33	-0.30	0.31	0.11	0.11	0.11	0.18	0.06	0.08	0.05	-0.15	0.15	-0.12	0.24	0.30
	% of Households Having Sewerage Connection (Gutter & Gutter Line)	-0.34	0.56	0.43	0.03	0.17	-0.25	0.52	0.18	0.17	-0.20	-0.30	0.16	0.17	0.00	0.07	0.10	-0.06	0.02	-0.06	-0.33	0.16	-0.27	0.00	-0.10
			0.65	0.42	0.54	0.34	-0.01	0.82	0.05	0.05	0.05	-0.26	0.33	0.58	0.38	0.38	0.18	0.19	0.18	0.23	-0.11	-0.24	-0.08	0.40	0.33

Table A42.10.1 Results of Correlation Analysis (2/2: Mainly on Sewerage)

→ **Influenced Valuables**

↓ **Influencing Valuables**

Legend

Coefficients Calculated Using Area Average Values Among
(1) 30 Sampling Areas of Katchi Abadis
(2) All the 56 Sampling Areas

Strength of Correlation:
■ High (0.8 > or - 0.8 >)
■ Moderate (0.5 > or - 0.5 >)

		Environmental Awareness				Type of Sanitation and Satisfaction			Willingness to Pay for New Sewer Connection			Toilet Flushing		Awareness	Diseases and Accidents		Solid Waste Management			Project Priority		
		Seriousness of Water Pollution in Karachi (the higher, the more serious)	% of the Households Thinking Their Toilet/Toilet Effluent Pollute Natural or Living Environment	% of the Households Thinking Their Home Wastewater (from Kitchen, etc.) Pollute Natural or Living Environment	% of the Households Thinking that Sewage should be Treated even It Costs Users	% of the Households having Sewerage Connection	% of the Sewerage Users connecting directly to Government-built Sewers	% of the Households being Satisfied with Current Sanitation	WTP for New Sewer Connection to Improve Household's Life (Rs./month)	WTP More for New Sewerage Connection to Improve Water Environment in Karachi (Rs./month)	WTP for the Initial Cost of New Sewerage Connection (Rs.)	% of the Non-Sewerage-User-Households Using Tank Flushing	% of the Sewerage-User-Households Using Tank Flushing	% of the Households Being Aware of the Sewerage Charges (25% of Water Bill)	% of the Household not Using Domestic Water Treatment	Monthly Medical Cost against Water Related Diseases	Availability of Garbage Collection Facilities (The higher, the more available)	% of the Households Knowing the Conservancy Fee (10% of Water Bill)	Satisfaction Level of Garbage Collection Service (The higher, the more satisfied)	Priority Level of Water Supply (The lower, the more important)	Priority Level of Sewerage (The lower, the more important)	Priority Level of Solid Waste Management (The lower, the more important)
Only for Katchi Abadis	Area (Acres)	(1) -0.22	0.19	0.25	0.12	-0.34	-0.21	-0.31	-0.13	[10] 0.72	-0.18	0.29	-0.07	-0.29	0.15	-0.09	-0.20	-0.18	-0.21	-0.46	0.11	0.06
	Estimated Average Building Density (Num/acre)	0.40	-0.12	-0.24	0.06	0.12	-0.10	0.02	-0.40	-0.27	0.29	-0.08	-0.20	0.02	-0.08	0.05	0.31	0.12	0.03	0.29	-0.12	0.11
Area-based Conditions	Elevation (Feet)	(1) -0.24	-0.04	-0.19	-0.21	[4] -0.42	-0.07	-0.17	0.17	-0.38	-0.14	0.14	0.38	-0.21	0.33	0.02	-0.54	-0.21	-0.05	-0.29	-0.07	-0.21
		(2) -0.39	-0.02	-0.03	-0.19	-0.52	-0.02	-0.17	0.28	0.32	0.29	0.06	0.18	-0.30	0.36	0.01	-0.35	-0.28	-0.22	-0.28	0.08	0.16
	Street Condition (% of Katchi)	0.24	0.36	0.12	-0.21	-0.59	-0.17	[7] -0.12	0.19	-0.15	-0.29	-0.01	0.06	-0.04	0.30	0.34	[15] -0.75	-0.06	-0.06	-0.21	0.03	-0.06
		-0.24	0.18	0.22	-0.24	-0.54	-0.1	-0.53	0.34	0.44	0.08	0.57	0.64	-0.45	0.70	-0.08	-0.79	-0.46	-0.47	-0.50	0.15	0.25
	Direct Distance from the Nearest Bulk Reservoir (m)	-0.08	-0.25	-0.24	0.34	-0.06	-0.08	-0.13	-0.35	0.16	0.47	-0.06	0.16	0.03	0.39	0.01	-0.24	0.09	0.19	-0.20	0.41	-0.02
		-0.54	-0.14	-0.03	0.21	-0.56	0.12	-0.34	-0.05	0.26	0.10	0.29	0.27	-0.24	0.48	-0.02	-0.41	-0.22	-0.24	-0.39	0.31	0.35
	Land Price of Surrounding Area (Rs./sq.yard)	0.14	-0.02	0.01	-0.19	0.31	0.19	-0.04	0.40	-0.25	0.23	0.00	-0.11	-0.05	-0.35	-0.13	0.48	-0.04	-0.16	0.34	-0.11	0.07
		0.20	-0.21	-0.19	-0.05	0.34	0.27	0.23	0.03	-0.24	0.11	-0.44	-0.53	0.30	-0.58	0.23	0.56	0.25	0.23	0.37	-0.08	-0.09
Household-based Conditions	Building Material (Total % of Semi Pakka & Katcha)	0.10	0.18	-0.08	0.36	[5] -0.22	-0.06	0.02	-0.34	-0.24	0.36	-0.19	-0.03	-0.19	0.36	0.28	-0.57	-0.24	-0.17	0.08	0.28	-0.16
		-0.48	0.02	-0.07	0.14	-0.69	-0.03	-0.42	0.06	0.37	0.24	0.46	0.61	-0.53	0.73	-0.09	-0.78	-0.58	-0.56	-0.40	0.29	0.29
	Plot Size (Sq.yard)	-0.21	0.29	0.31	0.02	-0.43	-0.07	-0.36	0.28	0.48	0.11	0.01	0.16	-0.27	0.57	0.07	-0.40	-0.30	-0.21	-0.45	-0.02	-0.06
		0.18	-0.14	-0.[3]	0.21	0.13	0.22	0.48	-0.13	0.55	-0.12	[11] -0.83	-0.88	0.60	-0.63	0.33	0.53	0.59	0.63	0.18	-0.12	-0.08
	Legal Status of the Plot (% of Leased Households)	0.43	0.13	0.04	0.50	0.43	-0.11	0.49	0.11	-0.19	0.42	-0.38	-0.43	[12] 0.54	-0.51	0.26	0.13	[16] 0.57	0.41	0.38	0.13	0.09
		0	[2] -0.09	-0.07	0.45	0.42	0.00	0.65	0.01	-0.18	0.28	-0.49	-0.59	0.69	-0.67	0.19	0.54	0.68	0.62	0.49	-0.11	-0.13
	Education Level of Family Head (% of Illiterate)	0.23	0.62	0.45	-0.20	-0.42	-0.16	0.00	0.64	-0.03	-0.02	-0.12	0.01	-0.15	[13] -0.43	0.36	-0.40	-0.32	-0.38	-0.08	-0.21	0.10
		[1] -0.28	0.18	-0.10	-0.32	-0.67	-0.11	-0.42	0.35	0.32	-0.28	0.48	0.63	-0.56	0.76	-0.12	-0.73	-0.65	-0.65	-0.48	0.12	0.25
	Total Monthly House Income (Rs./month)	0.59	0.50	0.54	0.35	0.30	0.13	0.35	[8] 0.66	0.51	0.13	-0.37	-0.29	0.23	-0.30	[14] -0.34	0.02	0.34	0.20	0.26	-0.04	-0.10
		0.25	0.05	-0.19	0.27	0.28	0.05	0.54	0.05	0.06	0.21	-0.78	-0.84	0.52	-0.62	0.55	0.56	0.56	0.54	0.25	-0.30	-0.09
	Total Monthly Expenditure for All Water Use including Water Line Connection, Tanker, etc. (Rs./month)	0.06	0.21	0.32	0.04	-0.32	-0.32	-0.37	-0.15	0.54	-0.29	0.08	-0.20	-0.17	0.15	0.06	-0.13	0.10	-0.04	[17] -0.64	-0.11	0.27
		0.08	-0.06	-0.09	0.25	0.02	0.07	0.17	-0.11	0.18	-0.32	-0.20	-0.58	0.39	-0.30	0.21	0.25	0.40	0.36	-0.14	-0.08	0.06
	% of Households Having Water Line Connection (Individual Connection & Shared Connection)	-0.14	-0.49	-0.46	0.19	[6] 0.56	0.34	0.29	-0.07	-0.37	0.42	-0.22	0.19	0.39	-0.31	-0.09	0.40	0.25	0.37	0.42	0.10	-0.10
		0.31	-0.01	0.03	0.24	0.65	0.29	0.33	-0.11	-0.40	0.16	-0.28	-0.21	0.41	-0.41	0.04	0.47	0.40	0.40	0.49	-0.20	-0.25
	% of Households Having Sewerage Connection (Gutter & Gutter Line)	-0.04	-0.06	0.01	0.27		0.19	0.28	0.00	[9] -0.34	0.03	-0.32	-0.10	0.45	-0.35	-0.15	0.40	0.41	0.47	0.19	0.13	-0.04
		0.49	0.10	0.18	0.18		-0.02	0.34	-0.20	-0.54	0.03	-0.36	-0.31	0.52	-0.56	0.01	0.58	0.46	0.45	0.50	-0.18	-0.43

APPENDIX – A42.11

Result Tables of Water Supply and Sewerage Usage Survey

A42.11 Result Tables of Water Supply and Sewerage Usage Survey

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (1/17)

Summary Table for WTP Analysis

Question		Unit/ Selection			Urban																	Rural	Estimated Average in Karachi*
					Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas					Village	
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
Area Characteristics	Total Area	Acre		(Asked to all)	18	71	528	57	59	303	262	50	25	107	84	127	107							
	Plot Size	Sq. Yard			93	100	128	95	89	126	112	98	90	93	98	113	100	90	245	605	319	465	160	136
	Legal Status of the Plot (% of Leased Households)	%			62%	62%	38%	59%	74%	45%	49%	60%	67%	61%	62%	52%	59%	81%	92%	98%	94%	95%	44%	71%
	Street Alignment	1	Messy		84%	50%	26%	100%	0%	0%	41%	67%	81%	71%	60%	47%	60%							
		2	Semi-organized or organized with narrow lanes		8%	31%	0%	0%	100%	0%	24%	20%	8%	6%	24%	26%	17%							
		3	Well Organized		7%	19%	74%	0%	0%	100%	35%	13%	10%	24%	16%	27%	23%							
		Total			100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%							
Income and General Expenditure	Monthly Household Income	Rs/month			9,810	10,744	10,321	10,293	11,323	9,230	10,826	10,139	10,197	9,857	10,767	10,365	10,252	10,181	22,174	63,636	26,233	52,547	7,201	13,296
	Monthly Expenditure for Electricity	Rs/month			577	690	805	604	825	662	664	691	636	635	547	773	653	651	1,588	4,388	1,760	4,124	330	878
Water Consumption	Water Consumption per capita per day (UK Gallon)	Gallon/capita/day			30	21	13	25	21	22	19	22	32	27	23	20	24	26	33	58	36	59	17	26
Water Related Expenditure	Total Monthly Expenditure for Water (Line connection, tanker, etc.)	Rs/month			96	352	893	190	344	634	518	161	211	320	202	374	304	253	545	1,677	476	2,656	400	365
	Cost of Domestic Water Treatment at Home	Rs/month			119	75	42	108	71	43	75	119	89	68	129	127	93	39	362	330	260	442	1	123
	Monthly Medical Expenditure for Water Related Disease	Rs/month			228	407	217	304	405	190	338	331	226	266	301	342	298	249	306	643	333	469	311	293
Current Water Supply Connection Ratio	Having Water Line Connection (Individual or Shared Connections)	%			90%	77%	28%	85%	69%	52%	44%	84%	99%	86%	73%	66%	77%	92%	93%	98%	61%	96%	30%	82%
New Water Line Connection	Willing to have Individual Water Line Connection if its Service Improves	%		(asked only to non-water line users)	88%	97%	100%	91%	97%	100%	89%	97%	100%	100%	89%	93%	94%	60%	33%	25%	75%	0%	96%	72%
	Willingness to Pay for New Water Line Connection	Rs/month			403	485	737	493	551	480	682	349	483	499	399	590	500	472	333	113	245		435	451
	Willingness to Pay for Initial Cost	Rs			758	607	884	711	796	627	717	508	1,333	983	498	615	707	380	5,000		2,826		705	
Improved Water Line Connection	Current Monthly Expenditure for Line Water (Individual and Shared Connection)	Rs/month		(asked only to water line users)	47	68	92	50	109	45	48	68	56	61	50	69	59	79	216	319	121	170	29	96
	For Sufficient Water Quantity and Improved Water Quality (Improvement)	Rs/month			105	142	232	129	166	111	166	126	114	110	148	160	133	131	711	950	283	517	51	244
	For Adequate Pressure & Improved Water Quality	Rs/month in Total			95	140	293	118	183	148	179	120	105	125	148	132	133	137	378	799	261	611	52	187
	For 8 hrs Water Supply Service	Rs/month in Total			96	157	295	121	209	153	175	134	117	136	140	152	140	138	374	955	236	562	57	193
	For 24 hrs Water Supply Service	Rs/month in Total			132	174	459	162	206	256	249	151	158	180	195	175	183	167	547	820	303	740	59	247
Current Sewerage Connection Ratio	Having Connection to Sewer (Gutter or Gutter line)	%		(asked to all)	93%	92%	83%	93%	100%	80%	88%	94%	97%	94%	94%	86%	91%	92%	100%	100%	97%	98%	11%	89%
New Sewerage Connection	Current Monthly Maintenance Cost of Toilet/Latrine (without Connection)	Rs/Year		(asked only to non-sewerage users)	31	56	41	483		402	397	846	160	591	508	393	42	58					57	
	Willingness to Connect to Sewerage	%			92%	100%	100%	96%		100%	100%	92%	100%	100%	100%	92%	97%	60%					84%	
	Willingness to Pay for New Sewerage Connection for Better Household Life	Rs/month			112	176	80	144		79	161	122	20	37	163	167	122	66					136	
	Willing to Pay for New Sewerage Connection for Both Better Household life and Better Water Environment	Rs/month in Total			125		118	165		112	199	138	23	49	200	194	146	93					260	
	Willingness to Pay for the Initial Connection Cost	Rs			1,025	506	697	838		615	726	750	1,500	781	775	758	771	493					767	
Current Sewerage Connection	Current Sewerage Charges (25% of Water Bill)	Rs /month		(estimated from the water bill of water line users)	12	17	23	13	27	11	12	17	14	15	13	17	15	20	54	80	30	43	7	24

Note: * This value is estimated by assuming the proportions of Karachi's population as follows. Katchi Abadis-45%, Rural Settlement-5%, Low & Lower Middle Income Group in Planned Area-26%, Upper Middle Income Group-17%, High Income Group-2%
(based on the an analyzing of the results of Socio-Economic Survey of the Karachi Master Plan-2020).

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (2/17)

Question		Unit/ Selection		Urban																			Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
			Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
				Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
			Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:									
			From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%									
			To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%									
			No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(4) Household Information	1) Sex of Respondent:	1	Male	74%	79%	74%	77%	70%	77%	75%	76%	76%	74%	71%	84%	76%	63%	63%	66%	60%	66%	83%	70%
		2	Female	26%	21%	26%	23%	30%	23%	25%	24%	24%	26%	29%	16%	24%	37%	37%	34%	40%	34%	17%	30%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) How many families belong to this household?	families		1.7	1.7	1.7	1.8	1.7	1.6	1.7	1.8	1.6	1.6	1.6	2.1	1.7	1.5	1.7	2.0	1.5	1.6	1.7	1.7
	3) How many persons and children usually live in this household?	persons in total		9.0	10.1	8.6	9.6	9.6	8.2	9.4	10.2	8.5	8.7	8.9	10.7	9.4	9.3	9.0	7.7	7.2	7.4	9.4	9.2
	4) How many children (below 10 years) live in your household?	children		2.3	3.0	2.3	2.6	2.6	2.4	2.6	3.0	2.1	2.4	2.1	3.2	2.6	2.3	2.3	1.9	2.3	1.7	3.2	2.4
	5) How many years has your family stayed at this place? (six months = 0.5 year)	years		25.9	25.0	19.3	28.1	23.6	14.5	21.2	24.7	29.0	24.8	24.9	24.2	24.6	22.4	18.8	16.8	24.6	7.7	51.9	24.1
	6) What is your household's mother tongue?	1	Urdu	60%	34%	41%	44%	54%	45%	37%	51%	54%	55%	59%	22%	46%	88%	66%	68%	62%	51%	0%	60%
		2	Sindhi	5%	4%	8%	8%	0%	1%	4%	3%	10%	8%	4%	2%	5%	0%	9%	8%	1%	16%	54%	7%
		3	Punjabi	11%	11%	16%	10%	12%	16%	11%	10%	16%	14%	7%	13%	12%	5%	19%	15%	15%	19%	0%	11%
		4	Pashtu	14%	29%	21%	19%	25%	23%	33%	13%	12%	11%	17%	39%	21%	3%	2%	1%	10%	0%	0%	11%
		5	Balochi	0%	9%	0%	6%	0%	0%	0%	9%	2%	1%	0%	10%	4%	0%	2%	0%	1%	5%	35%	4%
		6	English	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%
		7	Arabic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		8	Any other	11%	13%	15%	12%	9%	15%	16%	15%	6%	11%	13%	14%	12%	3%	2%	7%	10%	7%	11%	8%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	7) Where did your household live before coming to the current place?	1	Urban area of Karachi	26%	31%	30%	28%	32%	30%	33%	29%	24%	28%	30%	30%	29%	49%	58%	74%	67%	75%	16%	40%
		2	Rural area of Karachi	34%	37%	37%	31%	44%	43%	38%	34%	34%	36%	30%	40%	36%	35%	17%	6%	6%	14%	53%	33%
		3	Interior Sindh	10%	5%	8%	9%	6%	6%	8%	5%	11%	10%	11%	2%	8%	4%	6%	0%	4%	5%	11%	6%
		4	Punjab	9%	9%	13%	9%	9%	11%	8%	11%	11%	9%	10%	9%	10%	3%	6%	7%	13%	4%	2%	6%
		5	Baluchistan	0%	5%	1%	3%	1%	1%	0%	5%	3%	3%	1%	4%	2%	0%	2%	0%	0%	0%	9%	2%
		6	N.W.F.P	9%	8%	8%	10%	6%	5%	9%	7%	8%	6%	9%	12%	9%	0%	2%	3%	3%	0%	0%	4%
		7	Bangladesh	0%	2%	0%	2%	0%	0%	0%	3%	0%	2%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
		8	India	10%	2%	4%	8%	0%	3%	3%	6%	9%	6%	8%	2%	6%	9%	10%	6%	4%	0%	0%	7%
		9	Afghanistan	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%
		10	Nepal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		11	Srilanka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		12	Bhutan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		13	Iran	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
		14	Others	1%	0%	0%	0%	2%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	4%	1%	2%	8%	1%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	8) What is the education level of the house head?	1	Illiterate	31%	37%	33%	33%	36%	35%	38%	36%	24%	23%	33%	49%	34%	15%	7%	3%	12%	4%	59%	24%
		2	Literate	9%	10%	11%	11%	6%	10%	7%	11%	10%	11%	9%	10%	10%	5%	0%	0%	0%	0%	6%	6%
		3	Primary	11%	7%	10%	9%	6%	11%	9%	6%	13%	13%	7%	6%	9%	4%	2%	0%	3%	4%	12%	6%
		4	Middle	16%	12%	14%	14%	13%	13%	13%	13%	17%	19%	11%	9%	14%	17%	9%	1%	8%	4%	7%	13%
		5	Matric	21%	15%	19%	18%	21%	17%	19%	20%	17%	16%	28%	14%	18%	35%	17%	1%	25%	14%	9%	22%
		6	Inter,	6%	10%	6%	7%	11%	7%	6%	7%	11%	11%	5%	6%	8%	11%	17%	14%	10%	12%	5%	10%
		7	B.A./B.Sc.	5%	5%	6%	6%	3%	5%	6%	5%	6%	5%	6%	5%	5%	12%	33%	30%	21%	32%	1%	12%
		8	M.A/M.Sc.	0%	2%	1%	1%	3%	1%	2%	1%	1%	1%	1%	1%	1%	2%	13%	42%	18%	23%	1%	4%
		9	Any Others	0%	1%	1%	1%	1%	1%	0%	1%	1%	1%	1%	0%	1%	0%	2%	7%	4%	9%	0%	1%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	9) Type of Dwelling:	1	Bungalow	22%	19%	12%	22%	19%	12%	16%	21%	21%	23%	15%	18%	19%	16%	37%	97%	15%	67%	21%	23%
		2	Single storey house	53%	62%	72%	53%	55%	81%	67%	60%	50%	53%	61%	68%	60%	57%	17%	1%	7%	17%	66%	51%
		3	2-3 storey house	25%	19%	15%	25%	25%	6%	17%	19%	30%	23%	24%	14%	21%	27%	39%	0%	11%	17%	1%	24%
		4	Multi-storey flat	0%	0%	1%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	0%	7%	1%	65%	0%	0%	1%
		5	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	12%	1%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	10) Does your household have any shop/workshop at the same plot?	1	Yes	17%	18%	19%	19%	18%	15%	18%	17%	20%	18%	21%	15%	18%	12%	14%	11%	19%	17%	0%	14%
		2	No	83%	82%	81%	81%	82%	85%	82%	83%	80%	82%	79%	85%	82%	88%	86%	89%	81%	83%	100%	86%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	11) Type of Building Material:	1	R.C.C	24%	25%	23%	27%	30%	12%	20%	23%	32%	28%	26%	17%	24%	46%	76%	93%	79%	79%	9%	40%
		2	Pakka	45%	40%	43%	39%	37%	56%	44%	37%	43%	38%	40%	50%	42%	29%	14%	7%	19%	21%	20%	31%
		3	Semi Pakka	25%	29%	32%	27%	29%	27%	33%	32%	19%	28%	27%	27%	28%	23%	10%	0%	0%	0%	46%	23%
		4	Katcha	6%	7%	2%	7%	4%	6%	3%	8%	5%	6%	7%	6%	6%	2%	0%	0%	1%	0%	25%	5%
		Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	12) How old is the structure of dwelling?	years		18.9	18.6	14.6	19.9	17.5	13.5	17.0	17.0	21.0	19.1	17.3	17.7	18.2	19.7	23.0	20.8	36.0	12.4	21.5	19.7
	13) Size of Your Household's Plot:	square yards		93.2	99.7	128.3	95.3	88.9	126.4	111.8	98.3	90.1	93.3	98.1	113.0	100.5	90.4	245.2	605.2	318.6	465.0	160.5	136.2

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (3/17)

Question			Unit/ Selection	Urban																			Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(4) Household Information	14) Legal Status of Your Plot		1	Leased	63%	54%	37%	58%	70%	36%	47%	57%	68%	62%	61%	41%	55%	81%	92%	99%	94%	95%	43%	70%
			2	Unleased	37%	46%	63%	42%	30%	64%	53%	43%	32%	38%	39%	59%	45%	19%	8%	1%	6%	5%	57%	30%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	15) Nature of Possession of Your Household:		1	Ownership	87%	85%	89%	87%	86%	86%	88%	84%	86%	88%	86%	85%	87%	85%	83%	85%	60%	86%	98%	86%
			2	Tenancy	11%	14%	11%	11%	14%	14%	11%	15%	11%	10%	13%	14%	12%	15%	15%	14%	29%	9%	2%	13%
			3	Allotted	2%	1%	0%	2%	0%	0%	1%	0%	3%	1%	1%	1%	1%	0%	2%	1%	11%	5%	0%	1%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		If "2. Tenancy", how much does your household pay for rent?		Rs. per month	2,112.4	1,909.2	1,530.6	2,019.7	1,720.8	1,948.3	1,566.7	1,889.3	2,621.4	2,402.8	1,620.2	1,744.2	1,955.0	1,517.3	3,596.7	4,018.8	3,342.0	7,366.7	4.3	2,046.2
	16) Condition of Close by Street:		1	Katchi	44%	56%	55%	43%	58%	66%	57%	54%	35%	41%	48%	66%	51%	62%	14%	9%	7%	2%	71%	48%
			2	Pakki	56%	44%	45%	57%	42%	34%	44%	46%	65%	59%	52%	34%	49%	38%	86%	91%	93%	98%	29%	52%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(5) Economical Situation of the household	1) How many household members are earning money?			members	2.1	2.3	2.0	2.2	2.2	1.9	2.2	2.1	2.1	2.1	2.0	2.3	2.1	2.1	2.1	2.2	2.0	1.7	1.8	2.1
	2) What is the type of employment of the primary wage-earner?		1	Government/semi-government employee	8%	11%	18%	9%	13%	14%	13%	11%	9%	10%	11%	12%	11%	16%	24%	24%	22%	37%	10%	15%
			2	Private company/shop employee	36%	38%	34%	35%	48%	31%	38%	42%	33%	35%	38%	37%	36%	53%	33%	29%	37%	31%	23%	40%
			3	Self-employed	34%	28%	28%	33%	21%	30%	27%	27%	39%	36%	28%	24%	30%	17%	37%	44%	34%	29%	18%	27%
			4	Daily wages	17%	20%	19%	18%	13%	23%	19%	17%	15%	15%	19%	23%	18%	10%	6%	0%	3%	2%	43%	15%
			5	House Servant	5%	4%	1%	4%	6%	1%	4%	4%	4%	4%	4%	4%	4%	4%	0%	3%	3%	0%	6%	3%
			6	Unemployed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) How much is your household's income per month?			Rs per month	9810	10744	10321	10293	11323	9230	10826	10139	10197	9857	10767	10365	10252	10181	22174	63636	26233	52547	7201	13296
	5) How much is your household's expenditure per month?			Rs per month	8762	9219	10035	8789	10289	9165	9565	8955	9054	8928	9096	9400	9114	8721	16697	40054	18760	32257	6090	10821
	6) About how much does your household spend for food per month?			Rs per month	5345	5514	5254	5345	6124	4973	5430	5461	5417	5292	5342	5609	5400	5193	9676	19329	9820	14660	4024	6304
(5) - 7) Availability of Utilities and Equipment in the Area and Households	Utility Availability in the Area	Electricity	1	Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%
		Sui Gas	1	Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%	18%	96%
		Line Telephone	1	Yes	97%	94%	95%	97%	96%	91%	95%	96%	99%	98%	95%	93%	96%	100%	100%	100%	100%	100%	38%	95%
		Cable TV	1	Yes	96%	89%	96%	94%	96%	87%	92%	95%	99%	98%	94%	86%	93%	99%	96%	100%	99%	100%	23%	92%
	Utility Connection to the House	Electricity	1	Yes	100%	99%	98%	99%	99%	99%	98%	100%	100%	100%	99%	99%	99%	99%	100%	100%	100%	100%	88%	99%
		Sui Gas	1	Yes	97%	99%	96%	97%	98%	98%	96%	98%	98%	97%	96%	99%	98%	98%	100%	100%	100%	100%	14%	94%
		Line Telephone	1	Yes	21%	25%	25%	22%	30%	21%	23%	24%	25%	23%	24%	23%	23%	40%	78%	99%	68%	84%	10%	39%
		Cable TV	1	Yes	60%	46%	56%	54%	57%	49%	44%	58%	65%	67%	47%	40%	53%	69%	75%	93%	82%	79%	10%	61%
	If the Utility is Available, how much is its monthly charges?	Electricity		Rs per month	577	690	805	604	825	662	664	691	636	635	547	773	653	651	1,588	4,388	1,760	4,124	330	878
		Sui Gas		Rs per month	298	335	278	314	385	238	351	324	274	277	325	346	310	294	489	1,200	425	792	40	342
		Line Telephone		Rs per month	778	630	492	610	617	992	524	663	819	732	517	735	679	459	1,037	3,403	1,304	2,071	472	723
		Cable TV		Rs per month	142	140	140	142	153	131	141	132	155	150	144	127	141	182	195	303	217	448	37	161
	Equipment Availability in the House	Own Car	1	Yes	7%	6%	6%	6%	5%	8%	5%	5%	10%	8%	2%	7%	6%	5%	44%	96%	32%	57%	6%	14%
		AC	1	Yes	3%	2%	1%	3%	0%	3%	1%	1%	5%	4%	1%	1%	2%	3%	35%	93%	28%	55%	1%	10%
		Refrigerator	1	Yes	66%	59%	62%	64%	64%	56%	55%	64%	72%	70%	59%	55%	62%	69%	91%	100%	95%	98%	21%	68%
		TV	1	Yes	78%	69%	81%	76%	77%	69%	68%	81%	81%	85%	72%	64%	75%	94%	92%	99%	95%	95%	36%	82%
(6) Role Players in Water Supply and Sewerage/Sanitation	1) Before this interview, did you know that KW&SB is in charge of public water supply and sewerage services?		1	Yes	55%	48%	50%	53%	46%	50%	48%	51%	55%	55%	53%	44%	51%	65%	79%	88%	70%	82%	31%	60%
			2	No	45%	52%	50%	47%	54%	50%	52%	49%	45%	45%	47%	56%	49%	35%	21%	12%	30%	18%	69%	40%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) Are there any NGO or consumer based organizations working in your area for water supply and sewerage/sanitation?		1	Yes	2%	7%	10%	5%	5%	6%	6%	6%	3%	5%	4%	7%	5%	4%	0%	3%	10%	69%	4%	4%
			2	No	98%	93%	90%	95%	95%	94%	94%	94%	97%	95%	96%	93%	95%	96%	100%	97%	90%	31%	96%	96%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (4/17)

II. Water Supply

Question			Unit/ Selection		Urban																			Rural	Estimated Average in Karachi*
					Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
					Katchi Abadis Sampling Areas are Categorized by	Factor 1 Total Area (Acres)			Factor 2 Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Factor 3 Percentage of Using Line Water Connection (%)			Factor 4 Education Level of House head (% of Illiterate)				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
					From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
					To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
					No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(7) -1. Various Water Sources and Costs	1) What type of water use is enough, available normally at your house?		1	Only drinking	1%	2%	3%	2%	3%	1%	2%	1%	2%	2%	4%	0%	2%	2%	0%	6%	3%	0%	5%	2%
			2	Cooking and washing dishes	8%	9%	14%	11%	6%	7%	10%	10%	10%	10%	10%	8%	9%	10%	13%	0%	11%	4%	25%	11%
			3	Washing yourself in toilet	6%	7%	15%	3%	9%	18%	10%	7%	4%	8%	5%	10%	8%	3%	2%	4%	8%	0%	13%	6%
			4	Bathing	16%	12%	14%	14%	13%	14%	14%	14%	15%	15%	13%	13%	14%	12%	6%	0%	10%	5%	15%	12%
			5	Washing cloths or house cleaning	60%	60%	51%	59%	59%	58%	57%	58%	60%	56%	56%	65%	59%	70%	52%	51%	57%	53%	40%	60%
			6	Equipped toilet flushing or small scale gardening or car	9%	10%	2%	10%	10%	2%	7%	10%	9%	9%	12%	5%	8%	3%	27%	37%	10%	38%	2%	10%
			7	Livestock farming or agriculture	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	2%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Average Level	4.5	4.5	4.0	4.5	4.5	4.3	4.3	4.5	4.5	4.4	4.5	4.5	4.5	4.5	4.8	5.0	4.4	5.2	3.7	4.5
	2) At which percentage and at which cost each water source is normally used for drinking and other water usages on average?	Drinking Water:	1	Bottled water	1%	3%	3%	2%	3%	1%	2%	1%	3%	2%	2%	1%	2%	9%	12%	26%	21%	19%	0%	6%
			2	Individual house line water connection	78%	58%	4%	74%	52%	24%	30%	74%	80%	68%	66%	44%	60%	68%	80%	69%	42%	62%	20%	64%
			3	Shared line water connection (among flats, neighbors, etc)	7%	5%	6%	7%	7%	2%	5%	9%	4%	6%	7%	5%	6%	3%	2%	2%	25%	0%	4%	4%
			4	Water tanker	2%	21%	72%	5%	14%	67%	42%	5%	4%	18%	6%	33%	19%	4%	1%	3%	2%	13%	37%	12%
			5	Water carrying person (donkey cart, mashki, etc.)	1%	2%	6%	2%	1%	1%	4%	1%	1%	1%	3%	2%	2%	3%	1%	0%	3%	0%	6%	2%
			6	Public water storages (tanki)	1%	4%	7%	2%	7%	1%	7%	1%	1%	0%	4%	6%	3%	1%	2%	0%	3%	5%	19%	3%
			7	Well/bore	10%	7%	2%	7%	15%	4%	9%	9%	6%	5%	10%	9%	8%	11%	2%	1%	5%	0%	9%	8%
			8	Others (river, canal, water course, pond, lake, rain, spring, etc.)	1%	2%	6%	2%	1%	1%	4%	1%	1%	1%	3%	2%	2%	3%	1%	0%	3%	0%	6%	2%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Other Water Usage:	1	Bottled water	0%	0%	2%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	1%	1%
			2	Individual house line water connection	77%	58%	3%	72%	54%	24%	29%	73%	78%	67%	66%	42%	59%	61%	83%	91%	48%	70%	24%	63%
			3	Shared line water connection (among flats, neighbors, etc)	7%	4%	5%	6%	4%	4%	5%	7%	4%	5%	7%	4%	5%	4%	2%	0%	27%	0%	4%	4%
			4	Water tanker	2%	21%	70%	5%	15%	66%	40%	5%	5%	18%	6%	32%	19%	6%	4%	5%	3%	24%	31%	13%
			5	Water carrying person (donkey cart, mashki, etc.)	2%	3%	5%	3%	2%	1%	4%	1%	4%	2%	3%	3%	3%	1%	1%	0%	2%	0%	5%	2%
			6	Public water storages (tanki)	2%	3%	3%	2%	6%	2%	5%	1%	2%	1%	2%	5%	3%	1%	0%	0%	3%	4%	16%	2%
			7	Well/bore	11%	11%	12%	11%	19%	4%	16%	13%	6%	7%	15%	13%	11%	26%	10%	4%	18%	2%	12%	15%
			8	Others (river, canal, water course, pond, lake, rain, spring, etc.)	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	7%	1%
				Total	100%	100%	100%	100%	100%	101%	100%	101%	100%	100%	101%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Average Expenses		1	Bottled water	8	40	30	25	36	10	19	14	40	34	16	15	24	30	160	1,025	223	584	0	70
			2	Individual house line water connection	43	56	12	39	87	22	15	68	50	55	33	37	44	78	216	305	101	170	9	87
			3	Shared line water connection (among flats, neighbors, etc)	1	1	34	9	0	0	17	0	1	1	17	2	6	1	0	14	19	0	21	4
			4	Water tanker	28	219	670	69	173	589	373	64	95	206	61	282	190	115	142	327	94	1,889	291	167
			5	Water carrying person (donkey cart, mashki, etc.)	11	8	91	30	2	8	43	4	19	16	42	8	21	6	11	0	25	0	41	15
			6	Public water storages (tanki)	0	13	44	11	25	0	33	2	1	0	22	17	11	1	2	0	0	12	9	6
			7	Well/bore	5	15	13	9	21	5	17	9	5	7	10	13	10	22	14	7	14	0	13	14
			8	Others (river, canal, water course, pond, lake, rain, spring, etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	1
				Total	96	352	893	190	344	634	518	161	211	320	202	374	304	253	545	1,677	476	2,656	400	365
				Individual and Shared Connection	43	57	46	48	88	22	32	68	51	56	50	39	49	79	216	319	121	170	29	92
				Other than line connections	52	295	848	142	257	611	486	93	161	264	151	336	255	175	328	1358	356	2486	371	273
	3) Which line water connection do you use?		1	Don't have line connection	5%	26%	71%	9%	33%	59%	54%	9%	1%	13%	19%	43%	24%	8%	2%	1%	7%	4%	63%	17%
			2	Individual house connection	91%	69%	27%	85%	65%	41%	41%	85%	98%	85%	73%	52%	72%	92%	91%	99%	58%	96%	32%	80%
			3	Shared connection	4%	4%	2%	6%	3%	0%	5%	6%	1%	1%	8%	4%	4%	0%	6%	0%	31%	0%	5%	3%
			4	Both individual and shared connection	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	4%	0%	0%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) If "1.Don't have line connection", what is the main reason you don't have individual house connection?		1	Your area is not covered by public water supply line.	0%	83%	79%	43%	74%	88%	77%	23%	0%	61%	42%	89%	75%	17%	0%	0%	50%	0%	96%	44%
			2	House connection (both monthly charge and connection fee) is too expensive.	9%	5%	2%	3%	9%	1%	4%	8%	0%	4%	15%	0%	4%	33%	0%	100%	0%	0%	0%	14%
			3	Monthly charges is too expensive	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			4	Connection fee is too expensive	27%	2%	0%	10%	3%	0%	2%	15%	0%	4%	8%	1%	3%	0%	0%	0%	0%	0%	3%	1%
			5	The quality of line water supply is not good enough	9%	0%	0%	3%	0%	0%	0%	8%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
			6	Amount or hours of line water supply is not enough	0%	0%	3%	7%	0%	0%	2%	0%	0%	0%	8%	0%	1%	0%	0%	0%	0%	0%	0%	1%
			7	Present arrangement (alternative water supply) is satisfactory	9%	0%	2%	3%	0%	1%	1%	8%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	1%	1%
			8	Plot has not been regularized	0%	2%	3%	3%	0%	3%	2%	8%	0%	11%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
			9	Still in the waiting list for connection	0%	3%	6%	3%	3%	5%	6%	0%	0%	14%	4%	1%	4%	33%	0%	0%	0%	0%	0%	12%
			10	Others	45%	6%	5%	23%	12%	1%	6%	31%	100%	7%	23%	5%	9%	17%	100%	0%	50%	100%	0%	26%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (5/17)

Question				Unit/ Selection	Urban														Rural	
					Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas						
					Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	Estimated Average in Karachi*
						Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)									
					Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:									
					From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%									
					To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%									
					No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(7) -2. Various Water Sources and Costs		5) If "3. Shared Connection", what is the main reason you don't have individual house connection?		1	Your household is not covered by public water supply line.	63%	40%	100%	70%	0%	100%	67%	44%	100%	75%	40%	60%	57%				28%		100%	
				2	House connection (both monthly charge and connection fee) is too expensive.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				0%		0%	
				3	Monthly charges is too expensive	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				0%		0%	
				4	Connection fee is too expensive	0%	20%	0%	0%	33%	0%	0%	11%	0%	0%	0%	20%	7%				6%		0%	
				5	The quality of line water supply is not good enough	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				0%		0%	
				6	Amount or hours of line water supply is not enough	0%	20%	0%	10%	0%	0%	0%	11%	0%	25%	0%	0%	7%				0%		0%	
				7	Present arrangement (alternative water supply) is satisfactory	25%	0%	0%	10%	33%	0%	33%	11%	0%	0%	40%	0%	14%				22%		0%	
				8	Plot has not been regularized	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				0%		0%	
				9	Still in the waiting list for connection	13%	0%	0%	10%	0%	0%	0%	11%	0%	0%	20%	0%	7%				0%		0%	
				10	Others	0%	20%	0%	0%	33%	0%	0%	11%	0%	0%	0%	20%	7%				44%		0%	
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				100%		100%	
		6) If "1." or "3.", if KW&SB's piped water supply services newly covers your area or increase the amount of piped water supply to your area, would you like to have individual house connection?		1	Yes	74%	97%	100%	85%	97%	100%	94%	95%	100%	100%	83%	98%	95%	83%	100%	100%	100%	0%	99%	93%
				2	No	26%	3%	0%	15%	3%	0%	6%	5%	0%	0%	17%	2%	5%	17%	0%	0%	0%	100%	1%	7%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		7) If "Yes", how much would be the maximum limit you are willing to pay per month to have new individual house connection to the public water services?			Rs per month	403	485	737	493	551	480	682	349	483	499	399	590	500	472	333	113	245	0	435	451
		8) If "Yes", how much you are willing to spend for its initial connection cost (including material and labor costs)?			Rs	758	607	884	711	796	627	717	508	1,333	983	498	615	707	380	5,000	0	2,826	0	705	1,315
		9) If you have line water supply provided by KW&SB but it is not the primary water source, why isn't the line connection your primary water source?		1	Because the line water supply connection provide only limited water supply.	80%	60%	72%	67%	50%	87%	55%	73%	79%	77%	76%	59%	71%	65%	67%	67%	58%	82%	76%	68%
				2	Because the quality of piped water is not good enough.	12%	23%	0%	24%	13%	0%	6%	18%	21%	13%	12%	19%	15%	6%	33%	33%	8%	0%	0%	15%
				3	Because we can use cheaper alternative water sources (well, etc.).	2%	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	3%	1%	0%	0%	0%	8%	9%	0%	0%
				4	Others	5%	16%	28%	7%	38%	13%	39%	6%	0%	10%	12%	19%	14%	29%	0%	0%	25%	9%	24%	16%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(7) -3. Households buying water from water tanker, water carrying person or public water storage		10) Main Water Source within the Three Water Sources:		1	Tanker	77%	79%	89%	69%	70%	94%	83%	74%	84%	94%	64%	80%	83%	50%	75%	100%	43%	90%	64%	71%
				2	Water Carrying Person	23%	9%	7%	20%	3%	6%	6%	17%	16%	6%	20%	8%	9%	10%	0%	0%	14%	0%	13%	8%
				3	Public Water Storage	0%	12%	5%	11%	27%	0%	11%	9%	0%	0%	16%	11%	8%	40%	25%	0%	43%	10%	23%	21%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	<Tanker>		11) Ranger or Private?	1	Ranger	30%	15%	12%	16%	27%	11%	16%	13%	18%	19%	0%	14%	15%	30%	33%	15%	0%	22%	7%	22%
				2	Private	70%	85%	88%	84%	73%	89%	84%	88%	82%	81%	100%	86%	85%	70%	67%	85%	100%	78%	93%	78%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			12) Capacity of Tanker	1	1,000 Gallons	40%	41%	61%	41%	27%	60%	52%	60%	33%	46%	64%	51%	50%	40%	100%	57%	50%	42%	38%	55%
				2	600 Gallons	20%	14%	8%	27%	8%	7%	8%	13%	38%	22%	7%	5%	12%	0%	0%	7%	0%	0%	12%	6%
				3	400 Gallons	30%	9%	6%	14%	19%	5%	8%	20%	14%	12%	0%	8%	9%	60%	0%	0%	0%	0%	7%	23%
				4	Others	10%	36%	25%	19%	46%	28%	31%	7%	14%	20%	29%	36%	29%	0%	0%	36%	50%	58%	43%	16%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			13) Unit Price of Tanker Water		Rs. per tanker	492	579	554	537	621	531	523	565	581	553	606	508	548	283	392	589	296	365	340	430
			14) Water Quality	1	Very good (directly drinkable)	0%	7%	6%	5%	4%	7%	6%	19%	5%	5%	13%	6%	6%	10%	0%	7%	0%	11%	7%	6%
				2	Good	80%	34%	36%	70%	31%	28%	38%	31%	71%	50%	40%	28%	38%	0%	33%	36%	75%	42%	40%	25%
				3	Not bad	10%	43%	40%	16%	46%	47%	38%	31%	24%	36%	33%	44%	40%	70%	67%	29%	0%	47%	39%	53%
				4	Bad	0%	14%	17%	5%	15%	18%	18%	6%	0%	9%	13%	19%	15%	20%	0%	21%	0%	0%	9%	14%
				5	Very bad	10%	1%	1%	3%	4%	1%	1%	13%	0%	0%	0%	4%	2%	0%	0%	7%	25%	0%	4%	1%
				6	I don't know	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	< Water Carrying Person >		15) Type of Water Carrying Parson:	1	Donkey cart	67%	71%	50%	67%	0%	100%	38%	67%	100%	100%	50%	56%	63%	100%			0%		73%	
				2	Masiki	0%	29%	0%	0%	100%	0%	25%	0%	0%	0%	0%	22%	11%	0%			100%		9%	
				3	Others	33%	0%	50%	33%	0%	0%	38%	33%	0%	0%	50%	22%	26%	0%			0%		18%	
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			100%		100%	
			17) Water Quality:	1	Very good (directly drinkable)	0%	14%	20%	0%	0%	100%	14%	17%	0%	25%	20%	0%	11%	50%			0%		0%	
				2	Good	50%	0%	20%	29%	0%	0%	14%	33%	20%	25%	20%	22%	22%	50%			50%		36%	
				3	Not bad	50%	57%	40%	50%	100%	0%	57%	33%	60%	25%	40%	67%	50%	0%			50%		36%	
				4	Bad	0%	14%	20%	14%	0%	0%	14%	0%	20%	25%	20%	0%	11%	0%			0%		9%	
				5	Very bad	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			0%		18%	
				6	I don't know	0%	14%	0%	7%	0%	0%	0%	17%	0%	0%	0%	11%	6%	0%			0%		0%	
					Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			100%		100%	

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (6/17)

Question				Unit/ Selection	Urban														Rural	Estimated Average in Karachi*
					Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas						
					Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	
						Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)								
					Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
					From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
					To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
					No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(7) -3. Households buying water from water tanker, water carrying person or public water storage	< Public Water Storage >	19) Unit Price of Water if there is any:		Rs./gallons		1.4	5.0	5.0	1.4		3.2				5.0	1.4	3.2						142.9	
		20) Water Quality:	1	Very good (directly drinkable)		0%	25%	17%	0%		9%	0%			25%	0%	8%						30%	
			2	Good		44%	50%	67%	29%		36%	100%			50%	44%	46%						52%	
			3	Not bad		56%	0%	0%	71%		45%	0%			0%	56%	38%						13%	
			4	Bad		0%	0%	0%	0%		0%	0%			0%	0%	0%						4%	
			5	Very bad		0%	25%	17%	0%		9%	0%			25%	0%	8%						0%	
			6	I don't know		0%	0%	0%	0%		0%	0%			0%	0%	0%						0%	
				Total		100%	100%	100%	100%		100%	100%			100%	100%	100%						100%	
(7) -4. Households using Well and Bore	21) Type of Well/bore:		1	Well	43%	20%	5%	6%	39%	25%	8%	58%	13%	19%	7%	55%	24%	14%	11%	33%	26%		33%	20%
			2	Bore	57%	80%	95%	94%	61%	75%	93%	42%	88%	81%	93%	45%	76%	86%	89%	67%	74%		67%	80%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%
	22) Type of Pump:		1	Without pump	22%	9%	0%	16%	5%	0%	0%	32%	6%	10%	0%	29%	11%	4%	0%	0%	5%		0%	6%
			2	Hand pump	15%	11%	16%	10%	18%	20%	18%	12%	6%	10%	17%	14%	14%	0%	0%	0%	0%		7%	6%
			3	Electrical pump	63%	80%	84%	73%	77%	80%	83%	56%	88%	81%	83%	57%	75%	96%	100%	100%	95%		93%	87%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%
	23) Protection of Well/bore from Pollution:		1	Protected	92%	91%	58%	83%	95%	60%	78%	88%	94%	81%	83%	90%	84%	88%	78%	100%	94%		77%	84%
			2	Unprotected	8%	9%	42%	17%	5%	40%	23%	13%	6%	19%	17%	10%	16%	12%	22%	0%	6%		23%	16%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%
	24) Quality of the Well/bore Water:		1	Very good	23%	14%	0%	15%	18%	0%	10%	12%	27%	13%	14%	14%	14%	19%	0%	0%	32%		7%	12%
			2	Good	27%	37%	16%	21%	41%	40%	28%	32%	27%	30%	28%	29%	29%	11%	0%	33%	16%		27%	18%
			3	Not bad	42%	40%	16%	40%	32%	20%	25%	52%	33%	37%	24%	48%	35%	41%	63%	33%	37%		13%	40%
			4	Bad	8%	9%	47%	23%	9%	10%	28%	4%	13%	10%	31%	10%	18%	22%	38%	33%	5%		0%	22%
			5	Very bad	0%	0%	21%	2%	0%	30%	10%	0%	0%	10%	3%	0%	5%	7%	0%	0%	11%		53%	7%
			6	I don't know	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%
	25) How many households are using the same well/bore?			households	1.2	5.4	1.5	1.4	10.5	1.3	6.2	1.9	1.3	1.5	1.2	5.8	3.0	1.4	22.1	0.5	28.1		24.1	6.7
	27) Depth (ground surface to bottom of the well/bore):			m	14.8	22.5	6.4	19.8	14.5	8.9	10.4	17.0	24.4	21.2	8.6	15.6	17.3	15.0	28.0	3.3	27.9		31.8	18.8
	28) Water Depth in Wet Season (water surface to the bottom):			m	13.6	12.2		16.1	3.0		4.3	16.2	25.0	20.0	1.0	8.5	12.4	7.8	6.7	0.0	3.3		7.7	9.5
	29) Water Depth in Dry Season (water surface to the bottom):			m	10.5	8.0		9.7	1.8		2.9	10.8	12.0	11.3	1.8	7.3	8.4	8.0	3.3	0.0	1.7		4.8	7.1
	30) How much is the initial construction cost of the well facilities?			Rs	6,938	8,941	2,792	7,196	10,863	2,625	8,034	7,075	6,850	6,250	4,724	11,406	7,320	5,093	1,678	11,250	8,458		0	5,403
	31) How long will the well/bore (& pumping facilities) be usable?			year	8.0	5.4	5.9	7.0	2.9	9.2	6.6	5.7	6.8	6.9	3.6	7.4	6.4	6.6	10.2	8.8	5.8		4.3	7.0
	32) How much is the annual maintenance cost of the well facilities?			Rs/year	879	2,173	1,013	996	3,726	686	2,886	748	868	856	679	2,861	1,501	853	792	1,000	5,502		2,461	1,218
(7) -5. Households using other water source (river, canal, water course, pond, lake, rain, spring, etc.)	33) Type of Water Source:		1	River																			33%	
			2	Canal																			0%	
			3	Water Course																			0%	
			4	Pond																			11%	
			5	Lake																			0%	
			6	Rain																			56%	
			7	Spring																			0%	
			8	Others																			0%	
				Total																			100%	
	34) Water Quality:		1	Very good (directly drinkable)																			0%	
			2	Good																			28%	
			3	Not bad																			11%	
			4	Bad																			22%	
			5	Very bad																			39%	
			6	I don't know																			0%	
				Total																			100%	

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (7/17)

Question			Unit/ Selection	Urban														Rural	
				Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas					Village	Estimated Average in Karachi*
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(7) -6. Households fetching water from a distant water source.	35) From which water source does your household mainly fetch water?		1	Shared line water	29%	8%	14%	18%	8%	18%	11%	15%	38%	17%	16%	15%	16%	25%					0%	
			2	Water tanker	0%	38%	50%	12%	17%	82%	43%	20%	13%	54%	16%	20%	32%	50%					10%	
			3	Water carrying person	53%	33%	27%	47%	58%	0%	29%	45%	50%	29%	47%	35%	37%	25%					21%	
			4	Public water storage	0%	17%	9%	12%	17%	0%	11%	10%	0%	0%	11%	20%	10%	0%					21%	
			5	Well/bore	18%	4%	0%	12%	0%	0%	6%	10%	0%	0%	11%	10%	6%	0%					13%	
			6	Others (river, canal, water course, pond, lake, rain, spring, etc.)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					36%	
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					100%	
	36) How do you fetch water?		1	Hand	93%	67%	50%	74%	67%	100%	62%	79%	100%	100%	69%	60%	73%						88%	
			2	Cart	7%	20%	50%	22%	25%	0%	38%	7%	0%	0%	31%	27%	23%						12%	
			3	Bicycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%						0%	
			4	Motorbike	0%	7%	0%	0%	8%	0%	0%	7%	0%	0%	0%	7%	3%						0%	
			5	Car	0%	7%	0%	4%	0%	0%	0%	7%	0%	0%	0%	7%	3%						0%	
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%						100%	
	37) How frequently water fetch is required for your household a day?			Times a day	4.1	2.0	1.8	3.7	2.2	3.0	1.5	4.7	2.6	2.4	1.4	5.5	3.2	1.3			0.9		2.7	
	38) How much time does each water fetch take on average?			minutes	15.4	25.8	35.0	16.9	28.8	20.0	32.3	15.9	15.6	16.3	19.3	25.7	20.5	14.0			8.1		29.1	
	39) How many hours does your household spend for fetching water a day in			hours	1.7	2.0	1.1	1.6	2.2	1.0	1.4	1.9	1.8	1.5	1.3	2.3	1.7	0.7			0.6		2.3	
	40) Who mainly fetch water for your household (relation to household head)?		1	Household head	14%	57%	22%	17%	67%	0%	40%	31%	0%	0%	21%	60%	32%	25%			0%		9%	
			2	Household head's family	21%	0%	0%	13%	0%	0%	10%	0%	25%	13%	14%	0%	8%	25%			0%		50%	
			3	Other household member	64%	43%	44%	58%	33%	100%	35%	69%	75%	88%	43%	40%	51%	50%			75%		41%	
			4	Paid worker	0%	0%	33%	13%	0%	0%	15%	0%	0%	0%	21%	0%	8%	0%			25%		0%	
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			100%		100%	
	41) How old is the person who mainly carry water?			years old	25.5	29.4	20.9	26.3	29.5	17.0	29.3	27.6	22.3	23.0	25.1	31.3	26.6	15.2			11.9		22.7	
	42) Which is the sex of the person who mainly carry the water?		1	Male	80%	100%	100%	89%	100%	100%	90%	100%	80%	89%	87%	100%	93%	75%			100%		48%	
			2	Female	20%	0%	0%	11%	0%	0%	10%	0%	20%	11%	13%	0%	7%	25%			0%		52%	
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			100%		100%	
(7)-7. Total Water Consumption	43)-1. Monthly Household Water Consumption (UK Gallon)			Gallon/month/household	6,846	5,981	2,779	6,461	5,590	4,667	4,710	6,049	7,348	6,419	5,056	6,092	5,957	6,459	7,016	15,299	8,176	13,719	4,496	6,429
	43)-2. Water Consumption per capita per day (UK Gallon)			Gallon/capita/day	30	21	13	25	21	22	19	22	32	27	23	20	24	26	33	58	36	59	17	26
	44) Start Month of Having Difficulty Get Water			Month	5.1	5.2	5.1	5.1	5.2	5.1	5.1	5.3	5.0	5.1	5.1	5.2	5.1	5.3	5.0	5.1	5.1	5.1	5.1	5.2
	45) End Month of Having Difficulty Get Water			Month	7.7	7.8	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.9	7.7	7.5	7.4	7.3	7.8	7.8	7.7	7.6
(8) -1. Service Pipe, Meter, and Suction Pump	Service pipe	Installation	1	Installed	95%	75%	29%	90%	68%	44%	47%	91%	99%	88%	82%	56%	76%	95%	98%	100%	89%	96%	34%	84%
			2	Not installed	5%	25%	71%	10%	32%	56%	53%	9%	1%	12%	18%	44%	24%	5%	2%	0%	11%	4%	66%	16%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Age of pipe		Years old	14	16	15	14	18	13	14	12	18	15	13	15	15	16	16	16	35	11	4	15
		Who installed?	1	Skilled Plumber	74%	71%	82%	73%	70%	80%	70%	71%	77%	73%	70%	77%	73%	77%	88%	82%	73%	76%	58%	76%
			2	Unskilled Labor	3%	3%	5%	3%	4%	2%	2%	3%	3%	3%	2%	3%	3%	0%	0%	1%	5%	4%	0%	1%
			3	Yourself	8%	13%	9%	11%	12%	3%	16%	10%	6%	10%	11%	8%	10%	4%	0%	0%	2%	2%	18%	7%
			4	I don't know	15%	14%	5%	14%	14%	15%	11%	15%	14%	13%	16%	13%	14%	19%	12%	17%	21%	18%	24%	16%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Pipe material	1	Asbestos	9%	12%	4%	10%	13%	7%	9%	9%	11%	10%	7%	14%	10%	3%	0%	2%	8%	2%	3%	6%
			2	Steel	6%	2%	15%	3%	3%	16%	6%	2%	7%	7%	4%	1%	5%	4%	0%	2%	5%	4%	0%	3%
			3	Cast Iron	21%	20%	22%	21%	27%	13%	27%	19%	20%	18%	22%	25%	21%	19%	28%	35%	35%	33%	10%	21%
			4	PVC	28%	26%	11%	31%	17%	10%	28%	31%	19%	25%	27%	28%	26%	27%	6%	8%	7%	6%	72%	25%
			5	G.I.	36%	40%	48%	35%	41%	54%	28%	39%	43%	41%	40%	32%	39%	46%	66%	55%	45%	55%	15%	45%
			6	Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	85%	100%	100%	100%	100%	100%	100%	93%
		Permission	1	KW&SB's permission	48%	45%	56%	43%	52%	66%	39%	46%	54%	52%	42%	44%	47%	58%	69%	69%	66%	42%	18%	53%
			2	City Nazim's permission	2%	2%	0%	2%	1%	0%	2%	2%	1%	1%	3%	2%	2%	0%	0%	3%	0%	0%	0%	1%
			3	Town Nazim's permission	1%	3%	0%	1%	0%	7%	1%	4%	0%	1%	4%	1%	2%	3%	2%	0%	0%	7%	23%	3%
			4	UC Nazim's permission	10%	10%	11%	11%	11%	5%	15%	11%	7%	8%	14%	11%	10%	6%	0%	0%	0%	2%	15%	7%
			5	No permission	11%	14%	7%	13%	14%	7%	18%	12%	8%	11%	11%	15%	12%	17%	16%	3%	3%	7%	10%	14%
			6	I don't know	28%	25%	26%	30%	22%	16%	25%	24%	31%	27%	26%	28%	27%	16%	14%	26%	31%	42%	33%	22%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(asked to all)

(asked to water line users)

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (8/17)

Question			Unit/ Selection			Urban																		Rural	Estimated Average in Karachi*
						Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas					Village	
						Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consumers		
							Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)									
						Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
						From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
						To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
						No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(8) - 1. Service Pipe, Meter, and Suction Pump (8)	Water Meter	Installation	1	Installed	(asked to water meter users)																		29%		
			2	Not installed																			71%		
				Total																			100%		
		Condition	1	Broken																			0%		
			2	Not accurate,																			25%		
			3	Working																			75%		
			4	I don't know																			0%		
				Total																			100%		
		Basis of water bill	1	Based on the measured volume,																			29%		
			2	Fixed																			69%		
			3	I don't know																			2%		
				Total																			100%		
		Frequency of reading	1	Once a month																			100%		
			2	Twice a month																			0%		
			3	Others																			0%		
				Total																			100%		
	Water Suction Pump (including the one used as a booster pump)		1	Installed	(asked to all)	68%	63%	47%	67%	52%	62%	47%	71%	75%	73%	67%	49%	64%	77%	72%	73%	54%	44%	24%	67%
			2	Not installed		32%	37%	53%	33%	48%	38%	53%	29%	25%	27%	33%	51%	36%	23%	28%	27%	46%	56%	76%	33%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Leakage before receiving tank		1	Causing leakage	(asked to water line users)	2%	4%	0%	4%	2%	0%	4%	1%	4%	2%	3%	3%	3%	5%	0%	0%	4%	0%	8%	3%
			2	No leakage		98%	96%	100%	96%	98%	100%	96%	99%	96%	98%	97%	97%	97%	95%	100%	100%	96%	100%	92%	97%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(8) - 2. Tanks before taps	Receiving Tank	Installation	1	Installed	(asked to all)	50%	74%	89%	54%	69%	98%	75%	59%	62%	65%	60%	73%	67%	67%	84%	94%	63%	90%	71%	70%
			2	Not installed		50%	26%	11%	46%	31%	2%	25%	41%	38%	35%	40%	27%	33%	33%	16%	6%	37%	10%	29%	30%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Capacity		Gallons		1,179	1,844	1,807	1,278	2,081	1,863	1,547	1,522	1,506	1,790	1,283	1,370	1,529	1,269	2,295	3,524	7,664	4,220	1,908	1,642
		Location	1	Underground		85%	85%	83%	82%	81%	90%	82%	80%	88%	89%	77%	84%	84%	93%	90%	94%	97%	92%	35%	86%
			2	On ground		15%	15%	17%	18%	19%	10%	18%	20%	12%	11%	23%	16%	16%	7%	10%	6%	3%	8%	65%	14%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Flow valve instruction	1	Installed		39%	44%	24%	44%	52%	23%	31%	49%	43%	42%	44%	30%	38%	54%	65%	80%	79%	74%	10%	47%
			2	Not installed		58%	52%	67%	51%	43%	72%	62%	48%	51%	51%	51%	65%	57%	39%	24%	12%	9%	11%	86%	46%
			3	I don't know		4%	4%	9%	6%	5%	5%	7%	3%	6%	6%	5%	4%	5%	7%	11%	8%	12%	15%	4%	7%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overflow	1	Causing overflow		0%	3%	5%	1%	5%	4%	3%	5%	0%	3%	1%	2%	3%	7%	11%	6%	6%	9%	3%	5%
			2	No overflow		100%	97%	93%	99%	95%	95%	95%	95%	100%	97%	97%	97%	97%	93%	86%	93%	83%	88%	94%	94%
			3	I don't know		0%	0%	3%	1%	0%	1%	2%	0%	0%	0%	1%	1%	1%	0%	3%	1%	11%	2%	3%	1%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Overhead Tank/ Booster Pump	Installation	1	Installed		82%	67%	54%	75%	76%	59%	62%	74%	85%	79%	80%	54%	72%	90%	98%	99%	82%	94%	11%	79%
			2	Not installed		18%	33%	46%	25%	24%	41%	38%	26%	15%	21%	20%	46%	28%	10%	2%	1%	18%	6%	89%	21%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Capacity		Gallons		595	672	289	556	705	577	404	800	461	588	550	611	585	482	1,183	1,837	1,247	1,276	127	660
		Overflow	1	Causing overflow		3%	8%	5%	5%	6%	7%	6%	3%	7%	7%	4%	5%	5%	3%	4%	7%	10%	8%	0%	4%
			2	No overflow		96%	91%	93%	94%	93%	93%	93%	96%	93%	93%	94%	94%	94%	97%	93%	93%	84%	92%	100%	95%
			3	I don't know		1%	1%	2%	1%	1%	0%	1%	1%	0%	0%	2%	1%	1%	0%	2%	0%	6%	0%	0%	1%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(8) - 3. Taps	Number of taps inside			taps		3.6	3.7	3.7	3.6	4.4	3.1	3.5	3.7	4.0	3.8	3.7	3.5	3.6	4.4	8.2	13.4	6.8	11.9	1.4	4.7
	Number of taps outside			taps		0.6	0.5		0.5	0.2		0.4	0.7	0.4	0.4	0.5	1.2	0.5	1.0	0.3	0.3	0.2	0.2	0.3	0.6
	Leakage		1	Causing overflow		1%	3%	2%	1%	8%	1%	2%	3%	2%	3%	2%	2%	2%	3%	0%	2%	3%	0%	0%	2%
			2	No overflow		99%	97%	98%	99%	92%	99%	98%	97%	98%	97%	98%	98%	98%	96%	100%	97%	95%	100%	100%	98%
			3	I don't know		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	2%	0%	0%	0%
				Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(8) - 4. Water Appliances	Water Heater			sets		0.5	0.1	0.1	0.3	0.1	0.1	0.4	0.1	0.2	0.1	0.4	0.1	0.2	0.2	0.5	0.9	0.3	0.7	0.2	0.3
	Cloth Washing Machine			sets		0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.9	1.0	1.2	0.9	1.1	0.6	0.9
	flushing Toilet			sets		0.6	0.3	0.7	0.5	0.4	0.6	0.5	0.3	0.6	0.5	0.5	0.4	0.5	0.7	1.4	2.7	0.9	1.8	0.1	0.8

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (9/17)

Question			Unit/ Selection		Urban													Rural	
					Katchi Abadis (Low & Lower Middle Income Group)												Planned Areas						
					Katchi Abadis Sampling Areas are Categorized by	Factor 1 Total Area (Acres)			Factor 2 Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Factor 3 Percentage of Using Line Water Connection (%)			Factor 4 Education Level of House head (% of Illiterate)			Average in Katchi Abadis	Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	Estimated Average in Karachi*
					Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
					From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
					To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
					No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(9) -1. 1) Water Supply Service Levels (asked only to the household using line water)	1. Water Supply	1. Water supply hours	1	Very Good	20%	12%	0%	18%	16%	2%	19%	12%	18%	14%	21%	12%	16%	7%	21%	18%	15%	49%	16%	14%
			2	Satisfactory	44%	26%	0%	36%	37%	20%	21%	36%	38%	36%	29%	36%	34%	27%	52%	57%	49%	34%	45%	36%
			3	Bad	37%	62%	100%	46%	47%	79%	60%	52%	44%	50%	50%	52%	50%	66%	27%	25%	35%	17%	39%	50%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.2	2.5	3.0	2.3	2.3	2.8	2.4	2.4	2.3	2.4	2.3	2.4	2.3	2.6	2.1	2.1	2.2	1.7	2.2	2.4
		2. Water Pressure	1	Very Good	12%	9%	0%	11%	13%	2%	14%	10%	8%	7%	15%	10%	10%	4%	11%	11%	17%	47%	11%	8%
			2	Satisfactory	43%	24%	5%	35%	34%	18%	25%	31%	39%	33%	32%	34%	33%	34%	49%	55%	42%	36%	42%	37%
			3	Bad	46%	67%	95%	54%	53%	80%	61%	60%	53%	60%	53%	56%	57%	62%	40%	34%	42%	17%	47%	55%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.3	2.6	3.0	2.4	2.4	2.8	2.5	2.5	2.4	2.5	2.4	2.5	2.5	2.6	2.3	2.2	2.2	1.7	2.4	2.5
		Average Point			2.3	2.5	3.0	2.4	2.4	2.8	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.6	2.2	2.1	2.2	1.7	2.3	2.4
	2. Water Quality	1. Safety	1	Very Good	6%	5%	0%	5%	9%	2%	1%	6%	6%	5%	3%	8%	5%	6%	6%	7%	17%	53%	16%	6%
			2	Satisfactory	47%	25%	5%	38%	33%	26%	25%	34%	43%	37%	36%	36%	36%	43%	45%	38%	37%	38%	50%	40%
			3	Bad	47%	70%	95%	57%	58%	72%	74%	60%	51%	58%	61%	57%	59%	51%	49%	56%	46%	9%	34%	53%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.4	2.7	3.0	2.5	2.5	2.7	2.7	2.5	2.4	2.5	2.6	2.5	2.5	2.5	2.4	2.5	2.3	1.6	2.2	2.5
		2. Color	1	Very Good	6%	7%	0%	5%	12%	2%	6%	6%	6%	5%	5%	9%	6%	5%	8%	7%	22%	53%	13%	6%
			2	Satisfactory	52%	33%	9%	44%	45%	28%	31%	40%	49%	41%	45%	42%	42%	60%	49%	44%	39%	38%	47%	49%
			3	Bad	42%	60%	91%	51%	42%	70%	63%	54%	44%	54%	50%	49%	52%	35%	43%	49%	39%	9%	39%	45%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.4	2.5	2.9	2.5	2.3	2.7	2.6	2.5	2.4	2.5	2.4	2.4	2.5	2.3	2.4	2.4	2.2	1.6	2.3	2.4
		3. Taste	1	Very Good	7%	7%	0%	7%	9%	2%	9%	6%	6%	4%	10%	8%	7%	4%	6%	10%	20%	53%	13%	6%
			2	Satisfactory	51%	36%	5%	44%	46%	31%	30%	41%	50%	42%	43%	45%	43%	62%	52%	54%	48%	38%	45%	51%
			3	Bad	42%	57%	95%	49%	45%	67%	61%	53%	44%	54%	47%	48%	51%	34%	42%	36%	31%	9%	42%	43%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.4	2.5	3.0	2.4	2.4	2.6	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.3	2.4	2.3	2.1	1.6	2.3	2.4
		4. Smell	1	Very Good	6%	6%	0%	6%	7%	2%	5%	5%	6%	5%	6%	7%	6%	4%	2%	10%	17%	49%	17%	5%
			2	Satisfactory	49%	36%	9%	43%	45%	30%	35%	40%	47%	40%	41%	47%	42%	52%	58%	55%	47%	42%	53%	49%
			3	Bad	45%	58%	91%	51%	48%	68%	60%	55%	47%	55%	53%	47%	53%	44%	40%	35%	36%	9%	31%	46%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.4	2.5	2.9	2.5	2.4	2.7	2.6	2.5	2.4	2.5	2.5	2.4	2.5	2.4	2.4	2.3	2.2	1.6	2.1	2.4
		Average Point			2.4	2.6	2.9	2.5	2.4	2.7	2.6	2.5	2.4	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.2	1.6	2.2	2.4
	3. Public relations	1. Complaint Handling	1	Very Good	5%	4%	0%	5%	4%	2%	2%	3%	6%	5%	3%	3%	4%	1%	3%	0%	11%	29%	16%	4%
			2	Satisfactory	23%	17%	6%	19%	27%	13%	13%	21%	21%	17%	26%	18%	20%	18%	40%	32%	25%	54%	12%	22%
			3	Bad	72%	79%	94%	76%	69%	85%	85%	76%	73%	78%	71%	79%	76%	81%	57%	68%	64%	18%	72%	74%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.7	2.8	2.9	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7	2.8	2.7	2.8	2.5	2.7	2.5	1.9	2.6	2.7
		2. Promptness of repair work	1	Very Good	5%	3%	0%	5%	2%	2%	2%	4%	5%	6%	3%	2%	4%	3%	3%	0%	3%	27%	14%	4%
			2	Satisfactory	21%	12%	0%	17%	15%	12%	10%	14%	20%	18%	17%	9%	16%	20%	34%	24%	23%	62%	14%	20%
			3	Bad	74%	85%	100%	78%	83%	85%	88%	82%	75%	77%	80%	89%	80%	77%	63%	76%	74%	12%	73%	76%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.7	2.8	3.0	2.7	2.8	2.8	2.9	2.8	2.7	2.7	2.8	2.9	2.8	2.7	2.6	2.8	2.7	1.8	2.6	2.7
		3. Billing and payment services	1	Very Good	16%	18%	21%	12%	38%	21%	13%	18%	17%	17%	12%	26%	17%	30%	23%	40%	40%	42%	14%	23%
			2	Satisfactory	17%	16%	0%	15%	25%	8%	4%	18%	17%	16%	18%	12%	16%	30%	31%	33%	20%	58%	14%	23%
			3	Bad	67%	66%	79%	73%	37%	72%	82%	63%	65%	67%	70%	62%	67%	39%	46%	26%	40%	0%	71%	54%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.5	2.5	2.6	2.6	2.0	2.5	2.7	2.4	2.5	2.5	2.6	2.4	2.5	2.1	2.2	1.9	2.0	1.6	2.6	2.3
		4. Information Notice of KW&SB work	1	Very Good	6%	17%	8%	7%	29%	11%	12%	11%	12%	11%	10%	13%	11%	21%	12%	28%	34%	32%	20%	15%
			2	Satisfactory	14%	12%	0%	9%	27%	8%	0%	17%	12%	11%	11%	16%	12%	35%	39%	30%	20%	59%	13%	24%
			3	Bad	80%	70%	92%	83%	43%	81%	88%	73%	76%	77%	78%	71%	76%	44%	48%	43%	46%	9%	67%	61%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.7	2.5	2.8	2.8	2.1	2.7	2.8	2.6	2.6	2.7	2.7	2.6	2.6	2.2	2.4	2.2	2.1	1.8	2.5	2.5
		5. Trust on KW&SB Officials staff	1	Very Good	9%	10%	0%	7%	15%	12%	5%	9%	10%	11%	9%	6%	9%	13%	9%	11%	14%	15%	9%	10%
			2	Satisfactory	21%	12%	0%	17%	20%	5%	5%	18%	18%	16%	19%	13%	16%	27%	26%	34%	22%	56%	9%	21%
			3	Bad	70%	78%	100%	76%	65%	83%	91%	72%	72%	74%	72%	81%	75%	61%	66%	55%	64%	29%	83%	69%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
				Points	2.6	2.7	3.0	2.7	2.5	2.7	2.9	2.6	2.6	2.6	2.6	2.8	2.7	2.5	2.6	2.4	2.5	2.1	2.7	2.6
		Average Point			2.6	2.7	2.9	2.7	2.4	2.7	2.8	2.6	2.6	2.6	2.7	2.7	2.7	2.5	2.5	2.4	2.4	1.8	2.6	2.6
	Average Point				2.4	2.6	2.9	2.5	2.4	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	1.7	2.4	2.5

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (10/17)

	Question		Unit/ Selection	Urban														Rural	
				Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas						
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	Estimated Average in Karachi*
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(9) - 2. Water Supply Amount	2) How frequently do you receive water?		1	Daily	46%	38%	5%	48%	35%	0%	35%	35%	49%	41%	41%	40%	41%	46%	59%	54%	70%	63%	68%	47%
			2	Alternate days	18%	15%	9%	19%	6%	11%	15%	16%	17%	19%	9%	21%	16%	13%	29%	30%	17%	11%	8%	17%
			3	Two-three days a week	28%	22%	5%	22%	42%	16%	18%	26%	26%	28%	23%	18%	24%	8%	8%	11%	6%	15%	3%	15%
			4	Weekly	3%	15%	5%	3%	4%	44%	2%	14%	5%	5%	16%	4%	8%	16%	2%	1%	3%	4%	5%	9%
			5	Every two week or less	2%	1%	27%	1%	0%	15%	7%	3%	1%	4%	1%	4%	3%	2%	2%	1%	0%	4%	13%	3%
			6	Never comes	3%	9%	50%	5%	14%	15%	24%	7%	2%	3%	10%	14%	8%	14%	0%	3%	5%	4%	3%	8%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) How many hours do you receive water a day/each time?			hours	6.8	5.3	0.7	6.8	4.1	1.3	5.7	5.0	6.6	6.0	5.6	5.6	5.8	2.9	6.6	5.0	6.3	4.4	1.9	4.8
	4) Is the current water supply frequency and hours are enough for your household?		1	Enough	69%	51%	24%	66%	51%	21%	57%	52%	67%	62%	60%	51%	59%	46%	74%	76%	73%	76%	35%	57%
			2	Not enough	31%	49%	76%	34%	49%	79%	43%	48%	33%	38%	40%	49%	41%	54%	26%	24%	27%	24%	65%	43%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	5) If "2. not enough", How many additional hours of water supply would your household like to receive daily at least?			additional hours in winter	4.9	4.9	6.5	5.0	5.8	4.1	5.9	4.6	5.0	5.2	5.3	4.6	5.1	4.4	8.2	5.2	5.7	2.6	2.6	5.3
				additional hours in summer	8.1	7.5	8.0	8.3	7.6	5.9	9.7	7.2	7.2	7.7	8.7	7.1	7.8	6.9	10.8	7.7	9.2	4.0	2.9	7.8
	6) Is your household line connection registered in KW&SB?		1	Yes	64%	69%	58%	61%	81%	73%	55%	67%	69%	67%	68%	60%	66%	93%	98%	100%	97%	90%	12%	78%
			2	No	36%	31%	42%	39%	19%	27%	45%	33%	31%	33%	32%	40%	34%	8%	2%	0%	3%	10%	88%	22%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	7) Does your household receive water bill?		1	Yes	40%	37%	30%	28%	79%	51%	22%	45%	39%	40%	39%	35%	38%	80%	90%	92%	71%	96%	0%	59%
			2	No	60%	63%	70%	72%	21%	49%	78%	55%	61%	60%	61%	65%	62%	20%	10%	8%	29%	4%	100%	41%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	8) Do you think the water charge of line water connection (individual house connection and shared connection) is expensive?		1	Very low	5%	12%	0%	9%	7%	4%	11%	9%	6%	8%	8%	8%	8%	4%	7%	5%	2%	0%	50%	9%
			2	Low	2%	3%	0%	3%	2%	0%	0%	2%	3%	2%	2%	3%	2%	1%	0%	0%	7%	2%	50%	4%
			3	Fair	36%	36%	14%	38%	35%	23%	21%	33%	40%	40%	30%	30%	35%	32%	48%	69%	41%	55%	0%	35%
			4	High	27%	24%	71%	26%	30%	27%	32%	29%	24%	25%	32%	25%	27%	32%	37%	9%	27%	18%	0%	29%
			5	Very High	23%	17%	14%	16%	21%	35%	26%	18%	22%	19%	22%	23%	20%	16%	2%	3%	7%	6%	0%	15%
			6	I don't know	7%	9%	0%	8%	5%	12%	11%	9%	6%	7%	6%	13%	8%	13%	7%	14%	16%	18%	0%	9%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	9) Are you currently paying the bill for line water connection?		1	Yes	46%	43%	43%	34%	76%	48%	29%	46%	48%	48%	44%	38%	44%	61%	88%	92%	75%	96%	6%	56%
			2	No	54%	57%	57%	66%	24%	53%	71%	54%	52%	52%	56%	63%	56%	39%	12%	8%	25%	4%	94%	44%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(9) - 3. Billing and Collection		10) If "1. Yes", to which organization does your household pay water bill?	1	KW&SB	93%	96%	33%	94%	100%	79%	50%	100%	89%	88%	100%	100%	91%	97%	100%	98%	95%	11%	0%	90%
			2	Defense	7%	4%	0%	6%	0%	7%	0%	0%	11%	8%	0%	0%	6%	3%	0%	2%	0%	31%	50%	6%
			3	Others	0%	0%	67%	0%	0%	14%	50%	0%	0%	4%	0%	0%	3%	0%	0%	0%	5%	57%	50%	4%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		11) If "No", what is the main reason?	1	Connection is not registered	15%	14%	31%	16%	8%	17%	15%	22%	9%	17%	13%	15%	16%	0%	0%	0%	11%	0%	41%	9%
			2	No money	3%	5%	0%	2%	31%	0%	6%	4%	2%	2%	4%	6%	4%	12%	17%	0%	0%	0%	5%	8%
			3	Water bill is not coming	69%	60%	69%	67%	31%	71%	57%	58%	79%	70%	68%	55%	66%	46%	83%	100%	67%	0%	41%	62%
			4	No serious legal action even not to pay	3%	2%	0%	2%	8%	0%	2%	4%	1%	2%	4%	2%	2%	4%	0%	0%	0%	0%	0%	2%
			5	water supply is too short	4%	4%	0%	3%	0%	8%	2%	5%	3%	3%	1%	6%	4%	12%	0%	0%	0%	100%	14%	6%
			6	water quality is not satisfactory	1%	4%	0%	2%	0%	0%	4%	2%	1%	2%	3%	2%	2%	12%	0%	0%	0%	0%	0%	4%
			7	Can be connected by yourself after disconnection	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			8	Believing that Government should pay	4%	7%	0%	5%	8%	4%	11%	3%	3%	3%	6%	6%	5%	15%	0%	0%	6%	0%	0%	7%
			9	No reason	1%	4%	0%	2%	15%	0%	4%	3%	1%	1%	0%	8%	2%	0%	0%	0%	17%	0%	0%	1%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		12) If "No", what would be the main condition on which you are willing to pay based on water meter?	1	Water quality should be improved	5%	29%	0%	10%	38%	39%	14%	24%	7%	13%	12%	22%	15%	29%	67%	0%	0%	0%	13%	28%
			2	Water quantity should be sufficient	11%	9%	43%	12%	8%	11%	16%	12%	8%	10%	15%	8%	11%	38%	0%	0%	7%	0%	6%	17%
			3	Meter should be installed	26%	26%	29%	26%	15%	39%	22%	24%	31%	24%	29%	27%	26%	17%	17%	100%	57%	100%	25%	23%
			4	Water charges should be reduced	7%	12%	0%	7%	38%	0%	8%	9%	8%	8%	12%	6%	9%	0%	17%	0%	0%	0%	19%	8%
			5	If other people around your household also start paying their water bill	51%	24%	29%	46%	0%	11%	41%	32%	46%	44%	33%	37%	39%	17%	0%	0%	36%	0%	38%	25%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		13) If "2. Water quantity should be sufficient", how many hours of water supply will be sufficient for you to be willing to pay?		hours a day	8.3	8.6	3.2	8.7	7.6	4.1	8.4	8.5	6.7	7.1	8.8	8.1	7.8	5.0	2.8	4.1	11.4	1.7	1.9	5.7
	14) If water quantity is sufficient and water quality is improved, how much are you willing to pay for water bill per month?			Rs./month	105	142	232	129	166	111	166	126	114	110	148	160	133	131	711	950	283	517	51	244
	15) Do you know that water bill is collected based on household plot size?		1	Yes	24%	25%	21%	21%	36%	29%	21%	23%	27%	31%	20%	17%	24%	35%	55%	63%	40%	56%	7%	33%
			2	No	76%	75%	79%	79%	64%	71%	79%	77%	73%	69%	80%	83%	76%	65%	45%	38%	60%	44%	93%	67%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (11/17)

Question			Unit/ Selection	Urban																			Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:									
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%									
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%									
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(9) - 4. Maintenance and Leakage	16) Do you support plot size -based water bill?		1	Yes	22%	21%	37%	22%	28%	18%	28%	22%	20%	22%	25%	20%	22%	26%	46%	40%	29%	43%	11%	27%
			2	No	78%	79%	63%	78%	72%	82%	72%	78%	80%	78%	75%	80%	78%	74%	54%	60%	71%	57%	89%	73%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	17) Which is better for you to pay without difficulty, monthly water bill or water bill of every six months?		1	Monthly bill	60%	68%	69%	61%	63%	84%	65%	62%	66%	68%	58%	63%	64%	67%	60%	55%	52%	80%	61%	64%
			2	Bill every six month	28%	27%	19%	29%	32%	15%	27%	31%	23%	24%	30%	31%	27%	20%	26%	37%	37%	17%	27%	25%
			3	I don't know	11%	4%	12%	10%	4%	2%	8%	6%	10%	8%	12%	4%	8%	13%	6%	8%	11%	4%	12%	9%
			4	Other (Yearly)	0%	1%	0%	0%	1%	0%	0%	1%	1%	0%	0%	1%	0%	0%	8%	0%	0%	0%	0%	1%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	18) Do you have bank account?		1	Yes	26%	27%	52%	25%	35%	39%	29%	25%	32%	30%	26%	28%	28%	23%	71%	84%	58%	92%	17%	35%
			2	No	74%	73%	48%	75%	65%	61%	71%	75%	68%	70%	74%	72%	72%	77%	29%	16%	42%	8%	83%	65%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	19) Do you think it is fair to set water tariff depending on land price level or income level?		1	Fair	69%	68%	78%	70%	69%	66%	67%	71%	68%	68%	74%	66%	69%	71%	58%	46%	62%	52%	88%	68%
			2	Not Fair	25%	28%	19%	24%	27%	33%	27%	23%	28%	28%	20%	28%	26%	18%	40%	39%	25%	41%	8%	25%
			3	I don't know	5%	5%	4%	6%	4%	2%	6%	6%	4%	4%	6%	6%	5%	10%	2%	16%	13%	7%	4%	6%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	20) Do you think that the quantity of water should be set according to the population density of the area?		1	Yes	98%	98%	94%	98%	97%	100%	97%	97%	99%	99%	97%	95%	98%	99%	95%	98%	98%	95%	100%	98%
			2	No	2%	2%	6%	2%	3%	0%	3%	3%	1%	1%	3%	5%	2%	1%	5%	2%	2%	5%	0%	2%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	21) Who is maintaining water supply lines in your area?		1	KW&SB	26%	25%	30%	23%	39%	26%	18%	30%	25%	25%	27%	25%	26%	44%	43%	47%	45%	14%	23%	35%
			2	SKAA	0%	1%	0%	0%	1%	2%	0%	0%	1%	1%	0%	0%	1%	0%	2%	0%	0%	2%	0%	1%
			3	NGO	1%	1%	0%	1%	0%	0%	0%	0%	2%	1%	0%	2%	1%	0%	0%	0%	7%	0%	0%	0%
			4	CDGK	4%	2%	0%	3%	1%	7%	0%	3%	4%	4%	2%	2%	3%	7%	6%	4%	6%	0%	8%	5%
			5	Town	1%	2%	0%	1%	3%	0%	4%	1%	1%	1%	2%	2%	1%	0%	2%	0%	3%	0%	10%	1%
			6	UC	22%	16%	30%	22%	12%	21%	13%	21%	22%	19%	19%	23%	20%	10%	11%	7%	1%	0%	28%	16%
			7	Community/CBO	1%	2%	0%	1%	1%	2%	3%	0%	2%	1%	1%	3%	1%	0%	2%	1%	6%	65%	0%	1%
			8	Your household	22%	35%	13%	31%	13%	23%	31%	28%	25%	29%	25%	26%	27%	22%	9%	17%	9%	0%	18%	22%
			9	I don't know	22%	15%	26%	18%	29%	19%	30%	15%	19%	18%	24%	17%	20%	17%	25%	24%	22%	20%	15%	20%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	22) When you find water leakage outside your house, what would you do in general?		1	Inform KW&SB	13%	12%	0%	11%	14%	16%	8%	12%	13%	11%	14%	10%	12%	22%	18%	25%	25%	4%	20%	17%
			2	Inform Town Nazim	1%	4%	7%	2%	5%	2%	6%	3%	0%	2%	3%	2%	2%	1%	6%	0%	5%	52%	0%	2%
			3	Inform UC Nazism	33%	31%	21%	34%	25%	27%	18%	34%	36%	32%	30%	35%	32%	26%	25%	24%	20%	26%	37%	29%
			4	Try to fix at your cost	45%	49%	57%	48%	45%	42%	53%	48%	43%	48%	47%	44%	47%	40%	31%	41%	33%	13%	34%	41%
			5	Leave it as it is	9%	5%	14%	5%	12%	13%	14%	3%	8%	6%	7%	9%	7%	11%	20%	10%	17%	4%	9%	11%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(9) - 5. Water Save	23) Do you know about the water shortage in Karachi region?		1	Yes	86%	90%	93%	87%	84%	97%	90%	86%	90%	90%	85%	88%	88%	93%	84%	90%	91%	85%	83%	89%
			2	No	14%	10%	7%	13%	16%	3%	10%	15%	10%	10%	15%	12%	12%	7%	16%	10%	9%	15%	17%	11%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	24) Is government's effort to promote water save in Karachi enough?		1	far too little	22%	28%	27%	26%	23%	23%	26%	27%	22%	27%	23%	24%	25%	18%	27%	21%	19%	7%	33%	24%
			2	not enough	63%	63%	70%	62%	65%	69%	64%	64%	63%	62%	61%	68%	63%	67%	58%	64%	67%	87%	41%	62%
			3	enough	15%	9%	3%	12%	12%	8%	10%	9%	15%	11%	15%	8%	12%	14%	15%	15%	13%	5%	24%	14%
			4	I don't know	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	25) What is the reason of water shortage in Karachi?		1	limited water resource	32%	29%	33%	29%	33%	37%	28%	27%	35%	31%	31%	29%	31%	37%	30%	47%	33%	39%	45%	33%
			2	overuse of water	29%	24%	33%	27%	30%	24%	37%	24%	25%	27%	29%	25%	27%	21%	32%	22%	33%	27%	34%	26%
			3	water leakage	30%	41%	27%	37%	26%	32%	30%	44%	27%	32%	33%	41%	35%	38%	24%	22%	24%	18%	9%	32%
			4	Others	9%	6%	7%	7%	10%	8%	4%	5%	12%	10%	6%	5%	8%	5%	14%	9%	10%	16%	13%	8%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	26) Do you save water when using your public water supply service?		1	Yes	96%	98%	96%	96%	100%	98%	98%	98%	95%	96%	97%	98%	97%	100%	100%	99%	99%	98%	96%	98%
			2	No	4%	2%	4%	4%	0%	2%	2%	2%	5%	4%	3%	2%	3%	0%	0%	1%	1%	2%	4%	2%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	27) If "Yes", why do you save water? (multiple answers)																							
	· Because water is limited resource		1	Yes	83%	91%	88%	84%	89%	97%	92%	90%	81%	81%	94%	91%	87%	89%	76%	71%	79%	55%	96%	85%
	· Because water rate is expensive		1	Yes	14%	16%	50%	14%	15%	41%	27%	16%	14%	16%	16%	20%	17%	14%	26%	18%	6%	35%	7%	17%
	28) If "No", why do you not save water? (multiple answers)																							
	· Because water is plenty		1	Yes	33%	33%		33%				33%	0%	25%			33%			100%		100%	50%	
	· Because water rate is low		1	Yes	33%	0%		17%				33%	0%	25%			17%			100%		100%	100%	
	· Because water supply is irregular so that water tap need to be kept open		1	Yes	33%	50%		40%				0%	50%	25%			40%			0%		0%	0%	
	· I don't know		1	Yes	0%	0%		0%				0%	0%	0%			0%			0%		0%	50%	
	· Without any reason		1	Yes	67%	100%		75%				100%	50%	75%			75%			0%		100%	50%	

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (12/17)

Question			Unit/ Selection	Urban														Rural		
				Katchi Abadis (Low & Lower Middle Income Group)												Average in Katchi Abadis	Planned Areas						
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consumers	Village	Estimated Average in Karachi*
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)									
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(9) - 6. Removal of Suction Pump and Introduction of Water Meter	29) Do you know water sucking pumps causes contamination of line water by sucking dirty water into water pipes ?		1	Yes	85%	90%	76%	85%	94%	87%	82%	87%	88%	87%	86%	86%	87%	90%	85%	94%	83%	67%	63%	86%
			2	No	15%	10%	24%	15%	6%	13%	18%	13%	12%	13%	14%	14%	13%	10%	15%	6%	17%	33%	37%	14%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	30) Do you understand positive impact of meter & removal of suction pumps after the explanation?		1	Yes	73%	81%	71%	75%	79%	83%	74%	79%	75%	78%	71%	80%	77%	80%	81%	72%	71%	78%	46%	77%
			2	No	11%	8%	6%	10%	12%	2%	11%	9%	8%	9%	13%	7%	9%	6%	11%	14%	9%	4%	12%	9%
			3	I don't know.	16%	11%	23%	15%	8%	16%	15%	11%	17%	14%	16%	13%	14%	15%	8%	14%	21%	18%	42%	15%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	31) Do you support water meter?		1	Yes	83%	86%	77%	83%	80%	94%	79%	85%	85%	86%	78%	85%	84%	91%	89%	87%	87%	77%	66%	86%
			2	No	17%	14%	23%	17%	20%	6%	21%	15%	15%	14%	22%	15%	16%	9%	11%	13%	13%	23%	34%	14%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	If "1. Yes, I support"	32) Which is better way to let people to install water maters and to remove water suction pumps?	1	Your community or area should arrange the timing of the removal of water suction pumps	31%	22%	23%	29%	22%	17%	40%	21%	26%	21%	30%	34%	26%	12%	18%	14%	27%	42%	39%	21%
			2	KW&SB should put heavy fine to the people who uses suction pumps	65%	76%	73%	68%	76%	76%	59%	74%	71%	75%	65%	65%	70%	88%	77%	85%	67%	55%	58%	77%
			3	Others	5%	2%	5%	3%	2%	7%	1%	4%	3%	4%	5%	1%	3%	0%	5%	2%	5%	3%	3%	3%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		33) How do you want to pay the installment cost of water mater?	1	Pay it at the time of water meter instruction	26%	23%	10%	25%	24%	19%	12%	24%	28%	24%	21%	26%	23%	25%	38%	35%	35%	86%	8%	26%
			2	Pay extra price in water bill	74%	77%	90%	75%	76%	81%	88%	76%	72%	76%	79%	74%	77%	75%	62%	65%	65%	14%	92%	74%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	If "2. No, I don't support"	34) Why you don't support water mater?	1	I don't know water meter.	36%	27%	40%	39%	15%	0%	30%	30%	39%	41%	32%	23%	34%	22%	0%	13%	13%	10%	31%	24%
			2	I can not trust water meter.	18%	18%	40%	21%	15%	0%	30%	17%	14%	19%	23%	15%	20%	44%	50%	75%	38%	0%	31%	34%
			3	Water bill will be higher	41%	27%	20%	30%	46%	100%	30%	35%	39%	37%	32%	38%	35%	22%	50%	13%	50%	90%	31%	33%
			4	I will not be able to use water suction pump	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			5	I don't know.	5%	27%	0%	9%	23%	0%	10%	17%	7%	4%	13%	23%	11%	11%	0%	0%	0%	0%	6%	9%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		35) On which condition you will support the installation of water meter (most important condition)?	1	If KW&SB explains about meter properly	23%	26%	40%	25%	25%	0%	41%	25%	15%	19%	36%	15%	25%	33%	0%	11%	17%	22%	13%	22%
			2	If we receive enough hours of water supply	5%	5%	60%	12%	0%	0%	18%	10%	4%	4%	12%	15%	9%	11%	0%	22%	0%	22%	38%	10%
			3	If special lower water charge rate is apply for low water consumption households	15%	16%	0%	10%	25%	100%	6%	20%	15%	15%	12%	15%	14%	0%	0%	0%	0%	33%	13%	7%
			4	If the meter works properly	5%	0%	0%	4%	0%	0%	6%	0%	4%	0%	4%	8%	3%	0%	50%	44%	33%	11%	13%	11%
			5	If water bill don't increase dramatically	5%	5%	0%	4%	8%	0%	0%	10%	4%	0%	8%	8%	5%	0%	17%	0%	17%	0%	6%	5%
			6	If it was made sure that all the water meter works	23%	26%	0%	22%	25%	0%	6%	15%	37%	38%	12%	8%	22%	11%	33%	0%	17%	11%	13%	20%
			7	Others (including don't support any way)	25%	21%	0%	24%	17%	0%	24%	20%	22%	23%	16%	31%	22%	44%	0%	22%	17%	0%	6%	24%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(9) - 7. Improved Water Line Connection	36) - 1. Adequate Pressure & Improved Water Quality			Rs More /month	48	71	201	67	74	103	132	52	49	65	98	63	74	59	162	481	141	440	23	91
	36) - 2. For 8 hrs Water Supply Service			Rs More /month	50	88	204	71	100	109	127	66	60	75	90	83	81	59	158	636	115	392	28	97
	36) - 3. For 24 hrs Water Supply Service			Rs More /month	85	105	368	112	96	211	201	83	102	120	145	106	124	88	330	501	182	570	30	151

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (13/17)

III. Sewerage/Sanitation

Question		Unit/ Selection		Urban																		Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
				Katchi Abadis Sampling Areas are Categorized by	Factor 1 Total Area (Acres)			Factor 2 Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Factor 3 Percentage of Using Line Water Connection (%)			Factor 4 Education Level of House head (% of Illiterate)				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(10) Environment	1) How seriously water environment such as rivers and channels are polluted in Karachi?		1	Very serious	83%	88%	82%	86%	91%	79%	88%	85%	82%	82%	90%	85%	85%	89%	83%	93%	89%	82%	62%	85%
			2	Serious	16%	10%	18%	14%	6%	21%	12%	13%	17%	17%	10%	14%	14%	9%	15%	4%	11%	14%	14%	13%
			3	Not Serious but polluted	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	4%	1%
			4	Not polluted at all	0%	1%	0%	1%	1%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
			5	I don't know	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	2%	3%	0%	4%	19%	1%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) If "1." to "3." (polluted), what do you think causes water pollution the most in Karachi?		1	domestic wastewater	20%	21%	22%	20%	29%	15%	21%	22%	20%	18%	27%	18%	21%	18%	12%	20%	23%	18%	27%	18%
			2	Garbage	59%	61%	57%	59%	54%	64%	58%	57%	62%	62%	51%	63%	59%	67%	63%	48%	44%	64%	41%	61%
			3	Commercial/Industrial wastewater/solid waste	15%	13%	18%	14%	14%	17%	15%	15%	15%	16%	17%	11%	15%	12%	21%	18%	17%	16%	15%	15%
			4	I don't know	1%	2%	1%	2%	0%	1%	2%	1%	1%	1%	2%	1%	1%	0%	2%	5%	5%	2%	16%	2%
			5	Other	5%	3%	2%	5%	3%	2%	4%	5%	2%	2%	3%	7%	4%	3%	2%	9%	11%	0%	1%	3%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) Which environment is most polluted in Karachi?		1	Rivers and channels	53%	53%	44%	54%	43%	51%	48%	51%	53%	49%	52%	55%	52%	47%	38%	41%	29%	60%	46%	48%
			2	Lakes and ponds	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	2%	0%
			3	Beaches	4%	2%	2%	4%	2%	3%	1%	3%	5%	3%	2%	3%	3%	1%	8%	3%	1%	2%	3%	3%
			4	Residential area	34%	36%	47%	33%	50%	37%	45%	35%	33%	37%	38%	36%	37%	37%	37%	35%	42%	25%	39%	37%
			5	Roads	5%	5%	5%	5%	5%	5%	3%	7%	6%	6%	5%	4%	5%	9%	13%	13%	12%	5%	5%	8%
			6	Commercials buildings	3%	1%	1%	3%	0%	1%	1%	3%	2%	4%	1%	0%	2%	3%	2%	3%	13%	5%	3%	2%
			7	Other	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%	2%	0%	1%	3%	2%	4%	3%	2%	3%	2%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(11) Sewerage/Sanitation Option	1) Which sanitation option does your household mainly use for disposing human waste (feces and urine)?		1	Open defecation	1%	1%	4%	1%	0%	4%	2%	1%	1%	1%	0%	3%	2%	0%	0%	0%	1%	2%	44%	3%
			2	Latrine/Toilet without connecting to gutter (drainage) or gutter line (sewer pipe)	5%	7%	14%	6%	0%	16%	11%	5%	1%	4%	5%	12%	7%	8%	0%	0%	1%	0%	44%	8%
			3	Toilet connected to gutter (drainage) or gutter line (sewer pipe)	94%	92%	83%	93%	100%	80%	88%	95%	98%	95%	95%	84%	91%	92%	100%	100%	97%	98%	12%	89%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) If "2." or "3." (using any toilet/latrine), is it private toilet/latrine only for your household or common toilet?		1	Private toilet/latrine	99%	100%	100%	99%	100%	99%	100%	99%	99%	100%	100%	99%	100%	100%	100%	100%	100%	100%	79%	99%
			2	Common toilet/latrine	1%	0%	0%	1%	0%	1%	0%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	21%	1%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) Are you satisfied with the current situation of your household's human waste (feces and urine) disposal?		1	Yes	48%	47%	34%	50%	46%	35%	44%	50%	45%	47%	47%	42%	45%	48%	61%	71%	65%	83%	40%	49%
			2	Moderately	34%	29%	39%	32%	32%	34%	34%	32%	36%	35%	31%	30%	33%	24%	31%	17%	20%	9%	23%	29%
			3	Not at all	17%	25%	27%	18%	22%	31%	23%	18%	19%	18%	22%	28%	22%	27%	8%	11%	15%	8%	37%	22%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(12) Open Defecation	1) Why your household don't use toilet/latrine?		1	Existing toilet/latrine is in bad condition	0%	0%	0%	0%		0%	0%	0%				0%	0%						0%	
			2	Latrine is used for other purpose such as storage	0%	0%	0%	0%		0%	0%	0%				0%	0%						0%	
			3	The latrine is not needed / preference for open defecation	0%	0%	0%	0%		0%	0%	0%				0%	0%						41%	
			4	The latrine is too expensive / cannot afford	100%	100%	0%	100%		33%	0%	100%				50%	50%						59%	
			5	No space for constructing a latrine	0%	0%	0%	0%		0%	0%	0%				0%	0%						0%	
			6	Temporary Residence	0%	0%	0%	0%		0%	0%	0%				0%	0%						0%	
			7	Others	0%	0%	100%	0%		67%	100%	0%				50%	50%						0%	
				Total	100%	100%	100%	100%		100%	100%	100%				100%	100%						100%	
	2) Do you know that open defecation often cause diseases?		1	Yes	0%	100%	100%	0%		100%	100%	0%				75%	75%						94%	
			2	No	100%	0%	0%	100%		0%	0%	100%				25%	25%						6%	
				Total	100%	100%	100%	100%		100%	100%	100%				100%	100%						100%	
	3) Would your household like to have a private toilet/latrine or to use common toilet/latrine?		1	Yes, I would like to have a private latrine	100%	0%	100%	100%		67%	100%	100%				75%	75%						63%	
			2	Yes, common latrine	0%	0%	0%	0%		0%	0%	0%				0%	0%						20%	
			3	No, my household doesn't need any latrine	0%	100%	0%	0%		33%	0%	0%				25%	25%						17%	
				Total	100%	100%	100%	100%		100%	100%	100%				100%	100%						100%	
	4) If "1".or "2", how much are you willing to pay to construct the toilet/latrine?			Rs.	6,000		1,300	6,000		1,300	1,300	6,000				3,650	3,650						77	
(13) Toilets/Latrines without Connecting to Gutter or Gutter Line	1) Which type of toilet/latrine does your household use?		1	Latrine with Bucket	7%	0%	0%	5%		0%	0%	0%	33%	10%	0%	0%	2%	0%	0%		0%		0%	
			2	Simple Pit Latrine	27%	63%	92%	18%		100%	55%	20%	67%	80%	0%	71%	58%	0%	0%		0%		72%	
			3	Pour-Flush Latrine without Septic Tank	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%		26%	
			4	Double Pit Pour-Flush Latrine	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%		2%	
			5	Toilet/Latrine with septic tank connected to gutter or gutter line	60%	13%	8%	55%		0%	20%	80%	0%	10%	89%	13%	28%	75%	0%		0%		0%	
			6	Toilet/Latrine with septic tank connected soak to pit	7%	25%	0%	23%		0%	25%	0%	0%	0%	11%	17%	12%	13%	100%		100%		0%	
			7	Others	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	13%	0%		0%		0%	
				Total	100%	100%	100%	100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%		100%	
	2) Which type of toilet bowl does your household use?		1	WC (Indian Style)	96%	100%	100%	97%		100%	100%	100%	92%	95%	100%	100%	98%	100%	0%		25%		100%	
			2	Comodo (English Style)	4%	0%	0%	3%		0%	0%	0%	8%	5%	0%	0%	2%	0%	0%		50%		0%	
			3	Both	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	100%		25%		0%	
				Total	100%	100%	100%	100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%		100%	

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (14/17)

Question			Unit/ Selection	Urban														Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Planned Areas							
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4			Average in Katchi Abadis	Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(13) Toilets/Latrines without Connecting to Gutter or Gutter Line	3) Which flushing does your household use mainly?		1	Tank flushing,	13%	6%	0%	9%	25%	0%	3%	18%	8%	6%	10%	6%	7%	13%	100%	100%	67%	50%	6%	27%
			2	Hand flushing	87%	94%	100%	91%	75%	100%	97%	82%	92%	94%	90%	94%	93%	88%	0%	0%	33%	50%	94%	73%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) Do you think the effluent from your toilet/latrine pollute the surrounding environment or underground water?		1	Yes	77%	85%	88%	85%	100%	73%	91%	91%	62%	53%	93%	88%	83%	81%	60%	100%	75%	67%	69%	78%
			2	No	23%	15%	13%	15%	0%	27%	9%	9%	38%	47%	7%	12%	17%	19%	40%	0%	25%	33%	31%	22%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	5) Do you have any problem on your toilet/latrine?		1	Yes	18%	39%	25%	24%	13%	41%	25%	24%	8%	13%	23%	40%	29%	7%	20%	50%	25%	0%	63%	23%
			2	No	82%	61%	75%	76%	88%	59%	75%	76%	92%	88%	77%	60%	71%	93%	80%	50%	75%	100%	38%	77%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		6) If "Yes", what is the biggest problem of your toilet/latrine?	1	Dirty	25%	27%	0%	25%		20%	17%	25%		0%	0%	31%	22%						0%	
			2	Bad smell	0%	64%	33%	25%		60%	50%	0%		100%	0%	54%	44%						31%	
			3	Dangerous	0%	0%	0%	0%		0%	0%	0%		0%	0%	0%	0%						23%	
			4	No water available	25%	9%	67%	25%		20%	33%	25%		0%	50%	15%	22%						12%	
			5	Problem with Privacy	0%	0%	0%	0%		0%	0%	0%		0%	0%	0%	0%						8%	
			6	Overflow	0%	0%	0%	0%		0%	0%	0%		0%	0%	0%	0%						0%	
			7	Bad Construction	50%	0%	0%	25%		0%	0%	50%		0%	50%	0%	11%						23%	
			8	Others	0%	0%	0%	0%		0%	0%	0%		0%	0%	0%	0%						4%	
				Total	100%	100%	100%	100%		100%	100%	100%		100%	100%	100%	100%						100%	
	7) How much is the annual maintenance cost of the facility (including sludge disposal)?			Rs./year	371	674	491	483		402	397	846	160	591	508	393	505	695					686	
	8) How much is the construct cost of the toilet/latrine?			Rs.	3,758.3	4,804.2	6,136.1	5,653.7		1,865.3	6,748.3	3,225.0	5,600.0	2,800.0	6,970.0	3,785.8	4,641.4	2,805.0					3,659.5	
	9) What improvements would you like to make to your household's toilet/latrine? (preference points are calculated)		1	Connect to sewer line	2.8	2.8	2.7	2.5		3.0	2.8	2.6	2.0	2.3	2.4	3.0	2.8	2.7					2.7	
			2	Upgrade it to other better toilet/latrine	1.8	1.8	1.0	1.4		1.5	1.0	2.0	1.0	1.4	1.7	1.4	1.5	1.9					1.7	
			3	Construct it inside the house	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.9	
			4	Installing water tap	0.3	1.1	1.3	0.9		1.2	0.9	0.8	0.0	0.4	0.9	1.1	1.0	0.5					0.7	
			5	Have regular sludge disposal service with exhauster	0.9	0.3	1.0	1.0		0.3	1.3	0.7	2.0	1.0	1.0	0.5	0.6	0.8					0.0	
			6	Have regular sludge disposal service with bucket	0.3	0.0	0.0	0.3		0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.1	0.0					0.0	
	10) Do you think your toilet or effluent from the toilet pollutes natural environment or degrade your living environment?		1	Yes	68%	66%	82%	68%	78%	70%	81%	77%	36%	40%	74%	80%	70%	59%	75%	100%	0%	50%	48%	67%
			2	No	32%	34%	18%	32%	22%	30%	19%	23%	64%	60%	26%	20%	30%	41%	25%	0%	100%	50%	52%	33%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	11) Where do you dispose home wastewater (drain water from kitchen, bathing, washing etc.)?		1	Open gutter	3%	0%	12%	2%	0%	7%	6%	5%	0%	0%	0%	9%	4%	0%	0%	0%	0%	0%	0%	2%
			2	Closed gutter	38%	25%	18%	30%	38%	22%	24%	29%	50%	50%	29%	18%	28%	0%	0%	0%	50%	0%	10%	13%
			3	Gutter line	31%	22%	18%	28%	63%	7%	18%	33%	50%	19%	39%	15%	24%	53%	100%	100%	25%	100%	2%	47%
			4	Street surface	0%	31%	35%	2%	0%	56%	18%	0%	0%	6%	4%	41%	21%	6%	0%	0%	0%	0%	71%	15%
			5	Natural stream or river	24%	9%	6%	26%	0%	0%	12%	33%	0%	13%	25%	6%	14%	41%	0%	0%	0%	0%	2%	19%
			6	The soak pit/septic tank	3%	13%	0%	12%	0%	0%	15%	0%	0%	0%	4%	12%	6%	0%	0%	0%	25%	0%	0%	3%
			7	Kitchen garden	0%	0%	12%	0%	0%	7%	6%	0%	0%	13%	0%	0%	3%	0%	0%	0%	0%	0%	15%	2%
			8	It is re-used	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	12) Do you think your home wastewater pollutes natural environment or degrade your living environment?		1	Yes	59%	59%	82%	60%	75%	67%	73%	67%	42%	38%	64%	76%	64%	59%	50%	100%	0%	0%	51%	60%
			2	No	41%	41%	18%	40%	25%	33%	27%	33%	58%	63%	36%	24%	36%	41%	50%	0%	100%	100%	49%	40%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	13) Would you like to connect to sewer to improve your household's livelihood and/or the water environment in Karachi?		1	Yes	69%	100%	100%	81%		100%	85%	89%	100%	100%	67%	96%	91%	100%			100%		78%	
			2	No	31%	0%	0%	19%		0%	15%	11%	0%	0%	33%	4%	9%	0%			0%		22%	
				Total	100%	100%	100%	100%		100%	100%	100%	100%	100%	100%	100%	100%	100%			100%		100%	
		14) If "Yes", how much are you willing to pay for sewerage connection only for improving household's life at maximum?		Rs./month	112	176	80	144		79	161	122	20	37	163	167	122	66			8		136	
		15) If "Yes", how much MORE are you willing to pay for it to improve the water environment in Karachi in addition to improving household life?		Rs. more /month	13		38	21		33	38	17	3	13	38	28	24	27			0		124	
		16) If "Yes", how much you are willing to spend for its initial connection cost at maximum?		Rs.	1,025	506	697	838		615	726	750	1,500	781	775	758	771	493			0		767	
		17) If "No", why wouldn't you like to have connection to sewer? (up to 3) (pints are calculated)	1	Monthly charge of sewer connection is too expensive	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						0.7	
			2	Cost of connecting to sewer is too expensive	2.0	0.0		1.5			2.5	0.0		0.0	2.5		1.5						1.8	
			3	Don't want to spend any money for sewerage	1.3	1.0		1.3			1.3	1.0		1.0	1.3		1.3						0.7	
			4	Current toilet/latrine is enough	2.7	3.0		2.6			2.2	3.0		3.0	2.2		2.6						1.1	
			5	Not enough water to use flush toilet	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						1.1	
			6	Don't think sewerage is essential for our life	0.0	2.0		0.5			0.0	2.0		2.0	0.0		0.5						0.7	
			7	Don't think sewerage can improve livelihood or environment	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						0.0	
			8	Neighbors also don't connect to sewerage	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						0.0	
			9	The government doesn't enforce the connection and the use of sewerage	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						0.0	
			10	Others	0.0	0.0		0.0			0.0	0.0		0.0	0.0		0.0						0.0	

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (15/17)

Question		Unit/ Selection		Urban																			Rural	
				Katchi Abadis (Low & Lower Middle Income Group)														Planned Areas						
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4			Average in Katchi Abadis	Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	Estimated Average in Karachi*
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(14) Sewerage (Toilet connected to Gutter and Gutter line)	1) Which type of toilet bowl does your household use?	1	WC (Indian Style)	98%	98%	95%	97%	98%	97%	97%	98%	97%	97%	98%	98%	97%	96%	61%	19%	62%	43%	100%	89%
		2	Comodo (English Style)	1%	1%	2%	1%	1%	2%	2%	2%	1%	1%	1%	2%	1%	0%	7%	19%	17%	7%	0%	2%
		3	Both	1%	1%	2%	1%	1%	2%	2%	0%	2%	2%	1%	1%	1%	4%	31%	61%	21%	50%	0%	8%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) Which flushing does your household use mainly?	1	Tank flushing	2%	5%	6%	4%	6%	4%	6%	4%	3%	5%	3%	3%	4%	10%	50%	88%	46%	57%	0%	15%
		2	Hand flushing	98%	95%	94%	96%	94%	96%	94%	96%	97%	95%	97%	97%	96%	90%	50%	12%	54%	43%	100%	85%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) Where does the toilet/latrine directly dispose human waste off?	1	Open gutter	0%	2%	1%	1%	2%	1%	1%	2%	1%	1%	1%	2%	1%	2%	0%	0%	0%	4%	0%	1%
		2	Closed gutter	17%	14%	22%	18%	15%	14%	19%	14%	17%	19%	19%	9%	16%	10%	6%	17%	21%	16%	0%	12%
		3	Gutter line	80%	84%	76%	80%	82%	84%	79%	81%	82%	79%	78%	88%	81%	87%	94%	83%	79%	80%	100%	86%
		4	Street surface	0%	0%	1%	0%	0%	2%	1%	0%	1%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
		5	Natural stream or river	2%	0%	0%	1%	2%	0%	0%	2%	0%	0%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) Which sewerage system is your household directly connected to?	1	Sewer constructed by government	87%	79%	73%	86%	81%	67%	76%	80%	89%	81%	85%	78%	81%	85%	96%	93%	81%	72%	100%	86%
		2	Sewer constructed by community	10%	18%	27%	11%	15%	32%	22%	19%	8%	16%	13%	20%	16%	10%	4%	1%	6%	0%	0%	11%
		3	I don't know	3%	3%	0%	3%	4%	1%	2%	2%	3%	3%	3%	2%	2%	6%	0%	6%	13%	28%	0%	3%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	5) Who provided sewerage connection to your household?	1	KW&SB	24%	25%	10%	23%	31%	11%	16%	22%	31%	24%	24%	18%	22%	48%	51%	52%	49%	10%	0%	35%
		2	SKAA	1%	1%	0%	1%	0%	0%	1%	2%	0%	1%	0%	2%	1%	0%	0%	0%	0%	2%	0%	0%
		3	Town Nazism	3%	4%	10%	4%	5%	5%	8%	4%	2%	4%	6%	4%	4%	8%	2%	0%	1%	0%	38%	7%
		4	UC Nazism	25%	30%	25%	26%	27%	31%	26%	29%	23%	21%	29%	36%	27%	12%	15%	10%	0%	2%	38%	21%
		5	OPP	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	2%	0%	0%	0%	0%	0%
		6	Other NGO	1%	2%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	1%	3%	6%	0%	1%
		7	Your Community or CBO	1%	1%	0%	0%	2%	1%	0%	1%	1%	0%	0%	2%	1%	2%	4%	0%	1%	65%	0%	2%
		8	Your household	22%	26%	41%	23%	20%	42%	31%	28%	20%	30%	18%	28%	26%	13%	8%	7%	6%	6%	8%	18%
		9	I don't know	23%	12%	14%	20%	14%	9%	15%	12%	24%	18%	21%	10%	17%	17%	19%	29%	40%	10%	15%	17%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	6) Do you know that people are paying sewerage charge at 25% of water charges?	1	Yes	25%	24%	11%	20%	31%	22%	12%	27%	28%	25%	24%	17%	22%	35%	52%	65%	39%	50%	0%	31%
		2	No	75%	76%	89%	80%	69%	78%	88%	73%	72%	75%	76%	83%	78%	65%	48%	35%	61%	50%	100%	69%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	8) How expensive is sewer tariff (additional 25% of water bill) for your household?	1	Very high	33%	32%	28%	34%	29%	28%	30%	33%	29%	31%	29%	36%	32%	24%	30%	11%	15%	10%	25%	28%
		2	High	13%	20%	13%	17%	20%	9%	16%	17%	15%	15%	18%	16%	16%	18%	16%	11%	15%	7%	0%	16%
		3	Reasonable	45%	36%	43%	38%	37%	51%	37%	42%	44%	45%	37%	36%	41%	53%	50%	70%	53%	70%	38%	47%
		4	Low	3%	5%	9%	3%	10%	5%	10%	1%	5%	4%	6%	6%	5%	3%	0%	2%	4%	7%	13%	4%
		5	Very Low	6%	7%	7%	8%	4%	8%	7%	7%	7%	5%	10%	7%	7%	2%	5%	6%	13%	7%	25%	6%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	9) Who is maintaining sewer lines in your area?	1	KW&SB	10%	8%	0%	8%	8%	7%	5%	8%	12%	7%	12%	6%	8%	26%	26%	27%	21%	4%	0%	17%
		2	SKAA	1%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		3	NGO	0%	0%	1%	1%	0%	1%	1%	1%	1%	1%	0%	1%	1%	0%	2%	0%	12%	2%	0%	1%
		4	CDGK	4%	0%	0%	3%	1%	0%	0%	2%	3%	2%	3%	0%	2%	0%	0%	7%	1%	0%	0%	1%
		5	Town	0%	3%	4%	1%	5%	0%	5%	1%	0%	0%	5%	1%	2%	2%	2%	0%	1%	2%	0%	2%
		6	UC	40%	38%	25%	40%	39%	29%	24%	44%	41%	40%	36%	34%	37%	39%	37%	24%	15%	4%	42%	38%
		7	Community/CBO	1%	0%	0%	1%	0%	1%	1%	0%	1%	1%	1%	0%	1%	6%	0%	1%	1%	73%	0%	2%
		8	Your household	31%	44%	57%	36%	37%	54%	56%	37%	30%	38%	32%	51%	40%	20%	15%	18%	26%	2%	58%	30%
		9	I don't know	12%	6%	12%	10%	10%	8%	9%	8%	13%	10%	12%	7%	9%	7%	19%	23%	22%	13%	0%	10%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	10) Do you know where the collected sewage goes?	1	Yes	41%	43%	38%	42%	41%	39%	41%	43%	40%	39%	46%	39%	41%	38%	36%	56%	36%	51%	43%	40%
		2	No	59%	57%	62%	58%	59%	61%	59%	57%	60%	61%	54%	61%	59%	62%	64%	44%	64%	49%	57%	60%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	11) Do you think that the sewage from your household should be properly treated at wastewater treatment plant although it costs you eventually?	1	Yes	78%	81%	83%	79%	83%	78%	78%	83%	81%	82%	82%	75%	80%	80%	87%	89%	75%	95%	86%	82%
		2	No	22%	19%	17%	21%	17%	22%	22%	17%	19%	18%	18%	25%	20%	20%	13%	11%	25%	5%	14%	18%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	12) Do you have any complaints on the existing sewerage system?	1	Yes	70%	76%	74%	72%	75%	74%	74%	70%	74%	75%	66%	77%	73%	74%	62%	54%	66%	13%	50%	70%
		2	No	30%	24%	26%	28%	25%	26%	26%	30%	26%	25%	34%	23%	27%	26%	38%	46%	34%	88%	50%	30%
			Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (16/17)

Question			Unit/ Selection		Urban																		Rural	Estimated Average in Karachi*
					Katchi Abadis (Low & Lower Middle Income Group)													Planned Areas							
					Katchi Abadis Sampling Areas are Categorized by	Factor 1 Total Area (Acres)			Factor 2 Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Factor 3 Percentage of Using Line Water Connection (%)			Factor 4 Education Level of House head (% of Illiterate)			Average in Katchi Abadis	Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs	Village	
					Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:								
					From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%								
					To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%								
					No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7	
(14) Sewerage (Toilet connected to Gutter and Gutter line)		13) If "Yes", what is your major complaint to sewerage? (up to 3) (complain points are calculated)	1	Monthly charge is too expensive	0.3	0.5	0.2	0.3	0.6	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.3	0.3		0.0	0.4
			2	Cost to connect to sewer was too expensive	0.1	0.1	0.2	0.1	0.0	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1		0.0	0.2
			3	Not enough water to use flush toilet	0.0	0.3	0.4	0.1	0.2	0.5	0.3	0.1	0.1	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.0	0.2
			4	Clogging/Sewerage water overflow	2.7	2.5	2.7	2.7	2.4	2.6	2.5	2.6	2.7	2.7	2.6	2.5	2.6	2.6	2.6	2.4	2.4		3.1	2.6
			5	Not connected to main sewer	0.3	0.3	0.4	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.1	0.3	0.3	0.2	0.1	0.3	0.3		0.3	0.2
			6	Unsatisfactory complaint handling/response	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.5	0.2	0.4	0.3	0.3	0.7	0.4		1.7	0.4
			7	Mosquito/Flies due to nearby sewer	1.1	0.9	0.6	1.0	1.0	0.6	0.9	1.0	1.0	0.9	1.0	0.9	0.9	1.1	1.0	1.0	1.0		0.0	0.9
			8	Smell of open gutter, manhole, etc.	1.2	1.1	1.0	1.1	1.2	1.0	1.1	1.2	1.1	1.0	1.2	1.3	1.1	1.1	1.1	1.0	1.3		1.0	1.1
			9	Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
	14) Do you have any specific request to CDGK or KW&SB on sewage disposal?		1	Yes	46%	59%	51%	52%	60%	46%	53%	58%	45%	55%	49%	52%	52%	56%	58%	53%	62%	23%	36%	54%
			2	No	54%	41%	49%	48%	40%	54%	47%	42%	55%	45%	51%	48%	48%	44%	42%	47%	38%	77%	64%	46%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	16) Have you ever reported your complaints about sewage disposal to CDGK/KW&SB, town office or union council?		1	Yes - to CDGK/KW&SB	24%	29%	23%	24%	31%	28%	25%	26%	26%	28%	19%	30%	26%	27%	26%	22%	22%	9%	14%	26%
			2	Yes - to town office	6%	8%	8%	7%	7%	6%	9%	6%	7%	9%	6%	6%	7%	11%	9%	13%	8%	7%	7%	9%
			3	Yes - to union council	23%	29%	25%	24%	25%	31%	20%	29%	28%	27%	30%	21%	26%	23%	15%	13%	12%	7%	7%	22%
			4	No.	47%	34%	45%	44%	37%	35%	46%	39%	39%	36%	45%	44%	41%	39%	50%	52%	58%	77%	71%	44%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		17) If "Yes (1. to 3.)", how was the response to your complaints?	1	Good	18%	20%	14%	20%	24%	10%	14%	21%	20%	19%	24%	12%	19%	27%	0%	7%	40%	57%	0%	17%
			2	Not bad	34%	37%	30%	36%	34%	33%	36%	32%	38%	33%	33%	39%	35%	35%	57%	44%	36%	14%	100%	42%
			3	Bad	47%	43%	56%	44%	42%	57%	50%	47%	42%	47%	42%	48%	46%	38%	43%	48%	24%	29%	0%	41%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(15) Storm water Drainage	1) Have your household ever experienced inundation at your current dwelling below/over the floorboard?		1	Yes, below the floorboard	36%	37%	55%	34%	42%	49%	48%	32%	38%	35%	47%	39%	39%	40%	33%	26%	34%	20%	23%	37%
			2	Yes, over the floor board	19%	22%	18%	24%	15%	14%	18%	27%	15%	21%	22%	18%	20%	16%	4%	11%	6%	9%	34%	17%
			3	No, never experienced	45%	42%	27%	42%	42%	36%	34%	41%	47%	44%	32%	43%	41%	44%	62%	63%	59%	70%	43%	46%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) Is your living area served by drainage system?		1	Served	6%	5%	8%	8%	8%	1%	8%	8%	3%	5%	11%	4%	6%	3%	3%	31%	18%	54%	10%	5%
			2	Unserved	90%	91%	87%	88%	88%	96%	88%	87%	94%	88%	87%	94%	90%	95%	94%	61%	65%	35%	87%	91%
			3	I don't know	3%	4%	5%	4%	5%	3%	5%	4%	3%	7%	2%	2%	4%	3%	3%	8%	18%	11%	2%	3%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) Does your household take any measures to mitigate flooding problems?		1	Yes	17%	15%	25%	18%	21%	13%	21%	18%	14%	14%	35%	8%	17%	17%	17%	20%	13%	8%	21%	17%
			2	No	83%	85%	75%	82%	79%	87%	79%	82%	86%	86%	65%	92%	83%	83%	83%	80%	88%	92%	79%	83%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	6) Has your household ever reported flooding case to union council, town office or CDGK?		1	Yes	16%	19%	26%	18%	15%	25%	18%	22%	15%	19%	20%	19%	19%	16%	27%	23%	12%	11%	6%	19%
			2	No	84%	81%	74%	82%	85%	75%	82%	78%	85%	81%	80%	81%	81%	84%	73%	77%	88%	89%	94%	81%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table A42.11.1 Results of Water Supply and Sewerage Usage Survey (17/17)

IV. Others

Question			Unit/ Selection	Urban																		Rural	Estimated Average in Karachi*
				Katchi Abadis (Low & Lower Middle Income Group)													Average in Katchi Abadis	Planned Areas					Village	
				Katchi Abadis Sampling Areas are Categorized by	Factor 1			Factor 2			Factor 3			Factor 4				Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commer-cial Area	Bulk Consume rs		
					Total Area (Acres)			Street Alignment (1. Messy, 2. Semi-organized or organized with narrow lanes, 3. Well Organized)			Percentage of Using Line Water Connection (%)			Education Level of House head (% of Illiterate)										
				Category	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:	C1:	C2:	C3:									
				From (>)	0	30	200	0	1	2	0%	70%	95%	0%	30%	40%									
				To (<=)	30	200	800	1	2	3	70%	95%	100%	30%	40%	100%									
				No. of Sampling Area	14	12	4	19	5	6	10	10	10	13	8	9	30	5	3	4	4	3	7		
(16) Hygiene Practices and Water-bone Diseases	1) If your household use any domestic water treatment before using water, what treatment does your household use?		1	Both boiling and simple filtering,	5%	1%	5%	3%	1%	6%	4%	3%	4%	5%	4%	1%	3%	6%	9%	13%	7%	20%	0%	5%
			2	Boiling,	26%	18%	20%	23%	20%	20%	17%	21%	29%	26%	20%	17%	22%	24%	46%	38%	44%	24%	4%	26%
			3	Simple filtering	3%	2%	0%	2%	4%	1%	0%	1%	5%	3%	1%	2%	2%	1%	15%	25%	13%	7%	1%	4%
			4	Domestic chlorination	1%	1%	1%	1%	2%	1%	0%	0%	2%	1%	1%	0%	1%	0%	0%	0%	1%	0%	0%	0%
			5	Other means	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	2%	0%	12%	9%	7%	0%	1%
			6	N/A	65%	77%	74%	71%	72%	72%	78%	73%	60%	64%	75%	79%	71%	66%	30%	13%	26%	42%	95%	63%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3)-1 About how many % of your household members wash their hands after using toilet with SOAP?			%	98	95	98	97	96	96	95	97	99	99	98	93	97	96	100	99	99	100	78	96
	3)-2 About how many % of your household members wash their hands before taking foods with SOAP?			%	93	88	94	92	88	90	88	92	95	95	90	86	91	93	100	98	96	99	65	92
	5) How much does your household spend for doctor inspection and medicine per month in average?			Rs./month	490	609	494	559	646	384	561	549	526	540	519	553	538	443	718	2,174	1,428	3,231	547	577
	6) How much does your household spend for doctor inspection and medicines per month in average for diseases related to water?			Rs./month	228	407	217	304	405	190	338	331	226	266	301	342	298	249	306	643	333	469	311	293
	7) Have your neighborhood/household ever experienced serious accidents regarding water supply and sewerage?		1	Yes	5%	6%	3%	6%	7%	3%	6%	7%	4%	5%	6%	6%	5%	9%	0%	4%	3%	2%	8%	6%
			2	No	95%	94%	97%	94%	93%	97%	94%	93%	96%	95%	94%	94%	95%	91%	100%	96%	97%	98%	92%	94%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(17) Solid Waste Management	1) Any garbage collection facility available for your household in the area?		1	Yes	45%	26%	35%	43%	23%	23%	30%	27%	56%	43%	39%	23%	35%	46%	69%	82%	77%	96%	8%	44%
			2	No.	53%	71%	63%	54%	75%	74%	69%	70%	42%	55%	59%	74%	62%	50%	30%	16%	19%	4%	90%	53%
			3	I don't know	2%	3%	2%	3%	3%	2%	2%	4%	2%	2%	2%	3%	2%	4%	2%	1%	4%	0%	2%	3%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2) How do you dispose of your solid waste (garbage)?		1	Garbage Tank	32%	20%	22%	30%	20%	17%	21%	19%	40%	33%	27%	13%	25%	37%	52%	69%	46%	88%	3%	33%
			2	Throw in Gali	35%	51%	57%	39%	46%	62%	50%	46%	32%	36%	40%	62%	45%	22%	17%	3%	13%	0%	83%	34%
			3	Katchra Kundi	1%	3%	2%	1%	3%	4%	2%	3%	1%	2%	3%	1%	2%	0%	0%	0%	0%	0%	3%	1%
			4	Burn it	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			5	Others	33%	26%	19%	31%	31%	17%	26%	32%	27%	28%	30%	25%	28%	42%	31%	28%	42%	12%	11%	32%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3) Do you know that people are paying conservancy at 10% of water charge for CDGK's garbage collection and disposal?		1	Yes	15%	16%	7%	11%	28%	13%	8%	16%	21%	18%	13%	10%	14%	33%	33%	56%	26%	47%	2%	24%
			2	No	85%	84%	93%	89%	72%	87%	92%	84%	79%	82%	87%	90%	86%	67%	67%	44%	74%	53%	98%	76%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	4) Do you know that people are paying fire charge at 5% of water charge for fire control?		1	Yes	15%	15%	6%	11%	23%	13%	7%	13%	23%	18%	12%	8%	14%	28%	41%	54%	29%	45%	2%	23%
			2	No	85%	85%	94%	89%	77%	87%	93%	87%	77%	82%	88%	92%	87%	72%	59%	46%	71%	55%	98%	77%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	5) Do you hire somebody to dispose garbage?		1	Yes	50%	36%	37%	46%	37%	34%	33%	40%	58%	54%	45%	24%	42%	70%	83%	83%	90%	33%	0%	56%
			2	No	50%	64%	63%	54%	63%	66%	67%	60%	42%	46%	55%	76%	58%	30%	17%	17%	10%	67%	100%	44%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	6) How expensive is garbage collection tariff for your household?		1	Very high	18%	18%	19%	21%	20%	8%	16%	21%	18%	21%	15%	16%	18%	9%	13%	5%	8%	4%	0%	13%
			2	High	16%	25%	5%	19%	18%	17%	15%	25%	16%	18%	20%	17%	18%	19%	19%	11%	22%	4%	20%	18%
			3	Reasonable	57%	40%	40%	50%	48%	42%	42%	49%	53%	49%	49%	43%	48%	61%	65%	83%	67%	83%	30%	55%
			4	Low	2%	2%	16%	2%	2%	9%	9%	0%	3%	3%	3%	5%	4%	4%	0%	2%	3%	9%	20%	4%
			5	Very Low	7%	15%	21%	8%	12%	24%	19%	5%	10%	9%	12%	19%	12%	7%	4%	0%	0%	0%	30%	10%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	7) Are you satisfied with the current garbage collection service?		1	Yes	14%	11%	10%	14%	7%	11%	13%	7%	17%	15%	14%	7%	12%	23%	23%	55%	39%	95%	10%	18%
			2	Moderately	40%	28%	29%	36%	31%	26%	28%	30%	45%	37%	32%	29%	33%	33%	45%	32%	29%	5%	21%	35%
			3	Not at all	45%	61%	61%	50%	62%	63%	60%	63%	38%	48%	54%	63%	55%	44%	32%	13%	32%	0%	69%	47%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	8) Do you know where the collected garbage is finally disposed of?		1	Yes	20%	18%	17%	19%	22%	15%	17%	20%	22%	20%	23%	14%	19%	22%	33%	41%	42%	39%	4%	22%
			2	No	80%	82%	83%	81%	78%	85%	83%	80%	78%	80%	77%	87%	81%	78%	67%	59%	58%	61%	96%	78%
				Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(18) Development Priority	1) Priority of Government Investment	Water Supply		Average Points	1.9	1.8	1.1	2.0	1.8	1.1	1.8	1.7	1.9	1.7	2.2	1.5	1.8	1.7	2.2	2.1	2.3	2.1	1.2	1.8
		Sewerage			2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.3	2.4	2.4	2.3	2.6	2.1	2.5	2.3	2.6	2.4
		Electricity			3.3	3.6	3.7	3.2	3.6	4.1	3.6	3.3	3.4	3.4	3.3	3.7	3.5	3.4	2.6	3.4	3.0	2.8	3.8	3.3
		Solid Waste Management			3.4	3.4	3.5	3.4	3.3	3.5	3.3	3.6	3.3	3.4	3.3	3.4	3.4	3.6	3.7	3.5	3.1	3.5	3.9	3.5
		Medical Facilities			3.8	3.8	4.0	3.8	3.9	3.9	3.9	3.8	3.9	3.9	3.7	3.8	3.8	4.0	3.7	4.0	4.1	4.0	3.4	3.9

APPENDIX – A42.12

Complete Discussion on the Results of Water Supply and Sewerage Usage Survey

A42.12 Complete Discussion on the Results of Water Supply and Sewerage Usage Survey

(1) Area Prioritization for the Improvement of Water Supply and Sewerage

The figures in this section are prepared from the results shown in Page (1/17) of **Table A42.11.1** (Summary Table for WtP Analysis).

1) Water Supply Improvement and Willingness to Pay

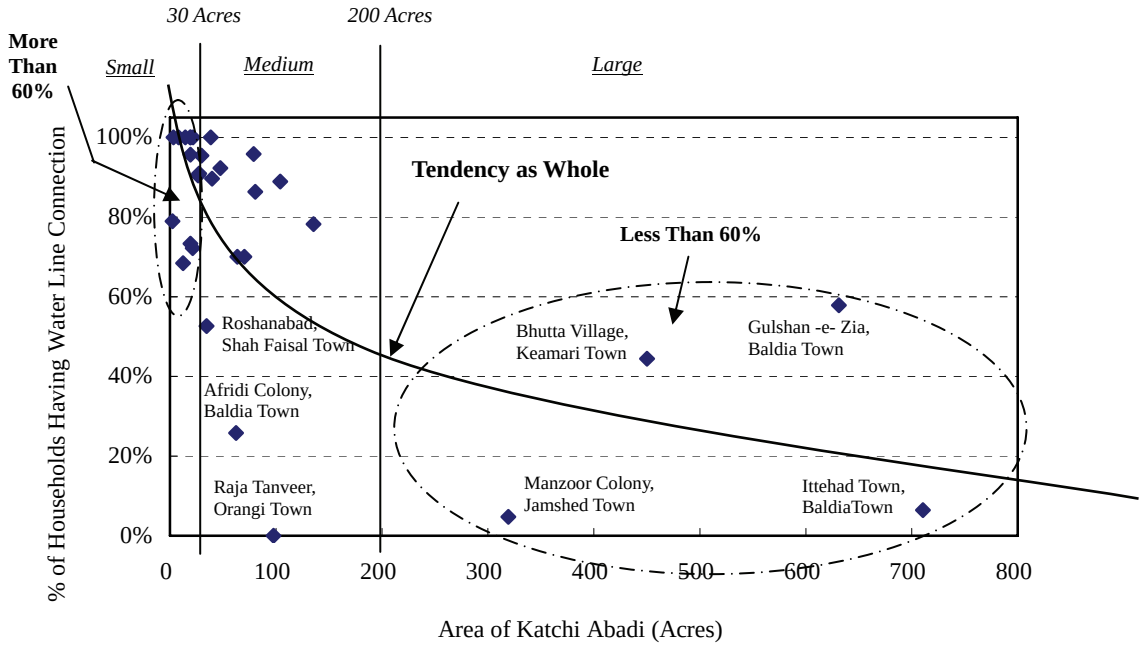


Figure A42.12.1 Influence of Area Size of Katchi Abadis on their Water Connection Rates

Figure A42.12.1 shows that small Katchi Abadis (less than 30 acres) have high water line connection rate of more than 60% (90% on average) while large Katchi Abadis (more than 200 acres) have low water line connection rate of less than 60% (28% on average). Among the 30 notified Katchi Abadis, from which the samples are randomly taken, the names of the Katchi Abadis with low connection rates are shown for reference.

Figures A42.12.2 to **A42.12.7** are prepared to analyze the WtP for better water supply services and for new sewerage connection in context of current water supply and sewerage connection rates, willingness to connect, income level and expenditure for water, etc. The results of different residential types are separately shown in those figures for comparison. In those figures, Katchi Abadis are further categorized by area size that is most influential factor to the WtP for water supply improvement.

Figure A42.12.2 shows water line connection rate is significantly low in large Katchi Abadis (200-800 acres) and villages, and among the residents in commercial areas. Especially in large Katchi Abadis, water line connection rate is much lower than its sewerage connection rate. One reason of this low water line connection rate seems to be the low leased plot rate in large Katchi Abadis as well as the distance from main streets of planned areas where water distribution mains are installed. In large Katchi Abadis, the willingness to have water line connection is 100% among the un-connected households.

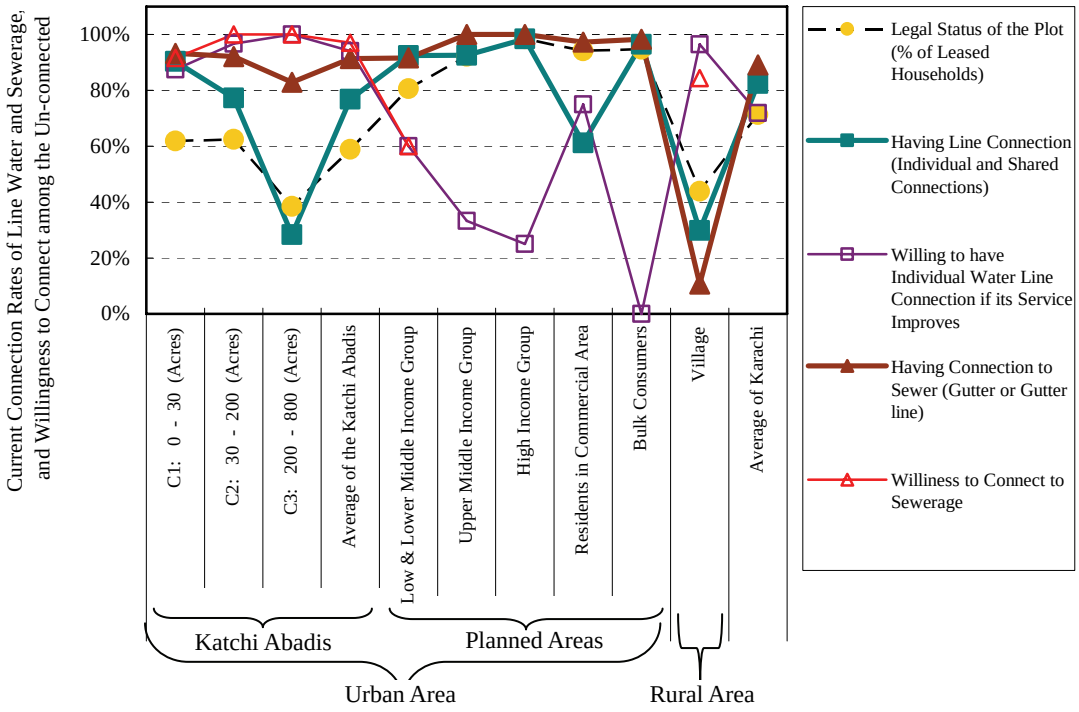


Figure A42.12.2 Current Connection Rates and Willingness to Connect

The water line connection rates of Low&Lower Income Group in planned areas and Upper Middle Income Group are around 90 %, however among their remaining households of 10% willingness to have individual water line connection is only 60% and 30% respectively, which are much lower than that in Katchi Abadis. This means large part of the households unconnected to water line in planned areas are already satisfied with their alternative water sources such as water tanker.

Figure A42.12.3 shows average economical conditions of each type of sampling area. In Katchi Abadis of every size and Low&Lower Middle Income Group of planned area, their total monthly household expenditure level is close to their total monthly household income level, which is around Rs. 10,000 per month. In those areas, the half of their expenditure is for hood and the total expenditure for water is as low as their medical expenditure. The economical conditions of Residents in Commercial Areas are as good as those of Upper Middle Income Group.

Figure A42.12.4 shows the levels of the total monthly expenditure for water and the water charges for line water connection in comparison with other utilities' fees. In general, monthly expenditure for electricity is about two times as expensive as total expenditure for water and gas charges. Water charges for line water connection are less than the expenditure for cable TV. The water charges which they are paying for line water connection is less than 1% of their average monthly income in most of the residential types. However, the estimated average total expenditure for water including water tankers is around 2.5% of their average income level in most of the residential types. In large Katchi Abadis, where water line connection rate is significantly low, average total expenditure for water is about 9% of their income. In High Income Group and Bulk Consumers such as DHA, where people buy much bottled water for drinking purpose, the total monthly expenditure for water is quite high as well.

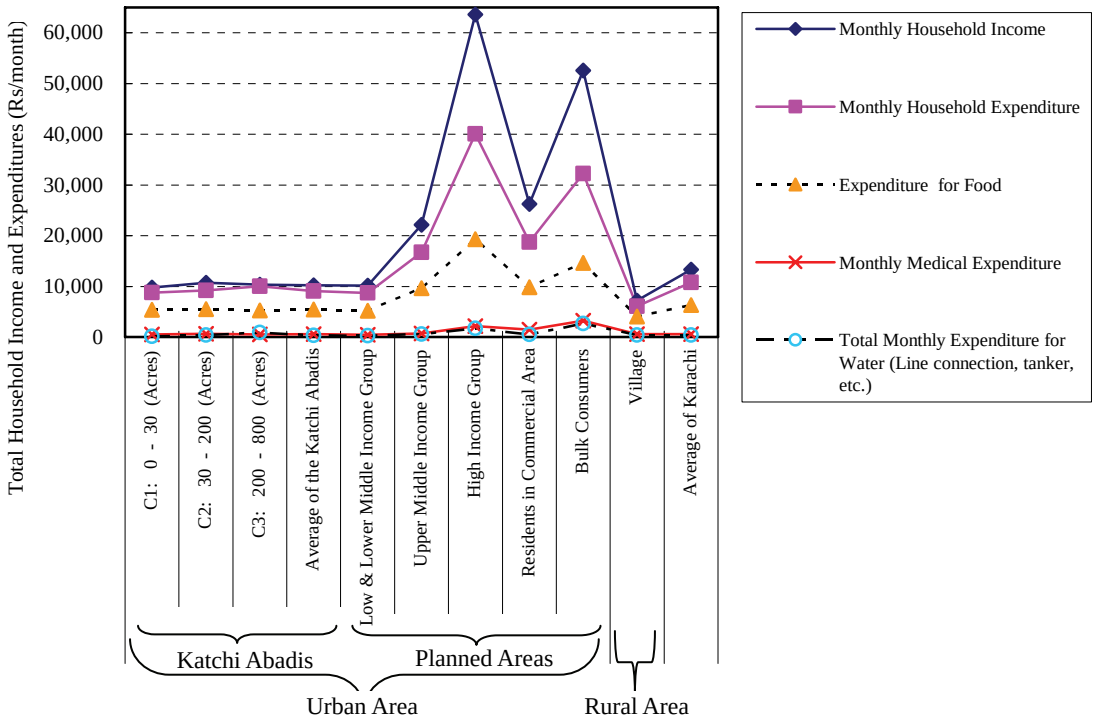


Figure A42.12.3 Household Income and Expenditures

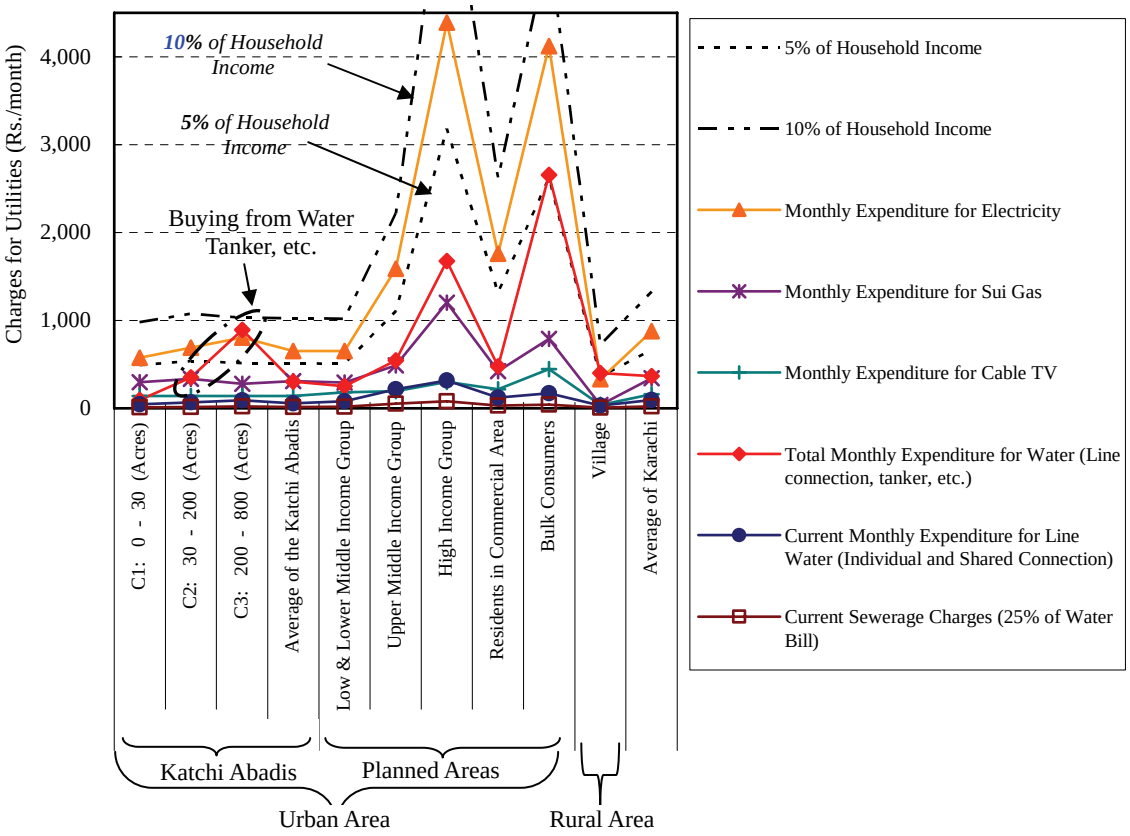


Figure A42.12.4 Levels of Utilities' Charges and Water Expenditures

Figure A42.12.5 shows the levels of monthly WtP for new water line connection and improved water supply services. The WtP for new water line connection is higher than the WtP for improved water supply services in Katchi Abadis, Low&Lower Middle Income Group of planned areas, and villages. However, it is other way around in Upper Middle Income Group and High Income Group. The expansion of water distribution system is required more than the rehabilitation of existing system in all the three types of low & lower middle income groups, especially in large Katchi Abadis, while the rehabilitation work is more preferred in Upper Middle and High Income Groups.

In large Katchi Abadis, where people are buying expensive water from Tanker, etc. because of low line water availability, the average monthly WtP for new water line connection is around 7% of their average income level. This WtP level for new connection is around ten times as high as their current average water charges for line water connection in large Katchi Abadis, which means that they have strong demand on the expansion of water line by KW&SB.

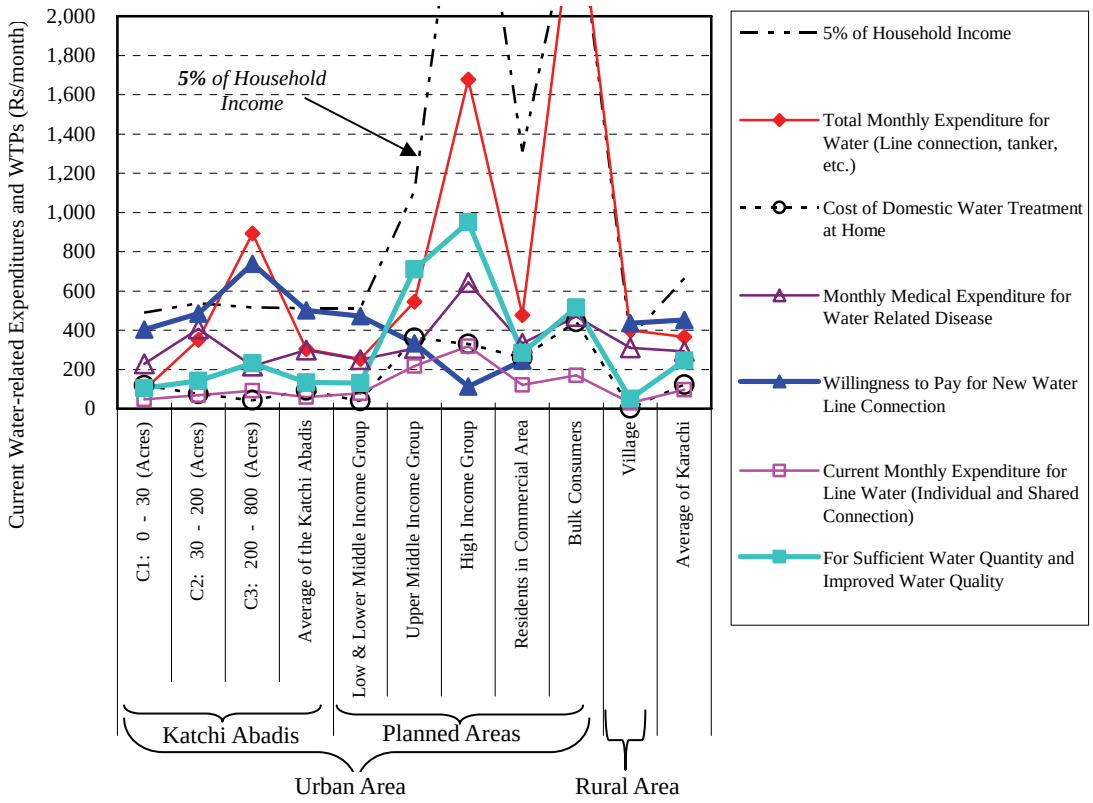


Figure A42.12.5 Levels of Willingness to Pay and Influencing Factors

Figure A42.12.6 shows the different levels of WtP for different levels of water supply services improvement. The WtP for better water supply services is higher in higher income group in general. As seen in the figure, in large Katchi Abadis the WtP for 24-hour water supply is significantly high, which is close to 5% of their average monthly income.

In conclusion, water distribution network should be expanded in large Katchi Abadis, where connection rate is low but the WtP for new line connection and 24-hour water supply service is significantly high. In Upper Middle Income Group and High Income Group, where WtP for better water supply services are significantly high, the rehabilitation of existing water supply system is more important and sustainable.

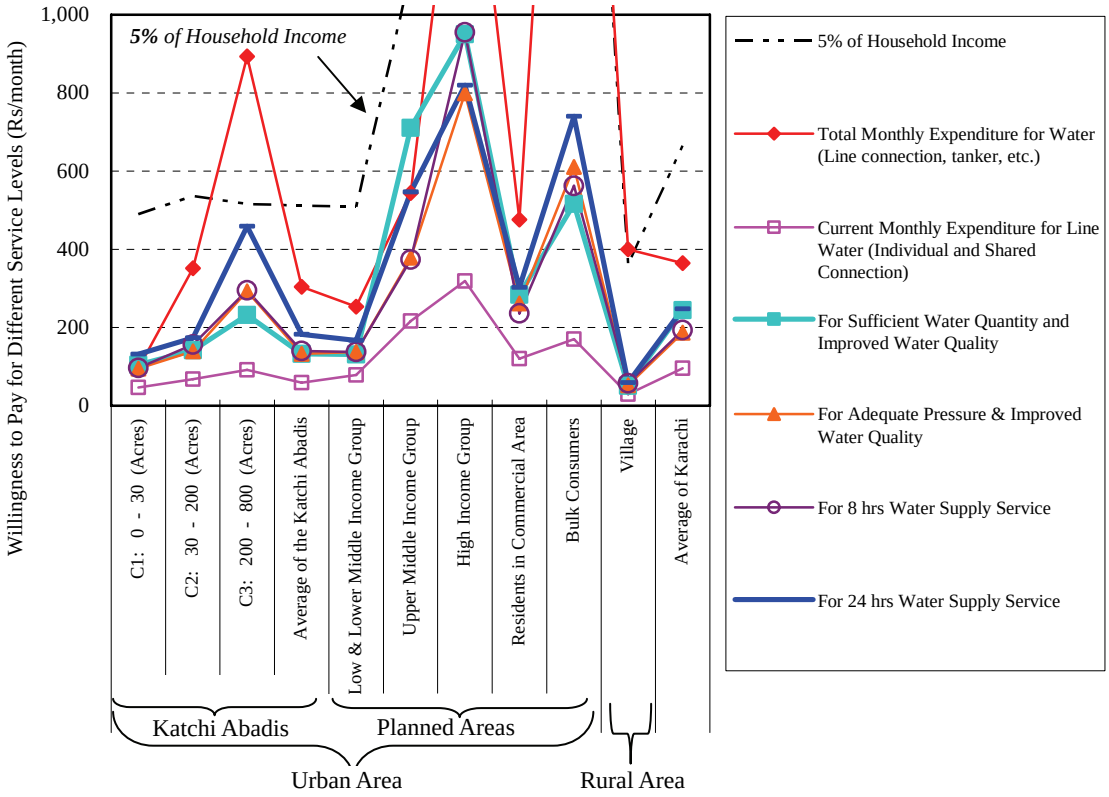


Figure A42.12.6 Willingness to Pay for Different Water Supply Service Levels

2) Sewerage Improvement and Willingness to Pay

Figure A42.12.2 shows the current sewerage connection rate in each type of areas. The sewerage connection rate (percentage of the households connected to sewers locally called "Gutter" and "Gutter line") is higher than water supply connection rate in general in Karachi except for rural areas. The sewerage connection rate is estimated at 89% in Karachi. In Upper Middle and High Income Group, the sewerage connection rates have already reached almost 100%.

Figure A42.12.7 shows the WtP for new sewerage connection and some factors influencing the WtP. The WtPs for new sewerage connection in those areas, where sewerage connection rates are already close to 100%, are not shown in the figure. As seen in this figure, the current level of sewerage charges is only around 0.2% of their household income level, which are even less than the average maintenance cost of toilets/latrines that are not connected to sewerage in the same area. The WtP for new sewerage connection to improve household life is only around 1% of their income in Katchi Abadis and Low&Lower Middle Income Group in planned areas. Because their WtPs for new sewerage connection to improve both their household life and environment in Karachi are hardly higher than those only for household life improvement, it can be said that the people in low and lower middle-income groups are not putting their importance on the environment.

Considering their high expenditure for water related disease in comparison of their income level, there seems to be potential of higher WtP for sewerage in those areas where sewerage conditions are not desirable. Therefore, it is quite important to raise the awareness on sewerage in Karachi to have the people accept the higher sewerage charges that is necessary for sustainable sewerage improvement in the future.

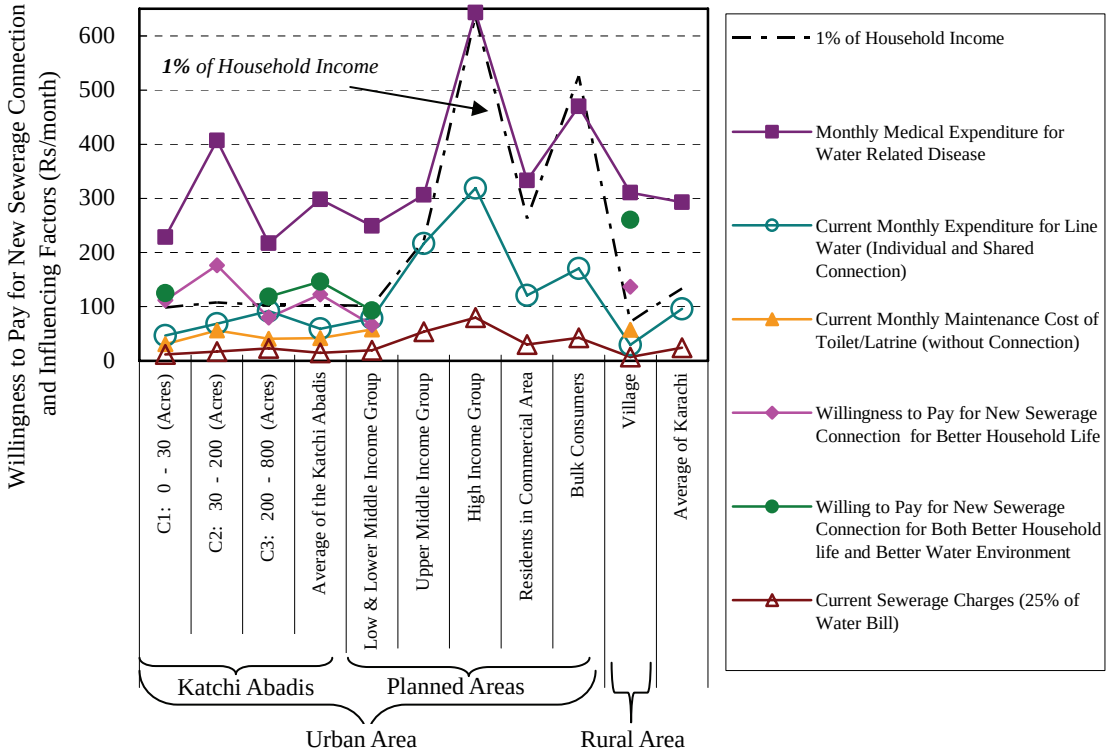


Figure A42.12.7 Willingness to Pay for New Sewerage Connection

3) Social Conditions of Different Residential Types

Social characteristics of each residential type are also analyzed below to support area prioritization in the social context of Karachi as well as its economical context examined above. The following summarizes the basic household information of different residential types and income groups shown in Page (2/17) and (3/17) of **Table A42.11.1** in **Appendix A42.11**.

Page (2/17) of the table shows that about 80% of the respondents in Katchi Abadis and villages were males while this ratio is about 65% in planned urban areas. This suggests higher unemployment ratio, higher labour availability and lower social advance among females in Katchi Abadis and villages. On average 1.7 families belong to one household and 9.2 persons including 2.4 children (blow 10 years old) live in one household in Karachi. These ratios do not differ dramatically among different residential types and income groups.

In Katchi Abadis, less than half of the households speak Urdu as their mother tongue while almost 90% of the households in Low&Lower Middle Income Group in planned areas speak Urdu as their mother tongue. In Katchi Abadis where many immigrants live, only 29% of the households had lived in other urban areas of Karachi before coming to current places. 36%, 8% and 21% of them have come from rural area of Karachi, Interior Sindh and other provinces such as Punjab, respectively. Illiterate ratio is higher in lower income groups, especially in villages. Illiterate ratio is 34% is Katchi Abadis while 3% in High Income Group.

The average duration of stay at the current place differ significantly between different residential types. On average, the duration of stay is 24.6 years in Katchi Abadis and 16.8 years in High Income Group while 51.9 years in villages and only 7.7 years in Bulk Consumers. However, the oldness of the structure of their dwelling does not differ significantly between different residential types and income groups, which is 19.7 years on average. The dwelling of Residents in Commercial Areas and Bulk Consumers are 36.0 and 12.4 years old respectively on average.

In low and lower middle income groups including Katchi Abadis, 60% of the households are living in single story houses. Multi-story flat is only common among Residents in Commercial Areas. 18% of the households in Katchi Abadis have either shop or workshop at the same plot while 11% in High Income Group do so. In High Income Group, most of the household are made of R.C.C. while more than 30% of the households in Katchi Abadis live in Semi Pakka or Katcha houses.

Average plot size of household ranges from 90 to 600 square yards mainly depending on their income level. Large Katchi Abadis have larger average plot size, which is 128.3 square yards.

Page (3/17) of **Table A42.11.1** shows that although the survey was conducted in notified Katchi Abadis, 45% of the households in those Katchi Abadis are built on unleased plots. Average ratio of tenant is 13% in Karachi. Their average rent is about Rs. 2,000 per month. Close-by street condition is bad in all type of low income groups including Katchi Abadis, planned areas and rural areas. More than half of their streets are not paved.

On average, 2.1 members are earning money in one household. In Katchi Abadis, 18% and 4% of their primary wage-earners are daily wages and house servant, respectively. Almost all the household have access to electricity and gas even in Katchi Abadis, however only 62% of the household in Katchi Abadis have refrigerator.

(2) Current Water Supply Conditions

This subsection explains the results of the survey which are related to the current water supply conditions. The related results are shown in **Tables 42.2.1** and **Tables 42.2.2** in the Main Report and Pages (4/17) to (10/17) of **Table A42.11.1**.

1) Usage of Different Water Sources and Water Consumption

a. Percentage of the Households Using Deferent Water Sources for Different Purposes

Table 42.2.1 in the Main Report shows the percentages of the households using different water sources for different purposes. The percentage of the households actually using individual or shared water line connections are 80% in total in Karachi, which is slightly lower than the percentage of the households having water line connections. This table also shows that the percentages of the households using water tankers and wells/bores are both 18%. More than 20% of the households in Katchi Abadis are using water tankers. 28% of Low&Lower Middle Income Group in planned areas are using wells or bore, although about half of this 28% do not use the ground water for drinking purpose because ground water is brackish in many areas. In High Income Group, 30% of the households use bottled water for drinking purpose. 6% and 4% of the households in Karachi use water carrying persons and public water storage tanks.

The table also shows that the average number of different types of water sources in use is 1.4 sources in Karachi. In Katchi Abadis, they use individual line connections and water tankers mainly.

b. Availability of Water

Page (4/17) of **Table A42.11.1** shows that in large Katchi Abadis, where line water connection rate is low, the total percentage of households not having enough water for more than bathing is 33% while those of High Income Group and Bulk Consumers are only 10% and 4% respectively. On the other hand, the total percentages of the households who have enough water for tank flushing of toilet, small scale gardening or car washing in High Income Group and Bulk Consumers are both 38% while those of large Katchi Abadis and villages are only 2% and 4% respectively.

c. Percentage of Water Sources in Volume and their Costs

The composition of water sources for drinking water and other water usages have some difference because higher income group use more bottled water for drinking purpose. 26% of drinking water is bottled water in High Income Group while that is only 2% in Katchi Abadis. Other than usage of bottled water, the composition of water sources for drinking water and other water usages are almost the same. The following describes the composition of water sources for non-drinking purpose.

As already explained, the consumption of line water is higher in higher income group and is lower in larger Katchi Abadis. The consumption of line water in large Katchi Abadis and villages are only 3% and 24% of the total water consumption for non-drinking proposes while its average in Katchi Abadis and High Income Group are 59% and 91% respectively. The consumption level of line water in Low&Lower Middle Income Group in planned areas is close to the average in Katchi Abadis while that of Upper Middle Income Group is 83%. In large Katchi Abadis, water tanker supplies 70% of their water. In villages, water tanker, public water storage and well/bore supply 31%, 16%, 12% of their water respectively.

In large Katchi Abadis, households are spending Rs. 670 per month for water tanker while spending only Rs. 12 per month for individual water line connection. High Income Group also pay significant cost for water tanker, which is Rs. 327 per month on average, while they are monthly paying Rs. 305 and Rs 1,025 for line water and bottled water, respectively.

d. Reasons of Not Having Line Connection and Not Using it as Main Water Source

Average income level of notified Katchi Abadis and Low&Lower Income Group in planned areas are almost the same. However, water supply conditions are quite different between them. The percentages of households not having water line connection are 24% and 8% in Katchi Abadis and Low&Lower Middle Income Group. 75% of the households without water line connection in Katchi Abadis claimed that their reasons of not having water line connection is the lack of public water supply line coverage in their areas, while only 17% of the households claimed so in Low&Lower Middle Income Group in planned areas.

Shared water line connection is not common in Karachi although the percentage of having shared connection is 35% among the Residents in Commercial Areas. Many households having water line connections do not use line water as a primary water sources. Page (5/17) of **Table A42.11.1** shows that the main reason of it is the limited volume of water supply in all the area types.

e. Water Tanker, Water Carrying Person and Public Water Storage

In Karachi, about 80% of water tankers are private tanker while only 20% belong to Ranger. The capacity of more than half of the tankers is 1,000 Gallons. Average water price for one tanker is Rs. 430. The percentage of households that think the water quality of tanker is bad or very bad is only 15% in total in Karachi.

Water usage of water carrying person and public water storage are both only few percent of total water consumption even in Katchi Abadis while water storage tank is more common in villages. Donkey cart is the most common type of water carrying parson. 27% of the households using water carrying person think its water quality is either bad or very bad.

f. Well/Bore and Other Natural Water Sources

Page (6/17) of **Table A42.11.1** shows the usage of well/bore is about 15% of total domestic water consumption, which is more common than those of water carrying person and public water storage. Among those wells and bores, about 80% is bore. Most of the wells and bores are equipped with electrical pumps and protected from pollution in Karachi. About 30% of

well/bore users think their water quality is bad or very bad.

Average depths of well/bore structure, water table in wet season, water table in dry season are 18.8m, 9.5m and 7.1m, respectively. Average initial construction cost of well facilities and annual maintenance cost are more than Rs. 5,000 and Rs 1,000, respectively.

The usage of other natural water resources such as direct use of river water, pond water and rainwater is common only in rural areas, which is about 7% of their total water consumption. Rainwater use is more than half of this 7%. More than 60% of those natural water sources have bad or very bad water quality.

g. Water Fetch

Page (7/17) of **Table A42.11.1** shows that the households in low and lower middle income groups including Katchi Abadis and villages fetches water from various water sources including water tankers, water carrying person, shared water line connection and well/bore mainly by hand. The average frequency of water fetch is about 3 times a day in Katchi Abadis and villages, and they are spending about 2 hours for water fetch per day. Males mainly carry water in Katchi Abadis while females carry water as much as males carry in rural areas.

h. Total Water Consumption Level

Average household water consumption data are re-tabulated in the following table. This water consumption includes all of their water sources including water tanker, etc. This data will be referred for the restructure of water tariff that will have the cross subsidy function between the poor using less water and the rich using more water. The average daily per capita water consumption in Katchi Abadis is significantly influenced by their area size, because large Katchi Abadis have more difficulty to gain enough water. In general higher income group use more water. Bulk Consumers use water the most while villages use water the least. It is more difficult to gain water from June to August in Karachi.

Table A42.12.1 Current Water Consumption Level

Urban										Rural	Estimated Average in Karachi
Katchi Abadis (One of Low & Lower Middle Income Groups)					Planned Areas					Village (One of Low and Lower Middle Income Groups)	
Katchi Abadis Sampling Areas are Categorized by Area (Acres)				Average in Katchi Abadis	Low & Lower Middle Income Group	Upper Middle Income Group	High Income Group	Residents in Commercial Area	Bulk Consumers		
From (>)	0	30	200								
To (<=)	30	200	800								
Average Monthly Household Water Consumption (UK Gallon/household/month)	6,846	5,981	2,779	5,957	6,459	7,016	15,229	8,176	13,719	4,496	6,429
Average Per Capita Water Consumption (UK Gallon/capita/day)	30	21	13	24	26	33	58	36	59	17	26

2) Conditions of Water Supply-related Facilities and Equipment at Home

a. Service Pipe

Table A42.11.1 shows that the average age of installed water service pipes is around 15 years old except for those among Residents in Commercial Areas and villages, which are 35 and 4 years old respectively. Skilled plumbers have installed majority of the service pipes, although the households themselves have installed 10% of them. On average, 45% of installed service pipes are made of G.I. in Karachi. In low income groups, the percentage of polymeric material such as PVC and polyethylene pipes are high, which are about 25% in Katchi Abadis and Low&Lower Middle Income Group in planned area and about 70% in villages.

b. Water Meter

Page (8/17) of the table shows that water meters are installed only in some areas of Bulk Consumers. 75% of the installed water maters are working properly. Those meters are read monthly.

c. Water Suction Pump

In Karachi, water suction pumps are also often used as booster pumps to send water to the overhead tanks of households. 67% of the households in Karachi are using water suction pumps, although only 24% of households in village have water suction pumps. In Bulk Consumers where water meter is partly installed, the usage of water suction pump is relatively low comparing to other urban areas.

d. Water Tanks and Taps

About 70% and 80% of the households using water line connection have receiving tanks and overhead tanks respectively in Karachi. Average capacity of receiving tanks and overhead tanks are about 1,600 and 700 gallons respectively. About 75% and 50% of the receiving tanks are installed underground and equipped with flow value, respectively.

The numbers of taps outside and inside house differs significantly depending on income levels, which are 3.6 and 0.5 taps respectively in Katchi Abadis, while 13.4 and 0.3 taps in High Income Group.

e. Water Leakage and Overflow

Regarding water leakage, only 3% and 2% of the households having line water connection in Karachi recognize water leakage from their service pipes and from water taps, respectively. Regarding overflow from their receiving tanks and overhead tanks, only 5% and 4% of the households recognize those types of overflow respectively in Karachi.

3) Current Service Level of Line Water Connection

Table 42.2.2 in the Main Report shows that in Karachi, 93% of the households have any complain on piped water supply services. In Katchi Abadis, 96% of the households have any complain. The people in Karachi have more complain on public relations of KW&SB (88%) than on received water quantity (61%) and water quality (64%).

Table 42.2.2 also shows that only 44% of the residents in bulk water supply areas have complain. In bulk supply areas, 89% of the households are satisfied with water quality. It suggests that there is no significant contamination within their water distribution system. Considering the other areas are using the same water sources for line water, it is important to improve water quality in other areas by removing cross connections and suction pumps drawing dirty water into water lines.

Page (9/17) of **Table A42.11.1** shows that in large Katchi Abadis, even the households which already have water line connection are not satisfied with KW&SB's water supply services at all

in terms of supplied water quantity, water quality and customer services of KW&SB. In general higher income group are more satisfied with current water supply services. For example, 50% of the water line users in Katchi Abadis are not satisfied with hours of water supply while this percentage is only 25% in High Income Group. The satisfaction level among Bulk Consumers is quite high. 83% of them are satisfied with current water supply hours.

In general, the water line users have similar satisfaction levels with water quantity (water supply hours, water pressure), with water quality (safety, colour, taste, and smell), and with billing and information notice of KW&SB work. More than 60% of the water line users in Karachi are not satisfied with those aspects. They are especially not satisfied with KW&SB's complain handling and promptness of repair work. 75% of the users are not satisfied with those aspects in Karachi. 70% of them also do not trust on KW&SB officials in Karachi. In large Katchi Abadis, mistrust on KW&SB is 100%.

Page (10/17) of the table shows detailed current conditions of water supply hours. Currently less than 50% of the water line users in Karachi are receiving water daily. More than 30% of them are receiving water two to four days a week. About 10% of them are receiving water only weekly and another 10% claim that water never comes. The situation is more serious in low and lower middle income groups, especially in large Katchi Abadis. The water supply hours per day or each time is 4.8 hours on average in Karachi while that of large Katchi Abadis is only 0.7 hour.

More than 40% of the users say that water supply frequency and hours are not enough. They are asking for additional water supply of 7.8 hours for summer and 5.3 hours for winter on average in Karachi.

(3) Improvement of Revenue Collection

This subsection explains the results of the survey which are related to billing and collection of water charges. The related results are shown mainly in Pages (10/17) to (12/17) of **Table A42.11.1**.

1) Current Billing and Collection

Page (10/17) shows that only 66% of water line users are registered in KW&SB in Katchi Abadis, while more than 90% of the users are registered in planned areas. In rural areas, only 12% of the users are registered.

In Katchi Abadis, only about 40% of the users are receiving water bill although almost all the users receiving water bill pay water charges. Even in large Katchi Abadis where water supply conditions are very bad, the water line users receiving water bills pay water charges to KW&SB. Therefore, current low revenue collection rate from Katchi Abadis has its root in KW&SB's billing system.

Among Low&Lower Middle Income Group in planned areas, 80% of the users receive water bills and 60% pay water charges. In Upper Middle and High Income Groups, about 90% of the users receive water bills and also pay water charges. Most of Bulk Consumers pay water charges while most of villagers do not receive water bills and do not pay water charges.

2) Expensiveness of Water Charges

More than 60% of the users not paying water charges in Karachi said that they do not pay because water bill is not coming. Even in Katchi Abadis, only 4% of the users not paying answered that it is because they do not have enough money.

In Karachi, about half of the line water users think current water supply charges are either fair,

low or very low, while only 20% and 15% of the users think it is high and very high respectively. We consider this result as a positive sign of potential acceptability of tariff increase required for future water supply improvement.

Comparing the level of current water charges with their income level, it is obvious that water charges is not high in Karachi, therefore those users thinking it is high or very high are expected to understand that it is currently set at low level after conducting public awareness enhancement.

3) Perception on Current Water Tariff Structure and Billing

In Karachi, only about 30% of the line water users know that water bill is collected based on household plot size. In Katchi Abadis, only 24% knows it.

Page (11/17) of **Table A42.11.1** shows the percentage of the users supporting plot-size based billing is also low, which is only 22% in Katchi Abadis and 27% in whole Karachi. However, about 70% of the users contradictory feel fairness to set water tariff depending on land price level or income level that has high correlation with plot size.

Monthly billing is more than two times as preferred as billing of every six months. The percentage of the users having bank account is about 35% in Karachi, which seems enough to initiate the automatic bill collection using their bank accounts.

4) Installation of Water Meter and Removal of Suction Pump

The study team thinks it is necessary to remove suction pumps and install water meter to each household to improve water supply conditions in Karachi. Therefore, in this survey, the users were asked whether they support water meter, after the field surveyors explained the advantages of water meter installation accompanied with the necessary removal of suction pumps that improperly rotate water meter by sucking air when water supply is intermitted.

Page (12/17) of **Table A42.11.1** that even before the surveyor's explanation to them, 86% of the water line users in Karachi already know that water suction pumps causes contamination of line water by sucking dirty water into water pipes. After the explanation, almost 80% of the users understand the positive impacts of water meter installation and the removal of suction pumps. Then, 86% of the users in Karachi agreed to support water meter installation. Even in Katchi Abadis, the ratio of supporting water meter is 84%. 80% of the users supporting water meter also answered that KW&SB should put heavy fine to the households using suction pumps continuously to encourage the installation of water mater and the removal of suction pumps.

About 75% of the users supporting water meter prefer to pay extra price as part of water charges for the cost of water meter installation instead of paying it at the time of installation at once.

Regarding the reasons why about 15% of the users are not supporting water meter, 24% and 34% of their reasons are because of not knowing water meter and because of not able to trust water meter, respectively in Karachi. In large Katchi Abadis, the ratios of these reasons among the non-supporter are quite high, which are both 40%. Almost none of them are significantly afraid of necessary removal of water suction pumps, although one third of the users not supporting water meter are afraid that their water bill may become higher because of water meter.

However, regarding the main condition on which the users not supporting water meter become willing to support water meter, only 5% of them think assuring that water bill will not dramatically increase is the most important condition. More than half of the non-supporter would also be wiling to support meter if KW&SB explains about water meter properly and

water meter works properly.

Moreover, 23% of the water line users in Karachi also answered that installation of water meter is the main condition on which they become willing to pay water charges. This seems to be another possible aspect of water meter installation.

(4) Organizations for the Maintenance of Water Supply Facilities

1) Permission of Water Line Connection

Page (3/17) of **Table A42.11.1** shows that in Katchi Abadis and rural areas, only about 30% and 50% of the households, respectively, know that KW&SB is in charge of public water supply and sewerage services, while this ratio is about 90% in High Income Group. Page (7/17) shows that only about half of line water connections are permitted by KW&SB. 36% of the households having water line connections neither have permission nor know about permission of their connection in Karachi. Interestingly, 10% of the connections are permitted by UC Nazim in Katchi Abadis, while 23% and 15% of the connections are permitted by Town Nazim and UC Nazim respectively in villages.

2) Maintenance and Leakage

Page (11/17) of the table shows that the water line users think only about 35% of water supply lines are maintained by KW&SB in Karachi. They also think about 15% and 20% of water lines in their areas are maintained mainly by UCs and household themselves respectively in Karachi. In Katchi Abadis their dependence on UCs is relatively high in terms of the maintenance, while dependence on KW&SB is high in planned urban areas.

In Karachi, only 17% of the water line users answered that they would inform KW&SB when they find water leakage outside their houses, while 29% and 41% of the users respectively answered that they would inform UCs and would try to fix it at their cost. In Bulk Consumers, communities/CBOs are mainly maintaining their water supply lines.

In Katchi Abadis, the percentage of the user who would inform KW&SB is only 12% because they depend more on UCs, while the tendency is other way around in planned urban areas.

(5) Current Sewerage/Sanitation Conditions

1) Satisfaction with Current Sanitation Options

Page (13/17) of **Table A42.11.1** shows that most of their toilets/latrines with/without sewerage connection are private toilets/latrines expect for those in villages where about 20% of them are common toilets. These figures suggest good sanitation conditions in Karachi, however still about half of the households are not fully satisfied with their current sanitation conditions.

The percentage of the households being satisfied with their sanitation options is lowest in large Katchi Abadis and highest in High Income Group and Bulk Consumers.

2) Open Defecation

Few percent of the households in Karachi still practice open defecation, mostly in rural areas where 44% of the households practice it although most of them know that open defecation often cause diseases.

In rural areas, about 60% of the households practicing open defecation said that they did open defecation because they could not afford toilet/latrine while the remaining 40% did not recognize the necessity of toilet/latrine or simply preferred open defecation. Among the households practicing open defecation, private latrine is more popular comparing to common latrine for their future sanitation improvement.

3) Toilet/Latrine without Connection to Gutter or Gutter Line

Close to 10% of the households in Karachi use toilets/latrines that are not connected to sewers. In rural areas, 40% of the households still use toilets/latrines without sewerage connection.

Majority of those toilets in Katchi Abadis and rural areas are simple pit latrines. The toilets using bucket for night soil disposal are disappearing in Karachi. Pour flush latrines without septic tanks are also in use in rural areas. In urban areas, toilets/latrines with septic tanks are also used. The most of those toilets/latrine are equipped with WC (Indian Style) as their toilet seat.

Page (14/17) of the table shows that in low income groups, most of the households use hand flushing, while majority of the households in High Income Group use tank flushing.

Although only 23% of the households using toilets/latrines without connection to sewerage have any problem with their toilets/latrines in Karachi, 78% of the households think the effluent from their toilets/latrines pollute the surrounding environment or ground water.

Major problems they are facing with their toilets are bad smell, dirty, danger and bad construction in order of frequency. The most preferred improvement option of those toilets/latrines is to connect to sewers. However, about 10% of the households using toilets/latrine without connecting to sewers in Katchi Abadis are not wiling to connect to sewerage because they think current conditions of their toilets/latrines are good enough.

In Katchi Abadis, about 20% of the households using toilet without connecting to sewers dispose their home wastewater (drain water from kitchen, bathing, washing, etc.) to street surface. This is also causing the degradation of living environment in Katchi Abadis.

4) Physical Arrangements of Sewerage Connection

About 90% of the households in Karachi already have sewerage connection. Page (15/17) of the table shows that the most of the toilets/latrines connected to sewerage system are also equipped with WC style toilet seat. In low and lower middle income groups, most of the households use hand flushing although their toilet is connected to sewers in which certain amount of water is required to flow down human waste, etc. One the other hand, majority of the households in High Income Group use tank flushing for their toilets connected to sewers.

86% and 12% of the toilets/latrines connected to sewers in Karachi are connected to gutter lines and closed gutters respectively, while only about 1% of them are connected to open gutters.

About 10% of the sewerage connections in Karachi are recognized by the people as being directly connected to the sewers constructed by communities. This ratio is especially high in the large Katchi Abadis in which streets are well organized.

5) Organizations involved in Providing Sewerage Connection and Maintenance

In Katchi Abadis, only 22% of sewerage connections have been provided by KW&SB, while UCs and the households themselves respectively provide 27% and 26% of them. However, in most of the planned urban areas except for Bulk Consumers, about half of their sewerage connections have been provided by KW&SB. In Bulk Consumers, 65% of their sewerage connections have been provided by their communities/CBOs. In villages, Town Offices have also provided sewerage connections as much as UCs have.

Regarding maintenance of sewer lines, communities/CBOs or households themselves maintain majority of sewers in urban areas. The percentages of areas where their sewers are maintained by communities/CBOs in large Katchi Abadis and High Income Group are relatively low among

those urban areas, which are both about 25%.

Only in 8% of Katchi Abadis, sewers are mainly maintained by KW&SB, while in about 25% of the planned urban areas sewers are maintained by KW&SB. In Bulk Consumers, most of sewer lines, as well as water lines, are maintained by communities/CBOs. In villages, about 40% of sewers are maintained by UCs.

6) Awareness on Sewerage, Complains and Requests

About 40% of the sewerage users in Karachi think that they know where their sewage goes. Even in Katchi Abadis 80% of the sewerage users think that the sewerage form their households should be properly treated at sewage treatment plants although it costs them eventually. This ratio in High Income Group is about 90%. This result is contradicted with the previously explained result that their WtP for sewerage to improve environment is quite low comparing to the WtP for sewerage to improve their living environment.

Currently only 22% of the households using sewerage in Katchi Abadis knows that people are paying sewerage charge at 25% of water charges. This ratio is much higher in High Income Group, which is 65%. On the other hand, almost no one knows about this sewerage charge in villages.

In Katchi Abadis, about half of the sewerage users consider this sewerage charges to be either high or very high, while only 22% of the sewerage users in High Income Group think so.

Although the sewerage connection rate in Karachi is already about 90%, about 70% of the sewerage users in Karachi have complains on current sewerage conditions. Page (15/17) of the table shows that majority of complains are clogging and overflow from sewers. They also complain on mosquitoes, flies and smell caused by mal-maintenance of sewers.

54% of the sewerage users in Karachi have specific requests to CDGK or KW&SB on sewage disposal. 9 % of the users in Karachi have actually reported their complains about sewerage to CDGK or KW&SB. However, 22% and 44% of the users have complained to Town Offices and UCs, which are much higher than that to KW&SB. 40% of the users having reported complains think that the responses to them were bad.

(6) Storm Water and Solid Waste

1) Storm Water Drainage

Page (16/17) of **Table A42.11.1** shows that most of the areas in Karachi (except for small portions of High Income Group, Residents in Commercial Areas and Bulk Consumers) are not served by drainage system.

37% and 17% of the households in Karachi experienced flood below the floorboard and over the floorboard, respectively, at their current dwelling. These ratios are higher in low and lower income groups of urban areas, which are 39% and 20% respectively in Katchi Abadis. 17% and 19% of the households in Karachi respectively take any measures to mitigate flooding problems and have ever reported flooding to UCs, Town Offices or CDGK.

2) Solid Waste Management

53% of the households in Karachi do not have any garbage collection facilities in their localities. This ratio reaches 62% in Katchi Abadis. Therefore, 34% and 45% of the households dispose their garbage by throwing them into Galis in Karachi and in Katchi Abadis, respectively.

Only 7% of the households in large Katchi Abadis know that people are paying conservancy at 10% of water charges for CDGK's garbage collection and disposal. This ratio is 56% in High

Income Group. 56% the households in Karachi hire somebody to collect garbage from their households for disposal. Nevertheless, 78% of the household do not know where collected garbage is finally disposed off. 47% of the households in Karachi are not satisfied with current garbage collection services at all.

(7) Public Awareness Enhancement

1) Water Save

Page (11/17) of the table shows that 90% of the households in Karachi know about the water shortage in Karachi. On their perception, limited water resources, overuse of water, and water leakage are all the major reasons of water shortage in Karachi.

98% of the households in Karachi already save water when they use public water supply services. However, 24% and 62% of them also think that government's effort to promote water save in Karachi is far too little and is not enough, respectively. About 85% of the households saving water answered that they save water because water is limited resource while only about 15% of them save water because water charges is expensive. This is natural because in most of the areas in Karachi except for some Bulk Consumers, water charges is collected based on plot size regardless the amount of water they consume.

The introduction of water meter-based water bill seems necessary to enhance the effectiveness of their water save because currently their motivation of water save is only depend on their morality.

The major reasons why few percentages of the households answered that they do not save water are different between Katchi Abadis and High Income Group. In Katchi Abadis, 40% of them do not save water because water supply is irregular so that water taps need to be kept open. One the other hand, some households in High Income Group and Bulk Consumers do not save water mainly because they think water is plenty and water rate is low. In both Katchi Abadis and High Income Group, majority of the households not saving water also feel that they do not save water without any specific reason. This have roots in their low awareness on water save.

2) Environmental Awareness

Page (13/17) of **Table A42.11.1** shows that 85% and 13% of the households in Karachi think that water pollution in Karachi is very serious and serious, respectively. 61% of the households think the water pollution is mainly caused by garbage, while only 18% and 15% of them respectively think its main cause is domestic wastewater and commercial/industrial wastewater/solid waste in Karachi.

Although 48% of them think that the most polluted environment in Karachi are rivers and channels, 37% of the household still think their residential areas is the most polluted environment in Karachi. These results suggest that the discharge of domestic wastewater from living environment may still have many problems although sewerage connection rate is quite high in Karachi (note: sewage treatment rate is still low in Karachi). These environmental perceptions do not differ significantly between different residential types.

3) Hygiene Enhancement

Page (17/17) of the table shows that 26% of the households in Karachi practice boiling as domestic water treatment. 5% and 4% of the households practice both boiling and simple filtering and only simple filtering, respectively. Because only one forth of the households in Karachi currently uses domestic water treatment, it is also important for KW&SB to improve the water quality of line water. Among urban areas, the percentage of the households using domestic water treatment is lowest in Katchi Abadis, where line water seems most contaminated because of heavy use of suction pumps and improper illegal connections.

Usage of soap after using toilet and before taking food are 96% and 92% respectively in Karachi, which are quite high comparing to other developing countries. However, cross-connections between water lines and sewer lines often cause serious epidemic of water bone diseases in Karachi. 6% of the households or their neighbourhoods have experienced serious accidents regarding water supply and sewerage.

APPENDIX – A42.13

Result Tables of Existing STPs
Environmental and Social Impact Survey

A42.13 Result Tables of Existing STPs Environmental and Social Impact Survey

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (1/6)

Category	Question	Selection of Answer/Unit		Existing Sewerage Treatment Plants			
				STP1	STP2	STP3	Area Average
				29 samples	55 samples	17 samples	
I. Basic Information							
(4) Household Information	1) Sex of Respondent:	1	Male	97%	84%	100%	93%
		2	Female	3%	16%	0%	7%
			Total	100%	100%	100%	100%
	2) How many years has your family stayed at this place? (six months = 0.5 year)	Ave.	(years)	42	25	24	30
	3) Type of Building Material:	1	R.C.C.	59%	64%	41%	54%
		2	Pakka	31%	31%	41%	34%
		3	Semi Pakka	10%	4%	12%	9%
		4	Katcha	0%	2%	6%	3%
			Total	100%	100%	100%	100%
	4) Legal Status of Your Plot	1	Leased	48%	91%	59%	66%
		2	Unleased	52%	9%	41%	34%
			Total	100%	100%	100%	100%
	5) What is the education level of the house head?	1	Illiterate	17%	5%	25%	16%
		2	Literate	10%	0%	6%	6%
		3	Primary	14%	7%	0%	7%
		4	Middle	14%	15%	13%	14%
		5	Metric	17%	20%	13%	17%
		6	Inter	3%	20%	25%	16%
		7	B.A/B.Sc	21%	25%	13%	20%
		8	M.A/M.Sc	3%	7%	0%	4%
		9	Others	0%	0%	6%	2%
			Total	100%	100%	100%	100%
II. Perception on Environment and Sewerage/Sanitation							
(5) Environmental Awareness	1) How seriously water environment such as rivers and channels are polluted in Karachi?	1	Very Serious	90%	82%	94%	89%
		2	Serious	10%	18%	6%	11%
		3	Not Serious but polluted	0%	0%	0%	0%
		4	Not polluted at all	0%	0%	0%	0%
		5	I don't know	0%	0%	0%	0%
			Total	100%	100%	100%	100%
	2) If "1." to "3." (polluted), what do you think causes water pollution the most in Karachi?	1	Domestic Wastewater	38%	35%	36%	37%
		2	Garbage	35%	56%	36%	42%
		3	Commercial/Industrial wastewater/solid waste	27%	8%	29%	21%
		4	I don't know	0%	0%	0%	0%
			Total	100%	100%	100%	100%
	3) Which environment is most polluted in Karachi?	1	Rivers and channels	41%	42%	38%	40%
		2	Lakes and ponds	0%	0%	0%	0%
		3	Beaches	0%	4%	0%	1%
		4	Residential area	48%	51%	38%	46%
		5	Roads	3%	4%	6%	4%
		6	Commercials buildings	7%	0%	19%	9%
			Total	100%	100%	100%	100%
	4) Do you think it is important to dispose home wastewater (from kitchen, bathing, washing etc.) and human waste (feces, urine) into sewer to improve your living environment and the water environment in Karachi?	1	Yes	93%	100%	100%	98%
		2	No	7%	0%	0%	2%
			Total	100%	100%	100%	100%
(6) Sewerage/Sanitation Option in Use	1) Which sanitation option does your household mainly use for disposing human waste (feces and urine)?	1	Open defecation	0%	0%	0%	0%
		2	Latrine/Toilet without connecting to gutter (drainage) or gutter line (sewer pipe)	3%	0%	6%	3%
		3	Toilet connected to gutter (drainage) or gutter line (sewer pipe)	97%	100%	94%	97%
			Total	100%	100%	100%	100%
	2) If "3. Toilet connected to….", do you have any complaints on the sewerage system which your household connects to?	1	Yes	75%	75%	88%	79%
		2	No	25%	24%	13%	20%
			Total	100%	98%	100%	99%

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (2/6)

Category	Question	Selection of Answer/Unit		Existing Sewerage Treatment Plants			
				STP1	STP2	STP3	Area Average
				29 samples	55 samples	17 samples	
(6) Sewerage/Sanitation Option in Use	3) If "Yes", what is your major complaint to sewerage? (up to 2)	1	Monthly charge is too expensive	24 points	49 points	18 points	30 points
		2	Cost to connect to sewer was too expensive	0 points	4 points	0 points	1 points
		3	Not enough water to use flush toilet	34 points	25 points	12 points	24 points
		4	Clogging/Sewerage water overflow	203 points	173 points	235 points	204 points
		5	Not connected to main sewer	7 points	0 points	12 points	6 points
		6	Unsatisfactory complaint handling/response	72 points	33 points	59 points	55 points
		7	Mosquito/Flies due to nearby sewer	28 points	91 points	53 points	57 points
		8	Smell of open gutter, manhole, etc.	38 points	60 points	29 points	42 points
		9	Leakage from lines	0 points	2 points	0 points	1 points
		10	Contaminating line water	0 points	2 points	0 points	1 points
		Total		407 points	438 points	418 points	421 points
	4) If "3. Toilet connected to….", do you know where the collected sewage goes?	1	Yes	86%	65%	88%	80%
		2	No	14%	35%	13%	20%
		Total		100%	100%	100%	100%
	5) If "3. Toilet connected to….", do you think that the sewage from your household should be properly treated at sewerage treatment plant ?	1	Yes	100%	100%	100%	100%
		2	No	0%	0%	0%	0%
		Total		100%	100%	100%	100%
	6) IF "Yes" then Can you pay some money in this Regard ?	1	Yes	76%	84%	100%	86%
		2	No	24%	16%	0%	14%
		Total		100%	100%	100%	100%
	7) If "Yes" How much money you can spend?	Ave.	(Rs)	87	72	58	72
	8) Are you satisfied with the current situation of your household's human waste (feces and urine) disposal?	1	Yes	52%	60%	38%	50%
		2	Moderately	41%	23%	31%	32%
		3	Not at all	7%	17%	31%	18%
		Total		100%	100%	100%	100%
	9) Where do you dispose home wastewater (drain water from kitchen, bathing, washing etc.)?	1	Open gutter	0%	0%	0%	0%
		2	Closed gutter	0%	0%	6%	2%
		3	Gutter line	100%	100%	94%	98%
		4	Street surface	0%	0%	0%	0%
		5	Natural stream or river	0%	0%	0%	0%
		6	6 the soak pit/septic tank	0%	0%	0%	0%
		7	Kitchen garden	0%	0%	0%	0%
		8	It is re-used	0%	0%	0%	0%
		Total		100%	100%	100%	100%
	10) Do you think your domestic wastewater pollutes natural environment or degrade your living environment?	1	Yes	93%	89%	88%	90%
		2	No	7%	11%	13%	10%
		Total		100%	100%	100%	100%
(7) Relation with KW&SB	1) Before this interview, did you know that KW&SB is in charge of sewerage services as well as water supply services?	1	Yes	86%	89%	82%	86%
		2	No	14%	11%	18%	14%
		Total		100%	100%	100%	100%
	2) Would you like to know more about the STP?	1	Very interested	48%	56%	35%	47%
		2	Interested	34%	38%	53%	42%
		3	Not very interested	14%	4%	6%	8%
		4	Not interested at all	3%	2%	6%	4%
		Total		100%	100%	100%	100%
	3) Do you know that people are paying sewerage charge at 25% of water charges?	1	Yes	59%	62%	59%	60%
		2	No	41%	38%	41%	40%
		Total		100%	100%	100%	100%
	4) Have you ever reported your complaints about sewage disposal to CDGK/KW&SB, town office or union council?	1	Yes - to CDGK/KW&SB	10%	22%	18%	17%
		2	Yes - to Town Office	3%	0%	0%	1%
		3	Yes - to Union Council	48%	36%	47%	44%
		4	No	38%	42%	35%	38%
		Total		100%	100%	100%	100%

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (3/6)

Category	Question	Selection of Answer/Unit	Existing Sewerage Treatment Plants			
			STP1	STP2	STP3	Area Average
			29 samples	55 samples	17 samples	
(7) Relation with KW&SB	5) If "Yes (1. to 3.)", what was your complain?	1 Sewer is blocked	67%	52%	73%	64%
		2 Maintenance/cleaning sewers	11%	19%	0%	10%
		3 Separation of water and sewerage lines	6%	6%	9%	7%
		4 Installation of new sewerage lines	6%	0%	0%	2%
		5 Cover for manholes	6%	3%	0%	3%
		6 Leakage from sewers	6%	10%	0%	5%
		7 No proper treatment	0%	3%	0%	1%
		8 Cleaning of Nalas	0%	3%	0%	1%
		9 Encroachment on Nala	0%	3%	0%	1%
		10 Overflow of sewage	0%	0%	18%	6%
		Total	100%	100%	100%	100%
	6) If "Yes (1. to 3.)", how was the response to your complaints?	1 Good	33%	19%	9%	21%
		2 Not Bad	22%	52%	55%	43%
		3 Bad	44%	29%	36%	37%
		Total	100%	100%	100%	100%
	7) Do you have any specific request to CDGK or KW&SB on sewage disposal?	1 Yes	48%	64%	71%	61%
		2 No	52%	36%	29%	39%
		Total	100%	100%	100%	100%
	8) If "1.Yes", please specify your request.	1 Development of proper system	36%	15%	20%	23%
		2 Replacement of old sewers	7%	0%	0%	2%
		3 Sewer lines should be covered	7%	0%	0%	2%
		4 Cleaning of sewers and removing blockage	7%	18%	20%	15%
		5 Remove contamination of water lines	7%	0%	0%	2%
		6 Installation of new sewerage lines	7%	15%	20%	14%
		7 Legalization of unauthorized areas	7%	0%	0%	2%
		8 Staff should be increased	7%	0%	0%	2%
		9 Increase the depth of manhole	7%	0%	0%	2%
		10 Better billing	7%	0%	0%	2%
		11 Honest, competent, serious work	0%	15%	0%	5%
		12 Cover nasal	0%	15%	0%	5%
		13 Control smell from STP	0%	3%	0%	1%
		14 Nala should be widen	0%	3%	0%	1%
		15 Better garbage picking	0%	3%	0%	1%
		16 Eliminate the polythene bags	0%	3%	0%	1%
		17 Clean nasal	0%	3%	10%	4%
		18 Remove encroachment from Nala	0%	6%	0%	2%
		19 Consider the view of local people in the development	0%	3%	0%	1%
		20 put a sucking pump on sewerage line	0%	0%	10%	3%
		21 develop ways for rain water	0%	0%	10%	3%
		22 sewerage construction should be done by competent agencies	0%	0%	10%	3%
		Total	100%	100%	100%	100%
III. Social and Environmental Considerations						
(8) Awareness on their STP	1) What do you think of the STP?	1 Very Important	69%	84%	94%	82%
		2 Important	31%	13%	6%	17%
		3 Not very important	0%	2%	0%	1%
		4 Not important at all	0%	2%	0%	1%
		Total	100%	100%	100%	100%
	2) Do you know that the STP treats the collected wastewater from households before discharge?	1 Yes	72%	80%	71%	74%
		2 No	28%	20%	29%	26%
		Total	100%	100%	100%	100%
	3) Do you know where is the discharge point of the STP?	1 Yes	55%	67%	88%	70%
		2 No	45%	33%	12%	30%
		Total	100%	100%	100%	100%
(9) Benefit of STP	1) Do you think the STP (together with sewers) contributes to the improvement of living environment in the city?	1 Yes	93%	93%	100%	95%
		2 No	45%	33%	12%	30%
		Total	138%	125%	112%	125%
	2) Do you think the STP (together with sewers) contributes to preserve the water environment such as beach and river?	1 Yes	93%	96%	94%	95%
		2 No	7%	4%	6%	5%
		Total	100%	100%	100%	100%
	3) Do you feel pride that your area contributes to environmental protection with the STP of your area?	1 Yes	72%	65%	71%	69%
		2 No	28%	35%	29%	31%
		Total	100%	100%	100%	100%

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (4/6)

Category	Question	Selection of Answer/Unit		Existing Sewerage Treatment Plants			
				STP1	STP2	STP3	Area Average
				29 samples	55 samples	17 samples	
(10) Public Notification	1) How long before, did your household know about the construction of the STP?	1	Long time	21%	52%	29%	34%
		2	Short time	43%	44%	29%	39%
		3	Just before the start of construction	7%	0%	0%	2%
		4	After the construction	21%	4%	12%	12%
		5	Move to this area after the construction started	7%	0%	29%	12%
			Total	100%	100%	100%	100%
	2) How did your household know about the construction of the STP?	1	Notified by the government	7%	0%	0%	2%
		2	Through the mass media	3%	7%	12%	7%
		3	By your neighbours	34%	45%	41%	40%
		4	By the notice board of construction	17%	5%	0%	8%
		5	By the start of the construction	10%	2%	12%	8%
		6	I forget/I cannot say	10%	27%	24%	20%
		7	Move to this area after the construction started	3%	2%	6%	4%
		8	Other	14%	11%	6%	10%
			Total	100%	100%	100%	100%
	3) Has your household had any chance to participate in any kind of public hearing about the STP before its construction?	1	Yes	0%	0%	0%	0%
		2	No	100%	100%	100%	100%
			Total	100%	100%	100%	100%
(11) Land Acquisition	1) Do you know what is the former land use before the STP?	1	Yes	14%	9%	29%	17%
		2	No	86%	91%	71%	83%
			Total	100%	100%	100%	100%
	2) If "Yes", what is the former land use?	Comment		Farming/Agricultural Use/Vacant Plot	Farming/Agricultural Use/Vacant Plot/Forest	Salt Industry/Drying Fish/Vacant Plot	-
	3) Have you heard any social dispute concerning the land acquisition and the construction of the STP before?	1	Yes	0%	2%	6%	3%
		2	No	86%	91%	71%	83%
			Total	86%	93%	76%	85%
	4) If "Yes", what is the problem?	Comment			Previously graveyard (having conflict, still some graves inside the boundary)	Illegal occupation by fishermen	-
	5) Do you know any people who have been relocated due to the construction of STP?	1	Yes	0%	0%	6%	2%
		2	No	100%	100%	94%	98%
			Total	100%	100%	100%	100%
(12) Social Influences of the STP and Waste Water Discharge	1) Do you have/heard any social problems concerning to the STP or the discharged wastewater from the STP?	1	Yes	0%	4%	6%	3%
		2	No	100%	96%	94%	97%
			Total	100%	100%	100%	100%
	2) If "Yes", what is the problem?	Comment			Conflict regarding graveyard		-
	3) Do you think the STP had changed any social and commercial value of the surrounding land?	1	Yes	7%	13%	12%	10%
		2	No	93%	87%	88%	90%
			Total	100%	100%	100%	100%
	4) If "Yes", what are the changes?	Comment		Trance liyari park is maintain by the water which is exiting from STP, this give rise to agriculture	Positive and negative, dirty smell, in winter its smell troubles much when STP runs, area Value downs	Both positive and negative, land value increases	-
	5) Do you understand or accept the reason why the STP was constructed there?	1	Yes	52%	65%	59%	59%
		2	No	48%	35%	41%	41%
			Total	100%	100%	100%	100%
	6) Do you feel the misdistribution of benefit and damage concerning this STP?	1	Yes	10%	13%	12%	12%
		2	No	90%	87%	88%	88%
			Total	100%	100%	100%	100%

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (5/6)

Category	Question	Selection of Answer/Unit		Existing Sewerage Treatment Plants			
				STP1	STP2	STP3	Area Average
				29 samples	55 samples	17 samples	
(13) Environmental Influences of the STP and Waste Water Discharge	1) Have you noticed any environmental impacts caused by the STP or the discharged wastewater from the STP?	1	Yes	7%	11%	6%	8%
		2	No	93%	89%	94%	92%
			Total	100%	100%	100%	100%
	2) If "Yes", what kinds of impacts are they?	Comment		Area is more polluted, greenery is noted	Both positive and negative, greenery is increased, in Winter STP smells a lot, gives water to gardens	Mosquitoes problem	-
	3) Have you noticed any changes in flora and fauna in the surrounding area?	1	Yes	14%	25%	6%	15%
		2	No	86%	75%	94%	85%
			Total	100%	100%	100%	100%
	4) Do you think the landscape become less beautiful due to the STP?	1	Yes	21%	29%	12%	21%
		2	No	79%	71%	88%	79%
			Total	100%	100%	100%	100%
	5) Do you think the odour from the STP is a problem?	1	Yes	17%	35%	12%	21%
		2	No	83%	65%	88%	79%
			Total	100%	100%	100%	100%
	6) If "Yes", how serious is it?	1	Very Serious	0%	26%	50%	25%
		2	Serious	40%	32%	50%	41%
		3	Not very serious	60%	42%	0%	34%
			Total	100%	100%	100%	100%
	7) During the construction of STP, have you had any problems with the noise and vibration of the construction?	1	Yes	3%	0%	0%	1%
		2	No	97%	100%	100%	99%
			Total	100%	100%	100%	100%
	8) During the operation of STP, have you had any problems with the noise and vibration of the operation?	1	Yes	0%	2%	0%	1%
		2	No	97%	100%	100%	99%
			Total	97%	102%	100%	99%
	9) Do you know where the sludge from the STP was damped?	1	Yes	14%	24%	12%	16%
		2	No	86%	76%	88%	84%
			Total	100%	100%	100%	100%
	10) If "Yes", where is it?	Comment		Used as fertilizer for agriculture	Used as fertilizer for agriculture, dumped inside the STP boundary	Used as fertilizer, taken into truck and dumped away from the city	-
	11) If "Yes", do you know any problem concerning to the damping site?	1	Yes	0%	0%	0%	0%
		2	No	100%	100%	100%	100%
			Total	100%	100%	100%	100%
	12) Do you think the discharged wastewater from the STP is polluting the receiving water?	1	Yes	3%	5%	18%	9%
		2	No	97%	95%	82%	91%
			Total	100%	100%	100%	100%
	13) If "Yes", how serious is it?	1	Very Serious	0%	0%	67%	22%
		2	Serious	100%	100%	33%	78%
		3	Not very serious	0%	0%	0%	0%
			Total	100%	100%	100%	100%

Table A42.13.1 Results of Existing STPs Environmental and Social Impact Survey (6/6)

Category	Question	Selection of Answer/Unit	Existing Sewerage Treatment Plants			
			STP1	STP2	STP3	Area Average
			29 samples	55 samples	17 samples	
(14) Suggestions	1) What is your most serious problem concerning the STP which you encounter currently?	(Only Main and New Aspects)				
		Sewers and nasal are blocked (particularly in rainy season).				
		No proper maintenance of sewers and nasal including periodical cleaning.				
		Rain water stays in streets because of the lack of proper system of rain water drainage.				
		Leakage from Sewers and its strong smell.				
		Contamination of nasal due to toxic waste.				
		Sewerage system is very old and not functioning.				
		Waste from textile industry is dumped in alas and creates diseases of breathing and skins.				
		Nala is dirty and polluted.				
		There is too much garbage in nasal so that in rainy days water entered in houses.				
		Due to the uncovered Nala dirty smell and mosquitoes are created.				
		Lack of water to clean toilets that creates blockage of sewers.				
		Sewerage and pure water is mixing.				
		No separate season anal and sewerage anal.				
		Alas are not covered				
		The diameter of sewers are too small.				
		Many encroachments along alas making blockage.				
		No manhole or no cover of manhole in sewers.				
	2) What do you think is a desirable countermeasure against the problem which you pointed out above?	(Only Main and New Aspects)				
		Replacement of malfunctioning sewers.				
		Installation of large diameter sewers and deep manholes.				
		Development of rain water drainage system.				
		Covering drainage, manholes and nasal.				
		Proper installation of new sewerage lines.				
		Instalment of new sewerage treatment plants in the city.				
		Development of small covered lines in the side of every street for rain water drainage.				
		Remove the encroachment from alas.				
		Proper maintenance of sewers and nasal including periodical cleaning (by cleaning staff or locals).				
		Increase the depth of Nala.				
		Develop walls around Nala.				
		Garbage dumping area should be develop.				
		Restrict the dumping of chemicals by industries.				
		Installed new lines in the middle of the streets/roads.				
		Develop separate alas for rain water drainage.				
		Provide enough water for toilets to avoid clogging of sewers.				
		The system should be handed over to expert external or international agencies.				
		Seasonal alas should be separated with sewerage alas and develop a road besides it.				
		There must be a slope for the sewers.				
		Establish measures for effective garbage picking.				
		Develop a road in slope like shape.				
		Proper system should be build for cleaning of sewers.				
		Spray for mosquitoes.				
		Remove these encroachments then rebuild nasal.				
		Repair leaking sewers.				
		Put a sucking pump on sewer.				
		Water lines and sewers should be installed separately apart from each other.				

APPENDIX – A42.14

Complete Discussion on the Results of Existing STPs Environmental and Social Impact Survey

A42.14 Complete Discussion on the Results of Existing STPs Environmental and Social Impact Survey

(1) Awareness on KW&SB's Work

Page (1/6) of **Table A42.13.1** shows basic information of the households sampled around the STPs in the survey. Education level of the households around STP-1 is relatively lower because many of the households are sampled in the Katchi Abadis in Southwest side of STP-1. On the other hand, many of the households sampled around STP-2 have higher education level.

Almost all the sampled households think that the pollution of water environment in Karachi is very serious and that sewerage is important to improve water environment as well as living environment. Almost all the sampled households already have sewerage connection to gutter lines, but about 80% of those sewerage users have complains on the sewerage system in Karachi, mainly about clogging and overflow.

Page (2/6) of **Table A42.13.1** shows that about 80% of the households around the STPs are aware of the destinations of collected sewage. This percentage is about two times as high as the average of the households in Karachi. The most of the households around the STPs think that collected sewage should be treated properly at the STPs and are willing to pay for it. However, the level of WtP for proper treatment is less than Rs. 100 per household, which indicates low understanding of STPs' operation cost among the households.

85% and 60% of the households around the STPs know that KW&SB is in charge of sewerage services and is taking sewerage charges at 25% of water charges, respectively. However, more than two third of their complains on sewerage are reported to the UCs and less than one third of their complains go to KW&SB. Page (3/6) of the table shows that about 40% of the total complains reported are poorly responded by concerning organizations. About 40% of the households have specific requests to KW&SB/CDGK, which are mainly development of proper sewerage system including new lines installation, cleaning of sewers, and removal of blockage.

(2) Social Considerations

About 95% of the households around the STPs think that their STPs contribute to the improvement of life and environment in Karachi. Moreover, 70% of the households feel pride that their areas contribute to environmental protection with their STP. However, many of the households, which are adjacent to STP-2 and along the Nala used as its discharge point, are not proud of their contribution with the STP as shown in Figure **A42.14.1**. The reasons of this seems that the garbage is accumulated in the Nala of STP-2 discharge point and many of the sampled households think the STPs are not working fully.

Page (4/6) of the table shows that former land usages of the STP sites are agricultural land, forest, vacant plot, grave yard, salt industry and drying beds of fish. Only few percent of the households are aware that there were some conflicts in removing fisherman illegally occupying the land regarding STP-3 and also in locating STP-2 site over the boundary of grave yard. Some claimed that some graves are still inside STP-2 site.

About 10% of the households think the STPs had changed the social and commercial value of the surround land. The households around STP-1 pointed out the positive value of the current reuse of effluent from STP-1 for park maintenance and agriculture. The households around STP-3 also pointed out a possible increase of land value due to STP-3. However, some households around STP-2 pointed out the decrease of land value due to the influences of the STP including dirty smell in winter.

Although 40% of the households neither understand nor accept the reasons why the STPs was constructed there, only about 10% of the households feel unfairness regarding that their area have the STP.

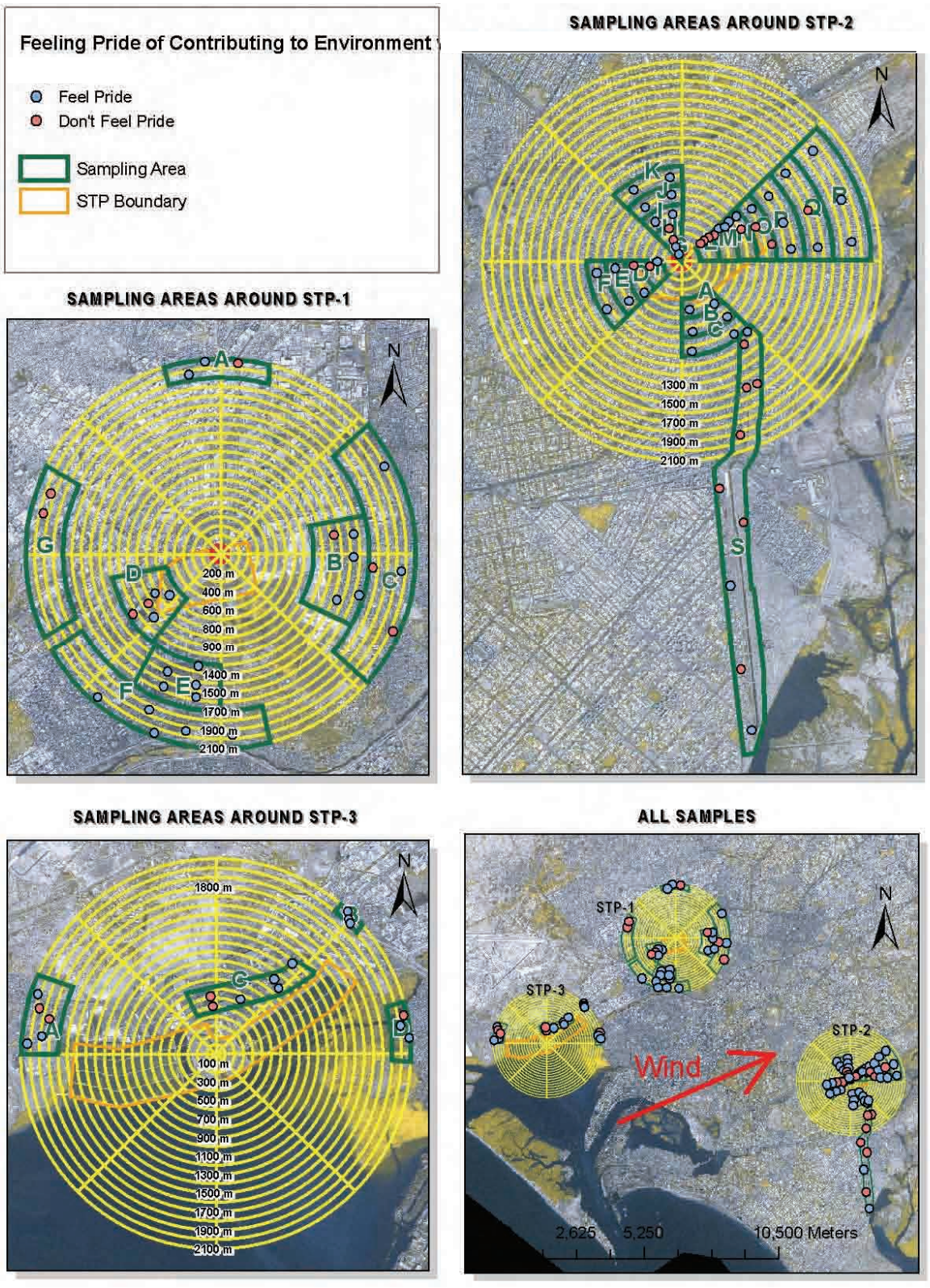


Figure A42.14.1 Feeling Pride of Contributing to the Environment with the STP

(3) Environmental Considerations

Page (5/6) of the table shows that 8% of the sampled households around the STPs have noticed any environmental impact of the STPs. Some of them answered that greenery has been increased in their areas because of the reuse of wastewater. Some of them are also aware that sludge from the STPs is partly used for agriculture.

However, some of them answered that their STPs are causing pollution and mosquito problems. About 20% of the households around the STPs also think the landscape became less beautiful due to the STPs. About half of those households are located close to the STP-2.

35% of the households sampled around STP-2 also think the odour from the STP is a problem. **Figure A42.14.2** shows how serious smell from the STPs is for the households. The concentric multiple circles in the figures show the distance from the smelliest facility of the STP. The households located close to the north boundary of STP-2 are significantly affected by the smell of the STP. In STP-2, some of the facilities causing strong smell are located close to the north boundary of the STP site. However, because the most of the households seriously affected by the smell are within 100m distance from the boundary of the STP, the intensity and travel distance of the smell from the STPs seem to be limited.

For future construction of new STPs, smelly facilities should be located at the far side of adjacent residential areas if its construction close to residential areas is not avoidable. It is also important to adopt wastewater treatment technologies that do not cause strong smell. If possible, new STPs should be constructed at least 100m away from residential areas.

Some of the households around the Nala used as the discharge point of STP-2 are also complaining the smell from STP-2. However, it seems that strong smell is coming from the Nala where garbage is accumulated and effluent from the STP become stagnant. For future construction of new STPs, it is important to consider appropriate measures to maintain the environmental conditions of discharge points. Discharge points can be covered with R.C.C. so that garbage does not fall in.

Many of the households around the STPs think that the STPs are not working properly. Around STP-3, 20% of the households also think that the discharged wastewater from the STP is seriously polluting the receiving water. Therefore, it is quite important to improve operation and maintenance of the existing STPs. Page (6/6) of the table lists the suggestions on sewerage given by the households around STPs

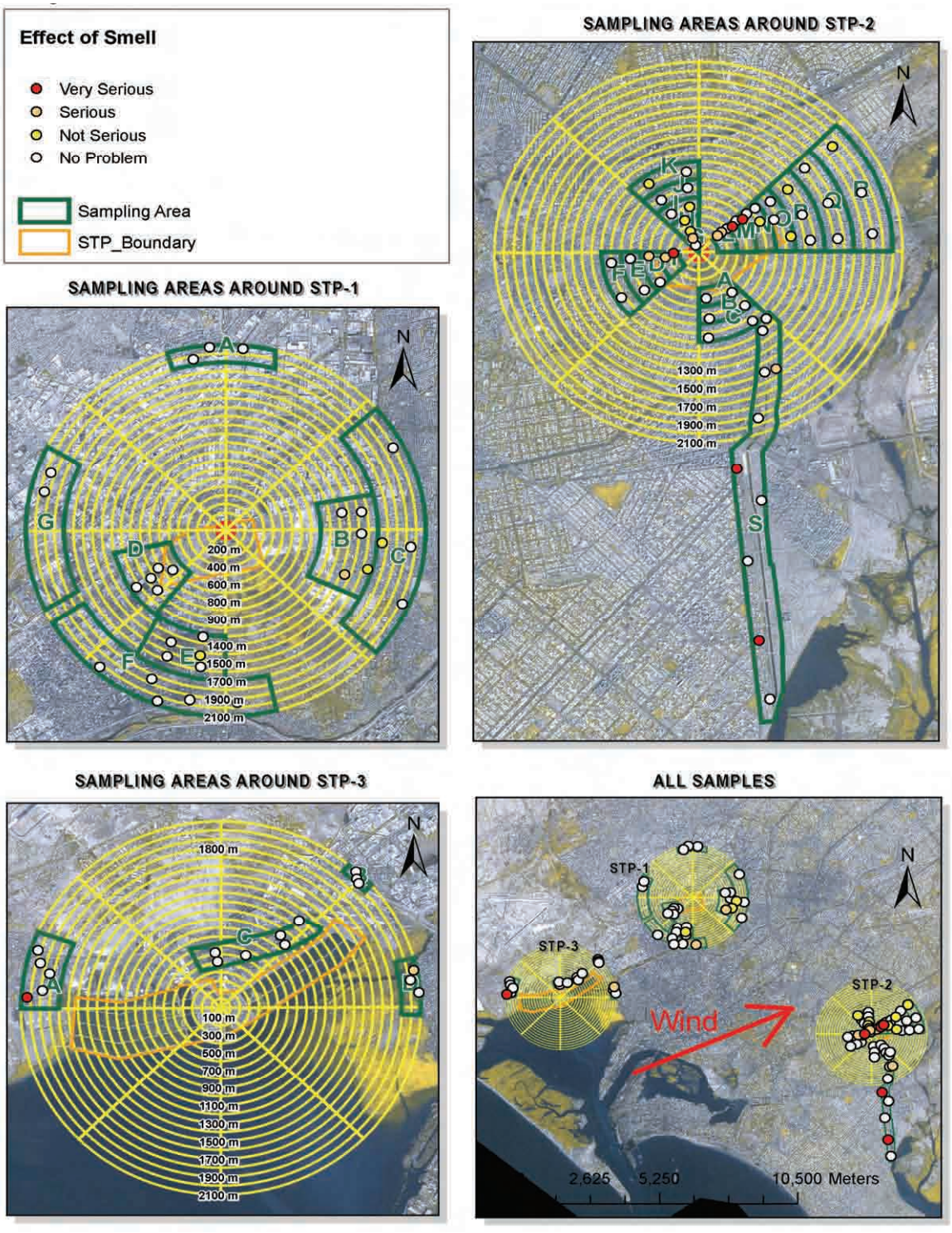


Figure A42.14.2 Influence of the Smell from the STPs

APPENDIX – A42.15

Photo Album from
Nala Awareness Survey

A42.15 Photo Album from Nala Awareness Survey

(1) Encroachment to Nalas








(2) Improved Nalas with Problems (Demolishment, Garbage and Broken Covers)








(3) Other Improved Nalas

APPENDIX – A42.16

Result Tables of Nala Awareness Survey

A42.16 Result Tables of Nala Awareness Survey

Table A42.16.1 Results of Nala Awareness Survey (1/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small & Medium Size Nalas)
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
I. Basic Information								
(4) Household Information	1) Sex of Respondent:	1	Male	90%	94%	83%	89%	91%
		2	Female	10%	6%	17%	11%	9%
			Total	100%	100%	100%	100%	100%
	2) How many years has your family stayed at this place? (six months = 0.5 year)		Years	32	32	28	31	28
	3) Type of Building Material:	1	R.C.C.	34%	44%	37%	39%	48%
		2	Pakka	38%	33%	40%	37%	30%
		3	Semi Pakka	17%	17%	23%	19%	9%
		4	Katcha	10%	6%	0%	5%	13%
			Total	100%	100%	100%	100%	100%
	4) Legal Status of Your Plot	1	Leased	72%	56%	57%	62%	87%
		2	Unleased	28%	44%	43%	38%	13%
			Total	100%	100%	100%	100%	100%
	5) What is the education level of the house head?	1	Illiterate	14%	11%	0%	8%	17%
		2	Literate	10%	6%	13%	10%	4%
		3	Primary	14%	0%	17%	10%	13%
		4	Middle	21%	22%	20%	21%	4%
		5	Metric	24%	22%	23%	23%	17%
		6	Inter	0%	6%	10%	5%	13%
		7	B.A/B.Sc	10%	17%	10%	12%	26%
		8	M.A/M.Sc	7%	17%	7%	10%	4%
		9	Others	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	6) Condition of Close by Street:	1	Katchi	31%	50%	47%	43%	9%
		2	Pakki	69%	50%	53%	57%	91%
			Total	100%	100%	100%	100%	100%
	7) How much is your household's income per month (salaries of all members + pension + investment profit, etc.)?		Rs.	17,760	14,412	12,879	15,017	21,727
II. Perception on Nala								
(1) Construction and Repair of NALA	1) Before this survey did you ever know that KW&SB is in charge of improvement of NALA as well as water supply service?	1	Yes	76%	78%	83%	79%	83%
		2	No	24%	22%	17%	21%	17%
			Total	100%	100%	100%	100%	100%
	2) Do you know when the NALA constructed?	1	Yes	79%	44%	67%	63%	87%
		2	No	21%	56%	33%	37%	13%
			Total	100%	100%	100%	100%	100%
	3) If "1. Yes", when was it constructed?		Years ago	43	40	42	42	20
	4) If"1. Yes", who made this NALA?	1	KW&SB	0%	0%	0%	0%	5%
		2	CDGK(KMC/KDA)	17%	63%	20%	33%	75%
		3	Town Nazim	0%	13%	0%	4%	5%
		4	UC Nazim	0%	0%	0%	0%	0%
		5	SKAA	0%	0%	0%	0%	0%
		6	Sindh Government	0%	0%	15%	5%	5%
		7	OPP	0%	0%	0%	0%	0%
		8	Other NGO	0%	0%	0%	0%	0%
		9	Together with neighbourhood	0%	13%	0%	4%	0%
		10	CBO	0%	0%	0%	0%	0%
		11	World Bank	4%	0%	0%	1%	0%
		12	Built in British Period	9%	0%	0%	3%	0%
		13	Natural	35%	0%	50%	28%	0%
		14	I don't know	35%	13%	15%	21%	10%
			Total	100%	100%	100%	100%	100%
	5) If"1. Yes", how much did you pay for the construction of NALA in total?		Rs.	0	13	0	4	0
	6) Had there any repair work done on the NALA of your locality in the last 10 years?	1	Yes	38%	28%	23%	30%	50%
		2	No	62%	72%	77%	70%	50%
			Total	100%	100%	100%	100%	100%

Table A42.16.1 Results of Nala Awareness Survey (2/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(1) Construction and Repair of NALA	7) If "1. Yes", who did the repair work?	1	KW&SB	9%	0%	0%	3%	0%
		2	CDGK(KMC/KDA)	18%	60%	71%	50%	55%
		3	Town Nazim	9%	0%	0%	3%	9%
		4	UC Nazim	55%	40%	0%	32%	18%
		5	SKAA	0%	0%	0%	0%	9%
		6	Sindh Government	0%	0%	14%	5%	0%
		7	OPP	0%	0%	0%	0%	9%
		8	Other NGO	0%	0%	0%	0%	0%
		9	Together with neighbourhood	0%	0%	0%	0%	0%
		10	CBO	0%	0%	0%	0%	0%
		11	MNA	9%	0%	0%	3%	0%
		12	Liyari Express way authority	0%	0%	14%	5%	0%
			Total	100%	100%	100%	100%	100%
	8) If "1. Yes", how much you paid for the		Rs.	0	0	0	0	0
	9) Had the NALA ever expanded in width?	1	Yes	7%	17%	30%	18%	13%
		2	No	90%	78%	70%	79%	87%
		3	I don't know	3%	6%	0%	3%	0%
			Total	100%	100%	100%	100%	100%
	10) If "1. Yes", had the houses demolished due to the expansion of NALA?	1	Yes	100%	33%	80%	71%	67%
		2	No	0%	67%	20%	29%	33%
			Total	100%	100%	100%	100%	100%
	11) If "1. Yes", how many household demolished?		Houses	225	20	43,803	14,683	800
	12) Had the NALA ever deepened?	1	Yes	15%	0%	18%	11%	0%
		2	No	78%	89%	82%	83%	100%
		3	I don't know	7%	11%	0%	6%	0%
			Total	100%	100%	100%	100%	100%
	13) Do you think the anal should not be used for sewage disposal but only for rain water drainage to improve natural environment?	1	Only for rain water drainage	79%	67%	66%	70%	78%
		2	Only for sewage disposal	14%	11%	3%	9%	9%
		3	For both	7%	22%	31%	20%	13%
		4	I don't know	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	14) Which option do you think is better?	1	Constructing new secondary sewer under the main streets of your community to dispose waste water from your community without using Nala	90%	67%	86%	81%	78%
		2	Converting existing Nala of your community into deepened and widened Pakka Nala for sewerage waste water disposal	7%	28%	14%	16%	13%
		3	I don't know	3%	6%	0%	3%	9%
			Total	100%	100%	100%	100%	100%
	15) Have you ever received any notice regarding this NALA?	1	Yes	14%	0%	20%	11%	4%
		2	No	86%	100%	80%	89%	96%
			Total	100%	100%	100%	100%	100%
	16) If"1.Yes", which organization issued the notice?	1	KW&SB	0%	N/A	0%	0%	0%
		2	CDGK(KMC/KDA)	67%	N/A	86%	76%	100%
		3	Town Nazim	33%	N/A	0%	17%	0%
		4	UC Nazim	0%	N/A	0%	0%	0%
		5	SKAA	0%	N/A	0%	0%	0%
		6	OPP	0%	N/A	0%	0%	0%
		7	Other NGO	0%	N/A	0%	0%	0%
		8	CBO	0%	N/A	0%	0%	0%
		9	Others	0%	N/A	0%	0%	0%
		10	I don't know	0%	N/A	14%	7%	0%
			Total	0%	0%	14%	7%	0%
	17) If"1. Yes" what kind of notice you get?	1	Demolishment of the	100%	N/A	33%	67%	100%
		2	Eviction	0%	N/A	50%	25%	0%
		3	Construction of road along the river	0%	N/A	17%	8%	0%
			Total	0%	0%	67%	33%	0%

Table A42.16.1 Results of Nala Awareness Survey (3/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(1) Construction and Repair of NALA	18) Have you ever attended any seminar regarding the construction/re-construction of NALA?	1	Yes	0%	0%	3%	1%	0%
		2	No	100%	100%	97%	99%	100%
			Total	100%	100%	100%	100%	100%
	19) If "1. Yes", who organized the seminar?	1	KW&SB	N/A	N/A	0%	0%	N/A
		2	CDGK (KMC/KDA)	N/A	N/A	100%	100%	N/A
		3	Town Nazim	N/A	N/A	0%	0%	N/A
		4	UC Nazim	N/A	N/A	0%	0%	N/A
		5	SKAA	N/A	N/A	0%	0%	N/A
		6	OPP	N/A	N/A	0%	0%	N/A
		7	Other NGO	N/A	N/A	0%	0%	N/A
		8	CBO	N/A	N/A	0%	0%	N/A
		9	Others	N/A	N/A	0%	0%	N/A
		10	I don't know	N/A	N/A	0%	0%	N/A
			Total	0%	0%	100%	100%	0%
(2) Complains	1) Had there any conflict due to this NALA?	1	Yes	14%	17%	17%	16%	17%
		2	No	86%	83%	83%	84%	83%
			Total	100%	100%	100%	100%	100%
	If "1. Yes", please specify the conflict	1	Overflow onto the street	50%	0%	0%	17%	0%
		2	Some people wanting to construct anal in the centre of street	0%	0%	0%	0%	0%
		3	Some people wanting to remove water lines passing over Nala	25%	0%	0%	8%	0%
		4	Garbage dumping into	25%	33%	0%	19%	0%
		5	Protest against CDGK, Police, etc mainly because of demolishment of encroachment	0%	67%	100%	56%	100%
			Total	100%	100%	100%	100%	100%
	2) Are you satisfied with the present condition of the NALA ?	1	Fully satisfied	0%	6%	7%	4%	9%
		2	Partially satisfied	38%	35%	47%	40%	43%
		3	Not satisfied	62%	59%	47%	56%	48%
		4	I don't know	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	3) Do you have any complain about the present condition of the NALA?	1	Yes	97%	94%	73%	88%	91%
		2	No	3%	6%	27%	12%	9%
			Total	100%	100%	100%	100%	100%
	4) If "1. Yes", is each of the following problems your complain? (% of complaining each type of problem)		[1] Often get blocked/choked	71%	41%	18%	44%	71%
			[2] Cause Flooding	71%	59%	41%	57%	43%
			[3] Pollute environment	96%	88%	86%	90%	90%
			[4] Danger of accident	75%	71%	95%	80%	52%
			[5] Bad smell	89%	82%	73%	81%	81%
			[6] Mosquitoes/flies	89%	94%	100%	94%	95%
			[7] Others (encroachment, no proper bridge, spreading	14%	6%	0%	7%	5%
	5) Which organization do you expect to coordinate the improvement of NALA in your community?	1	KW&SB	4%	13%	7%	8%	5%
		2	CDGK(KMC/KDA)	39%	38%	34%	37%	33%
		3	Town Nazim	11%	0%	14%	8%	19%
		4	UC Nazim	14%	25%	3%	14%	19%
		5	SKAA	0%	0%	0%	0%	0%
		6	Sindh Government	4%	0%	34%	13%	0%
		7	OPP	0%	0%	3%	1%	0%
		8	Other NGO	0%	0%	0%	0%	0%
		9	Together with neighbourhood	4%	0%	0%	1%	0%
		10	CBO	4%	0%	0%	1%	0%
		11	International Agency like JICA	18%	19%	3%	13%	19%
		12	Political Party	0%	0%	0%	0%	5%
		13	I don't know	4%	6%	0%	3%	0%
			Total	100%	100%	100%	100%	100%

Table A42.16.1 Results of Nala Awareness Survey (4/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(2) Complains	6) Which organization should provide the funding to improve this NALA?	1	KW&SB	4%	12%	4%	6%	5%
		2	CDGK(KMC/KDA)	30%	35%	43%	36%	38%
		3	Town Nazim	7%	6%	7%	7%	19%
		4	UC Nazim	7%	6%	0%	4%	14%
		5	SKAA	0%	0%	0%	0%	0%
		6	Sindh Government	7%	0%	21%	10%	0%
		7	OPP	0%	0%	0%	0%	0%
		8	Other NGO	0%	0%	11%	4%	0%
		9	Together with neighbourhood	4%	6%	0%	3%	0%
		10	CBO	0%	0%	7%	2%	0%
		11	International Agency like	19%	18%	4%	13%	19%
		12	Political Party	0%	0%	0%	0%	5%
		13	Private Contractor	4%	6%	0%	3%	0%
		14	I don't know	19%	12%	4%	11%	0%
			Total	100%	100%	100%	100%	100%
(3) Structure of Nala	1) What is the width of the NALA in average?		Feet	6	30	1911	649	15
	2) Should the width be increased?	1	Yes	34%	28%	13%	25%	30%
		2	No	66%	72%	87%	75%	70%
			Total	100%	100%	100%	100%	100%
	3) What is the depth of the NALA?		Feet	6	9	15	10	7
	4) Should the depth be increased?	1	Yes	45%	44%	20%	36%	39%
		2	No	55%	56%	80%	64%	61%
			Total	100%	100%	100%	100%	100%
	5) What is the structure of the NALA?							
	[1] 1. Pakka or 2. Katcha ?	1	Pakka	34%	39%	17%	30%	96%
		2	Katcha	66%	61%	83%	70%	4%
			Total	100%	100%	100%	100%	100%
	<1> If "2. Katcha", should it be pakka?	1	Yes	95%	71%	100%	89%	50%
		2	No	5%	29%	0%	11%	50%
			Total	100%	100%	100%	100%	100%
	[2] 1. Fenced or 2. Not fenced ?	1	Fenced	7%	11%	0%	6%	17%
		2	Not fenced	93%	89%	100%	94%	83%
			Total	100%	100%	100%	100%	100%
	<1> If "2. Not fenced", should it be fenced?	1	Yes	79%	76%	72%	76%	65%
		2	No	21%	24%	28%	24%	35%
			Total	100%	100%	100%	100%	100%
	[3] 1. Covered or 2. Uncovered ?	1	Covered	15%	11%	0%	9%	61%
		2	Uncovered	85%	89%	100%	91%	39%
			Total	100%	100%	100%	100%	100%
	<1> If "1. Covered", are there dangerous gaps between cover-structures which require repair?	1	Yes	64%	100%	0%	55%	85%
		2	No	36%	0%	100%	45%	15%
			Total	100%	100%	100%	100%	100%
	<2> If "2. Uncovered", should it be covered properly?	1	Yes	61%	56%	21%	46%	64%
		2	No	39%	44%	79%	54%	36%
			Total	100%	100%	100%	100%	100%
	[4] 1. With Wall or 2. Without Wall ?	1	With Wall	31%	33%	10%	25%	86%
		2	Without Wall	69%	67%	90%	75%	14%
			Total	100%	100%	100%	100%	100%
	<1> If "2. Without Wall", should there be a Wall?	1	Yes	83%	93%	86%	87%	75%
		2	No	17%	7%	14%	13%	25%
			Total	100%	100%	100%	100%	100%
	[5] 1. With Embankment or 2. Without Embankment ?	1	With Embankment	21%	28%	57%	35%	39%
		2	Without Embankment	79%	72%	43%	65%	61%
			Total	100%	100%	100%	100%	100%
	<1> If "2. Without Embankment", should it be With Embankment?	1	Yes	63%	100%	67%	76%	53%
		2	No	38%	0%	33%	24%	47%
			Total	100%	100%	100%	100%	100%
	[6] 1. With Plantation or 2. Without Plantation ?	1	With Plantation	14%	0%	38%	17%	30%
		2	Without Plantation	86%	100%	62%	83%	70%
			Total	100%	100%	100%	100%	100%
	<1> If "2. Without Plantation", should it be With Plantation for better environment?	1	Yes	89%	100%	82%	90%	89%
		2	No	11%	0%	18%	10%	11%
			Total	100%	100%	100%	100%	100%
	6) Do you think the government should cover the Nasal in Karachi with strong structure to widen streets and roads as much as required ?	1	Yes	100%	100%	100%	100%	100%
		2	No	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	7) How much you are willing to pay for the improvement of structure of the NALA into properly covered Pakka NALA?		Rs.	5,445	807	185	2,146	2,400

Table A42.16.1 Results of Nala Awareness Survey (5/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(4) Blockage and Encroachment	1) Is the NALA blocked or narrowed?	1	Yes	76%	56%	28%	53%	57%
		2	No	24%	44%	72%	47%	43%
		Total		100%	100%	100%	100%	100%
	2) If "1 Yes", What was the main reason?	1	Garbage	64%	70%	50%	61%	79%
		2	Industrial Solid Waste	5%	0%	30%	12%	7%
		3	Construction of Encroachment	14%	20%	20%	18%	7%
		4	I don't know	18%	0%	0%	6%	0%
		Total		100%	90%	100%	97%	93%
	3) Is there any encroachment over the NALA?	1	Yes	64%	61%	53%	60%	52%
		2	No	36%	39%	47%	40%	48%
		Total		100%	100%	100%	100%	100%
	4) If "1 Yes", what is the type of Encroachment?	1	House	37%	45%	63%	48%	42%
		2	Shop	21%	9%	0%	10%	0%
		3	Both House & Shop	42%	45%	31%	40%	58%
		4	Garbage Dump	0%	0%	0%	0%	0%
		5	Other	0%	0%	6%	2%	0%
		Total		100%	100%	100%	100%	100%
	5) If "1" or "3"(HOUSE), what is the price of each house?	Rs.		310,000	355,000	720,000	461,667	427,273
	6) If "1" or "3"(HOUSE), what is the Rent of each house?	Rs.		1,900	2,460	4,400	2,920	2,100
	7) If "2" or "3"(SHOP), what is the cost of each shop?	Rs.		121,364	155,000	187,500	154,621	705,714
	8) If "2" or "3"(SHOP), what is the rent of each shop?	Rs.		878	1,733	2,333	1,648	960
	9) Who is leading the build-up of this type of encroachment the most in Karachi?	1	Land Mafia	27%	20%	35%	27%	50%
		2	Builders	0%	0%	0%	0%	0%
		3	Individual Households	67%	50%	29%	49%	33%
		4	Government Agency	7%	30%	35%	24%	17%
		Total		100%	100%	100%	100%	100%
	10) How many years ago the Encroachments was	Ave.	(years ago)	24	28	25	26	15
	11) Where does the Encroachment mainly exist?	1	Over the Nala	5%	6%	5%	5%	9%
		2	Along the Nala	95%	94%	90%	93%	91%
		3	Within the Nala	0%	0%	5%	2%	0%
		Total		100%	100%	100%	100%	100%
	12) If "1. Over the NALA", does it disrupt the flow of Nala during rainy season?	1	Yes	82%	86%	80%	83%	82%
		2	No	18%	14%	20%	17%	18%
		Total		100%	100%	100%	100%	100%
	13) If"2. Along the NALA", how much has the width of the NALA being reduced in percentage?	%		27	35	45	36	35
	14) "If 3. With in the NALA", how much has the length of the NALA being reduced in percentage?	%		14	20	0	11	N/A
	15) Have you ever heard of receiving any notice from the Government against encroachment in your area?	1	Yes	16%	6%	34%	19%	32%
		2	No	84%	94%	66%	81%	68%
		Total		100%	100%	100%	100%	100%
	16) If "1. Yes", when did you heard about	Years ago		0.5	N/A	3.1	1.8	3.4
	17) Was there any action taken against encroachments?	1	Yes	0%	25%	57%	27%	50%
		2	No	100%	75%	43%	73%	50%
		Total		100%	100%	100%	100%	100%
	18) If"1 Yes", Which organization did take the action?	1	KW&SB	N/A	0%	0%	0%	0%
		2	CDGK(KMC/KDA)	N/A	67%	38%	52%	100%
		3	Town Nazim	N/A	33%	0%	17%	0%
		4	UC Nazim	N/A	0%	0%	0%	0%
		5	SKAA	N/A	0%	0%	0%	0%
		6	Sindh Government	N/A	0%	0%	0%	0%
		7	OPP	N/A	0%	0%	0%	0%
		8	Other NGO	N/A	0%	0%	0%	0%
		9	Together with neighbourhood	N/A	0%	38%	19%	0%
		10	CBO	N/A	0%	0%	0%	0%
		11	Liyari Express Way Authority	N/A	0%	25%	13%	0%
		12	I don't know	N/A	0%	0%	0%	0%
		Total		0%	100%	100%	100%	100%
	19) If"1 Yes", What was the action?	1	Demolishment of Encroachments	N/A	100%	83%	92%	67%
		2	Notice against Encroachments	N/A	0%	0%	0%	17%
		3	Protest against Government	N/A	0%	17%	8%	17%
		Total		0%	100%	100%	100%	100%

Table A42.16.1 Results of Nala Awareness Survey (6/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed
				Small Nala	Medium	Large Nala	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(4) Blockage and Encroachment	20) Do you think the encroachment should be stopped for the improvement of living environment?	1	Yes	97%	94%	97%	96%	100%
		2	No	3%	6%	3%	4%	0%
			Total	100%	100%	100%	100%	100%
	21) Which organization do you think should take action to prevent encroachment on NALAS?	1	KW&SB	10%	12%	0%	7%	17%
		2	CDGK(KMC/KDA)	62%	65%	43%	57%	57%
		3	Town Nazim	0%	12%	7%	6%	13%
		4	UC Nazim	10%	6%	3%	7%	4%
		5	SKAA	0%	0%	0%	0%	0%
		6	Sindh Government	7%	6%	37%	16%	4%
		7	OPP	0%	0%	3%	1%	0%
		8	Other NGO	0%	0%	3%	1%	0%
		9	Together with neighbourhood	0%	0%	0%	0%	0%
		10	CBO	0%	0%	0%	0%	0%
		11	International Agency like JICA	10%	0%	3%	5%	4%
		12	I don't know	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	22) Should the government take more action against the encroachment with fair penalty?	1	Yes	90%	100%	90%	93%	96%
		2	No	10%	0%	10%	7%	4%
			Total	100%	100%	100%	100%	100%
	23) Do you think government should provide alternative plots and compensation when demolishing encroachment?	1	Yes	83%	83%	67%	78%	78%
		2	No	17%	17%	33%	22%	22%
			Total	100%	100%	100%	100%	100%
	24) Before how many months do you think the government should notice the demolishment of encroachment to the encroachers for the improvement of NALA?		month before	3	4	4	4	4
	25) If waste water from lane sewer is diverted into new secondary sewer or trunk sewer so that your anal is used only for rain water drainage, do you think encroachment will escalate due to its reduced water flow on the NALA?	1	Yes	66%	72%	57%	65%	83%
		2	No	34%	28%	43%	35%	17%
			Total	100%	100%	100%	100%	100%
(5) Improper Cleaning	1) Had the NALA ever cleaned up?	1	Yes	66%	39%	17%	40%	43%
		2	No	34%	61%	83%	60%	57%
			Total	100%	100%	100%	100%	100%
	2) If"1 Yes" Who cleaned up the NALA?	1	KW&SB	0%	0%	0%	0%	20%
		2	CDGK(KMC/KDA)	11%	80%	75%	55%	20%
		3	Town Nazim	16%	0%	0%	5%	30%
		4	UC Nazim	68%	20%	0%	29%	30%
		5	SKAA	0%	0%	0%	0%	0%
		6	Sindh Government	0%	0%	0%	0%	0%
		7	OPP	0%	0%	0%	0%	0%
		8	Other NGO	0%	0%	0%	0%	0%
		9	Together with neighbourhood	5%	0%	0%	2%	0%
		10	CBO	0%	0%	0%	0%	0%
		11	Other	0%	0%	0%	0%	0%
		12	I don't know	0%	0%	25%	8%	0%
			Total	100%	100%	100%	100%	100%
	3) If "1.Yes", what was the method used?	1	By Hand	17%	0%	25%	14%	40%
		2	By Machine	83%	100%	75%	86%	60%
			Total	100%	100%	100%	100%	100%
	4) If "2. No", What was the main reason of not being cleaned up?	1	Government did not pay attention	88%	91%	78%	86%	100%
		2	Individual encroachers opposed the action	0%	9%	4%	4%	0%
		3	Local people apposed the action	0%	0%	0%	0%	0%
		4	Lack of system to clean up Nala in community	0%	0%	17%	6%	0%
		5	Corruption	13%	0%	0%	4%	0%
			Total	100%	100%	100%	100%	100%
	5) Is the NALA periodically cleaned up?	1	Periodically (or almost periodically)	0%	11%	0%	4%	9%
		2	Not periodically	7%	11%	10%	9%	26%
		3	Only in Emergency	69%	11%	17%	32%	22%
		4	Never cleaned up	24%	56%	73%	51%	39%
		5	I don't know	0%	11%	0%	4%	4%
			Total	100%	100%	100%	100%	100%
	6) If ever cleaned up, how many times the NALA cleaned up in the last 10 years?		Times	3.1	1.2	2.9	2.4	7.8

Table A42.16.1 Results of Nala Awareness Survey (7/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala	Medium Nala	Large Nala (& Nadi)	Average	
				<= 10 feet in width	11-40 feet in width	>= 40 feet in width		<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
(6) Flood	1) Does the NALA overflows in rainy season?	1	Yes	93%	83%	73%	83%	83%
		2	No	7%	17%	27%	17%	17%
			Total	100%	100%	100%	100%	100%
	2) In Rainy season does water enter into your house?	1	Yes	41%	39%	30%	37%	52%
		2	No	59%	61%	70%	63%	48%
			Total	100%	100%	100%	100%	100%
	3) If "1. Yes", how much do you estimate the damage due to the flood at your current dwelling in total in last 10 years?		Rs.	62,364	10,000	19,250	30,538	36,458
	5) If "2. No", does your household take any measure to prevent flooding into your house ?	1	Yes	62%	27%	39%	43%	44%
		2	No	38%	73%	61%	57%	56%
			Total	100%	100%	100%	100%	100%
	6) If "1. Yes", specify your measure?	1	Make the house at height	85%	67%	88%	80%	100%
		2	Make Slope in front of the door	8%	33%	0%	14%	0%
		3	Complain to UC/Town office	8%	0%	13%	7%	0%
			Total	100%	100%	100%	100%	100%
	7) If "1. Yes", what did you to save your dwelling from this flooded condition?	1	Complain to KW&SB	0%	0%	0%	0%	20%
		2	Complain to CDGK	14%	0%	22%	12%	30%
		3	Complain to Town	29%	0%	56%	28%	20%
		4	Complain to UC Nazim	57%	75%	22%	51%	30%
		5	Ask NGO for help	0%	0%	0%	0%	0%
		6	Maintain with the cooperation of neighbourhood	0%	0%	0%	0%	0%
		7	Other	0%	25%	0%	8%	0%
			Total	100%	100%	100%	100%	100%
	9) If "1. Yes", how expensive was the cost of recovery of your household?	1	Very High	44%	50%	36%	43%	60%
		2	High	6%	0%	21%	9%	10%
		3	Moderate	50%	25%	43%	39%	30%
		4	Low	0%	0%	0%	0%	0%
		5	Very High	0%	25%	0%	8%	0%
		6	I don't know	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	10) In which months the NALA gets flooded?		Starting Month	7	7	7	7	7
			Ending Month	8	8	8	8	8
(7) Pollution and Accidents	1) How seriously the NALA of your locality is polluted?	1	Very serious	55%	39%	33%	42%	48%
		2	Serious	7%	17%	27%	17%	13%
		3	Not serious but polluted	34%	39%	40%	38%	39%
		4	Not polluted at all	3%	0%	0%	1%	0%
		5	I don't know	0%	6%	0%	2%	0%
			Total	100%	100%	100%	100%	100%
	2) If "1" to "3" (polluted) then what is the main reason?	1	Domestic Wastewater	43%	35%	36%	38%	55%
		2	Garbage	57%	59%	25%	47%	45%
		3	Commercial/Industrial wastewater/solid waste	0%	6%	39%	15%	0%
		4	I don't know	0%	0%	0%	0%	0%
			Total	100%	100%	100%	100%	100%
	4) Does the NALA pollute the drinking water of your household?	1	Yes	86%	78%	60%	75%	83%
		2	No	14%	22%	40%	25%	17%
			Total	100%	100%	100%	100%	100%
	5) Have you ever noticed any unhygienic effect of NALA on your household?	1	Yes	86%	61%	60%	69%	78%
		2	No	14%	39%	40%	31%	22%
			Total	100%	100%	100%	100%	100%
	6) Have you ever noticed any unhygienic effect of NALA on your neighbourhood?	1	Yes	86%	61%	60%	69%	74%
		2	No	14%	39%	40%	31%	26%
			Total	100%	100%	100%	100%	100%
	7) To improve water quality of the Nala, how much are you willing to pay for improvement of waste water disposal system (so that your household waste water would not discharge into the NALA)?		Rs.	2,334	947	64	1,115	1,068

Table A42.16.1 Results of Nala Awareness Survey (8/8)

Category	Question	Selection of Answer/Unit of Average Value		Different-Size Nalas				Prominent Developed Nala (Small
				Small Nala <= 10 feet in width	Medium Nala 11-40 feet in width	Large Nala (& Nadi) >= 40 feet in width	Average	<= 40 feet in width
				29 samples	18 samples	30 samples		24 samples
	8) Have you ever noticed any accidents regarding NALA in your locality?	1	Yes	45%	33%	43%	40%	43%
		2	No	55%	67%	57%	60%	57%
		Total		100%	100%	100%	100%	100%
	9) If "1 Yes" please specify the accidents.	1	People/children fall in	83%	67%	89%	80%	100%
		2	Cleaning machine brakes the house	8%	0%	0%	3%	0%
		3	Broken electric wire dipped in Nala cause electric shock	8%	33%	11%	18%	0%
		Total		100%	100%	100%	100%	100%
(8) Large Nala	1) Do you support the construction of TRUNK SEWER along main NALAS in Karachi?	1	Yes	100%	100%	97%	99%	100%
		2	No	0%	0%	3%	1%	0%
		Total		100%	100%	100%	100%	100%
	2) Once the water quality of main nasal is improved, do you expect the Government to build river front amenity (including park, field, tourism) along the anal for the people ,so they could enjoy the improved environment?	1	Yes	100%	100%	100%	100%	96%
		2	No	0%	0%	0%	0%	4%
		Total		100%	100%	100%	100%	100%
	3) Should the government take strict action (like heavy penalty) against encroachment on the "river front area"?	1	Yes	100%	100%	97%	99%	96%
		2	No	0%	0%	3%	1%	4%
		Total		100%	100%	100%	100%	100%
(9) Suggestion	1) Do you have any suggestion for the improvement of NALA system?	1	Yes	97%	89%	90%	92%	87%
		2	No	3%	11%	10%	8%	13%
		Total		100%	100%	100%	100%	100%
	2) If "1. Yes", Which type of anal is your suggestion mainly related to ?	1	Small Nala	7%	0%	0%	2%	0%
		2	Large Nala & Nadi	11%	25%	19%	18%	30%
		3	Both Type of Nalas	82%	75%	81%	80%	70%
		Total		100%	100%	100%	100%	100%
	3) If "1. Yes", please specify your suggestion.	(Only the aspects not being covered enough by the questions)		Nala should be cleaned before monsoon/at least yearly.				
				Industrial wastewater should be treated before its discharge to Nalas.				
				Nala should be free from bad smell.				

APPENDIX – A42.17

Complete Discussion on the Results of Nala Awareness Survey

A42.17 Complete Discussion on the Results of Nala Awareness Survey

(1) Households along Nalas

Page (1/8) of **Table A42.16.1** shows that many of the sampled households belong to low and lower income groups including Katchi Abadis. Some of the sampled households along small Nalas belong to Upper Middle Income Group, which increased the average income level of the small Nala household samples. The average income of prominent developed Nala household samples is also higher than other categories because some upper middle and high income households are sampled in North Nazimabard as prominent developed Nala household samples.

(2) Construction and Repair of Nalas

According to the survey, about 80% of the sampled households are aware that KW&SB is in charge of improving Nalas as well as water supply services. Most of their Nalas, except for naturally formulated ones, have been constructed by CDGK. However, there have been some involvements of Town Offices and neighbourhoods in the construction of medium Nalas, while Sindh Government has been involved in the development of large Nalas.

About 30% of the Nalas in Karachi had some repair work done in the last 10 years. Smaller Nalas have higher frequency of repair work. Page (2/8) of the table shows that small and medium Nalas have been repaired mainly by CDGK and UCs. UCs are more involved in the repair of small Nalas. Many of large Nalas and Nadi have been repaired by CDGK while some of them have been repaired by Sindh Government. About 20% of the Nalas in Karachi has been expanded in width usually demolishing the encroaching households along Nalas. The number of demolished households is quite high especially in the expansion of large Nalas or Nadis. About 10% of Nalas have ever been deepened in Karachi.

(3) Use of Nalas for Waste Water Disposal

The most of Nalas in Karachi do not have any rainwater flow most of the time because rain season lasts for only about one month in Karachi. However, unexpectedly, about 70% of the respondents selected that Nalas should not be used for sewage disposal but only for rainwater drainage to improve natural environment. About 80% of the respondents also selected that constructing new secondary sewers under the main streets of their community to dispose sewage from the community without using Nalas over that covering existing Nalas of their community into deepened and widened Pakka Nalas for sewage disposal.

(4) Complains and Expected Responsible Organizations

About 10% of the households living around Nalas in Karachi have ever received any notice regarding their Nalas, mainly from CDGK but also from Town Nazim. Most of the notices are related to the demolishment of encroached houses and required eviction for the development of Nalas. Page (3/8) of the table shows that about 15% of the households living around Nalas have ever experienced conflicts mainly with CDGK and Police due to their demolishment of encroachment. Garbage dumping into Nalas, overflow onto streets, and water lines passing over polluted Nalas have also caused conflicts.

About 90% and 60% of the households living around Nalas have complains about the present conditions of their Nalas and are not satisfied at all, respectively. Most of the households complain of pollution, danger, bad smell, and breeding of mosquitoes and flies in Nalas. About half of the households complain of blockage and overflow.

About 40% of the households around Nalas expect CDGK to coordinate and fund the improvement of Nalas in their community. KW&SB, Town Nazim, UC Nazim, Sindh Government and international agencies were also expected by some parts of the households to take these responsibilities. However, the households are not expecting UC as a funding body.

(5) Current Structures of Nalas and Preferences on Them

Page (4/8) of **Table A42.16.1** shows that about 30% and 45% of the households both around small and medium Nalas think that their Nala should be widened and deepened respectively. More than 69% of the small and medium Nalas are Katcha Nalas. Most of the households think that those Nalas should be Pakka.

About 10% of small and medium Nalas are fenced in Karachi. The percentage of the small and medium Nalas that have covers are also about 10%. Majority of the coverage over Nalas have dangerous gaps into which children may fall. Installation of fence along the Nalas is more preferred than coverage. Moreover, about 30% of small and medium Nalas have walls along them, and most of the remaining Nalas are also expected to have wall structure. Plantation is not common along small and medium Nalas, however most of the household prefer to have plantation along them.

The average WtPs for the improvement of Nalas into properly covered Pakka Nalas to widen streets and roads are about Rs. 5,000, Rs 800 and only Rs 200 in small, medium and large Nalas, respectively. Small and medium Nalas are already part of existing sewer network in Karachi. Therefore, these WtPs for the improvement of small and medium Nalas can be considered as part of their total WtP for sewerage development in Karachi.

(6) Blockage and Encroachment

Blockage of Nalas by garbage and encroachers is a serious problem in Karachi. Page (5/8) of the table shows that 76% of small Nalas and 56% of medium Nalas are blocked or narrowed. Around 60% and 20% of the main reasons of the blockage and narrowed flow are respectively garbage and encroachment. About 60% of the Nalas in Karachi have encroachment of houses and shops along them. Average price of those houses and shops are Rs. 460,000 and Rs. 150,000, respectively. About the half of the households around Nalas think those encroachment have been lead by individual households while about a quarter of them think land mafia is responsible. Another quarter of them think government agencies are responsible in the build-up of encroachment.

The average age of those encroachments is about 25 years old. Most of them have been built up along Nalas but few percents of them are constructed over Nalas using bridge structure, most of which disrupt the flow of Nala during the rain season. Because of encroachment, the width of small Nalas has been reduced by about 30%, and the width of medium Nalas by 35% and the width of large Nalas by 45%.

Page (6/8) of the table shows that most of the households living around Nalas think mainly CDGK and Sindh Government should take actions to stop those encroachments for the improvement of living environment by charging fair penalty and demolishing encroachment (with about 4 month advance notice). About 80% of the households think the government should provide alternative plots and compensation when demolishing encroachments.

(7) Improper Cleaning

Only 66% of small Nalas, 39% of medium Nalas and 17% of large Nalas have ever cleaned up. Those Nalas were cleaned up few times on average in the last 10 years. However, majority of these clean up was done only in emergency. Small Nalas are mainly cleaned up by UCs, while medium and large Nalas are mainly cleaned up by CDGK (KMC/KDA). Most of those clean up have been conducted by using machinery.

Most of the households think that remaining Nalas have not been cleaned up because government have not paid enough attention to them.

(8) Flood

Page (7/8) of **Table A42.16.1** shows that about 80% of Nalas overflows in rainy season (July to August) and the water enters into 35% of the households around Nalas. Flooding is more serious around small Nalas. 62% of the households around small Nalas take some measure to preventing flood into their houses (mainly by making houses at height).

The damage due to flood have cost households more than Rs. 60,000 in total per household in the last 10 years, which is expensive considering their average monthly household income is less than Rs 18,000 on average. Many of those damaged households have complained to UCs, Town Offices or CDGK.

(9) Pollution and Accidents

55% of the households around small Nalas answered their Nalas are significantly polluted. This ratio is higher than 39% for medium Nalas and 33% for large Nalas. About 60% and 40% of the households both around small and medium Nalas answered respectively that garbage and domestic wastewater is main cause of the pollution. On the other hand, about 40% of the households around large Nalas think that commercial and industrial wastewater/solid waste is the main reason of the pollution of their large Nalas.

86% of the households around small Nalas think that their Nalas pollute drinking water. Around small Nalas, average WtP for the water quality improvement of their Nalas is more than Rs. 2,000, which is much higher than those of medium and large Nalas.

Page (8/8) of the table shows that about 40% of the households around Nalas have ever noticed any accidents regarding their Nalas. Majority of the accidents are the falls of people and children into Nalas.

(10) Large Nalas and Nadis

In the survey, almost all the sampled households answered that they support the construction of trunk sewers along large Nalas/Nadis in Karachi. They also support the ideas of building river front amenity once the water quality of those Nalas/Nadis improves and of taking strict action against encroachment on the riverfront.

CHAPTER 6

APPENDIX – A61.1

Population and Demand Projection

A61.1 Population and Demand Projection

(1) City Population

1) Population in 2005

CDGK conducted population censuses in 1961, 1972, 1981 and 1998. The Karachi Strategic Development Plan 2020 (hereinafter referred to as the "KSDP-2020") which was issued on 15th August 2007 as the final report shows town-wise population of Karachi City in year of 2005 as shown in **Table A61.1.1** based on past trends in population growth. Per annum population growth rate of 4.2 % has been adopted from 1998 to 2005 for estimating the total population in 2005. **Figure A61.1.1** shows past population trends from 1961 to 2005.

Table A61.1.1 City Population in 2005

No.	Town	Area *		Population in 2005 *	Population Density	
		(acre)	(km^2)		/acre	/km^2
1	Keamari	106,217	429.8	583,640	5.5	1,358
2	SITE	6,286	25.4	709,944	112.9	27,908
3	Baldia	7,217	29.2	616,722	85.5	21,116
4	Orangi	5,803	23.5	1,098,859	189.4	46,792
5	Lyari	1,977	8.0	923,176	467.0	115,388
6	Saddar	5,967	24.1	935,566	156.8	38,744
7	Jamshed	5,790	23.4	1,114,235	192.4	47,553
8	Gulshan-e-Iqbal	13,260	53.7	949,351	71.6	17,692
9	Shah Faisal	2,901	11.7	509,915	175.8	43,434
10	Landhi	9,670	39.1	1,012,391	104.7	25,870
11	Korangi	10,247	41.5	829,813	81.0	20,011
12	North Nazimabad	4,127	16.7	753,423	182.6	45,111
13	New Karachi	5,058	20.5	1,038,865	205.4	50,753
14	Gulberg	3,417	13.8	688,580	201.5	49,796
15	Liaquatabad	2,685	10.9	985,581	367.1	90,705
16	Malir	4,395	17.8	604,763	137.6	34,002
17	Bin Qasim	137,961	558.3	480,854	3.5	861
18	Gadap	355,798	1,439.9	439,674	1.2	305
sub-total		688,776	2,787.4	14,275,352	20.7	5,121
19	Cantonment	31,336	126.8	464,882	14.8	3,666
20	Defence	9,454	38.3	379,596	40.2	9,922
sub-total		40,790	165.1	844,478	20.7	5,116
Total		729,566	2,952.4	15,119,830	20.7	5,121

*: Karachi Strategic Development Plan 2020 (August 2007)

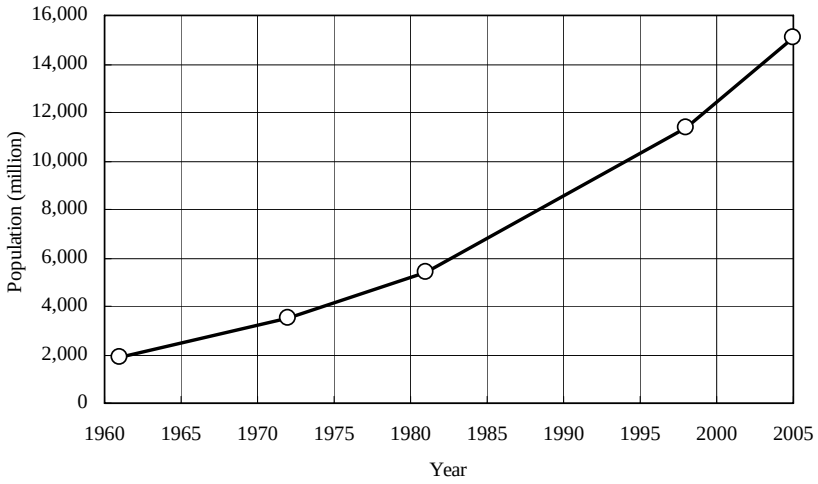


Figure A61.1.1 Past Population from 1961 to 2005

2) Population Projection estimated by KSDP-2020

KSDP-2020 has projected the population in Karachi as shown in **Table A61.1.2** and **Figure A61.1.2**.

Table A61.1.2 Future Population estimated by KSDP-2020 (August 2007)

Scenario	1998	2005	2010	2015	2020
Population (000s)	11,335	15,120	18,529	22,594	27,550
AAGR* in following years	4.20%	4.15%	4.05%	4.05%	-

source: KSDP-2020 (August 2007)
*: Average Annual Growth Rate

However, the estimates have been done only up to the year 2020. Meanwhile, previous versions of KSDP-2020 estimated the future population until the year 2030 as shown in **Table A61.1.3** and **Figure A61.1.1**.

Table A61.1.3 Future Population estimated by Previous Version of KSDP-2020

Scenario	1998	2005	2010	2015	2020	2025	2030
Population (000s)	10,660	15,120	18,930	23,130	27,550	32,010	37,190
AAGR* in following years	5.0%	4.5%	4.0%	3.5%	3.0%	3.0%	-

source: KSDP-2020 (Interim Report, July 2006 and CV-03, January 2007))
*: Average Annual Growth Rate, Exponential growth model was used for the estimates of future population.

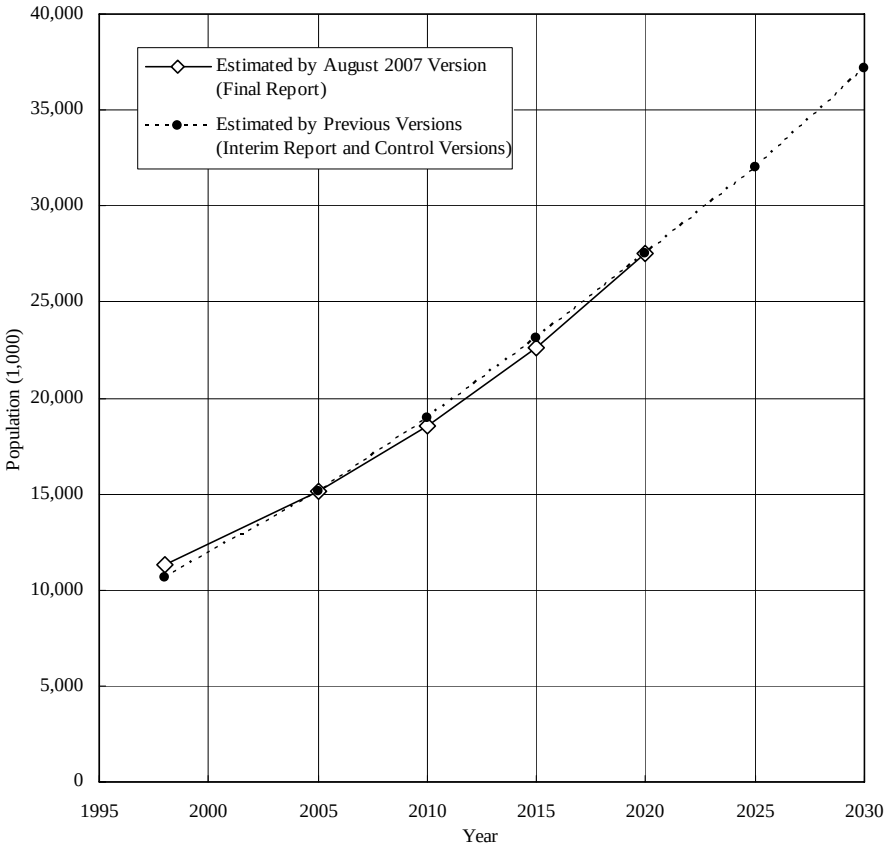


Figure A61.1.2 Future Population estimated by KSDP-2020

3) Population Projection of the Year 2025

The JICA Study is formulating a master plan for water supply and sewerage system for the target year of 2025. Therefore, for the JICA Study, the population projection until the year 2025 is indispensable. As described above, because KSDP-2020 forecasted population of Karachi only until the year 2020, it is necessary to estimate population in 2025 additionally. Although the previous versions of KSDP-2020 included the population projection until the year 2030, it is not useful. This is because a trend of population growth from 1998 to 2020 of the final version of KSDP-2020 is different from the previous versions as shown in **Figure A61.1.1**.

For estimating the population in 2025, the following three alternatives have been considered.

Alternative 1

Population of the year 2025 is estimated by using the same average annual growth rate (AAGR) as that of 4.05 % from 2015 to 2020.

Alternative 2

Population of the year 2025 is estimated by using the same increment as that of 991,000 per annum from 2015 to 2020.

Alternative 3

Population of the year 2025 is estimated by using the average annual growth rate (AAGR) of 3.05% from 2020 to 2025 which decreases from that of 4.05% from 2015 to 2020 by 1%.

The results of the population projection are shown in **Tables A61.1.4** to **A61.1.6** and **Figure A61.1.3**.

Table A61.1.4 Alternative 1: same AAGR as that from 2015 to 2020

Year	1998	2005	2010	2015	2020	2025
Population (000s)	11,335	15,120	18,529	22,594	27,550	33,599
AAGR in following years	4.20%	4.15%	4.05%	4.05%	**4.05%**	-
Increment per annum	541	682	813	991	1,210	-

Table A61.1.5 Alternative 2: same increment per year as that from 2015 to 2020

Year	1998	2005	2010	2015	2020	2025
Population (000s)	11,335	15,120	18,529	22,594	27,550	32,506
AAGR in following years	4.20%	4.15%	4.05%	4.05%	3.36%	-
Increment per annum	541	682	813	991	**991**	-

Table A61.1.6 Alternative 3: AAGR decreases by 1% from that from 2015 to 2020

Year	1998	2005	2010	2015	2020	2025
Population (000s)	11,335	15,120	18,529	22,594	27,550	32,016
AAGR in following years	4.20%	4.15%	4.05%	4.05%	**3.05%**	-
Increment per annum	541	682	813	991	893	-

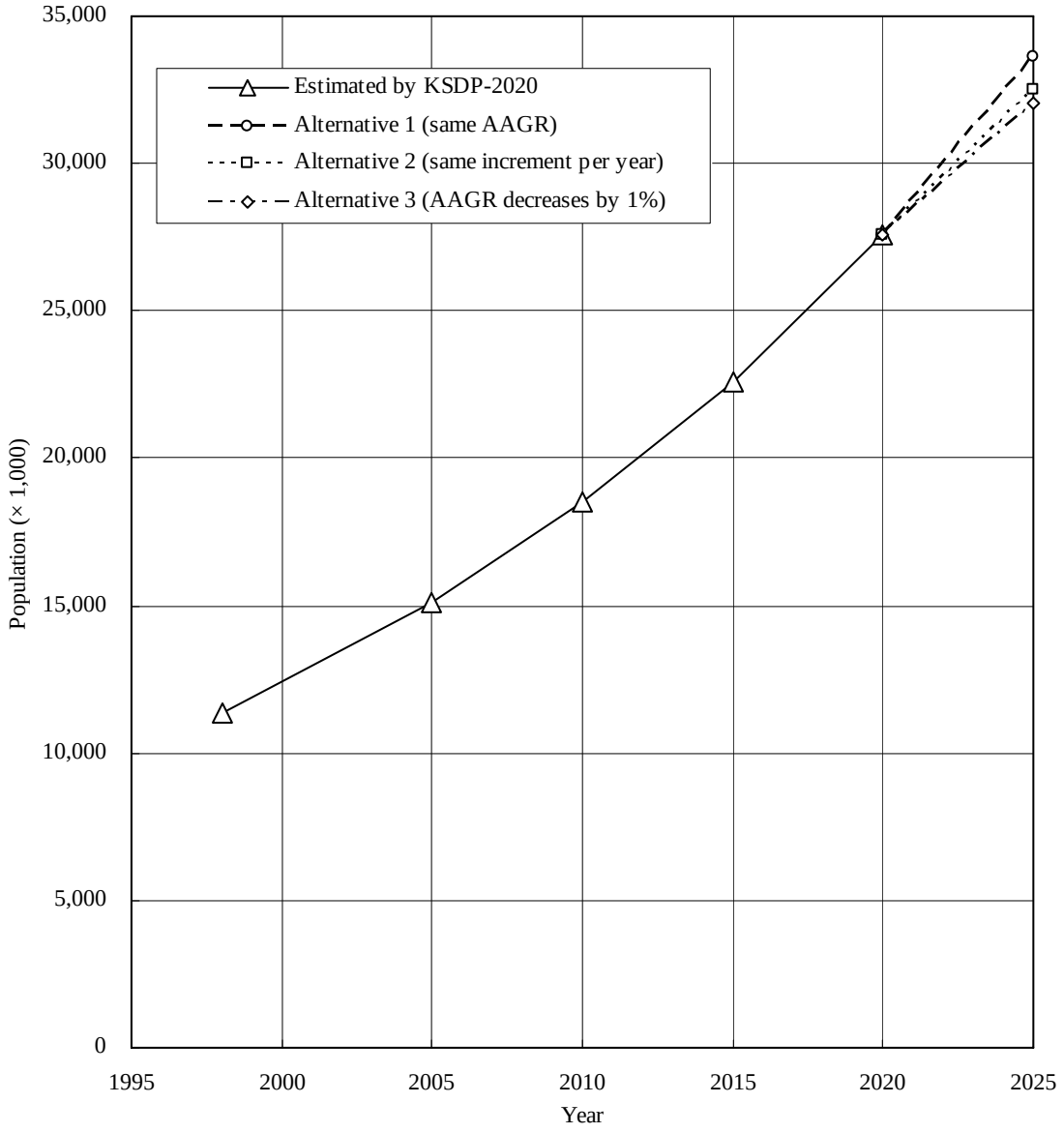


Figure A61.1.3 Comparison of Three Alternatives

As seen in **Figure A61.1.3**, the alternative 2 is seemed to be the best population growth trend after the year 2020. For the population projection KSDP-2020 explains as follows;

"Although the natural annual population growth rate is now probably close to 3.5 percent, it is assumed the current conflict in Afghanistan has pushed more refugees to Karachi, raising the total population growth rate to 4.2 percent, resulting in a Y2005 population of 15.12 million. The trend is continuing 2007, and perhaps subsequent years, but is assumed to decline slowly over the future."

After the 2020 the AAGR is expected to decrease from 4.05 %. Therefore the alternative 2 is the best alternative then the population until the year 2025 is estimated as shown in **Table A61.1.7** and **Figure A61.1.4**.

Table A61.1.7 Population in Karachi from 1961 to 2025

Year	1961	1972	1981	1998	2005	2010	2015	2020	2025
Population (000s)	1,913	3,499	5,395	11,335	15,120	18,529	22,594	27,550	32,506
AAGR*	5.64%	4.93%	4.46%	4.20%	4.15%	4.05%	4.05%	3.36%	-
Increment/year	144	211	349	541	682	813	991	991	-

source: 1) 1961, 1972 and 1981: Karachi Development Plan 2000, June 1991
2) 1998 to 2020: KSDP-2020 (August 2007)
*: Average Annual Growth Rate

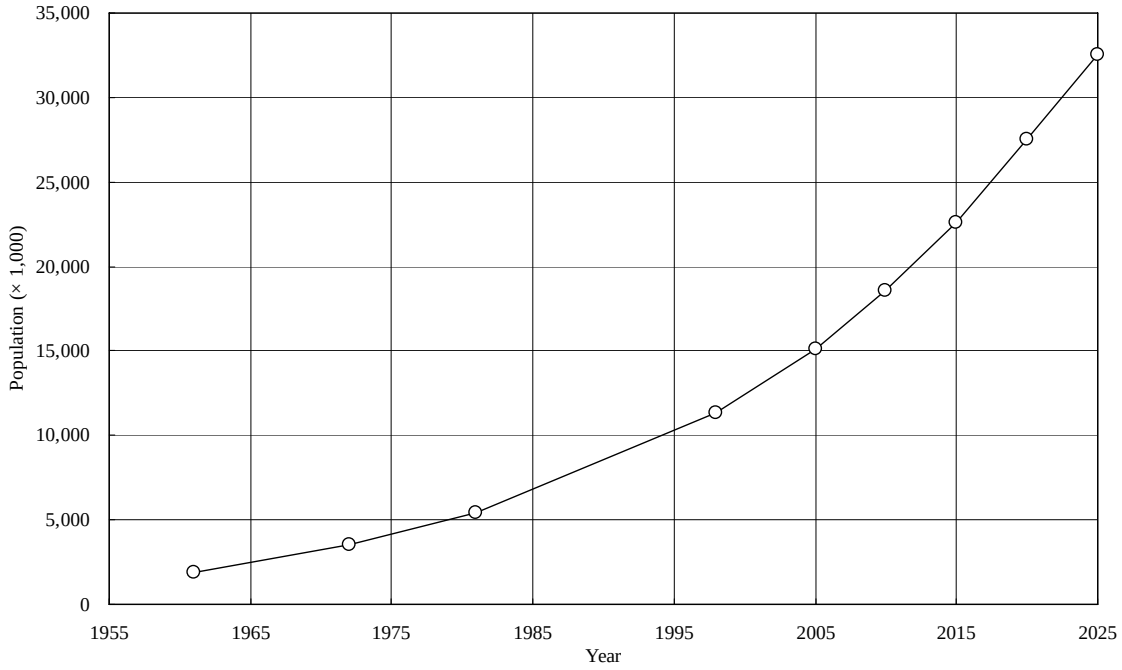


Figure A61.1.4 Population in Karachi from 1961 to 2025

(2) Town-wise Population

KSDP-2020 has also projected the future town-wise population in 2020 as shown in **Table A61.1.8** in consideration of spatial growth strategies such as densification, infill and expansion.

Table A61.1.8 Town-wise Population Projection in 2020

S. No.	Town Name	2005			Projected Increase in Population for 2020				Total Projections for 2020		
		Population	Area (Ac)	Density	Densifica-tion	Densifica-tion + Infill	Infill + Expansion	Status Quo	Population	Density	% increase
1	Keamari	583,640	106,217	5	-	-	1,340,272	-	1,923,912	18	230
2	SITE	709,944	6,286	113	184,585	-	-	-	894,529	142	26
3	Baldia	616,722	7,217	85	-	-	493,378	-	1,110,100	154	80
4	Orangi	1,098,859	5,803	189	-	-	330,066	-	1,428,925	246	30
5	Lyari	923,176	1,977	467	-	-	-	46,159	969,335	490	5
6	Saddar	935,566	5,967	157	187,113	-	-	-	1,122,679	188	20
7	Jamshed	1,114,235	5,790	192	445,694	-	-	-	1,559,929	269	40
8	Gulshan-e-Iqbal	949,351	13,260	72	-	1,424,027	-	-	2,373,378	179	150
9	Shah Faisal	509,915	2,901	176	101,983	-	-	-	611,898	211	20
10	Landhi	1,012,391	9,670	105	-	809,913	-	-	1,822,304	188	80
11	Korangi	829,813	10,247	81	-	995,776	-	-	1,825,589	178	120
12	North Nazimabad	753,423	4,127	183	226,027	-	-	-	979,450	237	30
13	New Karachi	1,038,865	5,058	205	-	207,773	-	-	1,246,638	246	20
14	Gulberg	688,580	3,417	202	206,574	-	-	-	895,154	262	30
15	Liaquatabad	985,581	2,685	367	-	-	-	49,279	1,034,860	385	5
16	Malir	604,763	4,395	138	-	-	302,382	-	907,145	206	50
17	Bin Qasim	480,854	137,961	3	-	-	1,672,699	-	2,153,553	16	348
18	Gadap	439,674	355,798	1	-	-	2,638,044	-	3,077,718	9	600
	sub-total	14,275,352	688,776	21	1,351,976	3,437,489	6,776,841	95,438	25,937,096	38	82
19	Cantonment	464,882	31,336	15	-	464,882	-	-	929,761	30	100
20	Defence	379,596	9,454	40	-	303,677	-	-	683,273	72	80
	sub-total	844,478	40,790	21	0	768,559	0	0	1,613,034	40	91
	Total	15,119,830	729,566	21	1,351,976	4,206,048	6,776,841	95,438	27,550,130	38	82

source: KSDP - 2020 (August 2007)

As shown in **Table A61.1.8**, population of Karachi City will increase about 12.43 million for 15 years from 2005 to 2020. The population to be increased in fringe 3 towns of Keamari, Gadap and Bin Qasim is 5.65 million of them and remaining population of 6.78 million will be increased in a central area including other 15 towns, cantonments and DHA, which is shown in **Figure A61.1.5**.

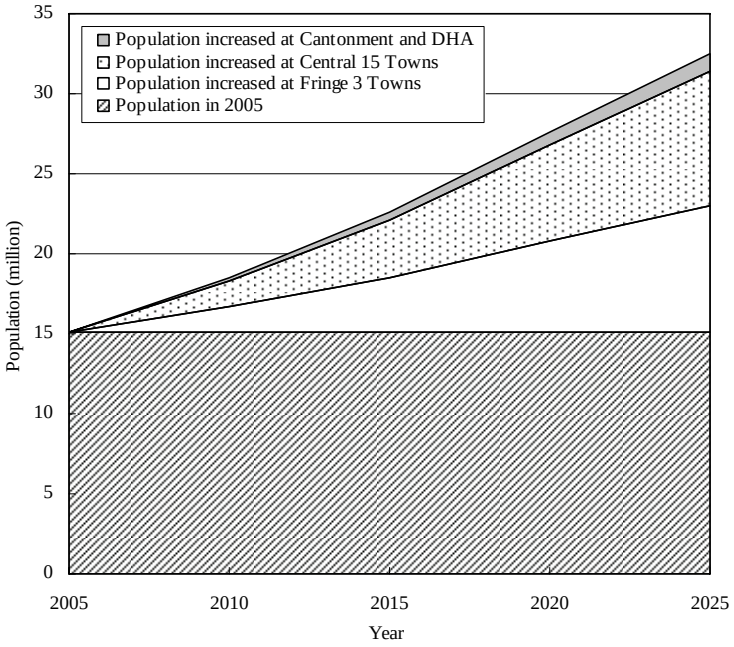


Figure A61.1.5 Population Increase at Each Area

KSDP - 2020 has considered spatial growth strategies that are densification, infill, expansion and status-quo. The population in the fringe 3 towns will be increased mainly by the expansion through developments of on-going and new large housing schemes. **Table A61.1.9** shows a status of on-going large housing schemes. These housing schemes can accommodate the population to be increased in the fringe 3 towns.

Table A61.1.9 Status of On-going Large Housing Schemes

SR. No.	Neme of Scheme	Year of Notification	Current Occupancy Status	Location
1	Scheme No.25-A (Shah Latif)	1980	5 %	Bin Qasim
2	Scheme No.33	1971	20 %	Gulshan-e-Iqubal, Gadap, Cant.
3	Scheme No.42 (Hawk's Bay)	1983	5 %	Keamari
4	Scheme No.43 (Halkani)	1986	0 %	Gadap
5	Scheme No.45 (Taisar)	1986	5 %	Gadap
6	New Malir Project - 1	1996	0 %	Bin Qasim

source: KSDP - 2020 (August 2007)

The population in the central area will be increased by the densification and infill. However, Lyari and Liaquatabad Towns which is already high population density are not expected to increase those populations.

The future town-wise population is shown in **Table A61.1.10**. It is noted that although KSDP - 2020 does not include town-wise population in 2010, 2015 and 2025, town-wise population in those years are estimated by JICA Study considering town- wise population increase trend from 2005 to 2020.

Table A61.1.10 Town-wise Population

No.	Town	Area*		Population				
		(acre)	(km^2)	2005*	2010	2015	2020*	2,025
1	Keamari	106,217	429.8	583,640	951,187	1,389,516	1,923,912	2,458,308
2	SITE	6,286	25.4	709,944	760,563	820,931	894,529	968,127
3	Baldia	7,217	29.2	616,722	752,023	913,379	1,110,100	1,306,821
4	Orangi	5,803	23.5	1,098,859	1,189,374	1,297,320	1,428,925	1,560,530
5	Lyari	1,977	8.0	923,176	935,834	950,930	969,335	987,740
6	Saddar	5,967	24.1	935,566	986,879	1,048,073	1,122,679	1,197,285
7	Jamshed	5,790	23.4	1,114,235	1,236,459	1,382,221	1,559,929	1,737,637
8	Gulshan-e-Iqbal	13,260	53.7	949,351	1,339,866	1,805,587	2,373,378	2,941,169
9	Shah Faisal	2,901	11.7	509,915	537,882	571,235	611,898	652,561
10	Landhi	9,670	39.1	1,012,391	1,234,496	1,499,374	1,822,304	2,145,234
11	Korangi	10,247	41.5	829,813	1,102,888	1,428,551	1,825,589	2,222,627
12	North Nazimabad	4,127	16.7	753,423	815,407	889,328	979,450	1,069,572
13	New Karachi	5,058	20.5	1,038,865	1,095,843	1,163,794	1,246,638	1,329,482
14	Gulberg	3,417	13.8	688,580	745,229	812,788	895,154	977,520
15	Liaquatabad	2,685	10.9	985,581	999,095	1,015,211	1,034,860	1,054,509
16	Malir	4,395	17.8	604,763	687,686	786,579	907,145	1,027,711
17	Bin Qasim	137,961	558.3	480,854	939,563	1,486,611	2,153,553	2,820,495
18	Gadap	355,798	1,439.9	439,674	1,163,113	2,025,871	3,077,718	4,129,565
sub-total		688,776	2,787.4	14,275,352	17,473,387	21,287,301	25,937,096	30,586,891
19	Cantonment	31,336	126.8	464,882	592,367	744,403	929,761	1,115,119
20	Defence	9,454	38.3	379,596	462,874	562,190	683,273	804,356
sub-total		40,790	165.1	844,478	1,055,241	1,306,594	1,613,034	1,919,474
Total		729,566	2,952.4	15,119,830	18,528,629	22,593,894	27,550,130	32,506,366

*: KSDP - 2020 (August 2007)

(3) Background of the finalization of KSDP-2020

CDGK issued a series of report for formulation of KSDP-2020 as listed in **Table A61.1.11**.

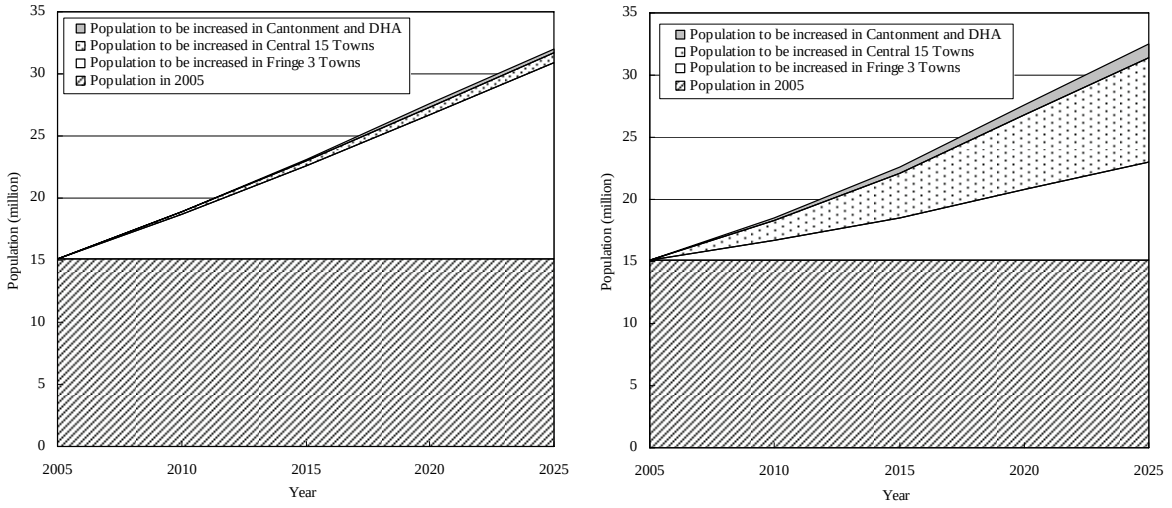
Table A61.1.11 Series of Report of KSDP-2020

No.	Title of the Report	issued on	Remarks
1	Interim Report, Strategic Spatial Plan for Karachi - 2020	July 2006	
2	CV-01 Draft Development Plan, Karachi Master Plan 2020	-	
3	CV-02 Draft Development Plan, Karachi Master Plan 2020	December 2006	used for Progress Report II
4	CV-03 Draft Development Plan, Karachi Master Plan 2020	January 2007	used for Interim Report
5	Draft Final, Karachi Master Plan – 2020 (Karachi Strategic Development Plan 2020)	April 2007	
6	Final Report, Karachi Strategic Development Plan 2020	August 2007	used for Draft Final Report and Final Report

In each report the CDGK projected future population in Karachi. There are some differences in the future population projections between the reports until CV-03 (January 2007) and after Draft Final (April 2007). The difference of total population from 1998 to 2020 has been already mentioned above (see **Figure A61.1.2**). In addition there is a significant difference in town-wise population projections where population projections in some areas have changed more significantly than others as shown in **Table A61.1.12** and **Figure A61.1.6**.

Table A61.1.12 Area-wise Population Increase Pattern

	a. Projection of CV-03 Draft Development Plan				b. Projection of Final Report			
	Population in 2005 (million)	Population in 2025 (million)	Population to be incresed (million)	Percentage of increased Population	Population in 2005 (million)	Population in 2025 (million)	Population to be incresed (million)	Percentage of increased Population
Fringe 3 Towns of Keamari, Gadap and Bin Qasim	1.504	17.317	15.813	93.6%	1.504	9.408	7.904	45.5%
Central 15 Towns	12.771	13.538	0.767	4.5%	12.771	21.179	8.407	48.4%
Cantonment and DHA	0.844	1.153	0.308	1.8%	0.844	1.919	1.075	6.2%
TOTAL	15.120	32.009	16.889	100.0%	15.120	32.506	17.387	100.0%



a. Projection of CV-03 | b. Projection of the Final Report

Figure A61.1.6 Area-wise Population Increase Pattern from 2005 to 2025

(4) Water Demand

1) Basis of the Future Water Demand Forecast

a. Service Ratio

The socio-economic survey conducted in KSDP - 2020 has indicated that the piped water supply ratio in Karachi is 89%. For reference, our survey which was conducted mainly at Katchi Abadis during basic study period in 2006 showed that the service ratio (water line connection rates) was estimated at about 82%. Based on these results, JICA study has adopted 90% as the current average service ratio in Karachi in 2005. This means that 90 % of population in Karachi use KW&SB water through pipelines or by tankers and the remaining 10% of population may depend mainly on groundwater. On the other hand, KSDP – 2020 says that about 60 % of the households are connected to the supply network at present. Considering the average groundwater withdrawal of about 30 mgd (Feasibility Study to explore Groundwater Sources in Karachi District, KW&SB, 2004), however, only 5 % to 10 % of population can access to groundwater other than KW&SB water. Because there is no alternative bulk source except KW&SB water and groundwater, as a result, about 90 % of population is using KW&SB water. Water of about 17 mgd is supplied by tankers from 10 bowser filling station according to KW&SB data in 2004.

The service ratio is assumed to increase gradually from the current service ratio of 90% to 100% by 2015 as shown in **Table A61.1.13**. KSDP-2020 also proposed a plan to make service ratio 100% by 2015. The 100% service ratio means that all the households in Karachi connect to the piped water supply system and as such receive treated water from the system.

Table A61.1.13 Future Service Ratio

Year	2005	2010	2015	2020	2025
Service Ratio	90.0%	95.0%	100%	100%	100%

b. Water Losses (UFW) Reduction

In the absence of flow measurements at the exits of service reservoirs and filtration plants as well as at the customers' service connections, it is impossible to accurately establish the UFW in the existing water distribution system. As mentioned previously, the current UFW in the transmission and distribution system from filtration plants to customers is seemed to be 20% to 35% of water supply capacity. It is assumed that through the implementation of the Distribution Network Improvements (DNI) which will be to replace all the exiting distribution network mains with new PE pipes during the next 20 years, UFW will be reduced to 15 % by 2025 as shown in **Table A61.1.14**.

Table A61.1.14 Expected Future Water Loss (UFW) Ratio

Year	2005	2010	2015	2020	2025
Technical Loss (UFW)	35.0%	33.0%	28.5%	21.5%	15.0%

c. Non-Domestic Water Consumption

Although there is not enough quantitative data, according to the data on revenue collection and bulk water supply customers provided by the Financial Department of KW&SB, domestic water consumption accounts for about 60% of the total water consumption in Karachi. At present, therefore, non-domestic water consumption is assumed to be 40 % of the total water consumption. In future, however, this proportion is expected to decrease gradually to about 35% in 2025 as a result of water conservation efforts such as recycling and reuse of wastewater and introduction of desalination system exercised by large industrial and commercial consumers. From 2008 a desalination plant with a capacity of 3 mgd at DHA area will be operated for supplying water to Clifton Cantonment and DHA area.

d. Proposed Domestic Per Capita Water Consumption

As mentioned above, at present bulk water of 40 gpcd is supplied to the customers in Karachi. JICA study assumed that 40 gpcd is also adopted for bulk water demand for the year 2025. Although the bulk water demand of 40 gpcd in 2025 is the same as the present demand, domestic per capita water consumption will increase because of the reduction of technical losses and water-saving efforts of non-domestic consumers. In other words, unless the technical losses decrease and the non-domestic consumption is conserved, the domestic per capita water consumption in 2025 will be the same as that in 2005. The future technical losses (UFW), the proportion of domestic water consumption and bulk water losses in 2025 are set at 15%, 65% and 10% respectively as discussed previously. Taking these ratios into consideration, the domestic per capita water consumption in 2025 is calculated at 20.1 gallons or 91.6 litres as illustrated in **Figure A61.1.7**.

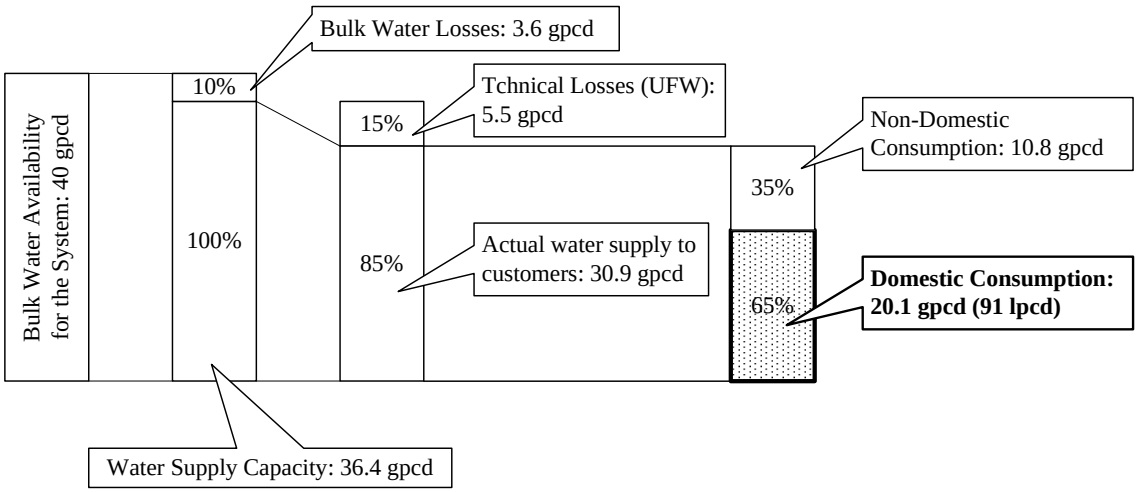


Figure A61.1.7 Per Capita Domestic Water Consumption in 2025

2) Future Water Demand of Karachi City

Based on the assumptions above mentioned, the future water demand is calculated as shown in **Table A61.1.15** and **Figure A61.1.8**.

Table A61.1.15 Future Water Demand

		unit	2005	2010	2015	2020	2025
a	Population	× million	15.120	18.529	22.594	27.550	32.506
b	Per Capita Bulk Water Demand	gpcd	40.0	40.0	40.0	40.0	40.0
c	Bulk Water Demand: a × b	mgd	604.8	741.1	903.8	1,102.0	1,300.3
d	Bulk Water Loss	%	10.0%	10.0%	10.0%	10.0%	10.0%
e	Water Demand: c / (1+d)	mgd	549.8	673.8	821.6	1,001.8	1,182.0
f	Water Loss (UFW)	%	35.0%	33.0%	28.5%	21.5%	15.0%
g	Total Supply to Customers: e × (1-f)	mgd	357.4	451.4	587.4	786.4	1,004.7
h	Ratio of Domestic Consumption	%	60.0%	60.4%	61.7%	63.2%	65.2%
i	Domestic Consumption: g × h	mgd	214.4	272.6	362.3	497.3	655.3
j	Non-domestic Consumption: g × (1-h)	mgd	143.0	178.8	225.1	289.1	349.5
k	Service Ratio	%	90.0%	95.0%	100%	100%	100%
l	Served Population: a × k	× million	13.608	17.602	22.594	27.550	32.506
m	Per Capita Consumption: i / l	lpcd	71.6	70.4	72.9	82.1	91.6

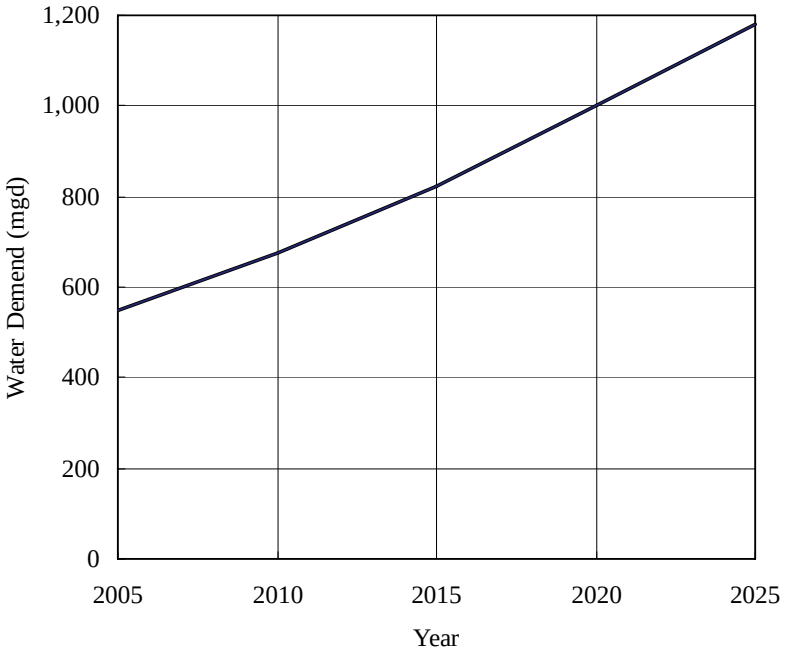


Figure A61.1.8 Future Water Demand

3) Future Water Demand of Each Town

Future Water Demand of each town, cantonment and DHA from 2006 to 2025 is summarised in **Table A61.1.16** and detailed in **Tables A61.1.17** to **A61.1.26**.

Table A61.1.16 Future Water Demand of Each Town

No.	Town	Area		Total Water Demand (mgd)				
		(acre)	(km2)	2005	2010	2015	2020	2025
1	Keamari	106,217	429.8	12.33	24.75	40.99	56.98	73.31
2	SITE	6,286	25.4	32.56	34.18	35.88	38.33	40.79
3	Baldia	7,217	29.2	10.58	17.15	24.54	30.01	35.63
4	Orangi	5,803	23.5	24.96	27.45	30.33	34.02	37.91
5	Lyari	1,977	8.0	22.41	22.61	22.90	23.70	24.59
6	Saddar	5,967	24.1	69.99	70.51	71.15	73.94	76.71
7	Jamshed	5,790	23.4	28.81	35.46	42.57	48.77	55.27
8	Gulshan-e-Iqbal	13,260	53.7	41.88	57.32	75.00	98.36	121.99
9	Shah Faisal	2,901	11.7	22.33	23.20	24.12	25.50	26.93
10	Landhi	9,670	39.1	32.03	37.30	43.49	52.86	62.40
11	Korangi	10,247	41.5	28.79	36.01	44.19	56.20	68.30
12	North Nazimabad	4,127	16.7	24.32	25.95	28.03	31.44	35.03
13	New Karachi	5,058	20.5	24.55	25.83	27.39	29.86	32.47
14	Gulberg	3,417	13.8	21.24	23.05	25.22	28.26	31.48
15	Liaquatabad	2,685	10.9	30.22	29.54	29.20	30.31	31.51
16	Malir	4,395	17.8	38.10	39.94	42.20	47.13	51.84
17	Bin Qasim	137,961	558.3	31.19	58.33	87.67	122.58	155.34
18	Gadap	355,798	1,439.9	10.42	33.33	64.79	97.72	130.58
	sub-total	688,776	2,787.4	506.71	621.93	759.67	925.94	1,092.09
19	Cantonment	31,336	126.8	21.60	26.81	32.55	39.64	46.48
20	Defence	9,454	38.3	21.50	25.03	29.37	36.24	43.48
	sub-total	40,790	165.1	43.10	51.84	61.92	75.88	89.96
	Total	729,567	2,952.5	549.81	673.77	821.60	1,001.82	1,182.05

Table A61.1.17 Town-wise Population from 2005 to 2025

No.	Town	Population																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	583,640	657,149	730,659	804,168	877,677	951,187	1,038,853	1,126,518	1,214,184	1,301,850	1,389,516	1,496,395	1,603,274	1,710,154	1,817,033	1,923,912	2,030,791	2,137,670	2,244,550	2,351,429	2,458,308
2	SITE	709,944	720,068	730,192	740,316	750,439	760,563	772,637	784,710	796,784	808,857	820,931	835,651	850,370	865,090	879,809	894,529	909,249	923,968	938,688	953,407	968,127
3	Baldia	616,722	643,782	670,842	697,902	724,962	752,023	784,294	816,565	848,837	881,108	913,379	952,723	992,068	1,031,412	1,070,756	1,110,100	1,149,444	1,188,788	1,228,132	1,267,477	1,306,821
4	Orangi	1,098,859	1,116,962	1,135,065	1,153,168	1,171,271	1,189,374	1,210,963	1,232,553	1,254,142	1,275,731	1,297,320	1,323,641	1,349,962	1,376,283	1,402,604	1,428,925	1,455,246	1,481,567	1,507,888	1,534,209	1,560,530
5	Lyari	923,176	925,708	928,239	930,771	933,303	935,834	938,854	941,873	944,892	947,911	950,930	954,611	958,292	961,973	965,654	969,335	973,016	976,697	980,378	984,059	987,740
6	Saddar	935,566	945,829	956,091	966,354	976,616	986,879	999,117	1,011,356	1,023,595	1,035,834	1,048,073	1,062,994	1,077,915	1,092,837	1,107,758	1,122,679	1,137,600	1,152,521	1,167,443	1,182,364	1,197,285
7	Jamshed	1,114,235	1,138,680	1,163,125	1,187,569	1,212,014	1,236,459	1,265,611	1,294,764	1,323,916	1,353,069	1,382,221	1,417,763	1,453,304	1,488,846	1,524,387	1,559,929	1,595,471	1,631,012	1,666,554	1,702,095	1,737,637
8	Gulshan-e-Iqbal	949,351	1,027,454	1,105,557	1,183,660	1,261,763	1,339,866	1,433,010	1,526,155	1,619,299	1,712,443	1,805,587	1,919,145	2,032,703	2,146,262	2,259,820	2,373,378	2,486,936	2,600,494	2,714,053	2,827,611	2,941,169
9	Shah Faisal	509,915	515,508	521,102	526,695	532,289	537,882	544,553	551,223	557,894	564,565	571,235	579,368	587,500	595,633	603,765	611,898	620,031	628,163	636,296	644,428	652,561
10	Landhi	1,012,391	1,056,812	1,101,233	1,145,654	1,190,075	1,234,496	1,287,471	1,340,447	1,393,423	1,446,398	1,499,374	1,563,960	1,628,546	1,693,132	1,757,718	1,822,304	1,886,890	1,951,476	2,016,062	2,080,648	2,145,234
11	Korangi	829,813	884,428	939,043	993,658	1,048,273	1,102,888	1,168,020	1,233,153	1,298,286	1,363,418	1,428,551	1,507,959	1,587,366	1,666,774	1,746,181	1,825,589	1,904,997	1,984,404	2,063,812	2,143,219	2,222,627
12	North Nazimabad	753,423	765,820	778,217	790,613	803,010	815,407	830,191	844,975	859,760	874,544	889,328	907,352	925,377	943,401	961,426	979,450	997,474	1,015,499	1,033,523	1,051,548	1,069,572
13	New Karachi	1,038,865	1,050,261	1,061,656	1,073,052	1,084,448	1,095,843	1,109,433	1,123,024	1,136,614	1,150,204	1,163,794	1,180,363	1,196,932	1,213,501	1,230,069	1,246,638	1,263,207	1,279,775	1,296,344	1,312,913	1,329,482
14	Gulberg	688,580	699,910	711,240	722,570	733,900	745,229	758,741	772,253	785,765	799,277	812,788	829,261	845,735	862,208	878,681	895,154	911,627	928,100	944,573	961,047	977,520
15	Liaquatabad	985,581	988,284	990,987	993,689	996,392	999,095	1,002,318	1,005,542	1,008,765	1,011,988	1,015,211	1,019,141	1,023,071	1,027,001	1,030,930	1,034,860	1,038,790	1,042,719	1,046,649	1,050,579	1,054,509
16	Malir	604,763	621,348	637,932	654,517	671,102	687,686	707,465	727,243	747,022	766,800	786,579	810,692	834,805	858,918	883,032	907,145	931,258	955,372	979,485	1,003,598	1,027,711
17	Bin Qasim	480,854	572,596	664,338	756,080	847,821	939,563	1,048,973	1,158,382	1,267,792	1,377,201	1,486,611	1,619,999	1,753,388	1,886,776	2,020,165	2,153,553	2,286,941	2,420,330	2,553,718	2,687,107	2,820,495
18	Gadap	439,674	584,362	729,050	873,737	1,018,425	1,163,113	1,335,665	1,508,216	1,680,768	1,853,320	2,025,871	2,236,241	2,446,610	2,656,979	2,867,349	3,077,718	3,288,087	3,498,457	3,708,826	3,919,195	4,129,565
	sub-total	14,275,352	14,914,961	15,554,568	16,194,173	16,833,780	17,473,387	18,236,169	18,998,952	19,761,738	20,524,518	21,287,299	22,217,259	23,147,218	24,077,180	25,007,137	25,937,096	26,867,055	27,797,012	28,726,974	29,656,933	30,586,893
19	Cantonment	464,882	490,379	515,876	541,373	566,870	592,367	622,774	653,182	683,589	713,996	744,403	781,475	818,546	855,618	892,689	929,761	966,833	1,003,904	1,040,976	1,078,047	1,115,119
20	Defence	379,596	396,252	412,907	429,563	446,219	462,874	482,737	502,601	522,464	542,327	562,190	586,407	610,623	634,840	659,056	683,273	707,490	731,706	755,923	780,139	804,356
	sub-total	844,478	886,631	928,783	970,936	1,013,089	1,055,241	1,105,511	1,155,783	1,206,053	1,256,323	1,306,593	1,367,882	1,429,169	1,490,458	1,551,745	1,613,034	1,674,323	1,735,610	1,796,899	1,858,186	1,919,475
	Total	15,119,830	15,801,592	16,483,351	17,165,109	17,846,869	18,528,628	19,341,680	20,154,735	20,967,791	21,780,841	22,593,892	23,585,141	24,576,387	25,567,638	26,558,882	27,550,130	28,541,378	29,532,622	30,523,873	31,515,119	32,506,368

Source: Karachi Strategic Development Plan 2020 (August, 2007)

Table A61.1.18 Town-wise Population Served from 2005 to 2025

No.	Town	Population Served																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Average Service Ratio		90%	91%	92%	93%	94%	95%	96%	97%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1	Keamari	378,562	454,910	535,584	620,370	709,104	801,658	910,719	1,024,119	1,141,767	1,263,586	1,389,516	1,496,395	1,603,274	1,710,154	1,817,033	1,923,912	2,030,791	2,137,670	2,244,550	2,351,429	2,458,308
2	SITE	647,579	664,667	681,454	698,015	714,405	730,672	748,812	766,878	784,903	802,913	820,931	835,651	850,370	865,090	879,809	894,529	909,249	923,968	938,688	953,407	968,127
3	Baldia	357,884	407,132	456,911	507,376	558,646	610,816	668,748	727,908	788,366	850,175	913,379	952,723	992,068	1,031,412	1,070,756	1,110,100	1,149,444	1,188,788	1,228,132	1,267,477	1,306,821
4	Orangi	991,605	1,021,477	1,050,886	1,079,956	1,108,781	1,137,437	1,169,473	1,201,432	1,233,364	1,265,315	1,297,320	1,323,641	1,349,962	1,376,283	1,402,604	1,428,925	1,455,246	1,481,567	1,507,888	1,534,209	1,560,530
5	Lyari	860,102	870,313	880,051	889,406	898,448	907,228	916,337	925,226	933,934	942,494	950,930	954,611	958,292	961,973	965,654	969,335	973,016	976,697	980,378	984,059	987,740
6	Saddar	880,777	897,316	913,547	929,543	945,353	961,022	978,578	996,034	1,013,420	1,030,760	1,048,073	1,062,994	1,077,915	1,092,837	1,107,758	1,122,679	1,137,600	1,152,521	1,167,443	1,182,364	1,197,285
7	Jamshed	864,099	914,793	964,727	1,014,157	1,063,288	1,112,276	1,165,879	1,219,572	1,273,468	1,327,661	1,382,221	1,417,763	1,453,304	1,488,846	1,524,387	1,559,929	1,595,471	1,631,012	1,666,554	1,702,095	1,737,637
8	Gulshan-e-Iqbal	903,020	983,537	1,064,562	1,146,086	1,228,104	1,310,612	1,408,461	1,506,888	1,605,885	1,705,452	1,805,587	1,919,145	2,032,703	2,146,262	2,259,820	2,373,378	2,486,936	2,600,494	2,714,053	2,827,611	2,941,169
9	Shah Faisal	465,122	475,846	486,320	496,600	506,730	516,743	527,761	538,697	549,575	560,417	571,235	579,368	587,500	595,633	603,765	611,898	620,031	628,163	636,296	644,428	652,561
10	Landhi	992,628	1,038,743	1,084,899	1,131,107	1,177,376	1,223,715	1,278,649	1,333,678	1,388,806	1,444,036	1,499,374	1,563,960	1,628,546	1,693,132	1,757,718	1,822,304	1,886,890	1,951,476	2,016,062	2,080,648	2,145,234
11	Korangi	829,813	884,428	939,043	993,658	1,048,273	1,102,888	1,168,020	1,233,153	1,298,286	1,363,418	1,428,551	1,507,959	1,587,366	1,666,774	1,746,181	1,825,589	1,904,997	1,984,404	2,063,812	2,143,219	2,222,627
12	North Nazimabad	716,654	733,086	749,360	765,516	781,589	797,604	815,969	834,307	852,638	870,974	889,328	907,352	925,377	943,401	961,426	979,450	997,474	1,015,499	1,033,523	1,051,548	1,069,572
13	New Karachi	967,886	987,413	1,006,541	1,025,364	1,043,948	1,062,346	1,082,825	1,103,175	1,123,432	1,143,630	1,163,794	1,180,363	1,196,932	1,213,501	1,230,069	1,246,638	1,263,207	1,279,775	1,296,344	1,312,913	1,329,482
14	Gulberg	634,813	652,044	669,042	685,870	702,576	719,195	737,944	756,654	775,351	794,056	812,788	829,261	845,735	862,208	878,681	895,154	911,627	928,100	944,573	961,047	977,520
15	Liaquatabad	975,961	979,835	983,638	987,380	991,076	994,732	998,884	1,003,003	1,007,094	1,011,162	1,015,211	1,019,141	1,023,071	1,027,001	1,030,930	1,034,860	1,038,790	1,042,719	1,046,649	1,050,579	1,054,509
16	Malir	604,763	621,348	637,932	654,517	671,102	687,686	707,465	727,243	747,022	766,800	786,579	810,692	834,805	858,918	883,032	907,145	931,258	955,372	979,485	1,003,598	1,027,711
17	Bin Qasim	448,000	538,331	629,850	722,479	816,158	910,843	1,023,815	1,137,908	1,253,089	1,369,330	1,486,611	1,619,999	1,753,388	1,886,776	2,020,165	2,153,553	2,286,941	2,420,330	2,553,718	2,687,107	2,820,495
18	Gadap	289,474	409,519	539,812	679,586	828,253	985,348	1,175,498	1,374,930	1,583,307	1,800,360	2,025,871	2,236,241	2,446,610	2,656,979	2,867,349	3,077,718	3,288,087	3,498,457	3,708,826	3,919,195	4,129,565
	sub-total	12,808,744	13,534,739	14,274,159	15,026,986	15,793,211	16,572,823	17,483,839	18,410,803	19,353,707	20,312,539	21,287,299	22,217,259	23,147,218	24,077,180	25,007,137	25,937,096	26,867,055	27,797,012	28,726,974	29,656,933	30,586,893
19	Cantonment	419,507	448,458	477,617	507,002	536,626	566,500	601,437	636,689	672,264	708,167	744,403	781,475	818,546	855,618	892,689	929,761	966,833	1,003,904	1,040,976	1,078,047	1,115,119
20	Defence	379,596	396,252	412,907	429,563	446,219	462,874	482,737	502,601	522,464	542,327	562,190	586,407	610,623	634,840	659,056	683,273	707,490	731,706	755,923	780,139	804,356
	sub-total	799,103	844,710	890,524	936,565	982,845	1,029,374	1,084,174	1,139,290	1,194,728	1,250,494	1,306,593	1,367,882	1,429,169	1,490,458	1,551,745	1,613,034	1,674,323	1,735,610	1,796,899	1,858,186	1,919,475
	Total	13,607,847	14,379,449	15,164,683	15,963,551	16,776,057	17,602,197	18,568,013	19,550,093	20,548,435	21,563,033	22,593,892	23,585,141	24,576,387	25,567,638	26,558,882	27,550,130	28,541,378	29,532,622	30,523,873	31,515,119	32,506,368

Table A61.1.19 Town-wise Service Ratio from 2005 to 2025

No.	Town	Service Ratio																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	64.9%	69.2%	73.3%	77.1%	80.8%	84.3%	87.7%	90.9%	94.0%	97.1%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2	SITE	91.2%	92.3%	93.3%	94.3%	95.2%	96.1%	96.9%	97.7%	98.5%	99.3%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	Baldia	58.0%	63.2%	68.1%	72.7%	77.1%	81.2%	85.3%	89.1%	92.9%	96.5%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	Orangi	90.2%	91.5%	92.6%	93.7%	94.7%	95.6%	96.6%	97.5%	98.3%	99.2%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5	Lyari	93.2%	94.0%	94.8%	95.6%	96.3%	96.9%	97.6%	98.2%	98.8%	99.4%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6	Saddar	94.1%	94.9%	95.6%	96.2%	96.8%	97.4%	97.9%	98.5%	99.0%	99.5%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
7	Jamshed	77.6%	80.3%	82.9%	85.4%	87.7%	90.0%	92.1%	94.2%	96.2%	98.1%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	Gulshan-e-Iqbal	95.1%	95.7%	96.3%	96.8%	97.3%	97.8%	98.3%	98.7%	99.2%	99.6%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9	Shah Faisal	91.2%	92.3%	93.3%	94.3%	95.2%	96.1%	96.9%	97.7%	98.5%	99.3%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10	Landhi	98.0%	98.3%	98.5%	98.7%	98.9%	99.1%	99.3%	99.5%	99.7%	99.8%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11	Korangi	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12	North Nazimabad	95.1%	95.7%	96.3%	96.8%	97.3%	97.8%	98.3%	98.7%	99.2%	99.6%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13	New Karachi	93.2%	94.0%	94.8%	95.6%	96.3%	96.9%	97.6%	98.2%	98.8%	99.4%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14	Gulberg	92.2%	93.2%	94.1%	94.9%	95.7%	96.5%	97.3%	98.0%	98.7%	99.3%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15	Liaquatabad	99.0%	99.1%	99.3%	99.4%	99.5%	99.6%	99.7%	99.7%	99.8%	99.9%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16	Malir	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17	Bin Qasim	93.2%	94.0%	94.8%	95.6%	96.3%	96.9%	97.6%	98.2%	98.8%	99.4%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18	Gadap	65.8%	70.1%	74.0%	77.8%	81.3%	84.7%	88.0%	91.2%	94.2%	97.1%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	sub-total	89.7%	90.7%	91.8%	92.8%	93.8%	94.8%	95.9%	96.9%	97.9%	99.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19	Cantonment	90.2%	91.5%	92.6%	93.7%	94.7%	95.6%	96.6%	97.5%	98.3%	99.2%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20	Defence	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	sub-total	94.6%	95.3%	95.9%	96.5%	97.0%	97.5%	98.1%	98.6%	99.1%	99.5%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Total	90.0%	91.0%	92.0%	93.0%	94.0%	95.0%	96.0%	97.0%	98.0%	99.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: Service Ratio in 2005 is referred to "Socio Economic Survey Report - 2005 V-01, Karachi Master Plan - 2020, January 2006

Table A61.1.20 Town-wise Per Capita Consumption from 2005 to 2025

No.	Town	Per Capita Consumption (lpcd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	65.24	64.64	64.65	64.66	64.66	64.67	64.69	65.39	66.10	66.80	67.50	68.85	70.68	72.54	74.41	76.29	78.20	79.98	81.78	83.60	85.45
2	SITE	68.12	67.50	67.50	67.51	67.52	67.53	67.55	68.28	69.02	69.75	70.48	71.89	73.80	75.74	77.69	79.66	81.65	83.51	85.39	87.29	89.22
3	Baldia	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
4	Orangi	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
5	Lyari	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
6	Saddar	86.60	85.80	85.81	85.82	85.83	85.84	85.87	86.80	87.73	88.66	89.59	91.38	93.82	96.28	98.76	101.27	103.80	106.16	108.55	110.97	113.42
7	Jamshed	77.55	76.84	76.85	76.86	76.87	76.88	76.90	77.74	78.57	79.40	80.23	81.84	84.02	86.23	88.45	90.69	92.96	95.07	97.21	99.38	101.57
8	Gulshan-e-Iqbal	84.68	83.90	83.91	83.92	83.93	83.94	83.97	84.88	85.79	86.70	87.61	89.36	91.75	94.15	96.58	99.03	101.50	103.81	106.15	108.51	110.91
9	Shah Faisal	73.69	73.02	73.02	73.03	73.04	73.05	73.07	73.87	74.66	75.45	76.24	77.77	79.84	81.93	84.05	86.18	88.33	90.34	92.37	94.43	96.52
10	Landhi	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
11	Korangi	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
12	North Nazimabad	82.05	81.29	81.30	81.31	81.32	81.33	81.35	82.24	83.12	84.00	84.88	86.58	88.89	91.22	93.57	95.95	98.34	100.58	102.85	105.14	107.46
13	New Karachi	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
14	Gulberg	80.16	79.42	79.43	79.44	79.45	79.46	79.48	80.35	81.21	82.07	82.93	84.59	86.85	89.12	91.42	93.74	96.08	98.27	100.48	102.72	104.98
15	Liaquatabad	74.86	74.18	74.18	74.19	74.20	74.21	74.23	75.04	75.85	76.65	77.45	79.00	81.11	83.24	85.38	87.55	89.73	91.78	93.84	95.93	98.05
16	Malir	65.73	65.12	65.13	65.14	65.15	65.15	65.17	65.88	66.59	67.30	68.00	69.36	71.21	73.08	74.96	76.86	78.78	80.58	82.39	84.23	86.08
17	Bin Qasim	67.12	66.51	66.51	66.52	66.53	66.54	66.56	67.28	68.00	68.72	69.44	70.83	72.72	74.63	76.55	78.49	80.45	82.29	84.14	86.01	87.91
18	Gadap	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
	sub-total	70.05	69.30	69.20	69.10	69.01	68.92	68.84	69.49	70.13	70.78	71.43	72.79	74.66	76.55	78.47	80.40	82.35	84.17	86.01	87.88	89.77
19	Cantonment	60.85	60.29	60.30	60.31	60.31	60.32	60.34	61.00	61.65	62.31	62.96	64.22	65.93	67.66	69.40	71.16	72.94	74.60	76.28	77.98	79.70
20	Defence	136.92	135.66	135.68	135.69	135.71	135.72	135.76	137.24	138.72	140.19	141.65	144.49	148.34	152.23	156.16	160.12	164.12	167.85	171.63	175.45	179.33
	sub-total	96.99	95.65	95.25	94.88	94.54	94.23	93.92	94.63	95.35	96.08	96.82	98.63	101.14	103.68	106.25	108.85	111.47	113.91	116.39	118.90	121.45
	Total	71.63	70.85	70.73	70.62	70.51	70.40	70.30	70.95	71.60	72.25	72.90	74.29	76.20	78.14	80.09	82.06	84.06	85.91	87.80	89.71	91.64

Table A61.1.21 Town-wise Domestic Consumption from 2005 to 2025

No.	Town	Domestic Consumption (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	5.43	6.47	7.62	8.82	10.09	11.40	12.96	14.73	16.60	18.57	20.63	22.66	24.93	27.29	29.74	32.29	34.93	37.61	40.38	43.24	46.21
2	SITE	9.70	9.87	10.12	10.37	10.61	10.85	11.13	11.52	11.92	12.32	12.73	13.21	13.81	14.41	15.04	15.68	16.33	16.97	17.63	18.31	19.00
3	Baldia	4.79	5.40	6.06	6.73	7.41	8.11	8.88	9.77	10.69	11.65	12.65	13.46	14.39	15.35	16.35	17.38	18.44	19.51	20.61	21.74	22.91
4	Orangi	13.27	13.55	13.94	14.33	14.71	15.09	15.52	16.12	16.73	17.34	17.97	18.70	19.58	20.48	21.41	22.37	23.35	24.31	25.30	26.32	27.36
5	Lyari	11.51	11.54	11.67	11.80	11.92	12.04	12.16	12.41	12.67	12.92	13.17	13.48	13.90	14.32	14.74	15.17	15.61	16.03	16.45	16.88	17.32
6	Saddar	16.78	16.94	17.24	17.55	17.85	18.15	18.48	19.02	19.56	20.10	20.65	21.37	22.25	23.15	24.07	25.01	25.97	26.91	27.88	28.86	29.87
7	Jamshed	14.74	15.46	16.31	17.15	17.98	18.81	19.72	20.85	22.01	23.19	24.40	25.52	26.86	28.24	29.66	31.12	32.63	34.11	35.64	37.21	38.82
8	Gulshan-e-Iqbal	16.82	18.15	19.65	21.16	22.67	24.20	26.01	28.14	30.31	32.53	34.80	37.72	41.02	44.45	48.01	51.70	55.53	59.38	63.37	67.50	71.76
9	Shah Faisal	7.54	7.64	7.81	7.98	8.14	8.30	8.48	8.75	9.03	9.30	9.58	9.91	10.32	10.74	11.16	11.60	12.05	12.48	12.93	13.39	13.85
10	Landhi	13.29	13.78	14.39	15.01	15.62	16.24	16.97	17.90	18.83	19.79	20.76	22.09	23.62	25.20	26.84	28.53	30.28	32.02	33.83	35.69	37.61
11	Korangi	11.11	11.73	12.46	13.18	13.91	14.63	15.50	16.55	17.61	18.69	19.78	21.30	23.02	24.81	26.66	28.58	30.57	32.56	34.63	36.76	38.97
12	North Nazimabad	12.93	13.11	13.40	13.69	13.98	14.27	14.60	15.09	15.59	16.09	16.61	17.28	18.09	18.93	19.79	20.67	21.58	22.47	23.38	24.32	25.28
13	New Karachi	12.96	13.10	13.35	13.60	13.85	14.10	14.37	14.80	15.24	15.67	16.12	16.67	17.36	18.06	18.78	19.52	20.27	21.00	21.75	22.52	23.31
14	Gulberg	11.19	11.39	11.69	11.99	12.28	12.57	12.90	13.37	13.85	14.34	14.83	15.43	16.16	16.90	17.67	18.46	19.27	20.06	20.88	21.71	22.57
15	Liaquatabad	16.07	15.99	16.05	16.11	16.18	16.24	16.31	16.56	16.80	17.05	17.30	17.71	18.25	18.80	19.36	19.93	20.50	21.05	21.61	22.17	22.74
16	Malir	8.74	8.90	9.14	9.38	9.62	9.86	10.14	10.54	10.94	11.35	11.77	12.37	13.08	13.81	14.56	15.34	16.14	16.93	17.75	18.59	19.46
17	Bin Qasim	6.61	7.88	9.22	10.57	11.94	13.33	14.99	16.84	18.74	20.70	22.71	25.24	28.05	30.97	34.02	37.18	40.47	43.81	47.26	50.84	54.54
18	Gadap	3.87	5.43	7.16	9.02	10.99	13.07	15.60	18.45	21.47	24.67	28.06	31.59	35.48	39.54	43.78	48.18	52.76	57.41	62.23	67.23	72.40
	sub-total	197.38	206.32	217.28	228.42	239.75	251.26	264.75	281.41	298.58	316.28	334.49	355.73	380.16	405.46	431.63	458.70	486.68	514.65	543.51	573.28	603.99
19	Cantonment	5.62	5.95	6.34	6.73	7.12	7.52	7.98	8.54	9.12	9.71	10.31	11.04	11.87	12.73	13.63	14.55	15.51	16.47	17.47	18.49	19.55
20	Defence	11.43	11.82	12.32	12.82	13.32	13.82	14.42	15.17	15.94	16.72	17.52	18.64	19.93	21.26	22.64	24.07	25.54	27.02	28.54	30.11	31.73
	sub-total	17.05	17.77	18.66	19.55	20.44	21.34	22.40	23.72	25.06	26.43	27.83	29.68	31.80	33.99	36.27	38.62	41.05	43.49	46.01	48.60	51.28
	Total	214.43	224.10	235.94	247.97	260.19	272.60	287.15	305.13	323.64	342.71	362.32	385.41	411.96	439.45	467.90	497.32	527.73	558.14	589.52	621.89	655.27

Table A61.1.22 Town-wise Non-Domestic Consumption from 2005 to 2025

No.	Town	Non-Domestic Water Consumption (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	2.58	3.05	3.56	4.08	4.62	5.18	5.83	6.51	7.22	7.94	8.68	9.36	10.12	10.88	11.66	12.44	13.23	13.96	14.68	15.40	16.11
2	SITE	11.46	11.53	11.66	11.79	11.92	12.05	12.20	12.38	12.56	12.74	12.93	13.15	13.46	13.77	14.09	14.41	14.73	14.97	15.21	15.44	15.67
3	Baldia	2.09	2.34	2.60	2.86	3.12	3.38	3.67	3.97	4.28	4.59	4.90	5.12	5.38	5.64	5.91	6.18	6.45	6.68	6.92	7.15	7.38
4	Orangi	2.95	3.01	3.09	3.16	3.23	3.30	3.38	3.47	3.55	3.64	3.72	3.82	3.95	4.08	4.21	4.33	4.46	4.57	4.67	4.77	4.86
5	Lyari	3.05	3.05	3.07	3.09	3.10	3.11	3.13	3.15	3.17	3.19	3.20	3.23	3.29	3.34	3.39	3.43	3.48	3.51	3.53	3.56	3.58
6	Saddar	28.72	28.65	28.74	28.85	28.97	29.10	29.25	29.49	29.73	29.97	30.22	30.60	31.20	31.80	32.42	33.03	33.65	34.08	34.51	34.92	35.33
7	Jamshed	3.98	4.17	4.37	4.57	4.76	4.95	5.16	5.38	5.60	5.82	6.04	6.23	6.46	6.69	6.93	7.16	7.40	7.59	7.78	7.97	8.16
8	Gulshan-e-Iqbal	10.40	11.13	11.90	12.67	13.44	14.20	15.11	16.04	16.98	17.91	18.83	20.03	21.38	22.74	24.12	25.51	26.92	28.18	29.44	30.69	31.94
9	Shah Faisal	6.98	7.00	7.06	7.12	7.18	7.24	7.31	7.40	7.49	7.57	7.66	7.77	7.93	8.09	8.25	8.42	8.58	8.70	8.81	8.93	9.03
10	Landhi	7.53	7.75	8.00	8.25	8.50	8.75	9.05	9.38	9.70	10.02	10.33	10.79	11.33	11.87	12.41	12.97	13.52	14.00	14.48	14.96	15.43
11	Korangi	7.61	7.96	8.35	8.73	9.11	9.49	9.94	10.42	10.89	11.35	11.81	12.47	13.23	13.99	14.76	15.54	16.32	17.02	17.71	18.40	19.09
12	North Nazimabad	2.87	2.91	2.97	3.02	3.07	3.12	3.18	3.25	3.31	3.38	3.44	3.53	3.65	3.77	3.89	4.01	4.12	4.22	4.31	4.40	4.49
13	New Karachi	3.00	3.03	3.08	3.12	3.16	3.21	3.26	3.31	3.36	3.42	3.47	3.54	3.64	3.73	3.83	3.92	4.02	4.09	4.16	4.23	4.29
14	Gulberg	2.61	2.65	2.71	2.77	2.82	2.88	2.94	3.01	3.08	3.14	3.21	3.29	3.40	3.51	3.62	3.73	3.84	3.93	4.01	4.10	4.18
15	Liaquatabad	3.57	3.55	3.55	3.55	3.55	3.55	3.55	3.56	3.57	3.58	3.58	3.62	3.68	3.74	3.80	3.86	3.92	3.95	3.99	4.02	4.04
16	Malir	16.02	16.11	16.30	16.50	16.70	16.91	17.17	17.48	17.79	18.10	18.41	18.94	19.61	20.29	20.97	21.66	22.35	22.92	23.49	24.05	24.60
17	Bin Qasim	13.66	16.06	18.52	20.95	23.35	25.75	28.56	31.44	34.30	37.14	39.98	43.48	47.31	51.18	55.09	59.04	63.01	66.66	70.30	73.91	77.50
18	Gadap	2.90	4.03	5.24	6.52	7.86	9.26	10.92	12.68	14.49	16.35	18.27	20.16	22.22	24.30	26.40	28.53	30.67	32.67	34.65	36.63	38.59
	sub-total	131.98	137.99	144.76	151.59	158.48	165.43	173.62	182.31	191.05	199.84	208.67	219.15	231.22	243.42	255.74	268.16	280.67	291.69	302.65	313.52	324.29
19	Cantonment	8.42	8.80	9.21	9.62	10.03	10.45	10.93	11.44	11.95	12.46	12.96	13.59	14.33	15.06	15.81	16.56	17.32	17.99	18.65	19.31	19.96
20	Defence	2.54	2.61	2.70	2.78	2.87	2.95	3.05	3.16	3.27	3.38	3.49	3.64	3.82	4.01	4.20	4.38	4.57	4.74	4.90	5.07	5.23
	sub-total	10.97	11.41	11.91	12.41	12.90	13.40	13.98	14.60	15.22	15.83	16.45	17.24	18.15	19.07	20.01	20.95	21.89	22.73	23.55	24.37	25.19
	Total	142.95	149.40	156.66	163.99	171.38	178.83	187.60	196.91	206.27	215.68	225.12	236.38	249.37	262.50	275.75	289.11	302.56	314.42	326.20	337.89	349.48

Table A61.1.23 Town-wise Total Water Consumption from 2005 to 2025

No.	Town	Total Water Consumption (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	8.02	9.52	11.17	12.90	14.71	16.58	18.79	21.25	23.82	26.50	29.31	32.02	35.05	38.17	41.40	44.73	48.17	51.57	55.06	58.64	62.32
2	SITE	21.17	21.40	21.78	22.15	22.53	22.90	23.33	23.90	24.48	25.06	25.65	26.36	27.26	28.19	29.13	30.09	31.06	31.95	32.84	33.75	34.67
3	Baldia	6.88	7.74	8.66	9.59	10.53	11.49	12.55	13.74	14.97	16.24	17.55	18.58	19.77	21.00	22.26	23.55	24.89	26.19	27.52	28.89	30.29
4	Orangi	16.22	16.56	17.02	17.49	17.94	18.39	18.90	19.59	20.28	20.98	21.69	22.52	23.53	24.56	25.62	26.70	27.81	28.88	29.97	31.08	32.22
5	Lyari	14.57	14.60	14.74	14.88	15.02	15.15	15.29	15.56	15.83	16.10	16.37	16.72	17.18	17.65	18.13	18.61	19.09	19.54	19.98	20.44	20.90
6	Saddar	45.50	45.58	45.99	46.40	46.82	47.24	47.73	48.50	49.28	50.07	50.87	51.97	53.44	54.95	56.48	58.04	59.62	60.99	62.38	63.79	65.20
7	Jamshed	18.72	19.63	20.68	21.71	22.74	23.76	24.88	26.24	27.61	29.01	30.43	31.75	33.32	34.93	36.59	38.28	40.02	41.70	43.42	45.18	46.98
8	Gulshan-e-Iqbal	27.22	29.28	31.55	33.83	36.12	38.40	41.12	44.18	47.28	50.43	53.63	57.75	62.40	67.19	72.13	77.22	82.45	87.57	92.82	98.19	103.69
9	Shah Faisal	14.52	14.64	14.87	15.10	15.32	15.55	15.79	16.15	16.51	16.88	17.24	17.68	18.25	18.83	19.42	20.02	20.63	21.18	21.74	22.31	22.89
10	Landhi	20.82	21.52	22.39	23.26	24.12	24.99	26.03	27.27	28.53	29.81	31.10	32.88	34.95	37.07	39.25	41.49	43.80	46.03	48.31	50.65	53.04
11	Korangi	18.71	19.69	20.80	21.91	23.02	24.13	25.45	26.96	28.50	30.04	31.60	33.77	36.25	38.80	41.42	44.12	46.89	49.58	52.34	55.17	58.05
12	North Nazimabad	15.81	16.02	16.37	16.71	17.05	17.39	17.78	18.34	18.90	19.47	20.04	20.81	21.75	22.70	23.68	24.68	25.70	26.69	27.69	28.72	29.78
13	New Karachi	15.96	16.13	16.43	16.72	17.02	17.30	17.63	18.11	18.60	19.09	19.58	20.21	20.99	21.79	22.61	23.44	24.28	25.09	25.91	26.75	27.60
14	Gulberg	13.80	14.05	14.40	14.75	15.10	15.45	15.84	16.38	16.93	17.48	18.03	18.72	19.56	20.41	21.29	22.19	23.11	23.99	24.89	25.81	26.75
15	Liaquatabad	19.64	19.54	19.60	19.67	19.73	19.79	19.86	20.12	20.37	20.63	20.88	21.33	21.94	22.55	23.17	23.79	24.42	25.00	25.59	26.19	26.79
16	Malir	24.76	25.02	25.44	25.88	26.32	26.76	27.31	28.02	28.73	29.45	30.17	31.31	32.69	34.09	35.53	36.99	38.49	39.85	41.24	42.64	44.06
17	Bin Qasim	20.27	23.94	27.73	31.52	35.30	39.08	43.55	48.28	53.04	57.84	62.69	68.73	75.36	82.16	89.11	96.22	103.49	110.47	117.56	124.75	132.04
18	Gadap	6.78	9.46	12.40	15.54	18.85	22.33	26.53	31.12	35.96	41.02	46.32	51.75	57.70	63.84	70.18	76.71	83.43	90.08	96.88	103.85	110.99
	sub-total	329.36	344.31	362.04	380.01	398.23	416.69	438.37	463.72	489.63	516.12	543.17	574.88	611.38	648.88	687.37	726.86	767.35	806.34	846.16	886.80	928.28
19	Cantonment	14.04	14.74	15.55	16.35	17.15	17.96	18.91	19.98	21.07	22.16	23.27	24.63	26.20	27.80	29.44	31.12	32.83	34.46	36.12	37.80	39.51
20	Defence	13.97	14.44	15.02	15.60	16.19	16.77	17.47	18.34	19.21	20.10	21.00	22.28	23.75	25.27	26.84	28.45	30.12	31.76	33.44	35.18	36.96
	sub-total	28.01	29.18	30.57	31.95	33.34	34.73	36.38	38.32	40.28	42.26	44.28	46.91	49.95	53.07	56.27	59.57	62.95	66.22	69.56	72.98	76.47
	Total	357.38	373.49	392.60	411.96	431.57	451.42	474.75	502.04	529.91	558.38	587.44	621.79	661.33	701.95	743.65	786.43	830.29	872.55	915.72	959.78	1,004.74

Table A61.1.24 Town-wise Domestic Water Demand from 2005 to 2025

No.	Town	Total Domestic Water Demand (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	8.36	9.95	11.63	13.37	15.17	17.02	19.20	21.51	23.89	26.34	28.85	31.26	33.69	36.14	38.62	41.13	43.67	46.29	48.94	51.63	54.36
2	SITE	14.93	15.18	15.45	15.71	15.96	16.20	16.48	16.82	17.15	17.47	17.80	18.23	18.66	19.09	19.53	19.97	20.41	20.89	21.37	21.86	22.35
3	Baldia	7.37	8.31	9.25	10.20	11.15	12.10	13.15	14.26	15.38	16.53	17.69	18.56	19.44	20.33	21.23	22.14	23.05	24.01	24.98	25.96	26.95
4	Orangi	20.42	20.84	21.28	21.71	22.12	22.53	23.00	23.53	24.07	24.60	25.13	25.79	26.46	27.13	27.81	28.50	29.19	29.92	30.67	31.42	32.19
5	Lyari	17.71	17.76	17.82	17.88	17.93	17.97	18.02	18.12	18.22	18.32	18.42	18.60	18.78	18.96	19.15	19.33	19.52	19.73	19.94	20.16	20.37
6	Saddar	25.81	26.06	26.33	26.59	26.84	27.08	27.38	27.76	28.14	28.52	28.89	29.47	30.06	30.66	31.26	31.86	32.47	33.13	33.79	34.46	35.14
7	Jamshed	22.68	23.79	24.90	25.98	27.04	28.07	29.22	30.45	31.67	32.89	34.12	35.20	36.30	37.40	38.52	39.64	40.78	41.98	43.20	44.43	45.68
8	Gulshan-e-Iqbal	25.88	27.93	30.00	32.06	34.10	36.12	38.54	41.07	43.61	46.14	48.67	52.03	55.44	58.88	62.35	65.86	69.41	73.09	76.82	80.59	84.42
9	Shah Faisal	11.60	11.76	11.93	12.09	12.24	12.39	12.57	12.78	12.99	13.19	13.40	13.67	13.94	14.22	14.50	14.78	15.06	15.36	15.67	15.98	16.30
10	Landhi	20.44	21.20	21.97	22.74	23.49	24.24	25.14	26.12	27.10	28.07	29.04	30.47	31.92	33.38	34.85	36.34	37.84	39.41	41.00	42.62	44.25
11	Korangi	17.09	18.05	19.02	19.97	20.91	21.84	22.97	24.15	25.33	26.51	27.67	29.38	31.11	32.86	34.62	36.41	38.21	40.08	41.98	43.90	45.84
12	North Nazimabad	19.90	20.17	20.46	20.75	21.02	21.30	21.63	22.03	22.43	22.83	23.22	23.84	24.45	25.07	25.70	26.33	26.97	27.65	28.34	29.04	29.74
13	New Karachi	19.93	20.15	20.38	20.61	20.83	21.04	21.29	21.61	21.92	22.23	22.54	23.00	23.46	23.92	24.39	24.86	25.34	25.85	26.37	26.89	27.42
14	Gulberg	17.22	17.53	17.85	18.16	18.46	18.76	19.11	19.52	19.93	20.33	20.74	21.28	21.83	22.39	22.95	23.51	24.08	24.69	25.31	25.93	26.56
15	Liaquatabad	24.73	24.60	24.51	24.42	24.33	24.24	24.16	24.17	24.18	24.18	24.19	24.43	24.67	24.91	25.15	25.39	25.63	25.91	26.19	26.47	26.76
16	Malir	13.45	13.69	13.95	14.21	14.46	14.71	15.03	15.39	15.74	16.10	16.46	17.06	17.67	18.29	18.91	19.54	20.17	20.84	21.52	22.20	22.90
17	Bin Qasim	10.18	12.12	14.07	16.02	17.96	19.90	22.21	24.59	26.97	29.36	31.76	34.82	37.90	41.03	44.18	47.37	50.59	53.92	57.29	60.71	64.17
18	Gadap	5.96	8.36	10.93	13.66	16.52	19.51	23.11	26.93	30.90	35.00	39.24	43.57	47.95	52.38	56.85	61.38	65.95	70.66	75.43	80.27	85.18
	sub-total	303.66	317.42	331.73	346.10	360.53	375.02	392.22	410.82	429.62	448.62	467.82	490.66	513.73	537.03	560.56	584.33	608.34	633.41	658.80	684.52	710.57
19	Cantonment	8.64	9.15	9.67	10.19	10.71	11.22	11.83	12.47	13.12	13.77	14.42	15.23	16.04	16.87	17.70	18.54	19.39	20.28	21.17	22.08	23.00
20	Defence	17.59	18.19	18.81	19.43	20.03	20.63	21.36	22.15	22.94	23.72	24.50	25.71	26.93	28.16	29.40	30.66	31.93	33.25	34.59	35.95	37.33
	sub-total	26.23	27.34	28.49	29.62	30.74	31.85	33.18	34.62	36.06	37.49	38.92	40.93	42.97	45.02	47.10	49.20	51.32	53.53	55.77	58.03	60.33
	Total	329.89	344.76	360.21	375.71	391.26	406.86	425.40	445.44	465.67	486.11	506.74	531.60	556.70	582.05	607.66	633.53	659.66	686.94	714.57	742.55	770.90

Table A61.1.25 Town-wise Non-Domestic Water Demand from 2005 to 2025

No.	Town	Total Non-Domestic Water Demand (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	3.97	4.70	5.43	6.18	6.95	7.73	8.64	9.51	10.38	11.26	12.14	12.91	13.67	14.42	15.14	15.85	16.54	17.18	17.79	18.38	18.95
2	SITE	17.63	17.74	17.80	17.86	17.92	17.98	18.07	18.07	18.08	18.08	18.08	18.13	18.19	18.24	18.30	18.36	18.42	18.43	18.44	18.44	18.44
3	Baldia	3.21	3.60	3.97	4.33	4.69	5.05	5.44	5.80	6.15	6.50	6.85	7.06	7.27	7.48	7.67	7.87	8.06	8.22	8.38	8.53	8.68
4	Orangi	4.54	4.63	4.71	4.79	4.86	4.93	5.01	5.06	5.11	5.16	5.20	5.27	5.34	5.40	5.46	5.52	5.58	5.62	5.66	5.69	5.72
5	Lyari	4.70	4.70	4.69	4.68	4.66	4.65	4.63	4.60	4.56	4.52	4.48	4.46	4.44	4.42	4.40	4.37	4.35	4.32	4.28	4.25	4.21
6	Saddar	44.18	44.07	43.88	43.71	43.56	43.43	43.33	43.04	42.77	42.51	42.26	42.20	42.16	42.13	42.10	42.08	42.06	41.94	41.82	41.70	41.57
7	Jamshed	6.13	6.41	6.67	6.92	7.16	7.39	7.65	7.86	8.06	8.26	8.45	8.59	8.73	8.86	8.99	9.12	9.24	9.34	9.43	9.52	9.60
8	Gulshan-e-Iqbal	16.00	17.12	18.17	19.20	20.21	21.20	22.38	23.42	24.43	25.40	26.34	27.63	28.89	30.12	31.33	32.50	33.65	34.69	35.69	36.65	37.57
9	Shah Faisal	10.73	10.77	10.78	10.79	10.80	10.81	10.83	10.80	10.77	10.74	10.72	10.71	10.71	10.72	10.72	10.72	10.73	10.70	10.68	10.66	10.63
10	Landhi	11.59	11.92	12.21	12.50	12.78	13.06	13.41	13.69	13.96	14.21	14.45	14.88	15.31	15.72	16.12	16.52	16.90	17.24	17.56	17.86	18.16
11	Korangi	11.70	12.24	12.74	13.23	13.70	14.17	14.73	15.21	15.67	16.10	16.52	17.20	17.87	18.53	19.17	19.79	20.40	20.95	21.47	21.97	22.46
12	North Nazimabad	4.42	4.48	4.53	4.57	4.62	4.66	4.71	4.74	4.77	4.79	4.81	4.87	4.93	4.99	5.05	5.10	5.15	5.19	5.23	5.26	5.29
13	New Karachi	4.62	4.67	4.70	4.73	4.76	4.79	4.82	4.83	4.84	4.85	4.85	4.88	4.91	4.94	4.97	5.00	5.02	5.03	5.04	5.05	5.05
14	Gulberg	4.01	4.08	4.14	4.19	4.24	4.29	4.35	4.39	4.42	4.46	4.49	4.54	4.60	4.65	4.70	4.75	4.80	4.83	4.86	4.89	4.92
15	Liaquatabad	5.49	5.47	5.42	5.38	5.34	5.30	5.26	5.20	5.14	5.07	5.01	4.99	4.98	4.96	4.94	4.92	4.90	4.87	4.83	4.79	4.76
16	Malir	24.65	24.79	24.89	25.00	25.11	25.23	25.44	25.52	25.60	25.67	25.75	26.12	26.50	26.87	27.23	27.59	27.93	28.21	28.47	28.71	28.94
17	Bin Qasim	21.01	24.71	28.27	31.73	35.12	38.43	42.32	45.89	49.35	52.69	55.91	59.98	63.94	67.79	71.55	75.21	78.77	82.05	85.21	88.25	91.18
18	Gadap	4.46	6.20	8.01	9.88	11.83	13.82	16.18	18.50	20.84	23.19	25.55	27.81	30.02	32.18	34.29	36.34	38.34	40.20	42.00	43.73	45.40
	sub-total	203.05	212.29	221.00	229.68	238.31	246.91	257.22	266.14	274.89	283.46	291.85	302.27	312.46	322.42	332.13	341.61	350.84	359.00	366.84	374.35	381.52
19	Cantonment	12.96	13.53	14.06	14.58	15.09	15.59	16.19	16.70	17.19	17.67	18.13	18.75	19.36	19.95	20.53	21.10	21.65	22.14	22.60	23.05	23.48
20	Defence	3.91	4.02	4.12	4.22	4.31	4.40	4.52	4.62	4.71	4.79	4.87	5.02	5.17	5.31	5.45	5.59	5.72	5.83	5.94	6.05	6.15
	sub-total	16.87	17.55	18.18	18.80	19.40	20.00	20.71	21.32	21.90	22.46	23.00	23.77	24.53	25.26	25.98	26.68	27.37	27.97	28.55	29.10	29.63
	Total	219.92	229.84	239.18	248.47	257.71	266.90	277.93	287.46	296.79	305.92	314.86	326.05	336.99	347.68	358.12	368.29	378.21	386.98	395.39	403.45	411.15

Table A61.1.26 Town-wise Total Water Demand from 2005 to 2025

No.	Town	Total Water Demand (mgd)																				
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Keamari	12.33	14.65	17.06	19.55	22.12	24.75	27.83	31.01	34.27	37.60	40.99	44.17	47.36	50.56	53.77	56.98	60.21	63.47	66.73	70.02	73.31
2	SITE	32.56	32.92	33.25	33.56	33.88	34.18	34.56	34.89	35.22	35.55	35.88	36.36	36.84	37.33	37.83	38.33	38.83	39.32	39.81	40.30	40.79
3	Baldia	10.58	11.90	13.22	14.53	15.84	17.15	18.59	20.06	21.54	23.03	24.54	25.63	26.72	27.81	28.90	30.01	31.11	32.23	33.36	34.49	35.63
4	Orangi	24.96	25.47	25.99	26.49	26.98	27.45	28.00	28.60	29.18	29.76	30.33	31.06	31.80	32.53	33.27	34.02	34.76	35.54	36.33	37.11	37.91
5	Lyari	22.41	22.46	22.51	22.55	22.59	22.61	22.65	22.72	22.78	22.84	22.90	23.06	23.22	23.38	23.54	23.70	23.87	24.04	24.22	24.40	24.59
6	Saddar	69.99	70.13	70.21	70.30	70.40	70.51	70.72	70.81	70.91	71.03	71.15	71.68	72.22	72.78	73.35	73.94	74.53	75.07	75.61	76.16	76.71
7	Jamshed	28.81	30.20	31.57	32.90	34.19	35.46	36.86	38.30	39.73	41.15	42.57	43.79	45.03	46.27	47.51	48.77	50.03	51.32	52.63	53.95	55.27
8	Gulshan-e-Iqbal	41.88	45.05	48.17	51.26	54.31	57.32	60.92	64.50	68.03	71.54	75.00	79.66	84.33	89.00	93.68	98.36	103.06	107.78	112.50	117.24	121.99
9	Shah Faisal	22.33	22.52	22.70	22.87	23.04	23.20	23.40	23.58	23.76	23.94	24.12	24.38	24.66	24.94	25.22	25.50	25.79	26.07	26.35	26.64	26.93
10	Landhi	32.03	33.11	34.18	35.24	36.27	37.30	38.56	39.81	41.06	42.28	43.49	45.36	47.22	49.10	50.97	52.86	54.75	56.65	58.56	60.48	62.40
11	Korangi	28.79	30.29	31.76	33.20	34.62	36.01	37.70	39.36	41.00	42.61	44.19	46.59	48.98	51.39	53.79	56.20	58.61	61.02	63.45	65.87	68.30
12	North Nazimabad	24.32	24.65	24.99	25.32	25.64	25.95	26.34	26.77	27.20	27.62	28.03	28.71	29.39	30.07	30.75	31.44	32.13	32.85	33.57	34.30	35.03
13	New Karachi	24.55	24.81	25.08	25.34	25.59	25.83	26.11	26.44	26.76	27.08	27.39	27.88	28.37	28.86	29.36	29.86	30.36	30.88	31.41	31.94	32.47
14	Gulberg	21.24	21.61	21.99	22.35	22.71	23.05	23.47	23.91	24.35	24.79	25.22	25.83	26.43	27.04	27.65	28.26	28.88	29.52	30.17	30.82	31.48
15	Liaquatabad	30.22	30.06	29.93	29.80	29.67	29.54	29.43	29.37	29.31	29.26	29.20	29.42	29.64	29.87	30.09	30.31	30.53	30.77	31.02	31.27	31.51
16	Malir	38.10	38.49	38.84	39.21	39.57	39.94	40.46	40.90	41.34	41.77	42.20	43.19	44.17	45.16	46.14	47.13	48.11	49.05	49.99	50.92	51.84
17	Bin Qasim	31.19	36.83	42.34	47.75	53.08	58.33	64.52	70.48	76.32	82.05	87.67	94.79	101.84	108.82	115.73	122.58	129.36	135.97	142.50	148.96	155.34
18	Gadap	10.42	14.55	18.94	23.54	28.35	33.33	39.30	45.44	51.74	58.19	64.79	71.38	77.97	84.56	91.14	97.72	104.29	110.86	117.43	124.01	130.58
	sub-total	506.71	529.71	552.73	575.77	598.84	621.93	649.43	676.96	704.51	732.08	759.67	792.93	826.19	859.44	892.69	925.94	959.18	992.42	1,025.64	1,058.87	1,092.09
19	Cantonment	21.60	22.68	23.73	24.77	25.80	26.81	28.02	29.17	30.31	31.44	32.55	33.98	35.40	36.82	38.23	39.64	41.04	42.41	43.78	45.13	46.48
20	Defence	21.50	22.21	22.93	23.64	24.34	25.03	25.88	26.77	27.64	28.51	29.37	30.73	32.09	33.47	34.85	36.24	37.64	39.08	40.54	42.00	43.48
	sub-total	43.10	44.89	46.67	48.41	50.14	51.84	53.90	55.94	57.96	59.95	61.92	64.71	67.50	70.29	73.08	75.88	78.69	81.50	84.31	87.13	89.96
	Total	549.81	574.60	599.39	624.19	648.98	673.77	703.33	732.90	762.47	792.03	821.60	857.64	893.69	929.73	965.78	1,001.82	1,037.87	1,073.91	1,109.96	1,146.00	1,182.05