WATER SUPPLY & SANITATION ANALYSIS IN SECTORS E & F
ISLAMABAD
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Assessment of Water Supply and Sanitation situation in E and F Sectors and Slum Areas (within or around E and F sectors) in Islamabad

Noor-Ul-Ain¹, Maryam Malik², Samina Perveen³

1. Context:

1.1 Background:

Until a few decades ago, Pakistan was a country rich in water resources with its huge reservoirs of lakes, rivers, glaciers and ice caps. However, with the passage of time, water resources started declining because of environmental influences like global warming, climate change etc. as well as various anthropogenic activities which may include over population, high pollution levels, rapid urbanization, industrialization and many other such reasons. As a result, Pakistan has been declared as water stressed country by Asian Development Bank and the World Bank. According to a report from ADB, Pakistan has the availability of less than 1000 cubic meters of water for a single person per year.⁴

With the rapid decline in water quantity of the country, the quality of water resources is also being affected to a huge extent. According to the Economic Survey 2011-2013, over 65% of the total population does not have an access to potable water leading to various water borne diseases⁵. A report from PCRWR states that almost 200,000 children in Pakistan die every year of diarrhea related diseases⁶.

Being the capital of the country, Islamabad holds great significance as one of the most developed and privileged city of Pakistan with best health facilities available to the citizens. However, the city is also suffering from water related issues. Since the water aquifer in the city is shallow and scattered, the major source of water in Islamabad are the reservoirs built upon Simli and Khanpur Dam as well as few tube wells. The water supply from these sources is 84 million gallons per day, as per CDA⁷, but it is still insufficient to fulfill the domestic needs of the locals. Moreover, the water supply is also being polluted due to untreated discharge of municipal and industrial effluents into the water bodies. Some other factors also contribute in polluting water like broken pipelines, improper drainage and sewage system etc.

Sanitation is another issue that is predominant in developing countries like Pakistan. The rural areas as well as a large number of slums are lacking proper sewerage system and toilets. The report published by ADB, WSP and Australian Aid states that almost 36% of the total population of Pakistan lacks the availability of proper toilet facilities.⁸ In developed urban areas like Islamabad, the sanitation system is adequate, however; the slums and underdeveloped areas of the city are still without well-established sanitation and proper disposal of solid waste and wastewater. All of these inadequacies are leading to

¹ Student at Fatima Jinnah Women University, Rawalpindi
² Student at Fatima Jinnah Women University, Rawalpindi
³ Student at Fatima Jinnah Women University, Rawalpindi
⁵Pakistan's Premier News Agency, 60% People Have Access to Safe Drinking Water in Country.
⁶DAWN. “More than 40 percent Pakistanis lack access to clean water”
⁷Government of Pakistan Capital Development Authority, Conduction of Water from Indus River System of Tarbela Dam to Islamabad and Rawalpindi.
⁸Water and sanitation program, Asian development Bank, Australian AID, The Economic Impacts of Inadequate Sanitation in Pakistan.
a declining standard of living and become the cause of various water borne diseases like cholera, diarrhea, dysentery, hepatitis etc. and these disease in many cases, turn out to be fatal for the people.

1.2 Problem Statement:

The continuously declining quality and quantity of water supply and improper sanitation which is adversely affecting the living standards of the locals has been an increasing concern for the citizens of Islamabad and its adjacent slums. A considerable number of residents of Islamabad are facing several water borne diseases because of contaminated drinking water and inadequate sanitation facilities.

1.3 Study Target Areas:

Capital Development Authority has established various housing sectors since the development of Islamabad. The report constitutes four target areas. The study target areas include sectors E-11 and F-11 of Islamabad and two slums near these CDA sectors.

1.3.1. Slum Areas of F-11 Sector Islamabad:

The first two target areas of the study are the slums located in CDA sector F-11, Islamabad. The two localities are situated at a distance of approximately 1 km from each other. Bheka Saiyidaan is located in F-11/4 whereas Mehrabadi is located in F-11/3. The exact population figures of the two localities were unavailable. However, according to the locals, the population of the two slums was said to be less than 500 persons per area.
Figure 2: A glimpse of Mehrabadi. Source: Personal photography

Figure 3: F-11 Map Highlighting target area 1 & 2: Mehrabadi & Bheka Saiyidaan Source: Retrieved from Google Maps on 16-7-2014
1.3.2. Golra Town Islamabad:

Golra Islamabad is a locality which holds much importance for the whole nation. This is due to the presence of shrine of Golra Sharif that is situated in the center of E-11 sector Islamabad. The major reason for the popularity of this shrine is the tomb of Pir Meher Ali Shah who was the Sufi Saint of 19th century. The estimated population of Golra Housing lies approx. between 3,000-5,000 individuals. Majority of the people residing this place belong to middle class families.

Figure 4: A glimpse of Golra Town E-11.
Source: Personal Photography

Figure 5: CDA sector E-11, Islamabad Map highlight target area Golra
Source: Retrieved from Google Maps on 12-7-2014
1.3.3. F-11 Sector of Islamabad:

CDA sector F-11 is one of the most populated sectors of Islamabad with its population exceeding 10,000 individuals. The sector is divided into four sub-sectors i.e. F-11/1, F-11/2, F-11/3 and F-11/4. This sector of Islamabad is considered as a highly privileged residential area of Islamabad apparently with best facilities available to the citizens.

Figure 6: Image of sector F-11
Source: Personal Photography

Figure 7: CDA sector F-11 Islamabad Map highlight F-11/1, F-11/2, F-11/3 & F-11/4
Source: Retrieved from Google Maps on 10-7-2014
1.4 Purpose of the Study:

The purpose of the study is to assess the current status of water quality and sanitation situation in CDA sectors and adjacent slum areas of Islamabad, to compare the water quality of different localities and to emphasize on the importance of clean water availability and adequate sanitary conditions to the local people of Islamabad for ensuring clean and healthy life.

1.5 Scope of the Study:

Focused on the water supply and sanitation situation in Islamabad and nearby slum areas, the study has been delimited to four selected areas within the city in order to obtain detailed results as regards the purpose of the study. These include two selected areas from CDA sectors and two slum areas within the CDA sectors E and F of Islamabad. There remains a considerable difference in the water availability and hygienic conditions among developed urban areas and underdeveloped favelas. Thus the report is focused on evaluation of water supply, sanitation situation and solid waste disposal of all study areas.

1.6 Detailed TORs:

The Terms of References of the study include:

- Preparation of Islamabad map to have spatial understanding of the population.
- Locate four selected locations each in slum area, E and F sectors.
- Select sample size in each of the four selected locations and explain the methodology.
- The total sample size should not be less than 100 interviews in the four selected areas divided in to four depending on the size of population in each category.
- Prepare the questionnaire (as simple as possible) to conduct interviews of the households in aspects related to water supply and sanitation.
- Pre-test the questionnaire and conduct the survey.

1.7 Transfer the data to Excel File, tabulate and analyze.

- Collect secondary information from net regarding work already done on water supply and sanitation in Islamabad.
- Take Pictures of the area visited including the environmental conditions around or within the selected area. Quality of the pictures should be good.
- Anything which you think is important or unique.
- Describe the study methodology including sampling & analysis procedures.
- Join the Pakistan Water Gateway (www.waterinfo.net.pk) and write individual blogs to document your weekly activities. Blogs must include pictures and a brief description of what and how you carried out the tasks.(minimum 500 words)
- Report writing and submission – the outline will include – Background information, Problem statement, purpose of the study, methodology, results, discussion and conclusions.
### 1.8 Work Plan and Schedule of Work:

Work plan and schedule of work is devised in the table 1 below;

**Table 1: Work Plan and Schedule of Work**

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Schedule of Implementation of Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Development of Proposal</td>
<td>June 4th Week</td>
</tr>
<tr>
<td>2.</td>
<td>Development of Questionnaire</td>
<td>July 1st Week</td>
</tr>
<tr>
<td>3.</td>
<td>Preparation of map</td>
<td>July 2nd Week</td>
</tr>
<tr>
<td>4.</td>
<td>Sample Size Selection</td>
<td>July 3rd Week</td>
</tr>
<tr>
<td>5.</td>
<td>Conduction of Survey</td>
<td>July 4th Week</td>
</tr>
<tr>
<td>6.</td>
<td>Data Analysis</td>
<td>August 1st Week</td>
</tr>
<tr>
<td>7.</td>
<td>Collection of Secondary data</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Compilation of Report</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Submission of Report</td>
<td></td>
</tr>
</tbody>
</table>
2. Methodology:

2.1 Review of Previous Studies:

The secondary data referred to in the report comprises of official statistics, review of case studies and reports relevant to the subject of water supply and sanitation situation in Pakistan (particularly focused on Islamabad and the nearby slums) collected from valid online sources. Most of the data obtained was qualitative in order to provide detailed information on the related issues. The prominent research findings were keenly analyzed and integrated into the report to further add significance to the primary research. The information was scanned; the facts were emphasized and then combined with personal perceptions to make the data more representative.

2.2 Selection of Target Area:

In order to conduct research on the prevailing situation of water supply and sanitation in Islamabad, four areas were selected as the target areas. The areas included:

- Mehrabadi F-11/3, Islamabad
- Bheka Saiyidaan F-11/4, Islamabad
- Golra Town E-11, Islamabad
- CDA Sector F-11 Islamabad

The areas were selected keeping in mind the difference in the living standards of the locals. Since the slums (Mehrabadi and Bheka Saiyidaan) are occupied by poverty stricken population of the area, thus they were selected to deeply analyze the hygienic status and water availability in the two areas. The other two areas were occupied by the majority of financially stable population. These were selected to analyze their water and sanitation related issues and also to compare the conditions prevailing there and in the lowly slums of Islamabad.

2.3 Selection of Sample Size:

The sample size of the four areas was selected according to the estimated population figure of each area. The sample size for the area having smaller population size was kept smaller and vice versa. Each sample represented a separate household. The sample sizes for four selected study areas are as follows:

<table>
<thead>
<tr>
<th>Selected Location</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mehrabadi (slum area)</td>
<td>20</td>
</tr>
<tr>
<td>Bheka Saiyidaan (slum area)</td>
<td>20</td>
</tr>
<tr>
<td>Golra Housing (E-11)</td>
<td>35</td>
</tr>
<tr>
<td>CDA sector F-11</td>
<td>45</td>
</tr>
<tr>
<td>Total Sample Size</td>
<td>120</td>
</tr>
</tbody>
</table>

Table 2: Describes Sampling location and sample size

2.4 Questionnaire and Pre-test:

The primary research was conducted with the help of semi-structured questionnaire. The questionnaire was comprehensive and was primarily based on the issues related to water supply such as water supply source, drinking water quality, commonly faced diseases, awareness of water borne diseases, water storage tanks, type of toilet used, sanitation conditions, personal hygiene, waste disposal and management, actions by concerned authorities and suggestions for addressing the issues of water supply and sanitation.
The questionnaire was pre-tested upon the small number of locals of the study areas and was revised as needed. For pilot testing, the majority of the respondents were females since the men were away for work at daytime. Also, Women were preferred for interviewing because they are more conscious about household requirements and accessibilities. A mixed response of cooperativeness and unsupportive attitude was there to be seen among the locals during the conduction of field survey.

2.5 Data Transfer and Tabulation:

Since the transcript was in Ms. Word, the data were transferred to the Excel Spreadsheets for analysis. Each response was transferred to a separate cell when entered into the Excel. As the responses were transferred, unique IDs were denoted to each response. Each column represented an individual question and each row was designated to an individual respondent.

The data were tabulated in the form of binary digits 1 and 0 to make the analysis easier and comprehensible. Each question was further divided into choices and the one selected was given entry of ‘1’ while those not applicable were denoted by ‘0’ digit.

<table>
<thead>
<tr>
<th>Response</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive, Applicable</td>
<td>1</td>
</tr>
<tr>
<td>Negative, Not Applicable</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3: Indicates response codes

2.6 Data Analysis:

After the data transfer and tabulation was completed, the data were analyzed. The analysis was performed with the help of computing frequencies, percentages, averages and then drawing histograms to make the results more illustrative.

2.7 Case Studies:

Three case studies have been specified in the report. The case study for the first two target areas has been combined because the two locations hold much similarity. The case studies constitute water supply and sanitation analysis, constraints and issues and options available to tackle the faced issues and problems.

2.8 Reporting:

The reporting has been done after a thorough field survey in each study area. The reporting is done in a brief and concise manner after analyzing the results of the survey.
3. Findings of Previous Studies:

3.1 Water Supply and Sanitation in Slums of Islamabad:

In a case study performed by Saeed R et al. named “Exacerbation of Poverty among Urban Slum Dwellers of Islamabad Because of Poor Drinking Water Quality and Sanitation”\(^9\), the water supply analysis was conducted in a settlement in sector I-11/1 Islamabad. The main purpose behind this was to analyze the prevalence of water borne diseases in the area caused by unhygienic water supply and to assess the extent of poverty in the area. The study area included the habitat of I-11/1 near the Metro Shopping Centre, Islamabad. Simple random sampling technique was used. 80 households were randomly selected and interviewed about various aspects regarding water supply situation.

10 water samples were randomly collected from different water sources including unprotected private wells, hand pumps and piped water supply water quality tests were conducted at PCRWR. It was found out that six out of ten households were using the water having Escherichia coli, a major source of diarrhea.

From the obtained results of water quality tests, it was determined that there was a close link between water sources and diarrheal diseases. The results revealed that all sources of water supply were contaminated except a single source of piped water supply. The storage water quality was also heavily deteriorated.

From the interviews conducted among 80 household containing 576 individuals, it was found out that about 460 individuals were suffering from water borne diseases particularly diarrhea. People were found infected with diarrhea and 70% households replied that they had diarrhea during last three months. Especially children under age five were found infected with this disease. Water treatment such as boiling is very essential for purifying water to some extent however, it was found out that almost 47 households out of 80 were using raw water without and were found infected with diarrheal diseases.

The study revealed extremely pathetic situation of water health and hygiene in the settlement of 1-11. The quality of water available to the locals was found below the permissible limits. As a result majority of the dwellers were dealing with health problems and a major chunk of their meagre income was being spent on health issues.

3.2 Socio-economic features and prevalence of water borne diseases: Error! Bookmark not defined.

Another case study by Siddique et al i.e. “Association of Socio-Economic Features, Hygienic Status, Age Groups and Gender with Prevalence of Waterborne Diseases in Rawalpindi and Islamabad”\(^10\) also involves the assessment of drinking water quality in the twin cities by determining the frequency of water borne diseases among the locals.

The research was performed by interviewing people from various settings of the Islamabad and Rawalpindi belonging to different socio economic classes. Random sampling technique was used and response data from 130 individuals was included in the study. Individuals were interviewed mainly regarding drinking water and prevalence of waterborne diseases.

The research results revealed that diarrhea was the major disease that was prevalent among water borne illnesses. Proportion of diarrhea in male and female was distributed as 28.4% and 26.2% respectively, followed by jaundice as a second major waterborne ailment with 15.9% proportion of males and 16.7% of females.


The reason behind great percentages of female patients was that women’s activities involve water usage in many ways, e.g. cooking and washing, etc. Moreover, since women live inside their homes, their immunity level is lower as compared to men.

It was also found out that diarrhea was the major ailment among the middle aged respondents whereas young people suffered comparatively lesser. Water The study revealed that water borne diseases were also linked with socio economic statuses of the individuals. Diarrhea contributes 92.6% in the study population who are socio-economically poor as well as illiterate. The reason behind this could be their unhygienic practices and inaccessibility to clean and pure drinking water.

The conclusion drawn from the results was that better hygienic conditions and installation of better water filtration system can reduce the occurrence of water borne diseases significantly and upraise the standard of living in the two cities.

3.3 Rawalpindi and Islamabad: Multi hazard risk mapping:

A study by Plan International namely “Rawalpindi and Islamabad: Multi hazard risk mapping”\textsuperscript{11}, stated that provision of clean drinking water and collection, treatment and disposal of waste water/sewage and solid waste which were three of key municipal services that determine the environment of an area, were being neglected in the cities of Islamabad and Rawalpindi.

Both Rawalpindi and Islamabad cities were unable to find an appropriate solution to fulfill these primary municipal needs of their residents. The conduction of survey in Muslim Colony located in CDA sector E-11 Islamabad revealed that majority of the residents were suffering from diseases like malaria, cholera, dengue fever etc. The residents also responded that during 2007, major number of population was affected by a certain kind of allergy, most probably because of unhygienic conditions in the area.

The female respondents of the locality declared the poor sanitary conditions the major problem faced by the local population. There was an improper disposal of waste in the drain which led to their choking and hence flooding.

Moreover as the area was located adjacent to Bari Imam, the residents complained that during the annual anniversary, devotees reached the shrine from far flung areas and created great problem for the locals by throwing garbage anywhere they liked. This resulted in further deterioration of environmental conditions. The respondents were also of the opinion that since the settlement was not recognized by CDA, hence no municipal services were provided for proper disposal of waste.

3.4 Impact of open dumping of waste on soil and vegetation diversity:

In a study by Maria et al “Open dumping of municipal solid waste and its hazardous impacts on soil and vegetation diversity at waste dumping sites of Islamabad city”\textsuperscript{12}, the contribution of openly dumped waste in soil contamination was analyzed in the dumping site of sector H-10 Islamabad.

Several analyses were performed in order to determine the soil quality after waste had been dumped on it. The results of the analysis revealed that soil was being heavily contaminated due of open dumping of waste in the area and it was affecting the diversity of vegetation in the area.

This showed that improper waste management not only affected the living population of the area but also the natural environment prevailing in the region which again affected the living beings indirectly. The contamination of soil by heavy metals affected human health, animals and soil productivity.

The organic matter, content, pH, conductivity, and available heavy metals on open dump sites were greatly affected by the quantity of wastes dumped. This was leading to the reduction of both. Thus there was seen reduction in soil quality as well as loss of vegetation diversity.

\textsuperscript{11}RDPI, 2013. Rawalpindi and Islamabad: Multi Hazard Risk Mapping, Islamabad.

\textsuperscript{12}Ali M, 2014. Open dumping of municipal solid waste and its hazardous impacts on soil and vegetation diversity at waste dumping sites of Islamabad city.
Reduction in soil quality also poses a threat to the living environment of the locality. Hence, there is a need for proper municipal solid management in the area for better quality soil. Otherwise, a number of contaminants may leach into the soil and affect vegetation as well as ground water of the area. This may result in water pollution which will consequently lead to water borne diseases among the local users.

3.5 Policy Review and Analysis:

Various policies have been formulated on national and provincial level to ensure the availability of proper water supply and sanitation to the citizens of Pakistan. Some of these are:

- National Drinking Water Policy 2009
- National Sanitation Policy 2006

3.5.1. National Drinking Water Policy:

National Drinking Water policy was formulated by the then Ministry of Environment and approved by the Federal Cabinet on 28th September, 2009 (Government of Pakistan). The basic aim of this policy is to provide a guiding framework to the federal and provincial governments in order to address the challenges faced by Pakistan towards the provision of clean and safe drinking water.

Some of the salient features on which the policy is based upon are:

- Access to safe drinking water is the basic human right of every citizen and that it is the responsibility of the Government to ensure its provision to all citizens.
- Water allocation for drinking purposes will be given priority over other uses.
- In order to ensure equitable access, special attention will be given to removing the existing disparities in coverage of safe drinking and for addressing the needs of the poor and the vulnerable.

National Drinking Water Policy is a generalized framework that provides guidelines for adequate water supply and sanitation. However, it fails to deal with area specific issues regarding availability of safe drinking water and proper sanitary conditions. Moreover, this policy also does not states any specific measures to be taken for improvement of situation in the under privileged areas like slums and Kachi abadis.

3.5.2. National Sanitation Policy:

National Sanitation Policy was approved by Cabinet Division on October 2006. The basic purpose of this policy is the meet the commitment to Millennium Development Goal Number 07 whose basic target is to reduce by half the population of Pakistan without having access to safe drinking water and sanitation by the year 2015.

Some of the salient features of this policy are as follows:

- Large urban areas have underground sewerage systems which are dilapidated due to poor maintenance and neglect. Thus most of the sewage goes untreated into natural water bodies resulting in severe contamination. The policy aims at changing this situation.
- Roads in Kachi abadis will not be raised higher than the level of plinths of the houses so as to make the sewage disposal and drainage possible and to prevent flood during rains.

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Effective waste management system will be established in urban centers and rural areas for municipal and industrial waste water.

Appropriate solid and liquid waste treatment facilities will be made integral part of all development projects.

Although this policy also focuses somewhat on maintenance of sewage disposal and drainage in Kachi abadis, yet from the observed scenario, there is far little practicality in this regard. This policy, focused on goal no.7 of Millennium Development Goals, also lacks guidelines and steps to deal with area specific issues rather it provides general recommendations for improved sanitation which are not much effective when dealing with a distinct locality.

3.5.3. WaterAid Pakistan Country Strategy 2010-2015:

In addition to federal and provincial policies, there are also certain strategies that have been formulated to ensure proper hygienic conditions to the locals. One of the common among these is WaterAid Pakistan Country Strategy 2010-2015.

WaterAid is an international non-profit organization who basic aim is the provision of safe drinking water and adequate sanitation on global level. Country Strategy of Pakistan focuses on the implementation of policies that promote and secure people’s rights and access to safe water, and improve hygiene and sanitation.\(^{15}\)

One of the major components of WaterAid Pakistan is to financially and technically assist private organizations for the improvement of WASH (Water, Sanitation & Hygiene) services.

It is also the ambition of Water Aid Pakistan to support the government in achieving MDG targets related to WASH. To achieve MGD goal, government has launched a program namely Clean Drinking Water for All (CDWA). CDWA was launched after a public turmoil against extremely unhygienic conditions and increased rate of water borne diseases in the country. WAP works in collaboration with the country’s policies like National Drinking Water Policy 2009 and National Sanitation Policy 2006.

4. Findings:

As Article 25 of The Universal Declaration of Human Right states:

“Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care…”

Provision of standard living conditions is a fundamental human right but unfortunately in a developing country like Pakistan, a considerable number of people are not subjected to such basic rights and are living below poverty line without even access to clean food and water.

Water Supply and Sanitation analysis of the two slums of F-11 revealed extremely distraught situation. Water supply is scarce and insufficient to fulfill the needs of inhabitants as the sole source are one to two hand pumps in each area. Also the water is contaminated and tainted with dirt due to which there is an increased rate of people suffering from water borne diseases. There is no proper system of waste disposal and management in Mehrabadi and Bheka Saiyidaan.

In Golra Town E-11, water supply source is a drilled well in each house. Water from the drilled well is sufficient to meet the needs of locals. Although water supply and sanitation situation in Golra Town are near to acceptability, yet there is no proper solid waste disposal in the whole locality resulting in piles of garbage in the open grounds in front of houses.

Sector F-11 of Islamabad has two water supply sources i.e. drilled wells and pipeline water supply. Pipeline water supply is very meagre in quantity, thus domestic needs are fulfilled by water from drilled wells. Citizens are not much concerned about the quality of these two water sources as mineral water is used for drinking purpose by majority of the residents.

4.1 Slum Areas of F-11 Sector of Islamabad:

4.1.1. Water Supply Analysis:

Water supply analysis of the slum areas of F-11 sector led to many contemptible discoveries. The sole source of water supply in Mehrabadi and Bheka Saiyidaan was the hand pumps that had been installed privately in the two areas. There was no sign of a proper pipeline or tube well to satisfy water requirements of the people.

The slums of CDA sector F-11 were simply lacking any proper source of adequate water supply. The hand pumps were fulfilling the needs of entire population. As a result, the locals were facing severe inadequacy of water. The residents complained that they had to wait for a long time approximately 2 to 3 hours every time for their turn to fetch water because of long queues in front of hand pumps.

Chart 1
Moreover, during summer seasons, the water quantity from the hand pumps also decreased due to falling groundwater level leading to further severity of water shortage.

The quality of water that was obtained from the hand pumps was also not up to mark as the water was occasionally tainted with dirt according to the locals. The same dirt containing water when used for drinking purposes led to various water borne diseases like malaria, diarrhea, cholera etc. among the locals, because of which children were affected the most.

One noticeable thing was that the residents, majority of them being illiterate and unknowledgeable, were unaware of the fact that the harmful diseases were being caused by the poor water quality and unhygienic conditions.

The treatment of drinking water e.g. straining, boiling etc. may improve its quality to some extent however, from the total of 40 respondents in the two areas, not a single interviewed individual used any method of water treatment. One of the major reasons behind using un-boiled water might be the deprivation of Sui gas facility in the areas.

In the present situation the slum dwellers seemed to be satisfied that at least they had water irrespective of its cleanliness. So they did not engage themselves in improving water quality to make it portable, they used the water from hand pumps as it is.

The use of Oral Rehydration Therapy in case of diarrhea was also not so common. The locals were not using the therapy personally rather it depended on the local doctor whether he gave them ORS for diarrhea cure or provides some other treatment.

The interviewees were also inquired about the occurrence of groundwater depletion in their dwellings. Mixed answers were received from the people because they did not have the exact knowledge regarding this issue.
4.1.2. Sanitation Analysis:

Living in dilapidated shelters, the inhabitants of the two slum areas were deprived of proper sanitation and sewerage system. There are no toilets at all in the whole localities. When asked question regarding this, the interviewed locals just pointed towards the open ground not much far from there. Exactly similar sanitary situations were prevailing in the villages of Bheka Saiyidaan and Mehrabadi.

This lack of proper sanitation also greatly contributed to various diseases among the locals. The only areas for children to play were breeding grounds for flies, cockroaches and rats; increasing the health risks for many people. People inhaled the toxic gases from the filthy ground that was breeding ground for mosquitoes. This was also one of the major reasons why the diseases like malaria were so common among the occupants.

Washing hands with soap after using toilet kills disease causing micro-organisms and personal hygiene is also maintained through this practice.

However, the poor people who cannot afford the usage of soap only use water to wash their hands. Thus the germs and contaminants enter the body along with food intake and become the cause of gastrointestinal infections in the body. Same was the case prevailing in the two localities.

4.1.3. Environmental Pollution:

Environmental Pollution basically includes air, water and soil pollution. From the situation analyzed, it became obvious that all three major kinds of environmental pollutions were prevailing in the two slums of F-11. Since water from hand pumps was tainted with dirt and impurities and was harming the local population, it revealed that there was existing high degree of water pollution in the areas. Although the water quality had never been tested, yet the situation itself speaks for its detrimental state. The land pollution was the one kind that could be observed even by throwing a slight glance at the open grounds of F-11 slums. The stagnant water probably leached into the ground and led to further aggravation of ground water pollution.

Just like deprivation of other basic living facilities of life, the two areas were also without any proper waste disposal and management services. People dumped their household garbage and refuse into the open grounds and the trash kept on piling without receiving attention either by the residents or by
any concerned authority. The huge garbage piles became breeding grounds for flies, insects, mosquitoes etc. resulting in extremely adverse environmental conditions.

### 4.2 Golra Town Islamabad:

#### 4.2.1. Water Supply Analysis:

The water supply source in *Golra Town* was the drilled well in each house since there was no water supply pipeline in the area. According to the inhabitants of the area, they were completely satisfied with the water supply quantity.

Water from the drilled wells was sufficient enough to fulfill their household demands. Thus people were not facing any issue regarding water supply quantity. People of Golra got adequate water supply source in the form of drilled wells to carry out their everyday routine tasks. They were contented with the water quantity as it was sufficient to meet the needs of residents living in Golra Islamabad.

As per water quality, there was a mixed response among citizens. Some were totally satisfied while there were also a few numbers of respondents who showed a slight dissatisfaction towards water quality. Maximum people declared that neither they nor their families suffered from serious diseases except common flu, cough and day to day illnesses. Although not completely satisfied, none of the individuals ever had their drinking water tested for its quality. The only way used by them for treating drinking water was boiling and straining. Many people were aware of Puri tabs but no one had used those for purifying water.

Water storage containers included cans, bottles and coolers. Their cleanliness was maintained by regular washing.

People residing in Golra did not purchase drinking water from any source and they were utilizing the same bored water for this purpose. Water storage tanks could be found in all houses.
The standard plastic tank was fixed in all houses, the capacity of which was 50 liters. The storage tanks were cleaned by most of the owners once or twice per year. However, no chemicals were used for cleaning purposes.

**Chart 2**

![Cleaning of water storage tanks](image)

People of Golra were privileged to have knowhow related to waterborne diseases. They were in position to take precautionary measures in case of any emergency. They were also familiar with appropriate steps for keeping their own living places clean and safe.
4.2.2. Sanitation Analysis:

The sanitation system is proper and well managed in Golra Town. All the houses had flush toilets which were linked with properly established sewerage system. All the respondents stated that their sewerage system had never choked. Thus the public was not facing any problem regarding sanitation.

People also took care of their personal hygiene by washing their hands with soap each time after using toilets. Thus, they were familiar with basic appropriate steps used to tackle any health crisis.

4.2.3. Environmental Pollution:

Despite having a good sanitation and satisfactory water supply, there is a great degree of environmental pollution in Golra. This is due to improper disposal of waste in the locality.

![Figure 14: A view of openly disposed garbage in Golra Town](Source: Personal Photography)

From general observation, anyone can agree to the fact that the biggest concern of the area is solid waste disposal and management. After witnessing the junkyard in empty plots in the locality, one can become well acquainted with the solid waste disposal of the area. The response of the residents concerning the whole situation was also as expected. When asked how they disposed of their household garbage, the people responded that since there was no proper management of waste in the whole area, they just dumped their household refuse in the nearby empty plots as they were left with no other option.

4.3 F-11 Sector of Islamabad:

4.3.1. Water Supply Analysis:

Unlike the previous three target areas having single source of water supply, CDA sector F-11 has two major water supply sources. One is the pipeline water supply and the other is drilled water or water boring system in all houses. In F-11 nearly every house has a bored well for provision of water. The reason behind that is the extreme inadequacy of water supplied through pipeline in the area.

Still the residents were satisfied because their water requirements were being fulfilled through water extracted from drilled wells. All of the interviewed residents were contented and not even a single house was found facing water crisis.
The reason citizens were not much concerned about the quality of groundwater was that majority of the interviewed locals was using purchased water for drinking purposes. Mineral water was utilized and people were apparently satisfied from its quality. The money spent on purchasing mineral water lied between the ranges of Rs.1,000-3,000 monthly depending upon family sizes.

Regarding the quality of this water, a minority of the locals had their bored water checked for purity level.

One of the residents namely Ghulam Nabirana responded that he once had the groundwater quality tested and the results revealed that the water did not meet up the standard limits for good quality water. It was at the depth of 400 feet that pure water could be found in that region whereas the boring was usually done almost up to 200 feet.

Although water quantity from boring system was on the whole sufficient yet most of the residents reacted that the groundwater was depleting slowly and a slight decrease in water quantity could be experienced in the summer season.
The disease rate in the area was also quite low because of healthier living conditions and people only suffered from day to day illnesses like cough, sore throat etc.

People of F-11 were aware about the Puri tabs but had never used the tablets for water purification. Cleanliness was maintained and taken care of by regular cleaning of water storage bottles and cans.

Every house had a concrete storage tank while some also had plastic tanks of standard size i.e. 50 liters. The water storage tanks were kept clean by washing once or twice a year. Many residents explained that they had used the chemical ‘Potassium Permanganate’ known commonly as Pinky for purifying their water storage tanks from germs and bacteria.

4.3.2. Sanitation Analysis:

Sanitation system is properly established in the area just like any other developed residential area of the city. All houses had flush toilets which were linked with sewerage system. None of the respondents had experienced choking in their toilets. Personal hygiene was also maintained and people used soaps and hand washes to wash hands after using toilets.

4.3.3. Solid Waste Management:

In CDA sector F-11, there was proper solid waste disposal. Trash cans were fixed on roads and waste collectors collected waste on regular basis. The public also had awareness about composting and separation of organic and inorganic waste at homes. However, they had never practiced the technique. The reason they communicated was the shortage of open spaces and lawns.

4.3.4. Environmental Pollution:

Water or land pollution could not be observed in the area because of well-maintained hygienic conditions. However air pollution might exist because of the presence of two slum areas in the sector F-11 which are not so far from the main roads.

Few of the interviewed locals were of the opinion that those slums should be displaced from the sector because they were a source of nasty smell spread over the whole area. Besides that, the slums were also ruining the scenic value of such properly established CDA sector of Islamabad.
5. **Key Issues:**

There are various obstacles that become the cause of stressful circumstances in areas under study. Some of the issues are general that might prevail in all the areas however; there are also certain issues that are specified for each area. All of these discussed as under:

5.1 **Generic Issues:**

Some of the generic issues that have been observed in all study target areas regarding water supply and sanitation conditions are:

- **Lack of Awareness:**
  
  Lack of awareness is a major issue that leads to unhygienic living conditions among the citizens. The residents of under privileged localities do not realize the importance of clean and healthy surroundings mainly because of their illiteracy. However, even that portion of public which is educated is not aware of the means and measures by which they can adopt healthy life styles.

  The residents of F-11 sector of Islamabad, even though educated and knowledgeable, still lack the knowledge of waste minimization techniques like composting at domestic level which can prove to be quite beneficial if practiced.

- **Lack of Resources:**

  Scarce resources especially financial resources result in number of obstacles in accessibility of safe water and proper sanitation. The residents of Islamabad slums and Golra Town belong to the lower and middle class of society respectively. Thus, lack of monetary and other resources are one of the factors that prevent the locals from taking any prominent measures for proper solid waste management and obtaining safe drinking water for themselves.

  Citizens of F-11 sector face no financial constraints though they reflect that due to the shortage of lawns and open spaces, they are unable to practice to compost the organic wastes on household level.
• **Lack of concern by Authorities:**

The poor localities of Islamabad like slums and favelas situated in the midst of the city are being totally neglected by the regulatory authority. Thus they are very much deprived of the basic human necessities as observed during survey.

Similarly no government institution is paying heed towards an increasing pile of garbage in the Golra Town. The Golra inhabitants revealed that since the area did not come under the regulation of Capital Development Authority, no one was taking care of the area’s management and maintenance related issues.

Water quantity supplied through pipelines remains unchecked by the authorities despite being aware of the problems faced by F-11 residents. Still no effort has been made to increase the water supply quantity. Improvement in the circumstances requires a keen attention by the responsible establishment.

### 5.2 Specific Issues:

#### 5.2.1. Slum Areas of F-11 Sector:

There are number of constraints which give rise to such detrimental situation in the slums of F-11 some of which are as follows:

- **Poverty:**

Poverty is doubtlessly the root cause of under development. The slums areas constitute that portion of the country’s population which lives below poverty line. The inhabitants of Mehrabadi and Bheka Saiyidaan belong to the extremely underprivileged class of society. This is due to their weak financial status that they are unable to raise their voice or demand for better living standards from the concerned authorities.

- **Illiteracy:**

The illiteracy rate is extremely high in the backwards slums of Pakistan. Similarly, majority of the residents of the two slums under study were ignorant and uneducated. Being unaware of their basic rights of life, it is impossible for them to struggle for their acquisition.

- **Social Disparities:**

Unfortunately in our society, there is an increased occurrence of social disparities. All the opportunities or conveniences are reserved for the privileged class and the poor are dispossessed of even their basic human rights. Such trend is very obvious in the big cities like Islamabad. In CDA sector F-11, similar situation exists with big bungalows with all luxuries of life and the lowly slums situated exactly in front of each other.

#### 5.2.2. Golra Town Islamabad:

There are a few constraints while considering the water supply and sanitation situation of Golra Housing Islamabad. Solid waste management faces many obstacles such as these:

- There are no bins or drums placed on the streets for garbage dumping.
- The residents of Golra Town are also unaware of after effects of the huge piles of garbage in front of their residential areas. Thus they do not attention towards keeping their surroundings clean and hygienic.
- The area contains a cow barn in the mid of houses. This becomes the cause of intense smell in the entire region as well as cow dung on the streets which is worrisome for the locals.
5.2.3. F-11 Sector of Islamabad:

Having access to satisfactory living conditions, the only problem local people were facing was slight water depletion in summer seasons and air pollution because of slums. Thus, the constraint regarding these issues might be as these:

- Water source of whole of Islamabad city are the two dams namely Simli Dam and Khanpur Dam as previously discussed. The water level is falling in these two dams because of which meagre amount of water is supplied to the citizens through pipelines.
- According to the residents of F-11, there can be felt a strong smell in the locality most probably because of the presence of two slums within the sector.

6. Options Available:

During the survey, citizens also suggested few measures to deal with environmental and water related concerns in study target areas. Just like key issues analyzed, the options that are available to deal with these are also divided into generalized and specific.

6.1 Generic Issues:

Following are few options available for dealing with those problems which are being faced by all citizens regardless of their dissimilarities.

- **Spreading Awareness:**

  Under the existing circumstances, there is a strong need to spread awareness among the public about the importance of maintaining personal hygiene and safe and cleaning surroundings. Awareness sessions and programs must be organized by government and private organizations for the people belonging to non-urbanized areas like slums as well as for the educated class of the country. It might also be an effective step to include such lessons in the schools’ curriculum.

  People should also be guided on practicing composting on domestic level so that a considerable amount of waste could be reduced and diminished appropriately.

- **Attention by concerned authorities:**

  The problems of the slum dwellers are of such great magnitude that these cannot be resolved until and unless attention is paid by the government. Being a legal or an illegal settlement is another aspect, the provision of basic facilities of life is a proven right of every human being.

  Not only the slums, government institutions, responsible in this regards, should pay heed to the water supply and sanitation conditions in all affected areas. On the whole, all these actions require the regulatory authority to own their responsibility and take measures for improvement of situation.

6.2 Specific Issues:

6.2.1. Slum Areas of F-11 Sector:

During the conduction of survey in the slums of CDA sector F-11, the respondents were given the opportunity to suggest measures or actions for the improvement of current situation. A few residents responded with one and only suggestion for the improvement of water supply.

The locals suggested that as the areas were facing severe water inadequacy, thus more hand pumps should be installed in the two slums to fulfill daily requirements of the residents. Some also suggested that installation of a tube well in the localities could solve their water problem to a great extent.
Being concerned only about water supply shortage, none of the individuals were concerned about the improvement in water supply quality, proper sanitation system or proper waste disposal and management.

The options available to deal with the present circumstances are:

- Installation of more water supply sources such as wells, hand pumps, tube wells etc. to meet the citizens’ needs.
- Improvement of groundwater quality by stopping the activity of open dumping of waste to avoid leaching.
- Proper waste collection: The individuals should do play their own part in this by placing drums and bins in their vicinities.

### 6.2.2. Golra Town Islamabad:

Residents of Golra Town were also given the opportunity to suggest measures to deal with the present problems. The residents suggested that waste collecting drums should be placed on roads in order to prevent open disposal of refuse.

Following options may be useful for dealing with related issues:

- By practicing composting at home, the amount of household waste can be reduced to a great degree.
- People should play their own part in every possible manner to keep their surroundings clean. Citizens themselves should place waste drums on roads and try to find some better alternative for proper waste disposal.

### 6.2.3. F-11 Sector of Islamabad:

Citizens suggested few actions to improve the environmental and water related concerns of the area. The options available many include the following:

- One option for increased water supply from pipeline could be the construction of more dams or to increase the capacity of already existing dams to tackle with the water supply shortage.
- The maintenance of water supply pipelines is also very crucial. Many times, there is a leakage in water pipelines which affects both the quantity and quality of supplied water. Thus pipes should be bigger and well maintained for ensuring satisfactory water supply.
- The motors that are installed for supplying water to the area must have higher efficiency so that they could deliver a satisfactory quantity of water to the whole residential area.
- Regarding air pollution, the only suggestion given by the locals was the removal of slums from sector F-11. However if the slums be removed, it is necessary that the people residing there are shifted to some other place that is equipped with all basic essentials of life.

### 7. Institutional Gaps:

The main institution responsible for maintenance and regulation of water supply and sanitation in Islamabad is Capital Development Authority. CDA was created as a result of the executive order titled Pakistan Capital Regulation passed on June 14th, 1960. It is responsible for development and maintenance of the capital as well as for public benefit by ensuring the provision of all basic necessities of life to its citizens16.

Capital Development Authority is divided into six wings the basic purpose of which is the division of labor to increase the efficiency in each area. These are Administration Wing, Estate Wing, Engineering

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16Government of Pakistan, Capital Development Authority. _Conduction of water from Indus River system of Tarbela Dam to Islamabad and Rawalpindi_.

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IUCN, International Union for Conservation of Nature, Pakistan
wing, Finance wing, Planning & Design Wing and Environment Wing. Each wing further includes several directorates.

Water Supply Directorate is included under the Engineering Wing. It is responsible for production, treatment, conduction and distribution of potable water to the whole city. Sanitation Directorate is included under the Administration Wing and its major responsibility is the delivery of adequate sanitation and proper garbage disposal within the municipal limits of Islamabad.

With continuous increase in population of the city, water shortage is becoming a major problem faced by citizens. The current two dams which are supplying water cannot fully meet demands of the residents. Thus CDA needs to hasten its efforts in increasing water supply sources of Islamabad.

Although water supply and sanitation facilities are being provided in all residential sectors and model villages etc. yet slums and some of the housing colonies, situated in the midst of several CDA sectors, are being totally neglected. No garbage disposal service is operational either in Golra E-11 or in the vicinity of F-11 slums. CDA should take initiatives to improve the sanitation and hygienic conditions in ignored places such as these. For proper garbage disposal, drums and bins need to be placed in such areas.

CDA’s efforts are quite prominent in some directorates while negligence of duties can be observed in others. There is a need for continuous monitoring of activities of all directorates by high ranking responsible officials.

8. Capacity Building Needs:

On individual level, CDA needs to build up the expertise and enhance existing knowledge and skills of its employees so that they could give their best output to the organization. Even though, CDA training academy is once again working on this task by arranging training courses for its employees, still there is a need to educate all its employees and train them properly to increase their potential.

Since there is no separate arrangement for monitoring or assessing the success and progress of each directorate and its on-going projects, there is a need to establish a distinct monitoring unit whose basic responsibility would be to monitor the progress of each unit. Increased efficiency can be expected by taking this initiative.

CDA will be able to build its capacity to a great extent by increasing its interaction with public by creating different forums and arranging awareness sessions. In this way, authority will be able to comprehend the problems faced by citizens more genuinely. Also people will become more aware of their personal responsibilities towards the maintenance of the city.

9. Awareness and Mass Communication Needs:

As discussed before, lack of awareness among the citizens is one of major causes of poor sanitary conditions in backward slums and less developed areas of Islamabad. Majority of the public don’t even know the harmful impact of germ-infested environment on personal health and hygiene. Thus, the need of the hours is to educate the masses to practice hygienic activities.

Media can play a crucial role in this regard by organizing different programs to disseminate awareness about cleanliness among the citizens. Awareness creating programs, shows and information sessions should be displayed on television. Print media should also perform its role sincerely in this regard. Articles and editorials can be written by environmental experts and analysts in newspapers and magazines in a comprehensible manner so that common man could apprehend the main objective easily. Short stories and plays can be quite helpful in educating young children.

People living in slums are mostly illiterate and poor. Thus, they have no access to newspapers and television. However, major bulk has an access to radio. So awareness programs should be run on radio in local languages to make people realize their duties towards their environment and surroundings.
10. Next Steps:

The options available have been discussed in a separate section. The institution responsible in this regards has also been analyzed briefly. Thus the next steps that are needed to be taken at the moment are as follows:

- Capital Development Authority should increase its pace and take effective measures to improve water supply demands of the citizens of Islamabad including both privileged as well as under privileged zones of the city.
- Since water supply sources presently are insufficient to fulfill the requirements of whole city, thus steps should be taken to build more dams for ensuring uninterrupted water supply.
- Public should be given awareness about the importance of maintaining personal good hygiene as well as good sanitary conditions to stay safe from various harmful diseases.
- Responsible government institutions should pay heed towards the provision of fundamental human rights to the slum dwellers including clean drinking water and food, a proper shelter and clothing etc.
- In order to increase the competency of CDA, more finances can be allocated to the organization by the government. Budget should be enhanced and strict check must be kept on its performance and outcomes.
- By coordinating with private organizations working for the betterment of the living conditions of the citizens, great deal of improvement can be expected. Collaborative efforts by CDA and active organizations like IUCN, WWF etc. can be valuable in achieving the desired goals.