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**Thesis**

Customers' satisfaction with clean drinking water provided by  
the Lahore Cantonment Board (LCB)

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## Summary

Clean drinking water supply services lie at the centre of household activities and maintenance of public health. In the recent past, a phenomenal increase in the above mentioned activities mainly in the urban areas has created an urgent need for improved water management. It is keeping this in mind that urban water distribution networks all over the world are under immense pressure to supply round the clock clean drinking water for household customers. Any disruption or inconsistency in this service even though for a short while has an unpleasant effect on all sorts of customers. For these reasons water supply agencies as well as their regulators are becoming increasingly sensitive to customer protection issues and customers' opinions about the service quality and performance. To ensure customers' satisfaction the public utilities are adopting benchmarking concepts with a view to comparing their own practices and processes with top performers in the same trade. In the context of customer satisfaction this approach helps them to identify and adopt best practices to improve their own processes.

This aim of this research is to find out whether the residents of Lahore Cantonment are satisfied or not with the clean drinking water provided by the LCB. This inquisition revolves around three main research questions that encapsulate the main aspects of clean drinking water that are vital to the customers of LCB and go on to determine their level of satisfaction. The first research question is about the overall satisfaction of people with the clean drinking water whereas the second one focuses specifically on the aspects of the water that the customers have complaints against such as quality, quantity, continuity and price. The last question concentrates on the satisfaction of the customers with the responsiveness of LCB to their complaints.

This research is exploratory as it seeks to find out whether the customers are satisfied or not with the clean drinking water provided by LCB. In order to carry out this research, survey strategy has been used with households as units of analysis. This survey served as a basic investigative tool in order to prove or disprove the hypothesis. The research was carried out in Lahore Cantonment (population 268,166) where two levels of households with respect to income were taken into consideration i.e. high and low income. The data was divided into primary and secondary data. The research instruments were a combination of a survey with questionnaires, in-depth and semi-closed interviews. Questionnaires were used to collect primary data from customers with respect to their response regarding the quality, quantity, continuity of water, monthly tariff, and disposal of complaints by the LCB authorities. Semi-structured and in-depth interviews were used to collect primary data from the officials of the LCB, and others. The secondary data was collected through visits to the Record Room of LCB and the information consisted of readily available compendia and reports of LCB. Frequency distributions and percentages were the main analytical methods. The display methods used were tables and graphs.

It was found out during the fieldwork that LCB's water supply systems were characterized by contamination of the clean drinking water through sewerage water entering the old and rusty water pipelines, no proper treatment other than chlorination, intermittent water supply (8-10 hrs a day), low per capita water supplied per day, and low responsiveness to customer complaints. The results of the research show that although a majority of customers belonging to both the high and low income areas are overall satisfied with the clean drinking water provided by LCB but a deeper analysis of questionnaires survey and interviews (corresponding to the second and third research question) revealed that owing to various reasons more than a quarter of them were not satisfied with various aspects of clean drinking water.

It is startling to know that LCB has no mechanism in place to ascertain the customers' satisfaction and neither is it using any form of benchmarking and key performance indicators to measure, monitor and improve its performance. This is the major reason why more than a quarter of the customers of both the income groups have serious reservations about the various aspects of clean drinking water such as quality, quantity and continuity, and the responsiveness of the staff to customer complaints. The situation is expected to get worse if immediate corrective actions are not taken by the LCB soon.

***Key Words that characterize this research:*** Customer Satisfaction; Clean Drinking Water; Lahore, Pakistan.

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## **Abbreviations**

<b>LCB</b>	Lahore Cantonment Board
<b>WASA</b>	Water and Sanitation Agency
<b>WHO</b>	World Health Organization
<b>WB</b>	World Bank
<b>WSP</b>	Water and Sanitation Programme
<b>LESCO</b>	Lahore Electric Supply Company Limited
<b>UNICEF</b>	United Nations International Children's Emergency
<b>OFWAT</b>	Office of Water Services (in England and Wales)
<b>IBNET</b>	International Benchmarking Network (for Water and Sanitation Utilities)
<b>SAAWU</b>	South African Association of Water Utilities
<b>WUP</b>	Water Utility Partnership
<b>CCR</b>	Consumer Confidence Reports
<b>UFW</b>	Unaccounted For Water
<b>NGO</b>	Non-governmental Organization
<b>CBO</b>	Community Based Organization

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# Chapter 1 Introduction

## 1.1 Background

Water supply is a major factor in ensuring a good level of public health and economic development in all parts of the world, developing or developed. “The human right to water”, declared the United Nations Committee on Economic, Social and Cultural Rights, “entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use (World Water Council, 2011). Improvement in quality and quantity of water leads to a reduction in diseases and improves the overall health of the people by allowing for better personal and domestic hygiene practices (e.g., hand washing, food washing, and household cleaning). Water supply services are central to household activities and economic production. The growing demands on freshwater resources create an urgent need for improved water management (JACKSON, et al., 2001).

It is a paradox that although water utility companies around the world claim that their ultimate aim is to provide quality water service to their customers, very little is actually done on ground to know whether or not the customers are satisfied with the goods and services provided to them. Customer satisfaction is important to water utilities in order for them to minimize customer complaints, maintain goodwill towards the utility, and increase public support for utility improvement initiatives (Fox, 1994).

There is a trend in public utilities to evaluate their own performance on the basis of objective tools such as net profit, return on investment, current ratio etc however this approach is not proper since this focuses too much on the fiscal perspective and is therefore more fit for ‘for profit’ organizations. For public utilities subjective tool such as customer satisfaction actually complements the above-said objective performance evaluation tools and can be very helpful as it takes into account the needs and preferences of the customers. The two main determinants of customer satisfaction are the “customers’ expectations” and “performance” of the utility. Performance is the actual level of service received by the customers whereas the expectations depend upon their personal characteristics such as education, living standard and their willingness to put up with adverse situations (Deichmann & Lall, 2007).

Nowadays the public utilities are increasingly adopting benchmarking concepts with a view to comparing their own practices and processes with top performers in the same trade. In the context of customer satisfaction this approach helps them to identify and adopt best practices to improve their own processes. Two kinds of benchmarking are being used worldwide namely ‘Metric benchmarking’ and ‘Process benchmarking’. The metric benchmarking relies on the simple analysis of ratio of inputs to outputs whereas process benchmarking focuses on how to change the way things are done (International Benchmarking Network for Water and Sanitation Utilities, 2011).

In the context of drinking water, the main concerns of the customers are the quality, quantity, frequency and price of the water that the water utility provides to them. Water has a number of attributes in terms of quality that the customers regard as very important namely odor, appearance and taste. In terms of quantity of water the customers want a reliable and continuous water supply free from breakdowns and low pressure problems. The price of water is more important and consequential to the customers belonging to the lower segment of the society than the affluent ones. In the interest of equity it is, therefore, essential for the water supplier to design the tariff in such a manner that almost everyone can afford to pay for such vital resource as water and at the same time sufficient money should be available for carrying out improvements in the water services such as expansion of coverage of the existing network and ostensible betterment in the quality, quantity and frequency.

## **1.2 Problem Statement**

Lahore's water supply systems are characterized by low pressure, intermittent water supply (8-10 hrs a day), low per capita water supplied per day, pollution of the clean drinking water through sewerage water entering the old and rusty water pipelines, and low responsiveness to customer complaints. In Lahore (population 5.5 million), 40% of the water supply is unfiltered and 60% of effluents are untreated. In Lahore there is no sewage treatment and only 3 out of 100 industries chemically treat their wastewater. In the first half of 2006, although the Cantonment area was less affected, incidents of outbreak of waterborne diseases were observed in the Lahore district as a result of sewage and industrial waste leaking into drinking water through damaged pipes (JICA, 2009).

Ever since it came into existence in 1876, Lahore Cantonment Board (hereinafter called as LCB), the local government in the Cantonment area, is charged with the responsibility of providing clean drinking water to the civilian residents of the Cantonment area spread over 60 square kilometers. With a population of fewer than 50,000 at the time of independence of the Country in 1947, the Lahore Cantonment has grown rapidly due to urbanization and population boom in the last sixty four years. The population of Lahore Cantonment stands at 268,166 as of 2011. Lacking in any fresh water waterway passing through its area of jurisdiction, the LCB relies solely on ground water for its water supply. LCB's 57 tube wells feed around 18.65 Million gallons of water daily to the water supply network of around 540,706 running feet (Lahore Cantonment Board, 2005).

In Pakistan, WHO standards have been applied as the regulations for the drinking water but some quality parameters of the standards are not suitable considering the water quality conditions of Pakistan. For instance, a number of tube-wells in Pakistan are regarded as "unfit" for drinking water in light of the WHO standards of Arsenic 10 parts per billion (0.010 mg/l) due to the high concentration of Arsenic observed in groundwater. Under the circumstances, the new regulation "National Standards for Drinking Water Quality" has been prepared by Environmental

Protection Agency in collaboration with the Ministry of Health, WHO and UNICEF in June 2008 but it has no backing of law and serves merely as a guideline (JICA, 2009). This situation combined with factors given in the above said paragraph is a cause for concern for the customers who have started feeling insecure. Intermittent supply and lack of proper water treatment facilities can result into pathogens entering the network through rusty and leaky pipes and leading to an outbreak of water-borne diseases of the likes of diarrhea, cholera and hepatitis.

Pakistan's federal government has not been able to increase the power generation substantially in the past decade and as a result the gap between the demand and supply has been increasing by leaps and bounds. At present Pakistan is in the grip of a very serious power shortage crisis which shows no signs of abatement with the situation getting from bad to worse with each passing year. This situation makes it increasingly difficult for the water supply utilities to cope with the ever growing needs and requirements of their customers. The gravity of the situation can be gauged from the fact that in 2007 the power failure for load management was two hours a day but since then the state of affairs has deteriorated by the year increasing the frequency of power failures.

During 2010 there were areas in Lahore Cantonment that got on average power supply of 3 to 12 hours, with power failures of 3 to 15 times a day, and power failure duration time of about one hour per failure (JICA, 2009). The power supply condition in the rainy season is roughly half of that of the dry season. The predicaments for the LCB are at their worst especially during the dry season when its capacity to pump water is most seriously compromised. Although the LESCO (Lahore Electric Supply Company Limited) disseminates information on weekly programmed power failure to the local governments, devising a water supply schedule in the light of the power plan is never easy. The customers suffer grievously on account of shortage of water quantity required for domestic purposes and the intermittent water supply. In such a scenario the customers are left with no other option but to go for inconvenient alternatives such as getting water from public taps or to buy generators and pump water out through domestic boreholes. This is leading to a growing customers' dissatisfaction with LCB's water supply performance.

A number of factors are responsible for the growing customers' dissatisfaction with LCB and one of them is low level of responsiveness to the customers' grievances. The LCB has a Public Facilitation Centre at their main office with a one window operation to catalogue and register complaints from the customers. Depending upon the nature of the complaints this system is meant to minimize public inconvenience by reducing the overall response time for the remedial measures to be taken by the staff of LCB. Apart from the Public Facilitation Centre, the customers can also lodge their complaints via email, phone or post. A common grouse of the customers is that although they face no problem in getting their complaints registered, it is the response time of the maintenance staff and the lack of properly qualified personnel that leave a lot to desire.

Since the military takeover of the country in 1999, the LCB has not had democratically elected representatives, although the democratic institutions were restored later on in the provinces. In the absence of elective bodies, councilors nominated by the Government are performing the functions of elected councilors but the mere fact that they do not represent the will of the people makes for a weak link between them and the residents of the Lahore Cantonment. As a result of this situation the LCB has been deprived of the advantage of getting a direct feedback from the residents/customers making it difficult for LCB to improve its service delivery.

The LCB does not use water meters anywhere in the Lahore Cantonment. The LCB charges fixed monthly water tariff from its customers depending upon the area of the house. The monthly tariff for very small residential units measuring up to 3 Marlas is as low as Rs 75 whereas for large ones up to 3 Kanals it is Rs 400 only (Lahore Cantonment Board, 2005). Although the tariffs are low and affordable to a vast majority, the people have serious reservations regarding water's quality, quantity and quantity and LCB's responsiveness to their grievances and complaints.

### **1.3 Justification of Study**

I am a member of the central superior services of Pakistan and am currently serving in the Cantonments Department. The topic of the research emanates from a genuine desire to ascertain about the state of customers' satisfaction with the clean drinking water services as I sincerely believe that this knowledge will lead to an increased understanding of how the customers perceive their services and what they actually want. Whilst the LCB tries its best to provide good quality services to its customers, it is very vital for it to know what the customers want and what they feel about the existing level of services being provided to them.

Once the results of the study are known I intend to share the same with the LCB authorities with a view to improving their services because at the moment not knowing what the customers think of the water service, meeting the demands of growing customers in terms of quality, quantity, continuity, price of water and handling of their complaints etc is a challenge that the LCB has to grapple with. This important information will form the basis of designing an effective and efficient service for the customers.

Writing a thesis is compulsory for all master's degree students. By so doing I will be able to fulfill the requisite criteria to earn my degree in addition to developing understanding about "customers' satisfaction" which is a very important aspect of Urban Infrastructure but it something which is oftentimes ignored in my part of the world.

### **1.4 Research Objectives**

To find out whether the customers are satisfied or not with the clean drinking water provided by the Lahore Cantonment Board (LCB)?

## **1.5 Research Questions**

1. Are the customers satisfied with the clean drinking water supplied by the LCB?
2. What are the main aspects of the clean drinking water that the customers have complaints against such as quality, quantity, continuity and price?
3. Are the customers satisfied with the responsiveness of LCB to their complaints?

## **1.6 Hypothesis**

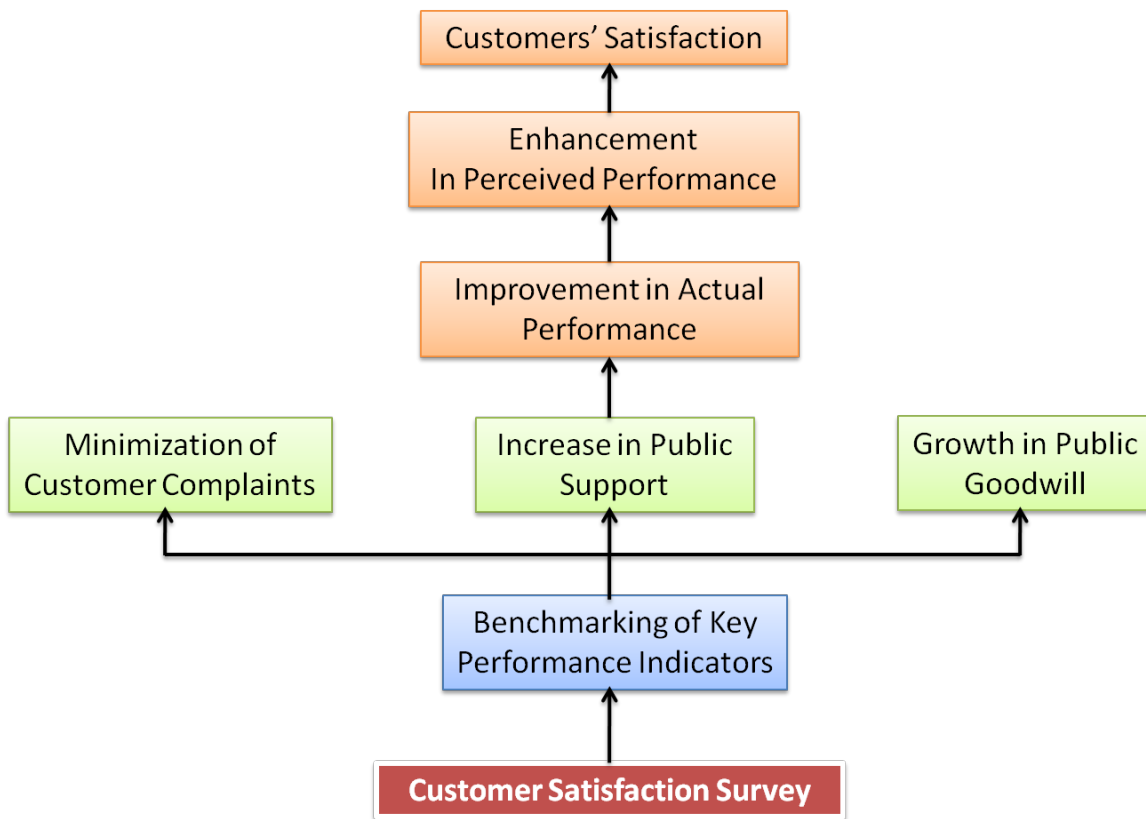
A majority of customers are not satisfied with the clean drinking water provided by the LCB!

## **1.7 Conceptual Framework**

Water supply services are central to household activities and economic production. The growing demands on freshwater resources create an urgent need for improved water management. It is an anomaly that although water utility companies around the world claim that their ultimate aim is to provide quality water services to their customers, very little is actually done on ground to know whether customers are satisfied with the goods and services provided to them. Public utilities continue to evaluate their own performance on the basis of objective tools such as net profit, return on investment, current ratio etc however this approach is not proper since this focuses too much on the fiscal perspective and is therefore more fit for 'for profit' organizations. For public utilities subjective tool such as customer satisfaction actually complements the above-said objective performance evaluation tools and can be very helpful as it takes into account the needs and preferences of the customers.

Consumer satisfaction is closely related to acceptance and preferences of the customers. Satisfaction is the fulfillment of the desire for a stated good or service. The extent to which a consumer is satisfied with a good or service is therefore determined by the perceived performance of the utility which is an evaluation of that good or service in the light of consumer's needs. The perceived performance depend upon two main factors i.e. customers' expectations and the actual performance of the public service utility. Expectations depend upon the socio-economic background of the customers as well as their personal characteristics such as education, living standard and their willingness to put up with adverse situations whereas the performance of a water utility depends upon the actual level of service such as the quality, quantity and continuity, pricing of water, and handling of customer complaints.

**Figure 1. 1: Conceptual Framework**



**Source: Self Construct**

If the utilities know what customers regard as important and if the utilities are able to gauge to what extent their customers are satisfied, they can devise strategies aimed at improving the aspects of services vital to the customers. Therefore it is of paramount importance for the utilities and organizations to find out through a customers' satisfaction survey as to how they are faring in terms of customer satisfaction. This knowledge can be instrumental in minimizing customer complaints, maintaining goodwill towards the utility, and increasing public support for utility improvement initiatives. An actual improvement in the performance of utility will result in enhancement of perceived performance in customers that in turn will lead to overall customers' satisfaction.

Nowadays the public utilities are increasingly adopting benchmarking concepts with a view to comparing their own practices and processes with top performers in the same trade. In the context of customer satisfaction this approach helps them to identify and adopt key performance indicators related to the parameters that are of main concern to the customers such as quality, quantity, continuity and pricing of water, and handling of customer complaints.

## **1.8 Thesis Structure**

The Structure of the thesis is as follows:

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Site Description

Chapter 4: Research Methods

Chapter 5: Results and Discussion

Chapter 6: Conclusion

References

Annexures

## **Chapter 2 Literature Review**

### **2.1 Water**

Water is vital for human survival. There cannot be a concept of life without water. Human beings must consume at least two and a half liters of water daily to lead a healthy life. Water sustains life through such vital processes as respiration and photosynthesis by conversion of energy into usable forms. Without this important resource no livestock can be sustained nor vegetation be grown therefore it can be said that no food can be produced without water. Humans have changed this natural resource into a social resource by including it into almost every kind of activity making it absolutely essential for economic development, health, environmental sustainability and social welfare.

Although three-quarters of the earth's surface is covered with water but since most of it is in seas and oceans and is therefore unfit for human consumption, irrigation and agricultural activities. Less than 1% of world's fresh water is readily available for direct human use making it a very scarce resource indeed. Since the latter half of the twentieth century, there has been an exponential rise in the withdrawal and consumption of water owing to phenomenal increase in world population especially in the urban areas, rising living standards, energy production, industrial growth, expansion of agricultural land and multiplication of waste disposal infrastructure. As a result of the above said activities, water crisis has started to manifest itself and becoming pronounced in certain places in the world (Jain & Singh, 2010).

### **2.2 Public Good**

In terms of economic and social characteristics, water will qualify for being a public good. A pure public good is characterized by non-exclusion and non-rivalry in consumption (Samuelson, 1955)- it is something for which it is technically impossible or prohibitively expensive to exclude beneficiaries, and for which the marginal cost of an individual consuming the good is zero. Moreover, benefits emanating from such goods are also of an external nature and therefore not limited to the particular customer who purchases them, but are extended to others as well. On the basis of this definition, public provision of such goods is necessary.

### **2.3 Customer Satisfaction**

It is the very nature of this commodity that makes the customer satisfaction so important. Water is a lifeline whose importance is felt only when people cannot get enough of it. It is keeping this in mind that urban water distribution networks are designed to supply water for household customers as well as industrial concerns twenty four hours a day, three sixty five days of the year. Any disruption or inconsistency in this service even though for a short while has an unpleasant effect on all sorts of customers.



There is a great pressure on the water delivering agencies to ensure customer satisfaction. One of the most relevant aspects of water services therefore is the important role of customers. Water supply agencies as well as their regulators are becoming increasingly sensitive to customer protection issues and customers' opinions about the service quality and performance (Aini, Fakhru'l-Razi, & Suan, 2001).

OFWAT, the water services regulatory authority in England and Wales, gives standards of service that contains service quality indicators measuring the water quality performance and level of service performance plus customer satisfaction. The OFWAT measures water quality performance by putting the samples taken at tap to rigorous laboratory tests for presence of contaminants and checking the physical appearance etc. The service performance is measured by pressure, leakages and water supply interruptions for longer than four hours. On the other hand customer satisfaction is ensured by setting up a 'guaranteed standard scheme' and if a company fails to meet any of the guaranteed standards, customers are entitled to a payment such as company not keeping an appointment, failure to maintain pressure, interruption of supply without prior notice, supply not restored within a stipulated time, failure to disseminate information about changes in service/payment arrangements, failure to respond to complaints etc. There is even a guarantee on behalf of the water company to make payments to customers in cases of drought. There are also comprehensive guidelines issued by the OFWAT to the water companies for the disabled, chronically sick and elderly customers (OFWAT, Household Consumers, 2011).

The situation is quite different in third world where in many countries public sector organizations are entrusted with the responsibility of delivering services to the residents of an area such as water supply, solid waste collection and disposal, roads, irrigation, power supply etc but the focus on customers' needs and satisfaction is very little. As a result customers are dissatisfied with the poor quality of service delivered. Customer dissatisfaction resulting from not having a demand orientation leads to wasted investments, lost economic production and low willingness to pay for the services (Fox, 1994).

## **2.4 Institutional arrangements in water sector**

Water utilities can be provided by the public or the private sector. On a global scale, around 90% of water utilities are owned and operated by the Governments whether local, provincial or national. Even in developed countries, government ownership accounts for more than 75%, barring the US, the UK, France and Germany (Madhoo, 2007).

Privatization is often considered to be beneficial in terms of expansion of access and improvement of service operations but the mere concept of privatization raises social concerns in developing countries. Moreover private investments have lagged behind in the water services where:

- Technological changes have straggled relative to energy and telecommunications
- The bulk of the assets are fixed and long-lived
- Current prices are lower than operating cost
- Reforms are met with stiff political resistance
- Local governments have traditionally played a strong role in the provision of services

In spite of these hurdles private participation in water sector has grown significantly in the 1990s as 43 developing countries (mostly in the Latin America/Caribbean and East Asia/Pacific regions) awarded more than two hundred projects with private participation, attracting investment commitments of almost \$40 billion (Lin, 2005) .

In case of private sector involvement, the government plays the role of a regulator. For the private sector's participation in the water sector, several arrangements exist and the same can be divided into the following broad categories i.e. divestiture, public ownership with private provision, and community provision.

Divestiture includes selling of shares (partially or fully) to a private entity which then collects fees and incurs capital and recurring expenditure on the water utilities. The government only regulates the industry. In the second alternative the ownership remains with the government which contracts out the water delivery through such arrangements as lease contracts or concessions by competitive bidding. The main aim of the government is to introduce competition in water activities that do not have monopoly characteristics.

The third form of private involvement is community provision. This form of provision works well at a local small-scale and the examples can be community water supply and sanitation. The success of such initiatives is dependent upon user involvement in the decision making process (Madhoo, 2007).

## **2.5 Institutional capacity building for water sector development**

Capacity building is a global concept and one of the very important elements in the development of water sector. It is a process that must go on continuously and must encompass each and every activity. Only a satisfactory level of institutional capacity can ensure better management of water resources and efficient allocation of water among the customers. In the context of third world countries lack of institutional capacity of water providers is a foremost cause of ineffective and unsustainable water services therefore development of institutional capacity is the order of the day. Each country and region has its peculiar conditions and requirements so the water sector

capacity building strategies must be tailored to meet their requirements (Hamdya, Abu-Zeid, & Lacirignola, 1998) .

## **2.6 Service Quality:**

Service quality refers to either specific or a broader definition. It is associated with physical appearance of water, turbidity, odor and its taste, presence of chemical and microbiological substances (contaminants) in the water supplied (Tebbutt, 2002).

The dimensions to water service quality include:

- the quality of the water itself, the frequency and length of interruptions and repairs,
- the courtesy of personnel to the public and their response to customer complaints,
- the system distribution pressure,
- the degree to which system expansion is geared to the pace of municipal development,
- the ability of the system to meet peak demand,
- the adequacy of fire protection installations provided for the city (Kitchen, 1975).

Service provider needs to identify the expectations of target customers concerning service quality because expectation of customers vary and differ greatly from one to another. Those service providers who fail to take into account their customers' demands find it increasingly difficult to ensure service quality. To overcome this difficulty it is extremely important that service providers clearly define and communicate the service quality that will be provided to the customers so that the employees have a fair idea of what they must deliver and customers know what they will get. A failure to maintain service quality leads to discontented users and the resultant customer dissatisfaction brings about low willingness to pay and underutilized services. (Kotler & Armstrong, 2010).

## **2.7 Performance Evaluation tools of Public Service Delivery**

In order to measure the efficiency and effectiveness of public services certain performance evaluation tools are required. The performance evaluation tools are normally based on objective indicators such as net profit, return on investment, current ratio etc. These indicators may be useful in their own right but they are more instrumental in giving an insight into the performance of 'for profit' organizations from a purely fiscal perspective.

It has been recognized that it is neither sufficient to evaluate organizations on the basis of profits they make in a given time nor is it enough to assess their performance on the basis of output generated with a given input of resources. Therefore it is of paramount importance for the organizations and their assessors to find out how the organizations are faring in terms of customer satisfaction i.e. satisfying the needs of and taking care of the preferences of the customers. Customer satisfaction is a subjective tool of performance evaluation which is very often ignored and thus less developed.

As a means of measuring the effectiveness of public service delivery agencies, 'subjective' tools such as customer-satisfaction do not supersede, but rather complement the 'objective' tools given above. Customer satisfaction goes on to subjectively evaluate the various attributes of a good service that the customer consumes. The product dimensions of the urban public services can be summarized in broad categories as given below:

- (1) Cost (the net cost of the service to customer);
- (2) Responsiveness (the extent to which customer's requests are addressed on a timely basis);
- (3) Access (including availability of the service and the ease with which it can be obtained);
- (4) Quality (including the service's reliability); and
- (5) Information (including the extent to which the customer is made aware of how to take maximum advantage of the service at minimum cost).

A subjective tool such as customer satisfaction that deals with what people feelings is best measured by a subjective device like surveys since it gives the opportunity to collect information directly from the customers themselves (Njoh, 1994).

## **2.8 Determinants of Customer Satisfaction**

Customer satisfaction is seen as one of the most effective means for assessing the quality of urban public service delivery. The reason why customer satisfaction can be so crucial is that it has the potential of enhancing responsiveness of and increasing accountability from the service providers especially in a scenario where there are no alternate suppliers of services due to natural monopoly or regulation.

How do we determine customer satisfaction? The major determinants of satisfaction are the customers' circumstances, aspirations, comparison with others and their 'baseline happiness'. When the main aim is to evaluate the public service delivery, the circumstances and aspirations of the customers correspond to the performance and expectations. Performance is the actual level of service received by the customers whereas the expectations depend upon their personal

characteristics such as education and living standard but they are also influenced by the above-given determinants of comparison of services with that of others and their willingness to put up with adverse situations.

There are two models of customer satisfaction that differ on account of the relationship between performance and expectations. In the disconfirmation model satisfaction is the gap between the performance and expectation. If performance of the public service utilities is equal to or higher than expectation, the customers are satisfied and if their expectation outweighs the performance they are dissatisfied. In this model, the performance does not affect the satisfaction directly as the former is dependent upon expectations. Therefore this implies that a people belonging to the poor segment of the society with low expectations may find the below average performance satisfactory as it exceeds their expectation. This poor household may be as satisfied with the appalling service delivery as a rich household with high expectations and much better service. In the disconfirmation model, expectations thus serve as the standard of reference about what the public service utility should deliver.

An alternative to the disconfirmation model is a performance model in which satisfaction is influenced positively by both performance and expectation. This model assumes that expectation serves as an anchor to performance which then goes on to determine satisfaction i.e. the customers keep adjusting their expectations as they experience the public utilities and by so doing they have a realistic idea of what the service provider will deliver. This means that the performance and expectations will never vary to a great extent and in this manner both can be positively related to the extent of satisfaction (Deichmann & Lall, 2007).

## **2.9 Benchmarking**

The World Bank WSP (Water and Sanitation Program) define benchmarking as “a systematic search for industry best practices leading to superior performance” (World Bank Water and Sanitation Program, 2009). The Oxford Online Dictionary defines benchmark as ‘a standard or point of reference against which things may be compared’. The concept of benchmarking came into being during the 1980s as a result of developments in the corporate sector and when business world found out that comparison was actually beneficial. The corporate sector compared their own processes with those of top performance and this helped them identify and adopt best practices to improve their own processes. Later on the public sector followed suit. The mere collection of data is not benchmarking, but is an integral step in the benchmarking path to improved performance.

According to World Bank’s International Benchmarking Network for Water and Sanitation Utilities (IBNET), a social and economic good such as water needs to be managed professionally in order to put more value on water services. For this purpose the water management should have clear objectives, there should be comparison between targets and results, and correction of the

causes of deviations. In order to achieve efficiency, enhance their performance and to be more competitive, the managements need benchmarking as a comparative tool. Benchmarking involves comparing utilities based on chosen parameters that represent utility efficiency and performance. It also involves finding out how others do business, whether they are more efficient than others and whether they understand and use their methods. In order to measure something, a standardized instrument of comparison is a must. The first step therefore in implementing a competitive benchmarking program is the development of relevant, quantifiable and objective standards (International Benchmarking Network for Water and Sanitation Utilities, 2011).

Two forms of benchmarking are used in the public sector. The most common form of benchmarking used in the public sector is the comparison of performance statistics as benchmarks. These benchmarks are based on professionally adopted standards, professional norms fixed by the state or a reputable international institution or targets or goals attained by counterparts. Less commonly used form is the development of targets as benchmarks which involves developing a vision for the community and identifying conditions that reflect that vision (Ammons, Coe, & Lombardo, 2001).

The WSP describes two types of benchmarking which complement each other and are being currently used by water utilities in South Asia namely ‘Metric benchmarking’ and ‘Process benchmarking’. The metric benchmarking relies on the simple analysis of ratio of inputs to outputs such as cost per cubic meter, number of staff per 1,000 water connections etc. With the gradual improvements in quality and reliability of data more sophisticated techniques such as regression analysis can also be used in metric benchmarking. Process benchmarking focuses on how to change the way things are done. In this case processes linked with targets are analyzed step by step and compared against those in best organizations. In this manner the comparative assessment of internal processes helps achieve improvements through a more streamlined approach. As per the World Bank more and more water utilities are adopting ‘process benchmarking’ to fine-tune performance improvements (World Bank Water and Sanitation Program, 2010).

## **2.10 Benchmarking and Performance Indicators for customer satisfaction**

OFWAT, the water industry regulator in England and Wales has developed metric benchmarking that sets out a number of performance indicators for all the stakeholders in the water services including customers (OFWAT, Household Consumers, 2011). These performance indicators are given hereunder:

- Level of household tariffs
- Level of large user-tariff

- Percentage of properties at risk of low pressure
- Number of unplanned interruptions of more than a few hours
- Number of complaints per 1000 customers
- Percentage of complaints cleared in a day
- Number and duration of supply restrictions

In addition to a number of key performance indicators similar to the ones mentioned above, the South African Association of Water Utilities (SAAWU) and Water Utility Partnership (WUP) Survey have identified certain other key performance indicators for customer satisfaction. These are ‘recording the customer complaints, conducting a customer survey to identify customer demand and needs’ (Ramjatan, Dlamini, Tiba, & Pillay, 2007).

## 2.11 Measuring Satisfaction

Consumer satisfaction is closely related to acceptance and preferences of the customers. Satisfaction is the fulfillment of the desire for a stated good or service. The extent to which a consumer is satisfied with a good or service is therefore determined by the perceived performance of the utility which is an evaluation of that good or service in the light of consumer’s needs. If the utilities know what customers regard as important and if the utilities are able to gauge to what extent their customers are satisfied, they can devise strategies aimed at improving the aspects of services vital to the customers.

One method that seeks to acknowledge the linkage between customers’ expectations and utilities’ performance and seeks to measure satisfaction by taking into account the gap between the expectations and performance is the SERVQUAL method. The greater the positive gap between the performance and the expectations the better the service and vice versa. This model identifies empirical factors that determine the quality of provided service as perceived by the customers:

- *External Characteristics or Tangibles* e.g. the taste of drinking water
- *Reliability* of the service
- *Responsiveness* to complaints etc
- *Assurance* i.e. the knowledge and politeness of the personnel

- *Empathy* measures whether the utility cares for the customers.

Documenting performance on the basis of the above dimensions and by using the above-said model, the utilities can usher in procedures that lead to changes that affect customer attitudes and improve service quality (Vloerbergh, Fife-Schaw, Kelay, Chenoweth, Morrison, & Lundehn, 2007).

## **2.12 Water Pricing**

As the population of the world continues to grow and the needs and requirements of the people increase, there is a demand for larger quantities of water but it is becoming very costly to develop new water supplies. In order to meet the growing demands at a reasonable cost, policy makers all over the world are grappled with the uphill task of exploring ways and means to allocate existing water supplies efficiently and at the same time to encourage the users to conserve water.

Pricing of water is thus one way to improve water allocation and encourage thriftiness in the use of water. Prices that reflect water's economic or scarcity value give important information to the users which they in turn use to make informed choices and in this manner water pricing affects water use efficiency at both the individual as well as societal level (Dinar & Subramanian, 1988).

The developing countries are committing large financial inputs and human resources to improve water supply in the urban areas but financial constraints make the task very difficult. In order to meet the future demands and to maintain the quality of service, it is imperative to devise innovative financial arrangements. The major source of revenue of the water utilities is the revenue that comes from the customers therefore major improvements in the service cannot be planned until and unless the customers are willing to pay more for the service.

In order to know whether the customers are willing to pay more in near future and what role customer satisfaction would have in this scenario, the metropolitan government in Mumbai, one of the megacities in India, conducted a sample survey in 2001 in which two types of customers were targeted i.e. the slum dwellers and those living in multi-storied buildings and independent bungalows and row houses. The survey revealed that the satisfaction level of the customers did not influence the odds in favour of willingness to pay more. Affordability was a major factor in slums where people expressed their inability to pay more even if there were to be improvement in the service. The other category of customers were willing to pay more for improved services if the utility was able to restore its faith amongst the customers by ensuring transparency in project operations, utilization of funds and its sustainability in the future. As seen above, the customer satisfaction plays a very little role in the willingness to pay more of the customers: for the poorer segments of the society, it is affordability that is foremost important whereas for the affluent



classes the measure of confidence and trust in drinking water supplies and the water utility's ability to produce and ensure safe drinking water plays a vital role.

For water utilities intending to increase water prices with a view to improving its services two important issues are worth considering. In view of the affordability issue of the lower stratum of the society a step wise marginal increase in the water price would be the right strategy to invite minimum resistance from these people. As far as the elite of the society is concerned, water utilities have to put more efforts in order to restore faith among them (Raje, Dhobe, & Deshpande, 2002).

### **2.13 Water Metering**

Water pricing works as a demand management instrument to the extent that connections are metered, and that people actually pay for services, and that they have incentives to pay (Rai, 2011). Water metering and meter reading exercise carried out every month may be expensive but is absolutely necessary for volumetric tariffs. Without it volumetric tariffs become redundant and useless taking away the economic incentive for water conservation. Water metering encourages conservation and can be very effective in areas that are facing acute water shortage.

### **2.14 Water Quality and Customer Satisfaction**

Owing to an increase in awareness about such issues as environmental pollution and instances of waterborne disease outbreaks, public concern over the quality of water they drink has grown sharply (Turgeon, Rodriguez, Theriault, & Levallois, 2004).

The Millennium Development Goal target 7c calls for reducing by half the proportion of people without sustainable access to safe drinking-water and basic sanitation by 2015. Reaching this target implies, inter alia, tackling both the quality (safety) dimensions of drinking-water provision (WHO, Guidelines for Drinking-water Quality, 2008).

Water scarcity forces the people to rely on unsafe sources of drinking water. Poor water quality can increase the risk of such diarrheal diseases as cholera, typhoid fever and dysentery, and other water-borne infections. Water scarcity can also lead to diseases such as trachoma (an eye infection that can lead to blindness), plague and typhus (WHO, Ten Facts About Water Scarcity, 2011).

Water has a number of attributes in terms of quality that the customers regard as very important namely odor, appearance and taste. On the face of it the taste, colour and smell have aesthetic nature but actually the customers consider them as important indicators of safety of the water they consume. In the National Customer Water Quality Survey carried out in 1999 in the United States it was found out that 60% of the respondents actually believe that the quality of water they consume has a direct bearing on their health. In the same survey about 50% of the respondents

expressed their concerns about the contaminants in the water supply that could affect their health; in 2001 survey, this percentage of people swelled to 86%. The growing sensitivity and concern of the people regarding water quality can be gauged from the fact that a majority of respondents said that they were willing to pay more for the water to remove contaminants found in their water supply (Dupont, 2004).

There are examples of organizations in developing countries that too are following into the footsteps of the developed countries by benchmarking key performance indicators pertaining to quality in order to continuously improve their performance and to adopt best practices. In this regard, the South African Association of Water Utilities (SAAWU) and Water Utility Partnership (WUP) Survey are noteworthy in that these organizations have undertaken a more rigorous benchmarking drill that covered key performance aspects which had not been covered sufficiently in past. Through this approach, the best and worst performers have been exposed merely on the basis of benchmarking of quality indicators such as routine monitoring of raw water quality. It has been established that those utilities that routinely monitor the quality of raw water or that of main water sources are going to have very advance warning of water quality problems and this will help prevent adverse public health incidents. Similarly routine monitoring of water quality at various points in the distribution system, percentage of samples failing to meet quality standards and promotion of public health education are other parameters that help steer water utilities toward continuous improvement in their water quality (Ramjatan, Dlamini, Tiba, & Pillay, 2007).

Information on water quality is important in building public trust in water systems. Information must be understandable, current and readily accessible. To build full trust, information needs to be available both from the water utility and the regulator. In order to ensure customer satisfaction the water utility companies in the developed countries take their customers into confidence regarding the quality of water being supplied to them i.e. they have to prove it to their customers that the water is safe to drink. In United Kingdom the water utilities are required by law to submit water samples for laboratory testing to ensure compliance with water quality standards. The Chief Inspectorate of Drinking Water then tests the water samples for their adherence to strict European Union water quality standards and publishes a summary of the same each year. OFWAT, the Office of Water Services, highlights the results of the individual companies and notes their performance in respect of meeting the water quality standards. The publication of results is thus made available to the customers in a highly accessible manner enabling them to evaluate the companies (OFWAT, Levels of Service for the Water Industry in England and Wales, 2002-2003 Report, 2003).

The same is the case in the USA where a law called Safe Drinking Water Act (SDWA) was passed in 1996 which includes provisions that recognize the consumers' right-to-know. The consumers' right-to-know is based on the belief that public support and accountability to the public are of utmost importance as far as addressing threats to drinking water quality and

prevention of future threats is concerned. Under this law, the Environment Protection Agency publishes Consumer Confidence Reports (CCRs) with a view to enhancing the understanding of the individual about the sources of his drinking water. The CCRs encourage a dialogue between consumers and their water providers and increase the level of involvement of consumers with issues that affect their health and well being. The CCRs provide accurate and timely information to the consumers on their drinking water quality and this in turn helps raise consumer awareness, develop and maintain public confidence in water enabling the customers make informed decisions. A Gallup Survey revealed that 37% of the consumers received the report in mail or saw it in newspaper and 78% of those consumers took the time to read it. It was also discovered in the above said survey that 71% of the consumers said they were very confident about quality and safety of their tap water, 94% of them received information on possible contaminants that may affect the quality of their drinking water. Overall 71% of those who read the CCRs were satisfied with the information they received (U.S. Environmental Protection Agency, 2003).

## **2.15 Water Quantity, Continuity and Customer Satisfaction**

It would not be wrong to say that world is on the verge of a water crisis owing to a combination of such factors as population explosion, growing industrial, agricultural activities and social inequalities. With the passage of time more and more people are facing water scarcity. In the context of developing countries large proportions of the population remain with little or no access to water services. The water services of the developing countries are characterized by low quantities, frequent breakdowns, low pressure etc (Deichmann & Lall, 2007).

Water has a number of different characteristics spanning quantity which in turn has a very strong relationship with customer satisfaction in a direct as well as indirect manner. In indirect manner it can be safely said that even the quality of water is dependent upon the quantity as the quality aspect comes into picture only after there is some quantity of water that can be allocated for use. In addition to caring about the quality attributes, customers want a reliable and continuous water supply free from breakdowns and low pressure problems (Dupont, 2004).

A survey was carried out in 2005 in Gaza Strip to investigate the degree of customers' satisfaction with water supply services and to ascertain by what aspects of water quantity they were most affected. In the questionnaire distributed amongst the targeted population of Gaza Strip, the customers were asked about the reasons for their satisfaction or otherwise with the water quantity. In this survey the major reasons that came to fore regarding water quantity were concerns of customers due to frequent breakdown of water supply, shortage of water quantity required for domestic purposes, low pressure in the pipes and injustices done by the water authorities in distribution of water connections i.e. preference given to certain localities in terms of number of water connections (Al-Ghuraiz & Enshassi, 2006).

In 2002 as part of the UK Periodic Review of the water system 2,076 people were surveyed. Amongst other questions, respondents were asked to rate the importance of different components of water and sewerage services. These “characteristics” included both quality and quantity attributes, as well as attributes associated with the quality of water in the natural environment, such as maintenance of the quality of coastal waters and avoidance of sewage flooding. Respondents ranked a reliable and continuous water supply as the most highly rated service aspect. Pressure and appearance came in second and third (Dupont, 2004).

It is a well known fact that benchmarking of key performance indicators pertaining to quantity and continuity leads to improvement in the performance of organizations. It has been recognized that comparison of competitors with respect of quantity and continuity of water, and adoption and implementation of the best practices results into long term sustainability of the organization. SAAWU and WUP Survey have identified key performance indicators with respect to quantity and continuity aiming at comparing and contrasting the performance of major water utilities of Africa. These key performance indicators include per capita consumption of water, water conservation or water use reduction programmes in place, sufficiency of water resources that could meet demand into the future, unaccounted for water (UFW), availability of piped water supply (hours per day), recording of interruptions to supply etc. The standards with which the performance indicators are compared are taken from the UK. In case of per capita consumption of water per head per day the standard in the UK is 130 to 170 liters per head per day, for sufficiency of water resources the existing resources should meet UK standard of 10 years demand into the future, for UFW the UK standard is 10 to 20 % and the availability of piped water supply standard in the UK is 24 hours daily (Ramjatan, Dlamini, Tiba, & Pillay, 2007).

## **2.16 Redressal of customers’ complaints and customer satisfaction**

The concept of benchmarking has played an important role in introducing accountability of utilities. It involves continuous and systematic measurement of performance of utilities. Gaps in performance are identified and removed by introducing sharing of performance and implementation of best practices. The overall outcome is provision of better service to people.

In collaboration with the World Bank WSP, the Ministry of Urban Development of India has developed a handbook of service level benchmarking for water utilities. Among other key performance indicators, it also includes efficiency in redressal of public complaints. According to the above mentioned handbook, the water utilities must have effective mechanisms and systems for on time capture and resolution of customer complaint. Since water supply is an essential service, the benchmark time for redressal of customer complaints has been fixed at 24 hours or the next working day. A benchmark value of this indicator is dependent upon a number of factors such as size of the city, number of customers and the age of network, etc. The benchmark value for this indicator is 80.

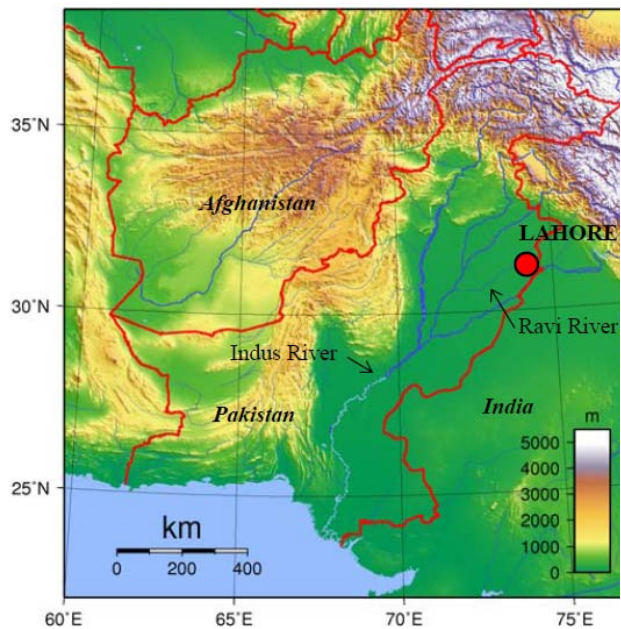
In order to maintain this efficiency level, it is vital that a record of all the water supply related complaints is maintained. The customers should be able to access the water utility through common phone numbers, written complaints, collection centers, drop boxes, online complaints on the website etc. The total number of water supply-related complaints that are satisfactorily redressed within 24 hours or the next working day, within a particular month expressed as a percentage of the total complaints lodged within that month will determine the efficiency of the utility. For the sake of transparency, building trust and confidence among the customers and for the accountability of the errant staff members, the satisfactory resolution of grievances should be endorsed by the complainant in writing on a proforma that is used to track complaints (Ministry of Urban Development, 2009).

SAAWU and WUP Survey have developed key performance indicators to compare the performance of water utilities. These key performance indicators include recording of customer complaints and conducting customer surveys to identify customer needs and demands. The customer surveys help in the identification and adoption of performance indicators that are directly related to aspects of main concern to customers such as quality, quantity and continuity, and importantly the redressal of grievances. The survey serves as an excellent confidence building tool and leads to an overall increase in customer satisfaction with their utility (Ramjatan, Dlamini, Tiba, & Pillay, 2007).

## Chapter 3 Site Description

### 3.1 Topography

Figure 3.1: Location map of Lahore District



Source: Water and Sanitation Lahore (WASA)

Lahore Cantonment is located on a flat alluvial plain on the left bank of River Ravi. Lahore Cantonment lies between  $31^{\circ} -15'$  and  $31^{\circ} -42'$  north latitude,  $74^{\circ} -01'$  and  $74^{\circ} -39'$  east longitude. Total area of the Lahore Cantonment is 60 km<sup>2</sup>. The general altitude of the area is about 208 to 213 meters above sea level (JICA, 2009).

### 3.2 Hydrogeology

Lahore Cantonment is underlain by unconsolidated alluvial deposits. The alluvial sands constitute the aquifer material. The aquifer is composed of unconsolidated alluvial of more than 400 meters thickness. Groundwater exists in 10 to 30 meters depth from ground level. Water source for drinking water is pumped up from underground at depths of 120 to 200 meters (JICA, 2009).

### 3.3 Climate

Weather condition in Lahore is shown in Table 1.1 and Figure 1.2. The summer season starts in April and continues till September. The hottest months are May, June and July. The maximum temperature rises to 40 degrees C. On the other hand, the lowest temperature in December, January and February is less than 10 degrees C (JICA, 2009).

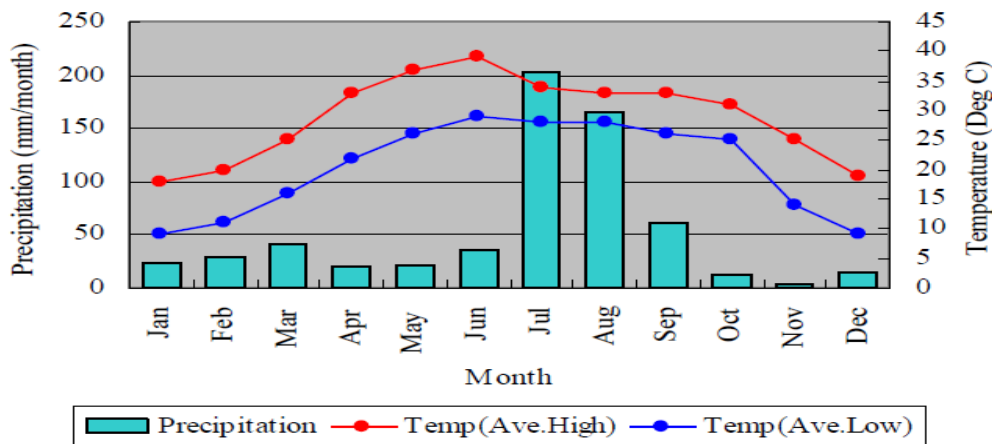
**Table 3.1 Temperature and Precipitation in Lahore**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Temperature (°C)	18	20	25	33	37	39	34	33	33	31	25	19	Ave. 29
: Ave. High	9	11	16	22	26	29	28	28	26	25	14	9	Ave. 20
: Ave. Low	23	29	41	20	22	37	202	164	61	12	4	14	629 mm
Precipitation	2	2	2	1	1	3	15	13	6	1	-	1	-
: Ave. mm/day													
: Ave. mm/month													

Source : <http://pportal.punjab.gov.pk>

The average annual rainfall in Lahore is about 629 mm. Maximum rainfall occurs in July and August when the monsoon depression travels westward. In this season, heavy rain may amount to 200 mm/month.

**Figure 3. 2: Temperature and Precipitation in Lahore**



Source: Water and Sanitation Lahore (WASA)

### 3.4 Population

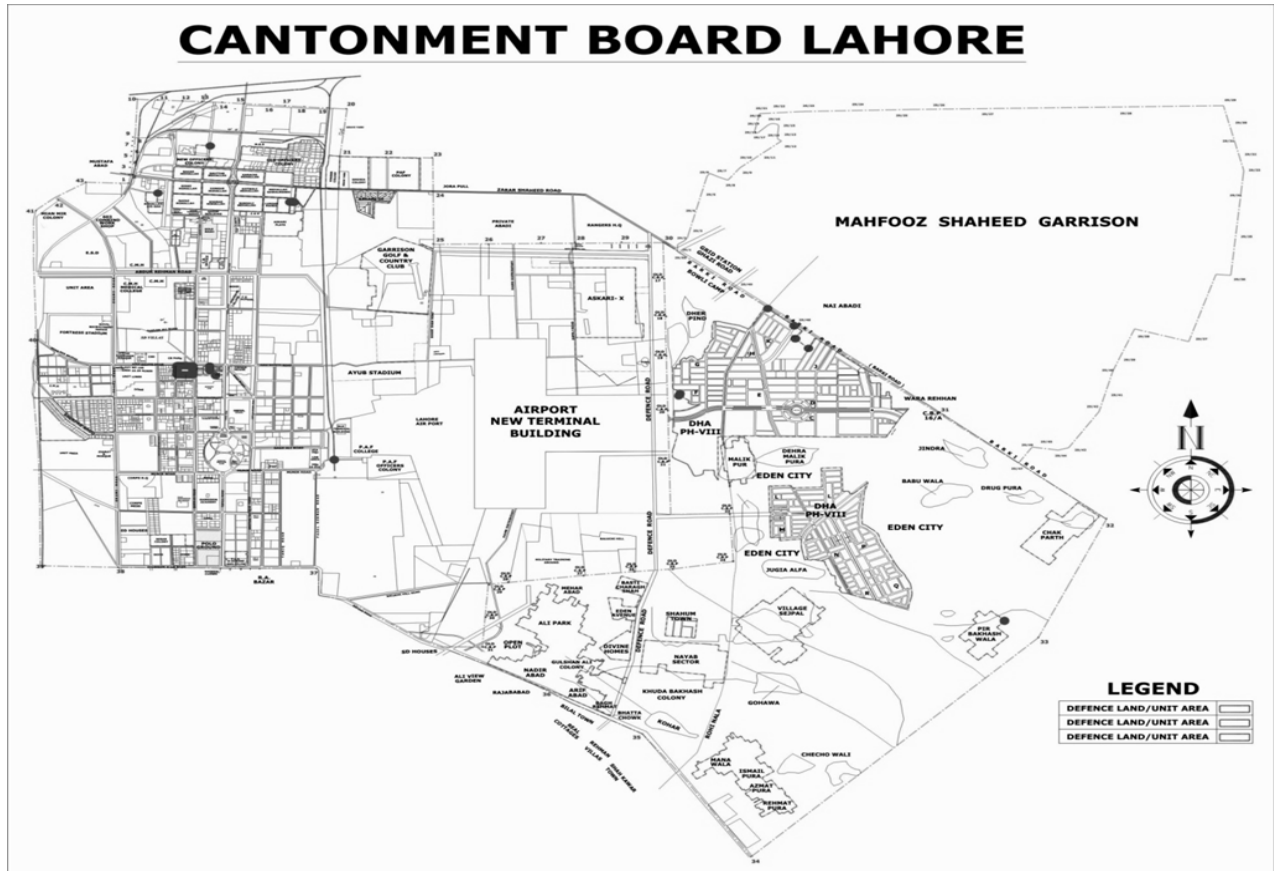
According to a preliminary survey house and population survey conducted by the Central Census Department in collaboration with the LCB, the present population of Lahore Cantonment is 268,166 as shown by secondary data obtained from the LCB.

### 3.5 Civil Administration

Lahore is the capital of the Pakistani province of Punjab and the second largest city in Pakistan, after Karachi. Lahore has two broad administrative areas namely the City District and the Cantonment,

administered by the provincial and the federal government respectively. For administrative convenience, in 1998, the Lahore Cantonment was subdivided into two cantonments namely Lahore Cantonment and the Walton Cantonment (JICA, 2009).

### 3.6 Map of Lahore Cantonment



### 3.7 Water Supply Network of LCB

The water supply network of the LCB comes under the ambit of the Engineering Branch which is headed by a Chief Engineer who is assisted by Engineers, Assistant Engineers and Supervisors. Down in the ladder of hierarchy is the technical staff comprising Tube-well Operators, Valve-men, Plumbers, helpers etc.

The water supply network of LCB comprises the following components:

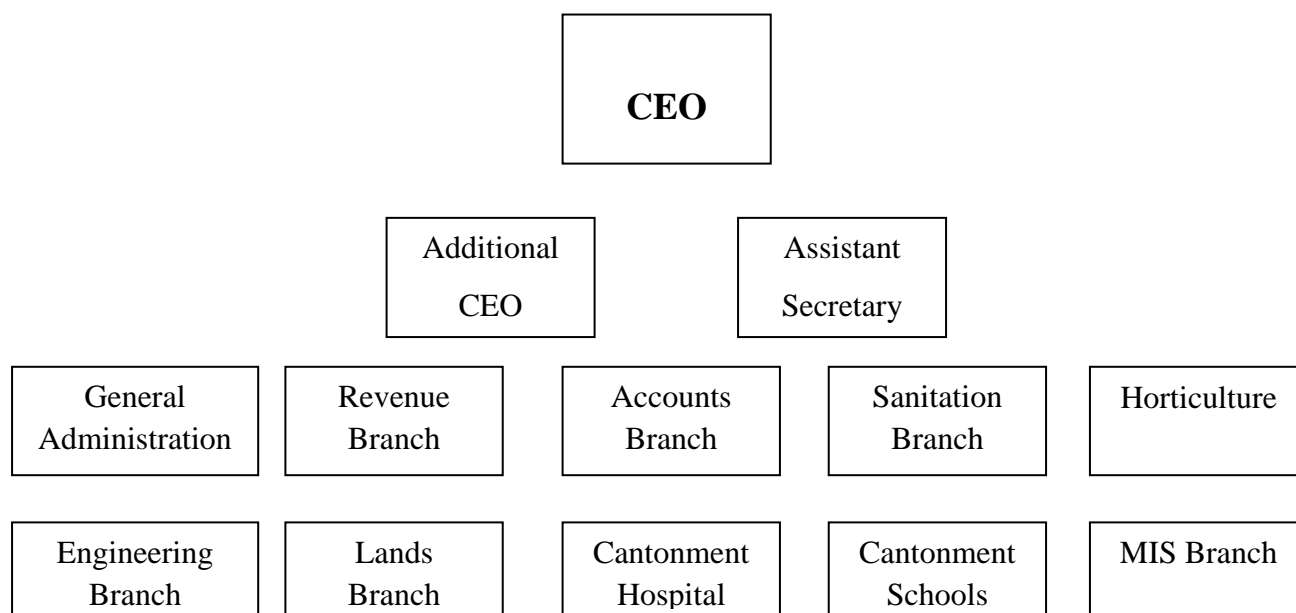
Tube-wells	57
Filtration Plants	15
Water Supply Network	540,706 Running Feet



### 3.8 Organizational Structure of LCB

The organizational structure of LCB is given hereunder in Figure 3.3.

Figure 3. 3: The organizational structure of LCB



### 3.9 Water Tariffs of LCB

A Schedule of tariffs enforced by the LCB with respect to houses of various sizes is given as under in Table 3.2:

Table 3. 2 showing the schedule of tariffs in Lahore Cantonment

Serial Number	Residential Category	Monthly Tariff
1	Up to 3 Marlas	Rs 75/-Per Month
2	Between 4 to 10 Marlas	Rs 100/-Per Month
3	Between 11 to 19 Marlas	Rs 150/- Per Month
4	Between 1 Kanal to 2 Kanals	Rs 300/- Per Month
5	Above 2 Kanals up to 3 Kanal	Rs 400/- Per Month
6	Above 3 Kanals	Rs 500/- Per Month

Source: LCB; 1 Euro = 122 Pakistani Rupees; 1 Acre = 8 Kanals; 1 Kanal = 20 Marlas

## **Chapter 4 Research Methods**

### **4.1 Type of Research, Strategies and Place**

The type of research was exploratory as it sought to find out whether the customers were satisfied or not with the clean drinking water provided by LCB. The survey strategy was used with households as units of analysis. Customer satisfaction could not be gauged without a process that involved asking them questions and then processing those answers. The trick was asking the right questions and getting the right answers. This survey served as a basic investigative tool in order to prove or disprove the hypothesis.

The research was carried out in Lahore Cantonment (population 2, 68,166) where two levels of households with respect to income were taken into consideration. Data was collected from two high income areas namely Askari IX and residential bungalows to the south of Alauddin Road, and two low income areas namely Bakkar Mohallah and Dongar Mohallah. The maps of the selected areas are placed in Annexure III.

### **4.2 Data Collection**

Data serves as the raw material and a basis for testing a hypothesis formulated in a research. Inferences based on imagination or conjecture cannot provide correct answers to the research questions. Data also provides the facts and figures that help form the tables and measurement scales which can then be analyzed with statistical techniques. Inferences based on results of statistical analyses provide the answers to research questions. The data was divided into two types of data namely secondary and primary data.

#### **4.2.1 Literature Study**

The secondary data was collected through visits to the Record Room of LCB and the information consisted of readily available compendia and already compiled statistical statements and reports of the LCB. Secondary data was based on published records and reports as well as unpublished records and information to be collected from LCB including total current population of the Lahore Cantonment, location of each tube well along with the yield, gallons of water supplied by the LCB per capita per day, total length of water supply network, maps of Lahore Cantonment and localities where survey was to be conducted, the managerial capacity of the LCB's water supply technical staff in terms of human resources, their educational level etc.

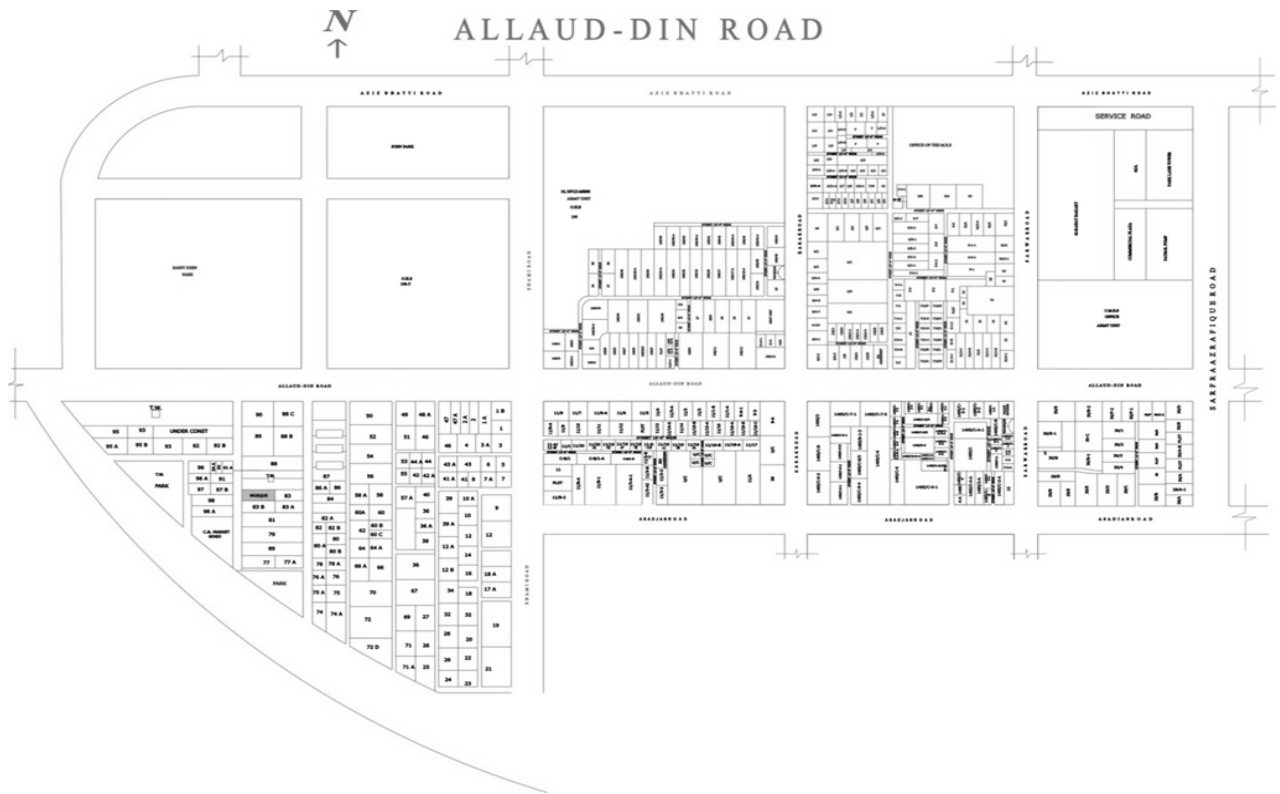
#### **4.2.2 Fieldwork**

Primary data is the first hand information collected directly from original sources. For this thesis, primary data was collected through fieldwork that lasted for about 25 days commencing on the 05<sup>th</sup> of July.

The sampling instruments were a combination of a survey with questionnaires, in-depth and semi-closed interviews. Survey with questionnaires were used in order to get the response of customers/respondents with regards to quality, quantity, pressure, continuity of water, disposal of complaints by the LCB authorities etc. Semi-structured and in-depth interviews were used to collect primary data from the officials of the LCB, and others.

- Questionnaire

Figure 4. 1: One of the high income areas chosen for survey with questionnaires



Survey strategy was used to collect data from the customers of LCB with the help of questionnaires. The primary data was collected from customers selected on the basis of random sampling. For this purpose each of the selected areas i.e. two high income areas namely Askari IX and residential bungalows to the south of Alauddin Road, and two low income areas namely Bakkar Mohallah and Dongar Mohallah were divided into 4 subsectors. For each subsector 5 streets were chosen by hazards and in this manner 50 households were selected each from the high and low income areas. Furthermore, it was decided to select every third house on each randomly selected street for survey with questionnaires. The maps of

the areas selected have been appended as Annexure III. The research sample included around 100 households with incomes separated into two categories: high and low.

- **Interviews**

Data from the LCB’s staff including the CEO of LCB, Water Supply Engineer and Supervisors, the nominated Councilor, representatives of local NGO and CBO, community leaders, representative of local business association etc were collected through in-depth and semi-structured interviews. The above-said respondents for the interviews were chosen based on purposive sampling as they were the key officials directly involved with water supply as well as important stakeholders of the area. The list of respondents interviewed is shown in Table 4.1 below:

**Table 4.1 List of respondents for Interviews**

Sr. No.	Name of official	Designation
1	Mr. Aftab Ahmad Asif	Chief Executive Officer
2	Mr. Mazhar Hussain	Assistant Water Supply Engineer
3	Mr. Arshad Hussain Shah	Water Supply Supervisor
4	Dr. Javed Asghar	Nominated Councilor for the entire Cantonment area
5	Mr. Ikhtlaq Hussain	Representative of Traders Association business association
6	Mr. Azmat-Asadi	Representative of local NGO, Apna Welfare Society
7	Mr. Zulfiqar Ahmad	Representative of the CBO of low income areas
8	Major (Retired) Usman Tikka	Secretary, Residents’ Committee Askari 9.
9	Mr. Salim Bhatti	Social Worker for low income areas

### **4.2.3 Justification of the research size sample**

Due to limitations and constraints of time and finances, it was decided to restrict the number of respondents from amongst the customers of LCB to 100: a maximum of 50 respondents from each of the two categories of households with respect to income i.e. high and low.

The dissemination of questionnaires amongst the respondents was done by visiting the households whereas the structured /semi-structured interviews of the staff members of the LCB namely the CEO, the Water Supply Engineer and Supervisors and the nominated Councilor will be conducted at the office of the LCB. The interviews of other people given at serial numbers 5-9 were held at their respective offices/homes.

### **4.3 Data Analysis Method**

According to the type and objective of the research, the analysis methods were applied such as the following:

Percentages and frequency distributions were main analytical methods. The results of the questionnaires were calculated in percentages while those of the interviews were clustered in frequency distributions according to the higher number of the same answer. The display methods used were tables and graphs.

### **4.4 Unit of Analysis**

Although the family/household was the basic unit of inquiry, the heads of the family/household were the respondents. The sample was a sample of households and not the individuals.

### **4.5 Variables and Indicators**

The research consists of two variables: independent and dependent. Dependent variable is output which in this research is customers' satisfaction the existence of which is influenced by the independent variables. Independent variables are the factors which influence dependent variables and can be measured by the following indicators:

**Table 4.2 Variables and Indicators**

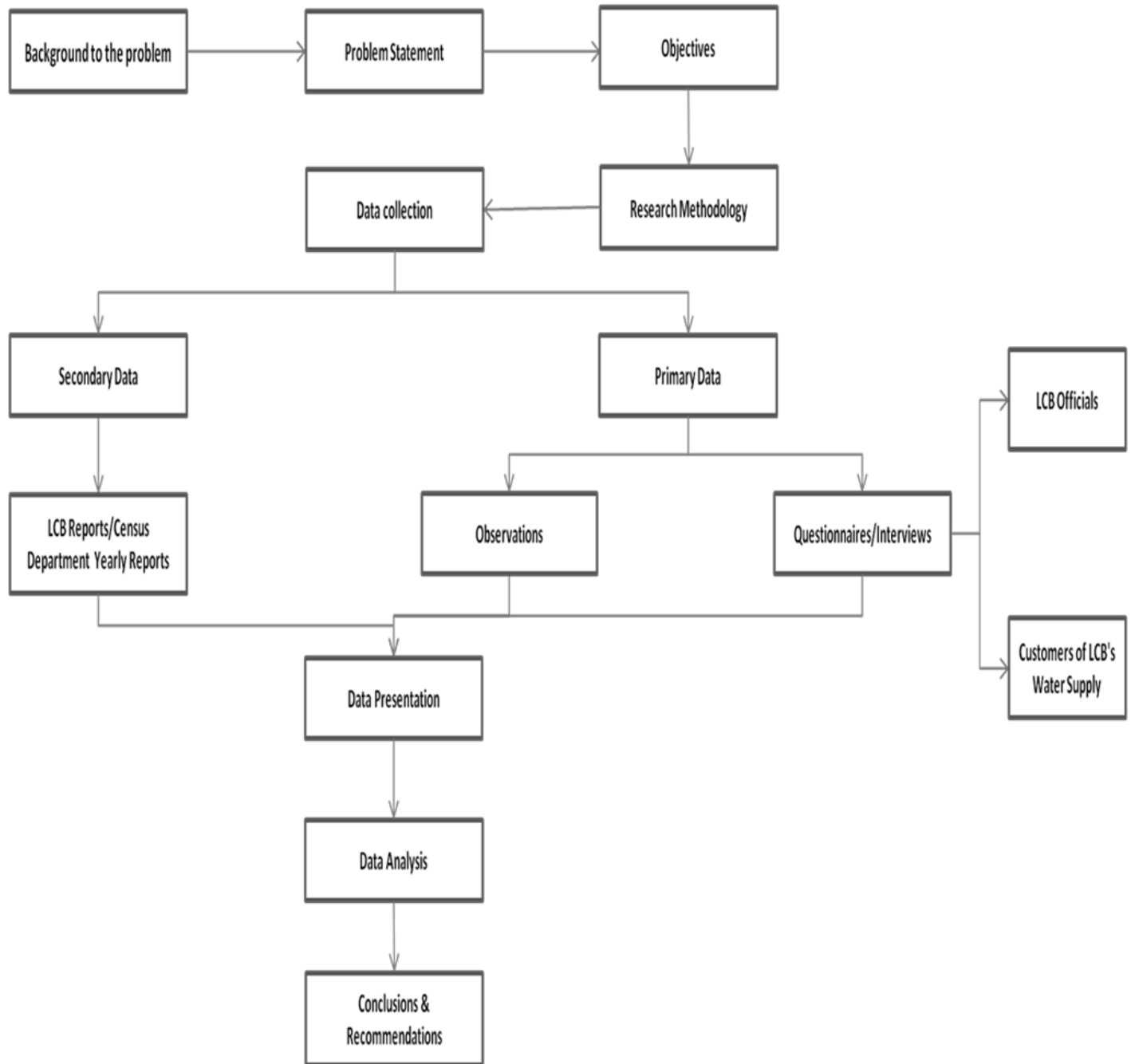
S. No.	Questions	Variables	Indicators	Source of data
1	Are the customers satisfied with the clean drinking water supplied by the LCB?	The customers' satisfaction with the clean drinking water supplied by the LCB. {Dependent}	Percent of survey respondents indicating that they are satisfied with the clean drinking water services of the LCB.	Customers' survey conducted by distribution of questionnaires among the sample population and interviews conducted.
2	What are the main aspects of the clean drinking water that the customers have complaints against such as quality, quantity, continuity and price?	Main aspects of clean drinking water that customers have complaint against. {Independent}	<p>Percentage of survey respondents indicating that they have complaints regarding quality.</p> <p>Percentage of survey respondents indicating that they have complaints regarding quantity and continuity.</p> <p>Percentage of survey respondents indicating that the price of water is beyond their affordability.</p>	Customers' survey conducted by distribution of questionnaires among the sample population and interviews conducted.
3	Are the customers satisfied with the responsiveness of LCB to their complaints?	Customers' satisfaction with LCB's responsiveness to their complaints. {Independent}	Percentage of survey respondents indicating that LCB is responsive to their complaints.	Customers' survey conducted by distribution of questionnaires among the sample population and interviews conducted.

**Source: The indicators have been adopted from the World Bank's International Benchmarking Network for Water and Sanitation Utilities and OFWAT.**

## 4.6 Research Design

To have a clear idea about how the research will be carried out, it is necessary to make a research design as shown in the Figure 4.2 below:

Figure 4. 2 : Research Design



Source: Own Design

## **4.7 Fieldwork implementation and changes in the proposal**

In activities that are going to take place at far off places, there are always surprises and unforeseeable problems: the issues that look very simple and straightforward sometimes become formidable challenges. During the course of the fieldwork that commenced on Monday, 4<sup>th</sup> of August, 2011, a few challenges arose that had not been taken into account beforehand. Some of these challenges are described hereunder.

Recruitment and training of staff which prima facie seems a simple task proved to be a quite a challenge. Contrary to the expectations, it took the researcher three to four days to get young men who were educated, enthusiastic, motivated as well as willing to work for the amount allocated for this purpose. Making them understand the spirit of the questionnaire, sensitivity of the survey and maintaining a strict time line were other issues that the researcher had to grapple with. The researcher engaged with them on a daily basis to get feedback from them and to resolve issues that kept on cropping up right up to the last day of the survey.

Another problem that the researcher confronted was establishing contact with the interviewees. Contacting some of the interviewees turned out to be quite a difficult pursuit. Only after strenuous efforts and by using some contacts was the researcher able to get in touch with them. What happened afterwards was that despite making commitments, some of the interviewees didn't appear at the appointed day and time so there was a lot of rescheduling that only made the task more uphill.

Before the commencement of the fieldwork, the researcher had chosen Askari Villas as one of the high income areas where survey by questionnaire was to be carried out. Later on, during the field visit it was found out that the locality in question had a lot of vacant plots and under-construction houses that would have made the random sampling task impossible. Therefore, it was decided there and then to choose another locality that would not pose any such limitations on the research activity. Keeping this in view, Askari IX, one of the high income areas in the Lahore Cantonment was found to be suitable for the survey and was accordingly selected.



## Chapter 5 Results and Discussion

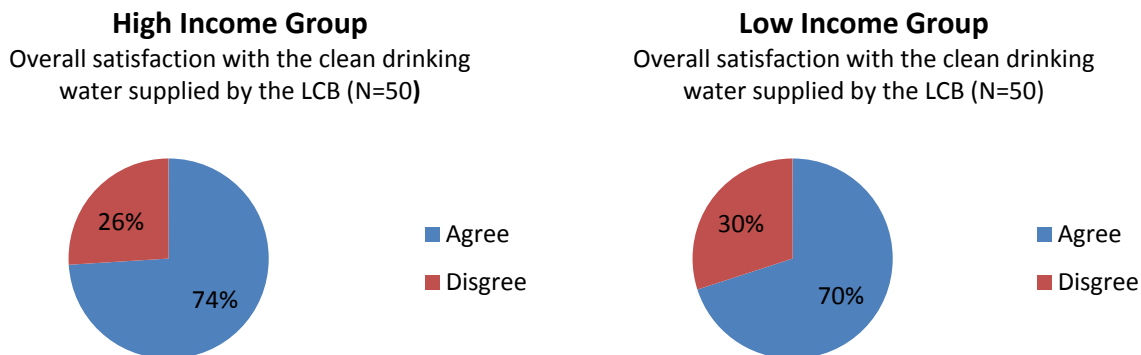
In this chapter the survey results will be described and data collected during fieldwork in Lahore Cantonment in July 2011 will be analyzed. As mentioned previously in the literature review, the customer satisfaction is a function of the expectations of the customers and the performance of the utility. The extent to which a consumer is satisfied with a good or service is therefore determined by the perceived performance of the utility which is an evaluation of that good or service in the light of consumer's needs.

For the purpose of this research the respondents have been divided into two categories on the basis of their income levels i.e. high and low. In Lahore Cantonment, the high and low income people live in distinct and well-defined localities therefore survey was carried out separately in two high and two low income housing colonies. In Pakistan, a monthly income of less than Rs. 10,000 is considered to be low whereas income upwards of Rs. 50,000 is regarded as high.

Different aspects of water supply that are vital to the customers such as the quality, quantity and continuity, price, and the responsiveness of the utility to their complaints were deemed as important parameters to ascertain their satisfaction. The questionnaire was designed in such a manner that the customers' satisfaction in respect of the above-mentioned aspects could easily be gauged. In order to get feedback from the respondents the questionnaire has been divided into sections that follow the sequence of the research questions such as their overall satisfaction, followed by the main aspects of the clean drinking water that the customers have complaints against such as quality, quantity, continuity and price quality, quantity, continuity, price, and lastly the responsiveness of the utility to the customers' complaints.

### 5.1 Overall satisfaction with clean drinking water

Answer to the first research question regarding the overall satisfaction of customers with clean drinking water provided by the LCB is expressed hereunder in pie charts. The same has been calculated on the basis of results of the survey with questionnaires:



It is evident from the above pie charts that 74% and 70% of the customers in the high income as well as low income groups respectively are satisfied with the clean drinking water provided by the LCB. Although more than a quarter of the respondents are not satisfied with their drinking water, the result is an expression of confidence of the majority of customers (almost three quarters of them) in their water utility.

## 5.2 Main aspects of the clean drinking water the customers have complaints against

The second research question is about the main aspects of the clean drinking water that the customers have complaints against. A review of international literature regarding customer satisfaction revealed that the main concerns of the customers pertain to quality, quantity and continuity, price etc.

### Quality

The first focus of the second research question is the quality of water. Public concern about the quality of drinking water has grown enormously in the recent past due to an increase in awareness about environmental pollution and instances of outbreak of waterborne diseases. It is a common knowledge these days that poor quality of water leads to an increased risk of such diseases such as cholera, dysentery and typhoid and that the water that we consume has a direct bearing on our health. The researcher will be discussing the quality of drinking water being supplied by the LCB by trying to present and interpret the results of questionnaires and interviews.

The questionnaires survey helped in the effort to ascertain to what extent the customers belonging to the high and low income levels are satisfied with the quality of water supplied to them. This is shown by the Table 5.1 given below:

**Table 5. 1 Level of satisfaction of customers of high and low income levels with the quality of water provided by LCB (%)**

	<b>High Income Customers</b>	<b>Low Income Customers</b>
<b>Satisfied</b>	73.6 %	74.8 %
<b>Not Satisfied</b>	26.4 %	25.2 %
<b>Total</b>	100 %	100 %

**N= 50**

The results of the questionnaires given above in Table 5.1 reveal that 73.6% of the high income customers are satisfied with the quality of water supplied by LCB whereas in the low income segment of the respondents the satisfaction level is 74.8%. On the face of it, it does appear that nearly three quarters

of the respondents in both the income groups are satisfied with the quality of their drinking water, it is, nevertheless, alarming at the same time to see that a quarter of the respondents in both the income groups are dissatisfied with the water quality. Quality is such an important parameter of clean drinking water that the above-given level of dissatisfaction cannot be ignored or overlooked.

Similarly looking at the results of the interviews given below in Table 5.2, we find out that a third of the respondents i.e. 3/9 recognize quality as the most serious problem that the customers are faced with by saying that old and rusty pipelines lead to mixing of sewerage water with clean drinking water. Furthermore all the respondents of the interview acknowledge the quality as one of the common problems.

The results of the interviews are given hereunder in Table 5.2 whereas the detailed results of the questionnaires covering various aspects of quality of water such as smell, colour and seasonal variation are provided in Annexure IV Table 6.2.

**Table 5. 2 showing the result of interviews with respect to the quality of drinking water supplied by the LCB**

Sr. No.	Question	Summary of Answer	Frequency of Appearance
1	What mechanism is in place to test the water samples for pollutants? If there are problems related to the quality of water, how are they tackled?	Water samples are neither taken nor tested	5/9
		I don't know	4/9
2	Does the LCB have properly qualified personnel who understand the quality standards to be complied with	LCB doesn't have properly qualified staff.	7/9
		I don't know	2/9
3	What are the main water treatment processes that are applied before the water is supplied to the customers	Chlorination only	8/9
		I don't know	1/9
4	What is your opinion about the colour and smell of water supplied by the LCB	The colour and smell are fine	5/9
		There are occasional problems of smell and discoloration	4/9
5	What are the main pollutants in your water?	Mainly Rust and sand	5/9
		Rust, sand and bacteria	1/9

		I don't know	3/9
6	What are the common problems that people face with respect to the drinking water supplied by the LCB?	Problems of Quantity, Continuity and mixing of sewage with drinking water due to leakage of pipes	9/9
7	What is the most serious problem that people face with respect to the drinking water supplied by the LCB?	Old and rusty pipes leading to mixing of drinking water with sewerage	3/9
		Continuity	4/9
		Quantity	2/9

N= 9

The results of the interview are nothing less than shocking eye-openers: firstly 5/9 of the respondents comprising mainly of the officials of LCB confessed that samples of water are neither taken nor tested, secondly 7/9 respondents of the interview including the officials of LCB cast a shadow of further doubt on the quality of water by saying that LCB does not have properly qualified staff that understands the quality of water, thirdly 6/9 believe that there are pollutants in water such as rust, sand and bacteria and lastly 8/9 respondents said that chlorination was the only treatment undertaken. These results are very alarming, indeed.

Another startling discovery was made during the interview with the officials of the LCB that LCB does not follow any health standards set by the WHO or the Government of Pakistan's own National Drinking Water Policy, 2009. When the researcher asked the Assistant Engineer of LCB about compliance with the national and international drinking water standards, he said "yes, I do know that a drinking water policy has been formulated by the Federal Government but we are not following it in any way at present".

During the interviews, the researcher made special efforts to determine as to why as many as a quarter of the customers were dissatisfied with the quality of water whereas as per international standards the dissatisfaction level should have been fewer than 5 percent. The secretary of residents' society of Askari IX, one of the respondents of the interview, said that "there were still areas with old infrastructure such as pipelines and no proper sewerage system; there is a sort of anxiety amongst people of the area regarding the quality of water because they don't actually know what their water contains".

Observations made during the fieldwork and interviews of technical staff of LCB reinforce the concerns of those not satisfied with the quality of water. It was observed during the fieldwork that the low income areas were very congested and were characterized by a number of houses as small as 500sq ft. The area had no proper sewerage system owing to physical constraints such as very narrow lanes and streets. Although the LCB has replaced more than half of the old water supply pipelines in the area, the fact remains that a substantial area still has old and rusty pipelines as also borne out by interviews of

technical staff as well as the representative of the residents' association of the area. Resultantly there are occasional incidents of water containing particles of rust and leakages in pipelines leading to mixing of sewerage water with drinking water. This means that there are vast areas with old and rusty pipelines and no proper sewerage system. This situation led to an occasional mixing of clean drinking water with sewerage water but no mechanism is in place to test and treat the water and surprisingly no professionals that understand the health standards to be followed.

The quality of water is foremost important as a performance indicator. Poor water quality poses serious hazards to public health. In order to prevent epidemics it is very important to monitor the supply of piped water therefore this performance indicator needs to be regularly monitored. It is keeping its importance in view that the World Bank WSP has prescribed the benchmark value of this performance indicator at 100. A number of water samples are to be taken every month both at the water source as well as at the consumer end. This sampling regimen should meet the laid down national standards and all parameters of water quality have to be met. Even if one standard is not met, the sample is considered to have failed the potable water standards (Ministry of Urban Development, 2009). In case of LCB, we see that nothing of this sort is being followed.

A review of international literature gives us a number of examples of organizations in developing and developed countries that have benchmarked key performance indicators related to quality to help steer toward continuous improvement in their water quality. These key performance indicators are routinely monitoring the quality of raw water, routine monitoring of water quality at various points in the distribution system, percentage of samples failing to meet quality standards and promotion of public health education, to name a few. By so doing, these organizations are able to compare themselves with other leading organizations and by adopting and implementing the best practices and procedures being followed by the leaders, there is a continuous improvement in their water quality. Several developed countries such as the USA have laws that make it mandatory for the water utilities to inform their customers in a transparent way about the quality of water being supplied to them. In this manner, the water utilities build trust and confidence in their customers by letting them know about the quality of water being supplied to them. Dissemination of accurate and timely information to the consumers on their drinking water quality helps raise consumer awareness, develop and maintain public confidence in water enabling the customers make informed decisions (U.S. Environmental Protection Agency, 2003) . It is extremely important that service providers clearly define and communicate the quality that will be provided to the customers so that the employees have a fair idea of what they must deliver and customers know what they will get (Kotler & Armstrong, 2010).

If we analyze LCB in the light of the above Para, the performance of LCB leaves a lot to desire in so far as the quality of water is concerned. More than a quarter of customers not satisfied with the smell and colour of their drinking water can be attributed indirectly to the absence of benchmarking of key performance indicators on part of LCB. The CEO of LCB himself said it in the interview that the only indicator of their performance is their net profit. There may be no incidents of breakout of water related diseases in Lahore Cantonment in the recent past but certain diseases related to drinking water take a

long time in surfacing. Compliance with water quality guidelines not only addresses current threats to the drinking water quality, by so doing future threats can also be prevented. It can be safely assumed that if LCB had been treating the water properly, conducting laboratory tests of its water and conveying the results to its customers, the confidence level of respondents would have been much more than it is at the moment.

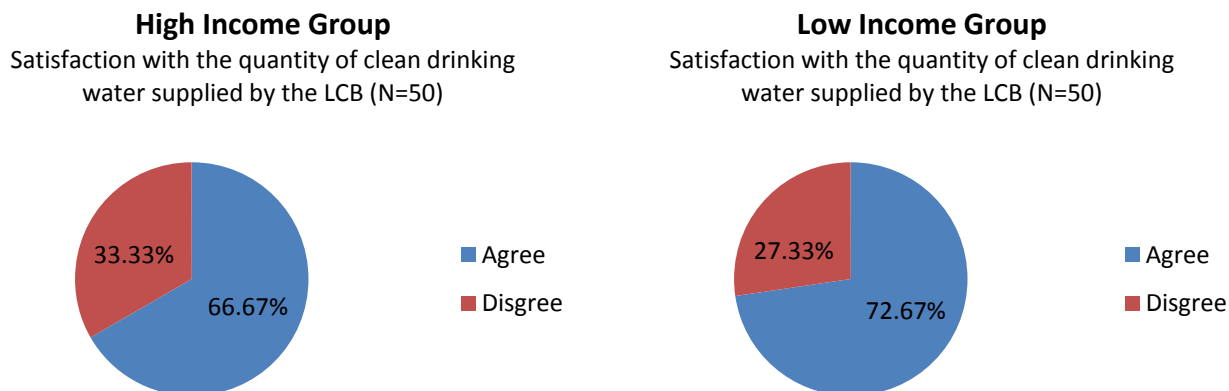
There is an element of disparity between the results of the interviews and the questionnaires that needs to be looked into minutely. For instance the results of the questionnaires show that a quarter of the respondents in both the income groups are not satisfied with the smell and colour of their drinking water whereas a much bigger proportion of respondents of interviews (9/9) say that quality is a common problem due to occasional mixing of sewage with drinking water leading to problems of smell and discoloration, 6/9 say that there are pollutants in their drinking water and a third of them declare the quality of water as the most serious problem. The difference lies in the fact that the respondents of the interviews included professional and experts who generally have a better understanding of and insights into these issues whereas the respondents of the questionnaire. Resultantly the research unveiled some very startling results from the interviews about the water not being sampled and tested, complete absence of professionals who understand water quality, chlorination being the only treatment and no compliance whatsoever with the national standards. Other explanation for the paradox is that there are no elective institutions in Lahore Cantonment so common people have no say in the operation of the water supply branch and as a result their interaction with the authorities is limited therefore their level of awareness about various aspects their drinking water is not very thorough. Common people regard the water quality as being good if there are no apparent problems such as colour and taste or if the water doesn't cause any health related problems in the short term.

Relatively high level of satisfaction of high income customers can be attributed to better infrastructure in most of the area such as new pipelines, proper sewerage system but we see the same percentage of customers satisfied in the low income group despite the fact that substantial areas have old and rusty pipelines, no proper sewerage system. Performance is the actual level of service received by the customers whereas the expectations depend upon their personal characteristics such as education and living standard but they are also influenced by comparison of service with alternative sources and their willingness to put up with adverse situations. Therefore in case of this research, with almost 75% of the respondents being satisfied with the quality of their drinking water, it can be implied that people belonging to the poorer segment of the society with low expectations may find the quality satisfactory as it exceeds their expectation (Deichmann & Lall, 2007).

### **Quantity and Continuity**

The researcher will be discussing the quantity and continuity of drinking water being supplied by the LCB by trying to present and interpret the results of questionnaires and interviews.

The survey by questionnaire helped in the endeavor to ascertain to what extent the customers belonging to the high and low income levels are satisfied with the **quantity** of water supplied to them. The results are given below in pie-charts:



The above results show that 66.67% of the customers belonging to the high income segment are satisfied with the quantity of water supplied by the LCB whereas in the low income group the satisfaction level 72.67%. Prima facie, it seems that two third of the customers in the high income group and close to three quarters of the respondents in the low income group are satisfied with the quantity of their drinking water, it is alarming to see that one third customers in the high income group and more than a quarter of respondents belonging to the low income group are not satisfied with the quantity of their drinking water. The same proportion of respondents of interview i.e. one third says that the quantity of water is insufficient.

The results of the interviews are given hereunder in Table 5.3 whereas the detailed results of the questionnaires covering various aspects of quantity and seasonal variations are provided in Annexure IV Table 6.3.

**Table 5.3** showing the result of interviews with respect to the quantity and continuity of drinking water supplied by the LCB

Sr. No.	Question	Summary of Answer	Frequency of Appearance
1	What do you think about the quantity of daily water provision by the LCB? Does it fulfill the requirements of the consumers?	Yes!	6/9
		No!	3/9
2	Seasonal Variations in quantity	No seasonal variation in quantity	2/9

		Quantity is slightly better in rainy season	7/9
3	Does the water provided by the LCB flow for 24 Hours?	No!	9/9
4	On an average for how many hours in a day is the water supplied by the LCB?	8-10 hours per day	4/9
		At times it is less than 8 hours	5/9
5	If you face a water shortfall, from where do you get water in order to overcome the problem?	Public Taps, boreholes. LCB provides water bowzers to overcome shortage when there is a breakdown of a tube well	7/9
		People accordingly reduce the use of water	2/9
6	Is the continuity of water provided by the LCB satisfactory in the dry season?	Yes!	3/9
		No!	6/9
7	Is the continuity of water provided by the LCB satisfactory in the rainy season?	Yes	4/9
		No!	5/9
8	In view of the power crisis, what steps have been taken in recent past to improve water supply continuity?	No special steps have been taken to improve water continuity problem during power crisis	7/9
		I don't know	2/9

**N= 9**

In Table 5.3 above, we find that the results of the interviews correspond with those of questionnaires with 6/9 respondents saying that the daily provision is sufficient whereas a third of respondents disagreeing. It is interesting to note that 7/9 respondents are of the opinion that the quantity of water during the rainy season is considerably more than that during the dry season while only 2/9 say that there is no significant seasonal variation in quantity.

When asked to shed some light on the increase in quantity of water in the rainy season, the CEO of the LCB explained in his interview that “the difference between dry and rainy season can be attributed to the drawdown of water table in the dry months when there are almost no rains compared to the prolonged rainy season when the subsoil layers containing water are charged. The collective result is a suboptimal yield of the tube wells particularly during the dry months when there is very little or no rain at all”.

The Assistant Engineer of the Water Supply Branch at the LCB was asked about the quantity of daily water supply in his interview. He said “with the help of 57 tube wells spread all over the Cantonment, LCB was currently supplying a total of 11.188 Million Gallons on a daily basis to a population of 2,



20,000 people with a per capita supply of 189 liters of water which exceeds the standard of 135 liters set by the World Bank Water and Sanitation Program. In my opinion we are over supplying”. This amount of per capita supply of water looks impressive and the same goes on to explain the satisfaction of a majority of the customers with the quantity of water supplied to them. As regards some customers who were not satisfied with the quantity in the high income areas the secretary of residents’ society of Askari IX was of the view that “a number of residents of the area were in the habit of wasting a lot of water by washing cars and watering their lawns on a daily basis so the water supplied by LCB is never going to be enough for them”.

When asked to elucidate as to why a substantial number of people are not satisfied with the water quantity, the Water Supply Supervisor of LCB said that “The reason for some respondents not satisfied with the quantity of water especially in the low income area is that there are still areas with old and leaky pipelines so a lot of water goes unaccounted for and doesn’t reach the people”.

The factor that played the most significant role in lower quantity of water being supplied to both the segments of customers is that of load shedding. It was observed during the field work that on an average there was a power shut down after every hour. The CEO was deeply concerned about this state of affairs and said in his interview that “the power crisis is at its worst these days. We are facing as many as 12 disruptions in the power supply on a daily basis but what makes this situation horrible is LESCO’s unscheduled shut downs which are not uncommon in Lahore especially during summers when the demand for electricity is high due to excessive use of air conditioners. This seriously hampers our capacity to supply water”.

The results of the questionnaires show that in cases of severe water shortage due to an unusually long power shut down or breakdown of a tube well, although none of the customers in the low income areas have to buy water, 66% of them are compelled to use public taps to overcome the problem of quantity. Similarly 82% of the customers in the high income area have boreholes to tackle severe shortages. It was observed during the course of the field work that most of the households belonging to the sample population have their own generators that run on diesel so in times of severe shortage of water, they were able to pump water out through boreholes. An interesting observation was made by two of the respondents of the interviews who said that when people face a shortfall of water, they reduce the use of water. This is true in case of many people who adapt themselves to the changed circumstances by making adjustments in their own lifestyles but very low availability and usage of water can be dangerous for individual as well as public health. Although LCB itself is a victim of power shutdowns but the fact remains that people have been left to fend for themselves for no fault of their own. The LCB cannot absolve itself of the responsibility of providing a continuous supply under the excuse of load shedding. It is ultimately the responsibility of the LCB to ensure that people get ample quantity of water.

If we compare the survey results of low income areas with those pertaining to the high income areas, we see that the level of satisfaction of the low income customers was higher than that of the high income customers. The low expectations of the low income customers and their willingness to put up with

adverse situations can be the possible explanations for them being more satisfied than the high income customers (Deichmann & Lall, 2007).

Although a majority of customers in both the income groups have expressed their satisfaction with the quantity of daily water supply but the fact of the matter is that one third of the customers in the high income group and more than a quarter of respondents the low income group are not satisfied with the quantity of their drinking water. Although the LCB officials claim to supply 189 liters of water per capita per day which is far in excess of the World Bank WSP standard of 135 liters, how come a lot of people are not satisfied with the amount of their daily water? As per standards set by the WSP daily quantities of water supplied is to be measured through metering and record thereof is strictly maintained. The total supply for the month is based on the aggregate of daily amounts and monitoring this on a monthly basis reveals seasonal variations. It was observed during the fieldwork that no water meters have been installed in Lahore Cantonment. It is interesting to note that the figures of LCB are based on the daily yield of water from the tube wells whereas what is of the essence here is the amount that actually reaches the people and only that amount forms the basis of per capita water supplied per day. The amount of water actually reaching the customers cannot be calculated without water meters. This means that the figures furnished by the LCB are not fault free.

The level of satisfaction of high and low income customers with the **continuity** of water provided by the LCB is given below in Table 5.4:

**Table 5.4 Level of satisfaction of customers of high and low income levels with the continuity of water provided by LCB (%)**

	<b>High Income Customers</b>	<b>Low Income Customers</b>
<b>Satisfied</b>	48.4 %	55.6 %
<b>Not Satisfied</b>	51.6 %	44.4 %
<b>Total</b>	100 %	100 %

**N= 50**

The above results have been compiled on the basis of survey by questionnaires. As evident in Table 5.4, 48.4% of high income customers are satisfied with the continuity of water whereas in the low income group the level of satisfaction is 55.6%. The results of the interviews almost correlate with those of the questionnaire. This situation looks chaotic and desperate as roughly half the respondents are not satisfied with the continuity of water supplied by the LCB. During the survey, all the respondents opined (Annexure IV Table 6.4) that water supply was not continuous for 24 hours and that it was confined to three timings i.e. morning, afternoon and evening. The results of the interviews show similar results with all the respondents confirming that water supply is not continuous.

Some very important results of the interviews are that 4/9 of the respondents were of the view that the continuity of water is the most serious problem (Table 5.3) and 5/9 respondents stated that the total duration of water supply per day was less than 8 hours. It was also found out during the interviews that the LCB faced immense difficulty in managing the continuity of water in order to deliver water continuously to its customers.

The Assistant Engineer of LCB's Water Supply Branch clarified in the interview by saying "the LCB has a schedule to supply water in three shifts daily i.e. in the morning from 4-8 am, in the afternoon from 12-2 pm and in the evening from 5-9 pm. Due to scheduled and unscheduled power shutdowns by the LESCO we find it increasingly difficult to enforce this water supply schedule yet the LCB tries their best to make up for the lost time by supplying water at times when the electricity was running and in this manner we are able to maintain a supply of 8-10 hours daily". The Assistant Engineer of LCB further said in this regard that "round the clock supply of water is a goal which becomes increasingly difficult to achieve due to factors such as power outages and fluctuations/instability of electricity that wreaks havoc on pumps. This means that tube well pumps/motors are overstretched and become more vulnerable to wear and tear and breakdowns. Although the power supply company disseminates information on weekly programmed power outages to the LCB, designing a water supply schedule in the light of the power plan is an uphill task." This situation is indicative of the agony that the customers have to go through on account of intermittent water supply.

Another very alarming result of the interviews is that 7/9 of the respondents said that no special steps were being taken by the LCB to tackle the issue of load shedding. The CEO of LCB said in this regard "we know for sure that the load shedding is going to stay as long as the power crisis is there. Having a backup system for each of the 57 tube wells was the need of the hour but that was a very expensive proposition and difficult to implement for LCB due to financial constraints".

Almost no city in South Asia has a round the clock water supply system which is a norm for almost all the cities of the developed world. If we take a look at things from the perspective of the consumers, they would like to have a twenty four hour water supply so that they won't have to bother about storing it for household purposes or to have other inconveniences. Water utilities in most Pakistani towns supply water intermittently to its consumers for limited a number of hours daily in order to manage inadequate supply. In order to avoid the negativities of intermittent water supply, water utilities must endeavor to improve their service by moving towards the benchmark of 24 hours.

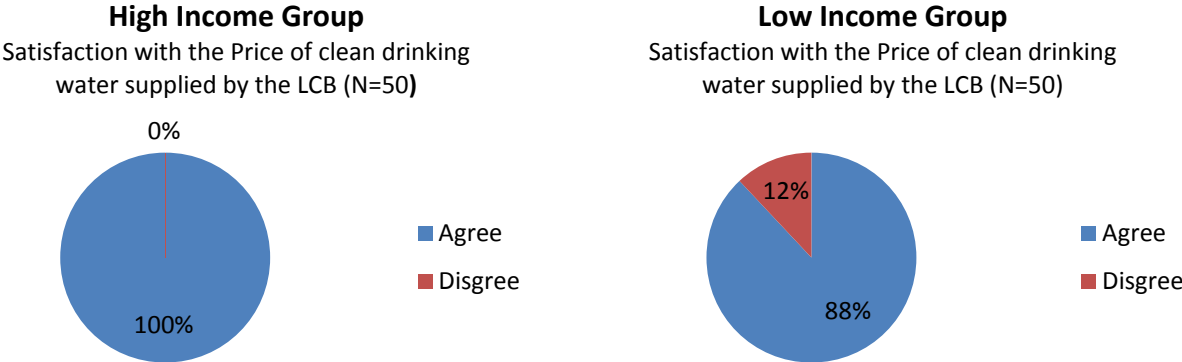
The World Bank WSP and leading water utilities of the developed countries have identified key performance indicators related to quantity and continuity that help the water utilities the world over to compare their own performance with the world leaders. The list of performance indicators is exhaustive but the most important ones are per capita consumption of water, water conservation or water use reduction programmes in place, sufficiency of water resources that could meet demand into the future, unaccounted for water (UFW), availability of piped water supply (hours per day), recording of interruptions to supply etc (Ministry of Urban Development, 2009). It is surprising and startling at the

same time to find out that LCB is following no such benchmarking regime. The only indicator that is being calculated is the daily per capita water supply but the manner in which it is being calculated leaves a lot to desire. Owing to the present water continuity of the LCB, customers belonging to the low income group have to resort to public taps and to have water storage tanks in their homes to see them through their household needs. The affluent ones are constrained to have boreholes and to buy generators to pump out water as and when required. It is ultimately the responsibility of the LCB to undertake substantial investments to improve this service quality failing which the levels of dissatisfaction of the customers is surely going to increase with the passage of time.

**Price**

Water pricing plays a key role in the sustainability of any utility. Tariff design goals include generating adequate and stable revenues to operate and maintain a water system. Different tariff structures can be used to meet these goals but in case of LCB, the tariffs are based on area of each house. The tariffs are traditionally kept at a low level as universal access to adequate and clean water services has long been recognized as essential to public health and individual welfare. In Pakistan as in other third world countries the government policy has historically been to keep water companies in public ownership, and to keep tariffs artificially low through a range of more or less explicit subsidy measures.

The survey by questionnaire helped to ascertain as to what extent the customers belonging to the high and low income levels are satisfied with the **price** of water supplied to them. The results are given below in pie-charts:



The results of the questionnaires expressed in the above pie charts indicate that price is not a problem for the high income customers. The above pie charts also show that 88% of the customers in the low income segment consider the present tariffs within their affordability and are satisfied with the water tariffs they are paying to the LCB whereas only 12% of them have expressed that the tariffs are beyond their affordability. The results of the interviews correspond to those of the questionnaires as 8/9 respondents have stated that the tariffs are within the affordability of the customers (Table 5.5 below).

**Table 5. 5 showing the result of interviews in respect of price of drinking water supplied by the LCB**

Sr. No.	Question	Summary of Answer	Frequency of Appearance
1	Is the monthly water bill within the affordability of the customers?	Yes!	8/9
		No!	1/9
2	What is the basis of the present pricing mechanism? Does it ensure equity?	Area of plot. Yes, it ensures equity	9/9

**N= 9**

Two factors are responsible for this result: one being that the monthly tariffs are very low and the other one being that affordability is not that much of an issue for the high income customers. It can be observed from Table 3.2 in Chapter 3 that the monthly tariffs in respect of high income customers are from Serial Number 4 to 6 i.e. from Rs 300 to Rs 500 which comes to Euros 2.5 to 4.2 per month only. This amount represents a very small fraction of the minimum income of customers belonging to high income segment therefore all the customers are satisfied with the monthly tariffs.

When it comes to paying the price, the most important factor in case of low income customers is the affordability (Raje, Dhobe, & Deshpande, 2002). The same is the case here: the tariffs are very low in general and hence within the affordability of the majority of the low income customers. Tariffs relevant to low income customers are given in Table 3.2 in Chapter 3 at Serial Number 1 and 2 i.e. Rs 75 to Rs 100 per month which comes to 60-80 European Cents. This amount represents a very small fraction of the income of low income customers therefore it is well within their affordability that is why a huge majority of 88% of the customers are satisfied with their monthly tariffs

The results of the interviews also reveal that all the respondents are of the view that prices are charged from the customers with respect to the area of the house. All of the respondents believe that the present pricing mechanism ensures equity because those living in smaller houses are supposed to pay less and those living in houses of bigger area have to pay more. The results of the survey and those of the interview almost correspond with each other. There is no point of divergence in so far as price and affordability is concerned.

In so far as the 12% of the low income customers who have stated that the tariff is beyond their affordability and the one respondent of the interview who is of the same view are concerned, the results can be explained by the current economic downturn in the country. In Pakistan more and more people are increasingly being affected by the slump in economic activity, rising unemployment and high inflation as a result of which the real incomes of the people as well as their buying power is being adversely affected. Some people are hit by this situation to such an extent that they find it difficult to pay a small amount of Rs 100 per month because affordability is of the essence when it comes to low income segment of the population.

### 5.3 Satisfaction of customers with the responsiveness of LCB to their complaints

This section corresponds with the third research question about the level of satisfaction of customers with the responsiveness of LCB to their complaints. Table 5.6 below shows the results of the satisfaction of customers with LCB’s responsiveness to their complaints. These results have been compiled on the basis of survey by questionnaires:

**Table 5.6 Level of satisfaction of customers of high and low income levels with the responsiveness of LCB to customers’ complaints (%)**

	<b>High Income Customers</b>	<b>Low Income Customers</b>
<b>Satisfied</b>	73.92 %	60.8 %
<b>Not Satisfied</b>	26.08 %	39.2 %
<b>Total</b>	100 %	100 %

**N= 50**

The Table 5.6 above shows that 73.92% and 60.8% of the high and low income customers respectively are satisfied with the level of responsiveness of LCB functionaries towards their complaints. The results reveal that a very significant percentage of customers in both the income groups i.e. 26.08% in the high income and 39.2% in the low income are not satisfied with the level of responsiveness of LCB staff. These numbers are huge and alarming and thus demand a further probe into the matter.

In terms of responsiveness to complaints and courtesy of staff, the results of the interviews almost follow the pattern seen above: 6/9 of the respondents were of the view that the LCB’s staff was responsive whereas 3/9 of them disagreed and said that the staff took too long in responding to the complaints.

Another important finding of the survey by questionnaires is that in both the income groups 100% of those who lodged complaints said that the staff of LCB that handles complaints was polite and courteous (Annexure IV Table 6.6). Similarly all the respondents of the interviews opined that lodging complaints with the LCB office was very easy and that the LCB staff was polite and courteous.

The results of the interviews are given hereunder in Table 5.7 whereas the detailed results of the questionnaires covering various aspects of responsiveness of LCB to customer complaints are provided in Annexure IV Table 6.6.

**Table 5.7 showing the result of interviews in respect of responsiveness of LCB to customer complaints**

Sr. No.	Question	Summary of Answer	Frequency of Appearance
1	Is the staff of LCB responsive to the customer complaints?	LCB's staff is responsive to customer complaints	6/9
		No! It isn't. They take too long in addressing the problems	3/9
2	How far is the perception true that the LCB pays more attention to the high income areas as compared to the low income ones in terms of various aspects of service quality?	This perception is false	5/9
		LCB authorities dispose of complaints from high income areas more expeditiously	4/9
3	Are people able to lodge their complaints with ease?	Yes!	9/9
4	When the customers lodge a complaint, is there a mechanism to find out whether the needful has been done or not and if yes in how much time?	Yes, the maintenance staff has to get a certificate signed by the complainant to the effect that the needful has been done	9/9

**N= 9**

A very important but equally disturbing finding that came to the fore during the interviews was that 4/9 of the respondents, all associated with the low income areas, said that the LCB staff paid more attention to and responded more swiftly to the issues faced by the high income areas whereas the rest of the respondents (5/9) denied such bias and preferential treatment to a particular segment of the society. If the results in respect of low income customers are analyzed it becomes obvious that a very large segment i.e. 39.2% are dissatisfied with the overall responsiveness of LCB staff. Although in the interview, the CEO of LCB brushed aside any such notions by emphasizing that they pay equal attention to the complaints irrespective of socio-economic background of the complainant, the social milieu and environment of a third world country are to be kept in mind: many of the high income customers are in fact very influential people and they include serving and retired civil servants and military officer, politicians holding important offices, very affluent businessmen and the likes. The fact remains that this factor puts a sort of urgency on the utilities to do their jobs more expeditiously than when the complaint comes from someone from the low income segment of the society with no connections or clout.

Another important result is that 9/9 of the respondents of interviews have confirmed the existence of a mechanism whereby the superiors authorities of LCB are able to find out whether a particular complaint was addressed and if yes, in how much time. This has been made possible by a certificate that the maintenance staff has to get signed by the complainant after the needful has been done.

Most of the Pakistani government offices dealing with public are characterized by red tapism where common man is subjected to rigid rules and excessive paper work that makes immediate remedy a remote possibility. Quite contrary to that, it was a pleasant surprise to observe during the fieldwork that the LCB had come a very long way as far as handling of customers' complaints is concerned. Not long ago, the practice was that complaints had to be lodged with the concerned Branch itself from where it went to the CEO who used to pass on instructions to the technical staff and in this way it used to take a couple of days for action to be taken.

Nowadays, the procedure has been much streamlined. Complainants are received at the Public Facilitation Centre by the Public Relations Officer. Each complainant is given a chit containing a number and is requested to wait in the specially built Waiting Lounge. On his/her turn, each complainant's number is announced and that number is flashed at a particular counter towards which he/she is then guided. At the complaints counter, he/she lodged his complaint with a well educated and polite lady who depending upon the nature of complaint gives him/her a definite time frame within which his complaint is expected to be looked into and addressed. The complainant retains one copy of this complaint whereas the second one becomes part of the official record of LCB. This complaint is passed onto the concerned staff and its status can be seen online by the CEO on his own computer. At the end of the day, if there are some pending complaints the deadline of which has passed, these are displayed in red on the CEO's computer for his information and necessary action. When the maintenance staff visits the problem site and takes necessary action, they have to get a certificate signed by the complainant himself to the effect that the job has successfully been done to his satisfaction. The maintenance staff passes on this task completion certificate to the Public Facilitation Centre staff that changes the status of the complaint and so the CEO is able to find out the time frame within which a particular complaint was addressed. If this time is more than the stipulated time for that particular complaint, the staff is asked to offer their explanation.

The concept of Public Facilitation Centre has had a very good and positive effect on the customers who feel that they are being treated well by the staff and this can be seen through results of the survey where not a single customer has complained about the staff being discourteous or polite.

In the recent past the LCB has purchased maintenance trucks that have made it easier for the maintenance staff to reach the site of complaint in a shorter span of time than before. This has had a positive effect on the efficiency of the LCB which has somewhat translated into 68.18% and 71.43% of customers (whose complaints were responded to) belonging to the high and low income groups respectively expressing that the time frame within which their complaint was addressed is satisfactory (Annexure IV Table 6.6).



When asked why 31.81% and 28.57% of customers (about one third) in the high and low income groups (Annexure IV Table 6.6) respectively are not satisfied with the time frame within which their complaints were addressed, the Assistant Engineer of LCB explained in his interview “sometimes the work involves a lot of digging to reach the problem spot, welding of broken pieces of metal, replacement of spares etc which takes more time than usual and the customers feel that the staff are not responsive enough”. This might be true in some cases but when the survey also reveals that 13.66% and 16.67% of the customers belonging to the high and low income groups respectively say that their complaints were not responded to (Annexure IV Table 6.6), it means that there is a serious problem. What casts a further doubt on the responsiveness of LCB is the fact that 4/9 of respondents of interviews say that LCB is more receptive to the complaints and issues of the high income areas.

A review of international literature on the subject of customers’ complaints gives us an insight into what is happening around the world. For the successful disposal of complaints, forward looking utilities have set for themselves a benchmark time of 24 hours or the next working day at the maximum; the benchmark value for this indicator is set at 80% or above. The total number of complaints that are successfully responded to within 24 hours or the next working day is expressed as a percentage of total complaints lodged within that month and this determines the efficiency of that utility (Ministry of Urban Development, 2009). Although the LCB has developed a very modern Public Facilitation Center where the customers are able to lodge their complaints with ease in a dignified manner, the record related to complaints is being maintained and furnished to the superiors, there is neither any benchmark time for the redressal of complaints nor any benchmark value of this indicator.

In addition to the above, many utilities have benchmarked key performance indicators such as conducting a survey after every few months time in a year (Ramjatan, Dlamini, Tiba, & Pillay, 2007). The customers’ surveys help in the identification and adoption of performance indicators that are directly related to aspects of main concern to customers such as quality, quantity and continuity, and importantly the redressal of grievances. The survey serves as an excellent confidence building tool and leads to an overall increase in customer satisfaction with their utility. LCB has never conducted a survey related to customers’ satisfaction. The current situation in LCB can be gauged from the Table 5.8 given below:

**Table 5.8 showing the result of interviews in respect of customer satisfaction, benchmarking and performance indicators of LCB**

Sr. No.	Question	Summary of Answer	Frequency of Appearance
1	Is customer satisfaction important? If yes, how is it determined as to what the customers want and to what extent they are satisfied with your drinking water?	Yes, it is important but no concrete steps being taken to determine what the customers want and whether they are satisfied with the services.	5/9

		Even elections are not being held to start a process of formal interaction between civil society and authorities	
		Yes, it is important. The number and nature of complaints indicates the extent of customer satisfaction	4/9
2	What measures are being taken to enhance customer satisfaction?	Better Facilitation of Customers, Improvement in handling of complaints, Vehicles for maintenance staff, Complaints can be uploaded on the website of LCB	4/9
		Reorganization of office, Better Facilitation of Customers, Improvement in handling of complaints, Vehicles for maintenance staff	5/9
3	What form of benchmarking is being followed by the LCB?	No form of benchmarking is being followed by LCB	4/9
		I don't know	5/9
4	What performance indicators are being used by the LCB?	Net Profit	4/9
		I don't know	5/9

**N= 9**

The results of the interviews reveal that 5/9 respondents say that LCB is taking no steps to find out what the customers want and whether they are satisfied with the water services. 4/9 respondents consisting of LCB officials only expressed that they were able to gauge customers' satisfaction through the complaints that are received in their office on a daily basis. Although the number and nature of complaints received do give an idea of what people are going through and the type of problems they are facing but this cannot be compared to a proper survey where questions are specially designed to feel the pulse of the customers.

4/9 respondents comprising of LCB officials say that they are not using any form of benchmarking and the only performance indicator that is being used is the 'net profit'. It is startling to find out that the only key performance indicator that LCB uses is an objective one such as net profit. This indicator is very important but it is more suited to a 'for profit organization'. Water utilities need to set for themselves subjective indicators such as the ones mentioned above. The results of interviews clearly show that the respondents from low income area have a perception that LCB is more responsive to the complaints of high income area. This indicates that there is a trust deficit between the LCB and the customers from the

low income areas. This is a very serious situation and unless the LCB adopts and implements benchmarking, a substantial number of its customers will continue to remain dissatisfied with its responsiveness to their complaints and if the situation remains the same, there is a big possibility this number is going to grow further. The concept of benchmarking will usher in accountability; the LCB will be able to identify gaps in performance and will be able to remove the same by introducing sharing of performance and implementation of best practices. The overall outcome will be provision of better service to people and increase in overall customers' satisfaction.

## Chapter 6 Conclusion

The results show that a majority of the customers in the high and low income groups are satisfied with the clean drinking water provided by the LCB but a deeper analysis of questionnaires survey and interviews conducted during the fieldwork reveal that owing to various reasons a sizable number is not satisfied with various aspects of clean drinking water such as quality, quantity and continuity, and the responsiveness of LCB to customers' grievances and complaints.

There are issues related to the water quality that need immediate attention of LCB notwithstanding the satisfaction of a majority of customers with their water. Bulk of the areas in Lahore Cantonment have been equipped with proper sewerage system and new water pipelines but still there are vast areas with old and rusty pipelines leading to mixing of sewerage water with drinking water that causes foul smell and discoloration. Since no proper water treatment is carried out other than chlorination, there must be pollutants in the water but since samples of water are neither taken nor tested so the LCB authorities don't know what their water contains. Neither does the LCB have properly qualified staff that understands the quality of water. Compliance with water quality guidelines not only addresses current threats to the drinking water quality, by so doing future threats can also be prevented. Conducting laboratory tests and conveying the results to the customers would raise their trust and confidence level in their utility.

If we compare the survey results of low income areas with those pertaining to the high income ones, we see that the level of satisfaction of the low income customers is higher than that of the high income customers. The low expectations of the low income customers and their willingness to put up with adverse situations are the possible explanations for them being more satisfied than the high income customers.

For the customers it is vital to receive a continuous supply of water twenty four hours of a day to meet their basic needs for cooking, bathing, washing and hygiene. As per the results of the survey, a majority of customers in both the income groups say they are satisfied with the quantity of daily water supplied by LCB but almost half the customers find the daily water quantity supplied to them insufficient. A major power crisis that involves around 12 disruptions in electricity every day combined with old, leaky pipelines are making it increasingly difficult for the LCB to fulfill the quantity and continuity needs of its customers. Resultantly a large proportion of customers in the high and low income groups have to resort to boreholes and public taps respectively to overcome the shortage of water in times of severe shortage. The LCB has failed to devise a strategy to develop a backup system of power supply to overcome the problem of continuity in order to provide round the clock supply to its customers.

In Pakistan the government policy has historically been to keep tariffs artificially low through a range of subsidy measures. The water prices of LCB are very low and within the affordability of the majority of customers for whom this is not an issue barring 12% of customers belonging to the low income group who find the price beyond their affordability due to reasons of poverty.

A majority of customers in both the income groups say they are satisfied with the responsiveness of LCB's staff to their complaints yet sizable numbers have serious reservations with LCB's handling of complaints especially the low income customers. There exists a trust deficit between the LCB and the low income group who think their utility is more responsive to the complaints of the high income customers. Although the new Public Facilitation Centre and reorganization of office etc has made it easier for the people to lodge their complaints, due to complete absence of benchmarking and key performance indicators there can be very little improvement in the responsiveness of LCB to customers' grievances.

The objective of this research was to find whether the residents of Lahore Cantonment are satisfied or not with the clean drinking water provided by the LCB. A majority of customers belonging to both the high and low income areas are overall satisfied with the clean drinking water provided by LCB. However, it is startling that LCB is not using any form of benchmarking and key performance indicators to measure, monitor and improve its performance and this is the major reason why a substantial minority of its customers belonging to both the high and low income groups has serious reservations about the various aspects of clean drinking water such as quality, quantity and continuity, and the responsiveness of the staff to customer complaints. The situation is expected to get worse if immediate corrective actions are not taken by the LCB soon.

Finally we can conclude on the basis of the overall results of the research that a majority of the customers is satisfied with the clean drinking water provided by the LCB even though more than a quarter of them is not satisfied therefore the hypothesis made at the very outset of this research that a majority of customers are not satisfied with the clean drinking water provided by the LCB stands rejected.

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## ANNEXURE - I - Interview Questions

Name of Interviewee \_\_\_\_\_

Occupation \_\_\_\_\_

Organization \_\_\_\_\_

Age \_\_\_\_\_

Educational Qualifications \_\_\_\_\_

### General

- For how long have you been working at the LCB?
- What are your functions regarding water supply?
- In your opinion, what are the common problems that people face with respect to the drinking water supplied by the LCB?
- In your view, which is the most serious problem of water supply, and what is being done to overcome it?
- How far is the perception true that the LCB pays more attention to the high income areas as compared to the low income ones in terms of various aspects of service quality such as quality, quantity, continuity and customer complaints?

### R 1 Quality

- What is your opinion about the taste and colour of water supplied by the LCB?
- Are there any seasonal variations in the quality of water provided by the LCB?
- What are the main water treatment processes that are applied before the water is supplied to the customers in order to ensure that the water is safe and meets the national drinking standards?
- What are the main pollutants in your water?

- What mechanism is in place to test the water samples for pollutants? If there are problems related to the quality of water, how are they tackled?
- Does the LCB have properly qualified personnel who understand the quality standards to be complied with?

## **R 2 Quantity**

- What do you think about the quantity of daily water provision by the LCB? Does it fulfill the requirements of the consumers?
- In your opinion, is the quantity of water provided by the LCB adequate in the rainy season?
- In your opinion, is the quantity of water provided by the LCB adequate during the dry season?

## **R 3 Continuity**

- Does the water provided by the LCB flow for 24 Hours?
- At what time of day is the water supplied by the LCB?
- On an average for how many hours in a day is the water supplied by the LCB?
- If you face a water shortfall, from where do you get water in order to overcome the problem?
- Is the continuity of water provided by the LCB satisfactory in the dry season?
- Is the continuity of water provided by the LCB satisfactory in the rainy season?
- In view of the power crisis, what steps have been taken in recent past to improve water supply continuity?

## **R 4 Pricing**

- When was the last time water prices revised?
- What is the basis of the present pricing mechanism? Does it ensure equity while at the same time recovering the full cost?

- Is the monthly water bill within the affordability of the customers?
- Are the customers willing to pay more for the drinking water that they get from LCB?

### **R 5 Customer Complaints**

- Is the staff of LCB responsive to the customer complaints?
- How do you ensure that the customers are able to lodge their complaints at the Public Facilitation Centre without any difficulty?
- What effective steps have been taken to reduce the response time of your technical staff in addressing the customer complaints?
- After the customers lodge a complaint, do you get back to them to find out whether the needful has been done or not and if yes in how much time?

### **R 6 Customer Satisfaction and Benchmarking**

- What is your opinion regarding customer satisfaction?
- Do you think customer satisfaction is important? If yes, how do you determine what the customers want and to what extent they are satisfied with your drinking water?
- What measures are you taking to enhance customer satisfaction? How do you rate these measures in terms of their effectiveness?
- What form of benchmarking is being followed by the LCB?
- What performance indicators are being used by the LCB with respect to customer satisfaction, coverage, water consumption and production, UFW, metering practices, cost and staffing, quality of service?

## ANNEXURE - II - Questionnaire

### GENERAL

- A. Name of Customer :  
 B. Address :  
 C. Date :

### I. Identity of Respondent

a. Sex:

- Male  
 Female

b. Age:

..... Years

c. Home status:

- Lease- holder       others  
 Owner  
 Tenant

d. How long have you been living in Lahore Cantonment?

..... Years

### II. Socio-Economic Background

a. Occupation?

	Occupation	Job	Second Job (if any)
a.	Public Servant		
b.	Business		
c.	Vendor		
d.	Self Employed		
e.	Unemployed		
f.	Housewife		
g.	Other		

b. Level of education?

- |                                                                                                                                                                                                                        |                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> No Schooling<br><input type="checkbox"/> Primary Education<br><input type="checkbox"/> Secondary Education<br><input type="checkbox"/> Matriculation<br><input type="checkbox"/> Intermediate | <input type="checkbox"/> Graduation<br><input type="checkbox"/> Masters<br><input type="checkbox"/> Others |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|

c. Number of children

- Have no children
- 1-2
- >2 (.....)

d. Total number of family members?

..... Persons

e. Your average income per month in Rupees?

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <10k         | <input type="checkbox"/> 10k to 50k   |
| <input type="checkbox"/> 50k to 100k  | <input type="checkbox"/> 100k to 250k |
| <input type="checkbox"/> 250k to 500k | <input type="checkbox"/> 500k to 750k |
| <input type="checkbox"/> 750k to 1mn  | <input type="checkbox"/> > 1Million   |

f. Average monthly family income in Rupees?

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <10k         | <input type="checkbox"/> 10k to 50k   |
| <input type="checkbox"/> 50k to 100k  | <input type="checkbox"/> 100k to 250k |
| <input type="checkbox"/> 250k to 500k | <input type="checkbox"/> 500k to 750k |
| <input type="checkbox"/> 750k to 1mn  | <input type="checkbox"/> > 1Million   |

### III. Satisfaction with Clean Drinking Water Service

a. What is the source of your clean drinking water? More than one answer may be ticked.

- |                                                   |                                         |
|---------------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> LCB Household Connection | <input type="checkbox"/> Street Vendors |
| <input type="checkbox"/> Public Tap               | <input type="checkbox"/> Other          |
| <input type="checkbox"/> Water bore               |                                         |

b. Are you satisfied with the clean drinking water service of LCB?

- Yes
- No

### IV. Quality

a. What is your opinion about the smell of water provided by the LCB?

- Foul Smell
- Normal

b. What is your opinion about the colour of water provided by the LCB?

- Unusual Colour  
 Normal

c. Is the quality of water provided by the LCB good in the dry season?

- Yes  
 No

d. Is the quality of water provided by the LCB good in the rainy season?

- Yes  
 No

e. Are you satisfied with the overall water quality supplied by the LCB?

- Yes  
 No

## V. Quantity

a. Is the quantity of water provided by the LCB adequate in the rainy season?

- Yes  
 No

b. Is the quantity of water provided by the LCB adequate in the dry season?

- Yes  
 No

c. Are you satisfied with the overall quantity of water provided by the LCB?

- Yes  
 No

## VI. Continuity

a. Does the water provided by the LCB flow for 24 Hours?

- Yes  
 No

b. If the answer of the above question is in the negative, at what time of day is the water supplied by the LCB?

<input type="checkbox"/>	Morning	<input type="checkbox"/>	Evening
<input type="checkbox"/>	Afternoon	<input type="checkbox"/>	Late Night

c. On an average for how many hours in a day is the water supplied by the LCB?

<input type="checkbox"/>	>8 Hours	<input type="checkbox"/>	2-4 Hours
<input type="checkbox"/>	4-8 Hours	<input type="checkbox"/>	< 2 Hours

d. If you face a water shortfall, from where do you get water in order to overcome the problem?

<input type="checkbox"/>	Vendors	<input type="checkbox"/>	Domestic Water bore
<input type="checkbox"/>	Public Tap	<input type="checkbox"/>	Not Applicable

e. Is the continuity of water provided by the LCB satisfactory in the rainy season?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

f. Is the continuity of water provided by the LCB satisfactory in the dry season?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

g. Are you satisfied with the overall continuity of water provided by the LCB?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

## VII. Pricing

a. What is your monthly water bill?

<input type="checkbox"/>	Rs.75	<input type="checkbox"/>	Rs.300
<input type="checkbox"/>	Rs.100	<input type="checkbox"/>	Rs.400
<input type="checkbox"/>	Rs.150	<input type="checkbox"/>	Rs.500

b. Is your monthly water bill within your affordability?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

c. Are you willing to pay more for the drinking water that you get from the LCB?

- Yes  
 No

### VIII. LCB's response to customers' complaints

a. Have you ever lodged a complaint at the LCB's Public Facilitation Centre regarding some problem related to your water supply?

- Yes  
 No

b. If the answer of the above question is in the affirmative, how many times have you lodged a complaint with the LCB?

- Once  More  
 Twice  
 Thrice

c. If the answer to the above question is in the affirmative, how long did it take for the LCB's technical staff to respond to your complaint?

- <10 Hours  3 Days  
 1-2 Days  > 3 Days

d. Was the response time satisfactory?

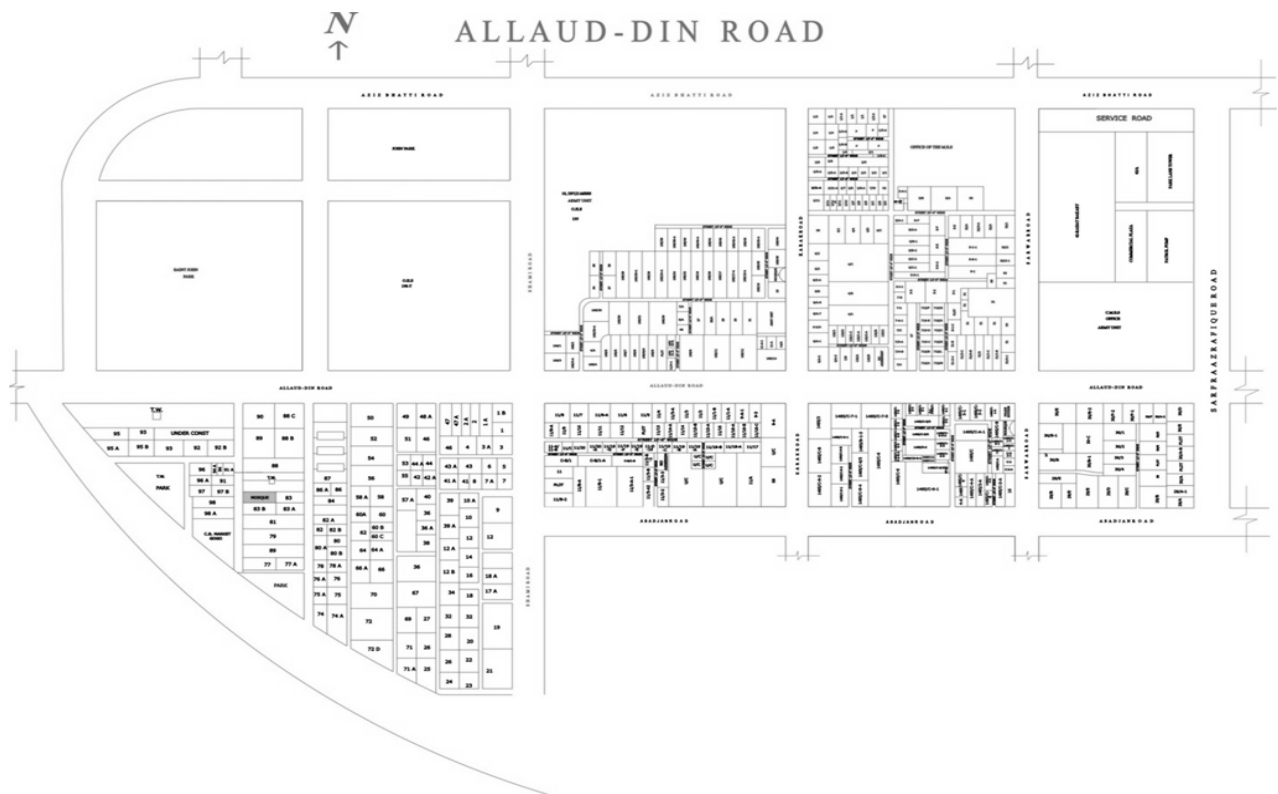
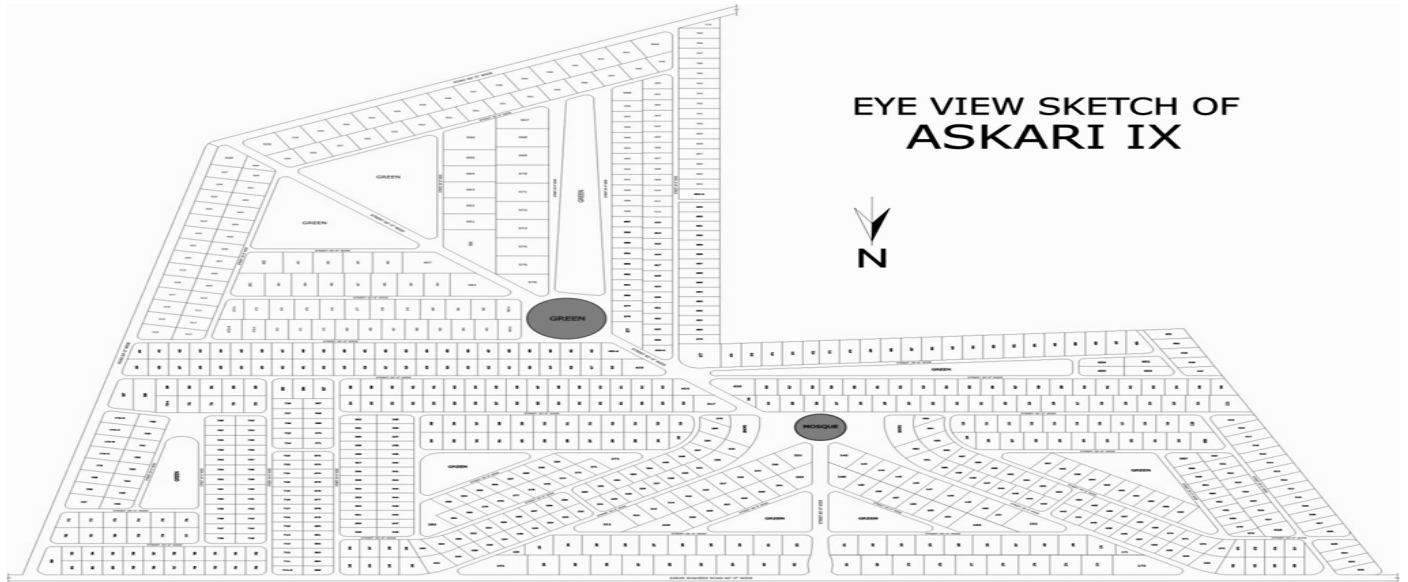
- Yes  
 No

e. In your opinion, is the LCB's staff responsive to your complaints?

- Yes  
 No

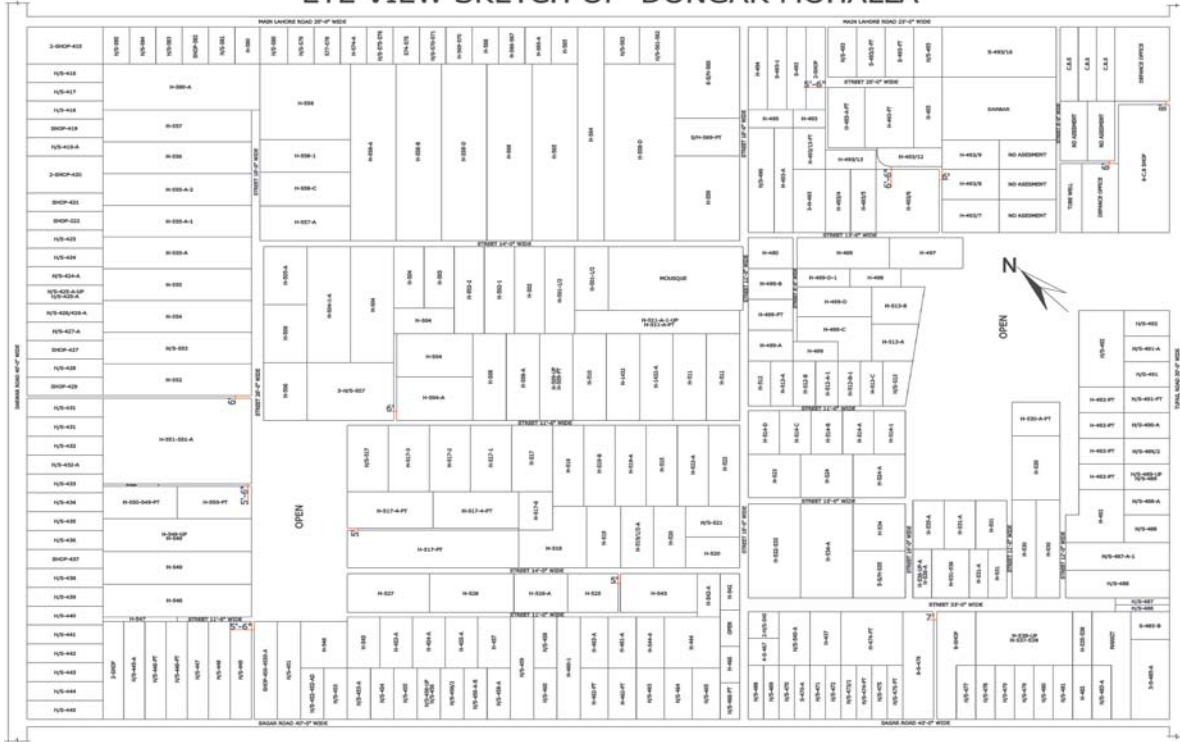


# ANNEXURE - III (A) – Maps of Two High Income Areas of Lahore Cantonment

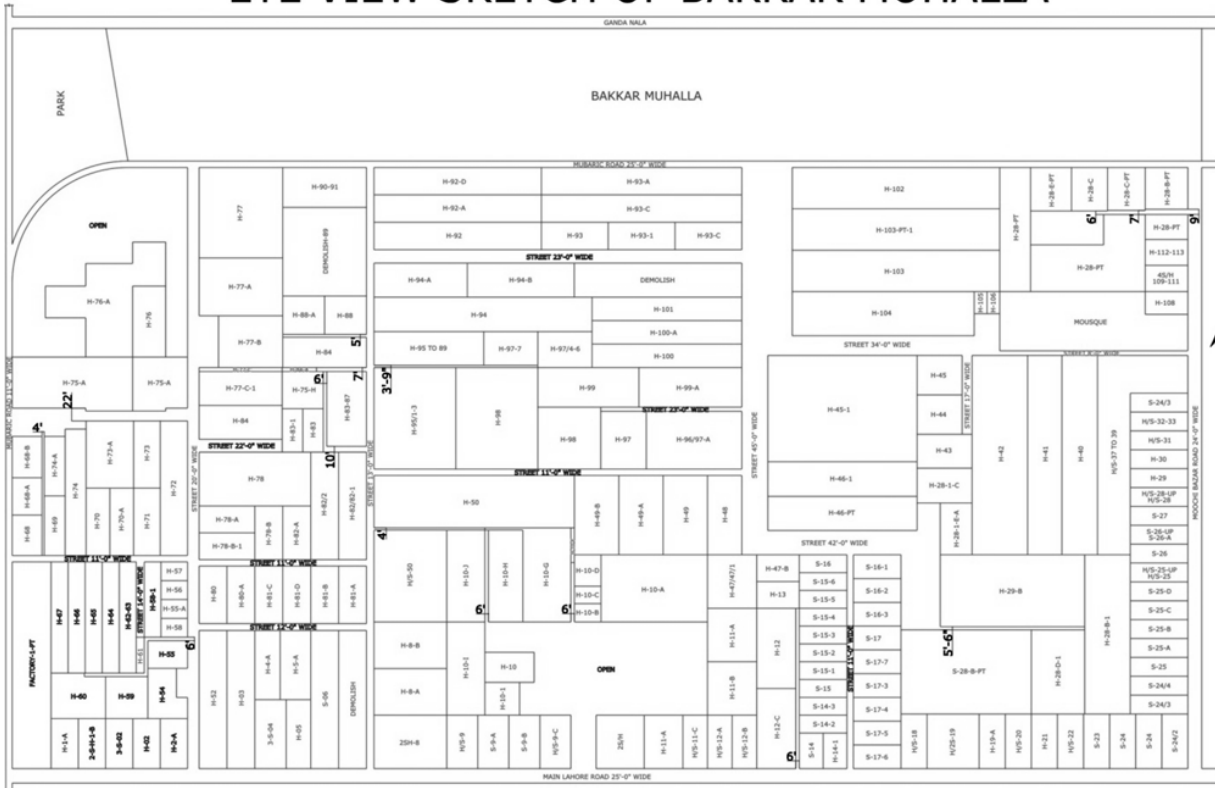


# ANNEXURE - III (B) – Maps of Two Low Income Areas of Lahore Cantonment

## EYE VIEW SKETCH OF DONGAR MOHALLA



## EYE VIEW SKETCH OF BAKKAR MOHALLA



## ANNEXURE – IV- Questionnaire Percentages

• **Table 6.1. Percentages for Overall Satisfaction**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	I am overall satisfied with the clean drinking water supplied by the LCB.	37	74	13	26	35	70	15	30
	Average	37	74	13	26	35	70	15	30

N=50

• **Table 6.2. Percentages for Quality of clean drinking water**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	The smell of water is normal	38	76	12	24	36	72	14	28
2	The colour of water is normal	36	72	14	28	38	76	12	24
3	Good quality of water in dry season	35	70	15	30	37	74	13	26
4	Good quality of water in rainy season	37	74	13	26	39	78	11	22
5	I am satisfied about overall quality of water	38	76	12	24	37	74	13	26
	Average	36.8	73.6	13.2	26.4	37.4	74.8	12.6	25.2

N=50

• **Table 6.3. Percentages for Quantity of clean drinking water**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	The daily provision of water is sufficient	34	68	16	32	37	74	13	26
2	Good quantity of water in dry season	32	64	18	36	34	68	16	32
3	Good quantity of water in rainy season	34	68	16	32	38	76	12	24
	Average	33.33	66.67	19	33.33	36.33	72.67	13.67	27.33

N=50

• **Table 6.4. Percentages for Continuity of clean drinking water**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	Water supply is continuous for 24 Hours	0	0	50	100	0	0	50	100
2	Water supply is limited to mornings, afternoons and evenings	50	100	0	0	50	100	0	0
3	Good continuity of water in dry season	23	46	27	54	28	56	22	44
4	Good continuity of water in rainy season	24	48	26	52	30	60	20	40
5	I am satisfied with the overall continuity	24	48	26	52	31	62	19	38
	Average	24.2	48.4	25.8	51.6	27.8	55.6	22.2	44.4

N=50

• **Table 6.5. Percentages for Price of clean drinking water**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	The price of water is within my affordability	50	100	0	0	44	88	6	12
	Average	50	100	0	0	44	88	6	12

N=50

• **Table 6.6. Percentages for LCB's response to Customers' Complaints**

Sr. No.	Item	High Income				Low Income			
		Agree	(%)	Dis	(%)	Agree	(%)	Dis	(%)
1	I have never lodged a complaint with LCB	28	56	22	44	8	16	42	84
2	My complaints were responded to by the LCB	19	86.34	3	13.66	35	83.33	7	16.67
3	My complaints were responded to the same day	13	59.10	9	40.90	14	33.33	28	66.67
4	The response time to complaints was satisfactory	15	68.18	7	31.81	30	71.43	12	28.57
5	The staff of LCB is courteous and polite	22	100	0	0	42	100	0	0
	Average	19.4	73.92	8.2	26.08	25.8	60.8	17.8	39.2

N=50

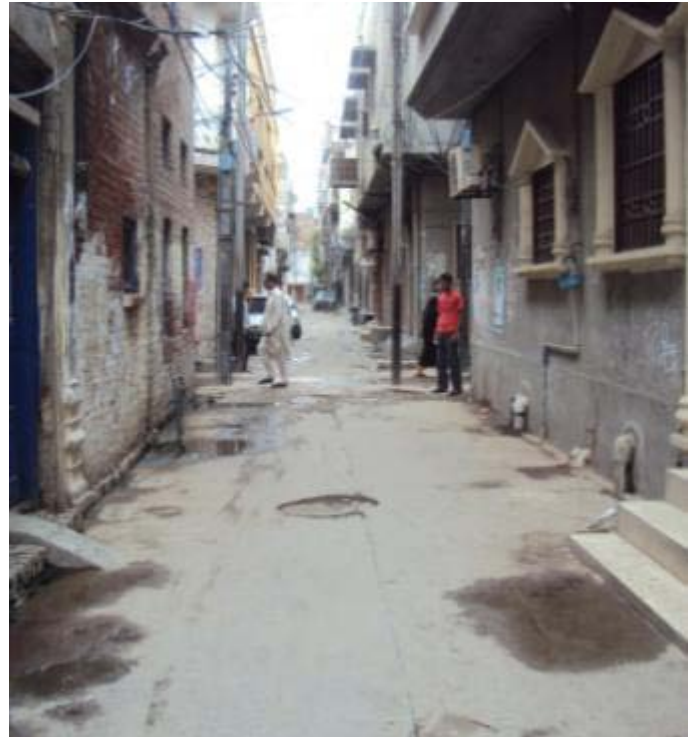
**ANNEXURE – V - Pictures**



**A typical house in the high income area of Lahore Cantonment**



**Juxtaposed houses in the low income area**



**A street in the low income area**





**The main office block of the LCB**



**Public Facilitation Room of LCB**



**Tube well Room**