A COMPARATIVE STUDY OF GO MANAGED AND NGO MANAGED WATER SUPPLY AND SANITATION FACILITIES FOR URBAN POOR IN DHAKA CITY

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In Memory of My Beloved Father-

Late Md. Mokhlesur Rahman

Abstract

Urbanization is positively correlated to socio-economic development of any nation. However, the rapid urban growth in Bangladesh has created an adverse effect to its overall urban environment. The various adverse effects are mass poverty, proliferation of slums and squatters, inadequate supply of urban facilities such as water, electricity, garbage disposal, sanitation, sewerage, fuel for cooking etc., and degradation of social, neighborhood and physical environment. The poor are the most unserved in respect of all urban facilities. Dhaka, the Primate City of Bangladesh, where the level of urbanization as well as the rate of urbanization is higher than other urban centers. In this city, 70 percent people live below the poverty line and they are far behind the urban facilities according to the demand. After long years of independence the urban and rural poverty remain static in this country though many efforts have especially been taken to eradicate the rural poverty. On the other hand, urban poor are largely sufferers not only from government resource allocation for them but also urban poverty alleviation programs. The aim of this study is to understand the impact of water supply and sanitation facilities provided by the Government Organizations (GOs) and Non-government Organizations (NGOs) for urban poor in Dhaka City. The present study has been made an attempt to compare the GO managed and NGO managed water supply and sanitation facilities on the basis of types of facilities, provision standard, performance standard, maintenance and management, and cost recovery system. The study is based on questionnaire survey. A total of 200 questionnaires have been administered in four different sites in Dhaka City. Among four sites two are GO managed and two are NGO managed. Meanwhile, the various factual data have been collected from secondary sources to know the present status of water supply and sanitation situation and activities of GOs and NGOs in these sectors. In the data analysis, a satisfaction index and a priority ranking technique have been adopted. The satisfaction index has been used to know the dwellers' satisfaction about water supply and sanitation facilities and priority ranking technique has been used to rank the problems faced by the dwellers related to water supply and sanitation facilities provided by different GOs and NGOs. Dwellers' are reacted differentially with various aspects of water supply and sanitation facilities provided by GOs and NGOs. In

maximum cases, the variables of water supply and sanitation facilities have been shown the negative index of satisfaction. Various problems related to water supply and sanitation facilities have been investigated through reconnaissance, community and questionnaire survey and then the problems have been priority ranked. The development of GO managed and NGO managed water supply and sanitation for urban poor in this city greatly depend on the mitigation of problems on priority basis. So, there is an acute need to address the problems faced by dwellers' on water supply and sanitation facilities provided by GOs and NGOs. The comparative study has been tried to find out the problems and prospects of management system of water supply and sanitation facilities for urban poor in Dhaka City provided by concerned GOs and NGOs. In this way, the formulated policies may be helpful to improve the present conditions of water supply and sanitation facilities for urban poor in all over the country.

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TABLE OF CONTENTS

Contents **Page No**

Contents **Page No**

List of Tables **Page No**

List of Tables **Page No**

List of Tables **Page No**

List of Maps

List of Figure

Action Aid: An International NGO Working for Alleviating Urban and Rural Poverty

ADB: Asian Development Bank

ASA: Association for Social Advancement, a renowned National NGO in Bangladesh

BBS: Bangladesh Bureau of Statistics

BRAC: Bangladesh Rural Advancement Committee, One of the Leading National NGOs in Bangladesh

BDR: Bangladesh Rifle

BAUPA: A Local NGO Working for Alleviating Urban Poverty

CARITAS: A National NGO Working for Alleviating Poverty

CBO: Community Based Organization

CUS: Center for Urban Studies, Dhaka

Cont.. Continue

DCC: Dhaka City Corporation

DFID: Department of International Development

DPHE: Department of Public Health Engineering

DSK: *Dustha Sahazza Kendra*, a Local NGO Working for Alleviating Urban Poverty

DWASA: Dhaka Water and Sewerage Authority

FULKI: A Local NGO Working for Alleviating Urban Poverty especially in Water Supply Sector

GO: Governmental Organization

GOB: Government of Bangladesh

HPS: Hand Pump System

HSC: Higher Secondary Certificate, A-Level Education in Bangladesh

ICDDR,B: International Center for Diarrheal Diseases Research in Bangladesh

Kutcha Latrine: Unsanitary Open Latrine

LGED: Local Government Engineering Department

NEMAP: National Environmental Management Action Plan

NGO: Non-governmental Organization

NGO-AB: NGO Affairs Bureau of Bangladesh

OXFAM: An International NGO Working for Alleviating Urban and Rural Poverty

Petty Business: Small business which can be started with micro investment, such as vegetable shop

PI: Plan International, an International NGO Working for Alleviating Urban and Rural Poverty especially in Education and Water Supply Sectors

PROSHIKA: A Human Development Center, a well-known National NGO in Bangladesh

Rickshawpuller: Rickshaw is a well known and popular non-motorized vehicle of Bangladesh, which is especially seen in urban areas, and driver of this vehicle is known as rickshawpuller

SIP: Slum Improvement Project

SSC: Secondary School Certificate, O-Level Education in Bangladesh

UBSDP: Urban Basic Service Delivery Project, an Urban Poverty Alleviation Program is running in the Urban Poor Areas, has jointly implemented by DCC and UNICEF

UK: United Kingdom

UNCHS: United Nations Center for Human Settlement

UNCRD: United Nations Center for Regional Development

UNDP: United Nations Development Program

UNESCAP: United Nations Economic and Social Commission for Asia and the Pacific

UNICEF: United Nations International Emergency Children Fund

UNO: United Nations Organization

UPRP: Urban Poverty Reduction Project

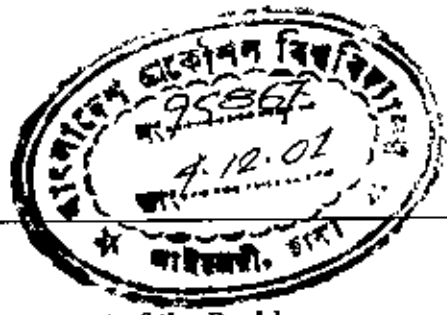
USA: United States of America

VERK: A Local NGO Working for Alleviating Poverty

WASA: Water Supply and Sewerage Authority

WHO: World Health Organization

Yr.: Year



Chapter: 01 Introduction

1.1 Statement of the Problem

Bangladesh is one of the most densely populated countries of the World. More than 23 million people live in the urban areas of this country, almost half of them in three major cities- Dhaka, Chittagong and Khulna. The trend of urbanization rate is very high over the last three decades compared to the national population growth rate. The rate of urban population growth was 5.43 percent in 1991 while the national population growth was 2.17 percent (BBS, 1997). With rapid urbanization, the numbers of the urban poor have also increased from about 7 million in 1985 to 11.5 million in recent time. According to the Center for Urban Studies, this figure is expected to increase to 15 million by the year 2000 and double within the next twenty years (Islam, 1997) Much of the urban growth is due to migration of the rural poor to the urban areas and also with natural increase of native urban population. The rapid urban growth has caused economic and socio-cultural improvements for some people but also deterioration of overall urban environment (Islam and Nazem, 1996). The result has been a much higher rate of growth of the urban poor population (Islam, 1996).

The high density of urban population puts extraordinary strain on jobs, housing, education and health. These kinds of urban facilities are quite unsatisfactory for urban dwellers in Dhaka City especially for urban poor. A large number of urban poor in this city live in slums and squatters whose monthly income is near about or less than Tk 3000 with which they can hardly manage their basic amenities (Islam, 1992). The presence of thousands of slums and squatters within Dhaka is an ever-present threat to public health. Many of these have been set up over open water bodies or besides railway tracks. They have no proper arrangement of water supply and sanitation system that create an adverse effect on city's environment. In the absence of sanitary latrines, inevitably human as well as general household waste is finding its way into the surface water bodies. It is believed that urban areas have received a disproportionate share of the investments in development expenditure in the country (Pramanik, 1982). On the other hand, this investment has not benefited the poor in the urban areas much and their condition has remained extremely

unsatisfactory, in some sectors the situation is even worse than in rural areas (Islam, 1996).

In Dhaka City 55 percent poor households have access to tap water and 43.5 percent have access to tube well water for drinking purpose which is not sufficient for all household purposes. Only 18.9 percent households have access to sanitary latrine (semi-*pucca*) and 42 percent have access to pit or open pit latrine (Islam, 1997). The main problem for urban poor in this city is insufficient water supply and second main problem is the cost of the water, both to the slum dwellers and to city residents as a whole. The slum dwellers pay a very high price for water but receive a very poor service in return (Water Aid, ACTION AID and VERC, 1997). The availability of water supply and the access to sanitation facilities are essential minimal conditions, which should be present particularly in all urban settlements A sizeable number of residents still carry water from nearby rivers (17.6 %), ponds (3.6 %), and ditches (1.6 %). This situation illustrates clearly that the bulk of slum dwellers in Dhaka City still dependent on impure and unhygienic water sources and for this reason, many of the children and women become the severe victim of water-born diseases (Karim, 1999).

A few number of Governmental Organizations (GOs) and Non-governmental Organizations (NGOs) are trying to improve the condition of water supply and sanitation facilities for urban poor in Dhaka City with different approaches. But the crisis of water supply and sanitation facilities is a common feature in daily life of urban poor. So, it is an immediate concern to study the approaches of different organizations related to water supply and sanitation facilities for urban poor in this city. It is also a prime question how to improve the existing condition.

1.2 Objectives with Specific Aims

The main objective of this research is to make a comparative study on the management system of GOs and NGOs related to water supply and sanitation facilities in some selected areas of Dhaka City that will help to formulate some policy guidelines for the improvement of the situation.

CHAPTER 5

5.1 EXISTING HEALTH FACILITIES IN DACCA CITY

When a study is undertaken it is necessary to know not only what facts are needed but also what the standard of strenghh are. Otherwise no appraisal is possible. Hence enumeration of existing facilities in Dacca City is considered pre-requistite for the future guidance to health development.

Dacca being the capital city, it is evident that maximum health care facilities are concentrated within the city limit. It is not only the foci of qualified allopathic, homeopathic and other praatices of both private and public sectire of national health service, but also of the practice, activities and specialisation of national international voluntary organisation. But with regard to the data on health status services, the sources are most inadequate. After repeated visits and interview with the respective authorities of Government Health Directorates, Medical Association of both private services, hospitals, health personnels like the presidnat of Diabetic Association Dr. Ibrahim, the president of NATAB, Dr. Chowdhury, Dr. Emdadul Islam of Health Directorate and Dr. Anwar, Chief Medical Officer of Dacca Municipal Corporation, the following information have been collected. For a general understanding and comparative analysis, the distribution of health facilities within the city may be grouped into the following classes.

1. those run by Government Health Division
   a) hospitals with teaching institute
   b) hospitals for special categories of population
   c) out - door government dispensaries
2. those run by Municipal Corporation
   a) out - door clinics
3. government assisted and international organisation aided
4. family planning and maternity services
   a) those run by government population division
   b) those run by non-profit organisation
   c) private maternity clinics
5. private profit - oriented clinics
   a) allopathic dispensaries or pharmacies
   b) homeopathic dispensaries
   c) Ayeurbedic pharmacies

The specific objectives of the study are as follows-

1. To study the water and sanitation facilities provided by the Governmental Organizations (GOs) and Non-governmental Organizations (NGOs) for urban poor in Dhaka City. The GO managed and NGO managed water supply and sanitation facilities will be studied and compared on the basis of types of facilities, provision standards, performance standards, maintenance, management and cost recovery of the facilities.

2. To suggest some policy guidelines for the development of water supply and sanitation facilities for urban poor in Dhaka City.

The specific aims of the study are to find out a proper management system for water supply and sanitation facilities and to formulate some policies for the improvement of existing situation of water supply and sanitation facilities for urban poor in Dhaka City.

1.3 Methodology of the Research

The study has been done based on following methodologies-

1.3.1 Collection of Information

Primary Surveys are primarily concerned with the collection of data at household level from the dwellers' of selected urban poor areas in Dhaka City about water supply and sanitation facilities provided by either GOs or NGOs. Site selection, Reconnaissance survey, Questionnaire Survey, Community Survey etc. are all primary surveys in this study.

Secondary surveys are concerned with the collection of data on overall status of water supply and sanitation facilities for urban poor mainly from various sources such as review of Books, Journals, Periodicals, Reports, Thesis, Research Project and Newspaper etc.

1.3.2 Site Selection

There are large number of slums and squatter settlements in Dhaka City. The Center for Urban Studies (CUS, Dhaka) has identified about 3007 slums and squatter settlements in

Dhaka City, located scatteredly all over the city (Map- 01). However, it is quite difficult to get an urban poor area, which is fully GO managed or fully NGO managed because different types of Governmental Organizations, Non-governmental Organizations and Community Based Organizations are working individually or mutually for eradicating the urban poverty in different urban poor areas in Dhaka City. For the purpose of site selection, at first, some major slums and squatter settlements (according to area and population) have been pre-selected arbitrarily in different parts of Dhaka City from a wide list of slums in this city (CUS, 1996). Then, a preliminary survey with a short questionnaire (Appendix-01) incorporating some questions regarding the present conditions of water supply and sanitation facilities and also the organizations responsible for providing such facilities, were conducted.

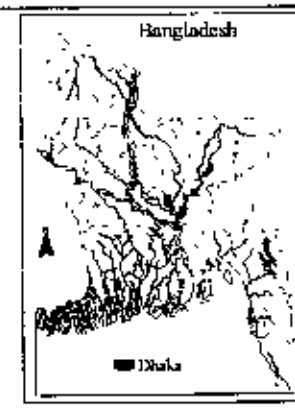
Table: 1.1 List of Some Slums and Squatter Settlements (with no of Household, Total Population, Area and Ward Number) in Dhaka City.

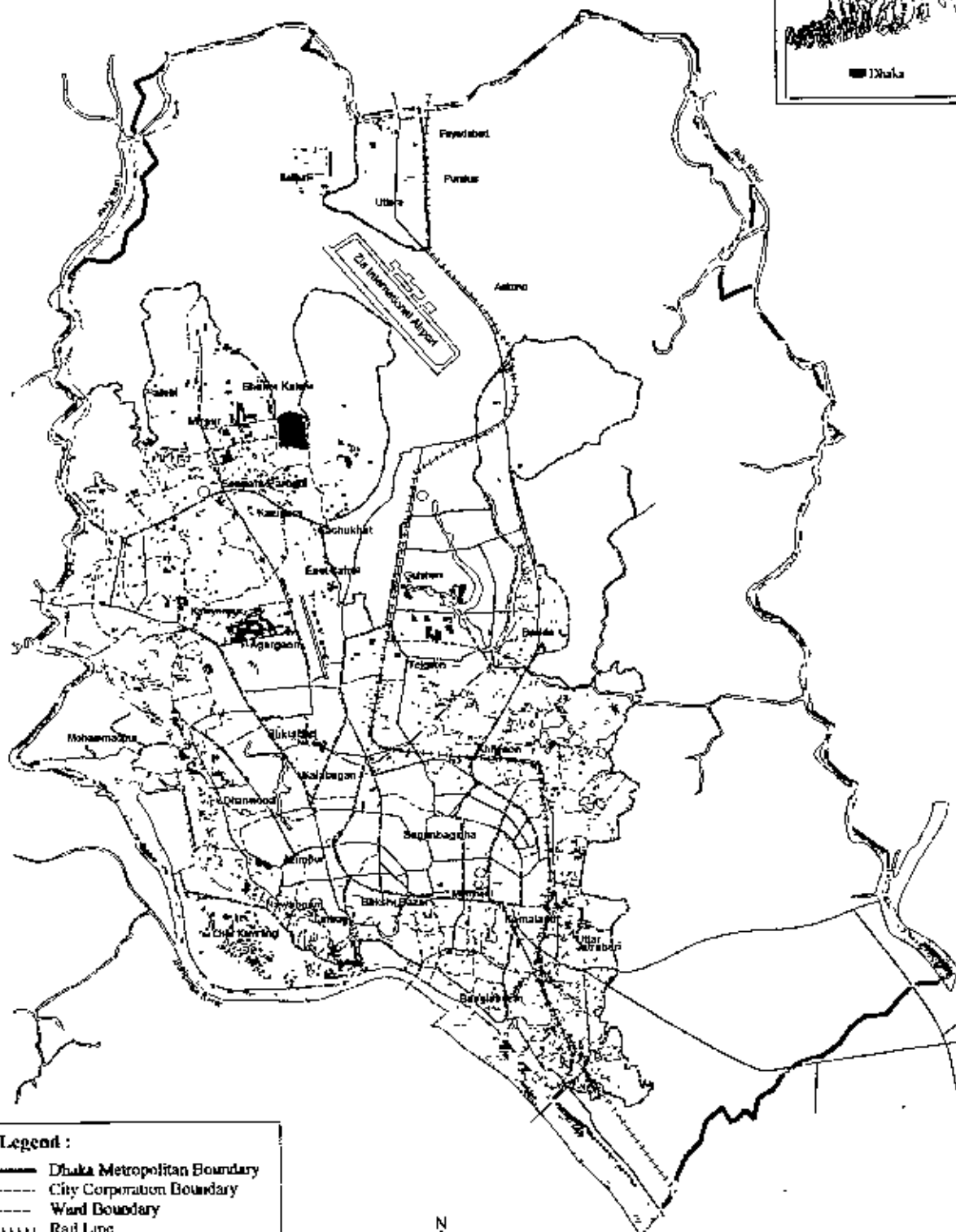
SL. No.	Name and Address of the Slums	No of Household	Total Population	Area (acre)	Ward Number
01	Kurmitola Bastee, Section-12, Pallobi	750	3850	8.33	02
02	**Kallayanpur Pora Bastee**	**1402**	**7300**	**2.91**	**11**
03	Vasantek 4, Dhaka Cantonment	1200	5000	15.0	15
04	Korail Bastee (North Side of Gulshan Lake)	7000	31000	12.0	19
05	WASW Plot Bastee, Rd No.55, Plot No. 12	300	3000	2.66	19
06	Kamalapur Railway Barak Bastee	450	2200	1.5	31
07	Khilgaon Bagicha Bastee	230	1150	1.5	34
08	**Agargaon Radio Office (North Side)**	**5500**	**30250**	**64.5**	**41**
09	Geneva Camp	7500	41250	9.88	47
10	Bacila Bastee, Mohammadpur	920	8740	42.2	47
11	Beriband Bastee, Beriband, Dhanmondi	300	1500	5.0	48
12	North Side bastee of High Court	300	1500	5.0	56
13	Bangladesh Railway Colony Bastee, Phulbaria	300	1500	1.5	57
14	Gandaria Rail Line bastee, Gandaria	700	4500	4.1	57
15	Kalunagar Bastee	204	1122	4.6	58
16	**Ganoktoli Sweeper Colony Bastee**	**852**	**4686**	**2.3**	**58**
17	13 & 14 Shahidnagar Bastee	650	3275	2.0	60
18	North Portion of Buriganga River, Islambagh	700	3600	4.0	65
19	Agasadek New Rd Bastee, Majed Sardar Road	200	1000	1.65	69
20	25, Agasadek Hindu Sweeper Colony	400	2500	2.47	72
21	Kowartek, Begumganj, Sutrapur	343	2025	5.9	80
22	**Dhalpur Bastee**	**118**	**584**	**0.59**	**85**
23	Katarigate, Member Bari, Puratan KC	450	2300	2.5	90
24	229/5, East Jurine Rail Line Bastee	1000	4000	2.47	90
25	Refuge Camp, Nondipara	520	3200	3.30	90

Source: Survey of Slum and Squatter Settlements in Dhaka City, CUS, Dhaka, for UPRP. Sponsored by Asian Development Bank (ADB), 1996.

Note: Bold marked urban poor areas have been taken as study area.

Map : 01 Location of Slums and Squatters in Dhaka City





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Based map supplied by Dhaka City Corporation

Slum & Squatters Data Source : Urban Basic Service Delivery Project (UBSDP), 1999

After getting a clear scenario through site visits and talking to the chief of Slum Improvement Project (SIP) of Dhaka City Corporation (DCC), two sites (Ganaktuli Sweeper Colony and Dhalpur City Palli) have been selected as GO managed urban poor areas and two sites (West Agargaon Radio Office North side Bastee and kallayanpur Pora Bastee) have been selected as NGO managed urban poor areas in Dhaka City on the basis of organizational area coverage of water supply and sanitation facilities.

1.3.3 Reconnaissance Survey

Before commencing the questionnaire survey, a reconnaissance survey was conducted in all the four sites to enrich the questionnaires and to know the physical environment and neighborhood facilities provided in the sites.

1.3.4 Questionnaire Survey

The study is based on questionnaire survey. A detail questionnaire (Appendix 02) has been prepared on the basis of types of facilities, provision standards, performance standards, maintenance, management and cost recovery system of water supply and sanitation facilities provided by concerned Governmental and Non-governmental Organizations. For questionnaire surveying a systematic random sampling technique has been adopted. A total of 200 questionnaires have been administered in four different sites; 40 in Ganaktuli, 50 in Dhalpur, 60 in Agargaon, and 50 in kallayanpur. Sample size has been selected on the basis of population size. The questionnaire survey has been done in the household level. As a respondent, household head has been chosen for questionnaire survey whether the respondent is male or female. However, in the social context of urban or rural area in Bangladesh the household head is male in maximum cases. Meanwhile, getting the head of the household for questionnaire survey at household level is difficult especially during working hours. In that case, a second person has been selected as respondent.

1.3.5 Community Survey

During the questionnaire survey, a community survey has been conducted through a brief pre-coded questionnaire (Appendix: 03) to know the types of facilities, exact number of

the facilities, maintenance and management body of the provided facilities, overall community feelings about the provided facilities, etc.

1.3.6 Literature Review

An extensive literature review has been carried out to find out the various information about the conditions of water supply and sanitation facilities for urban poor. The review has been somewhat helpful to find out the proper management system to ameliorate the existing problems

1.3.7 Data Processing, Analysis and Representation

After getting the data from all sources, the data have been processed and analyzed in a sequential manner. Both manual and computer techniques have been used in data processing. On the other hand various statistical tools and techniques have been used in data analysis for finding the facts of this research. Such as frequency distribution, satisfaction index, priority ranking, etc. are used in this research. A Satisfaction Index (I_s = fs - f_d / N, Where, fs = Number of Satisfied Respondents, f_d = Number of Dissatisfied Respondents and N = Total Number of Respondents) has been selected (Yeh and Lee: 1975, Miah and Weber; 1990, Khan; 1992, Hossain; 1995, Rahman; 1996; 2000, Hasan; 1999) to determine the dwellers' satisfaction about water supply and sanitation facilities provided by GOs and NGOs. The highest value of satisfaction index is +1, meaning *highly satisfaction* and lowest value of satisfaction index is −1, meaning *highly dissatisfaction*. A Priority Ranking Technique has also been adopted to rank the problems of water supply and sanitation facilities perceived by the dwellers. Priority ranking of the problems has been done by getting *mini score* (Miah and Weber, 1990) meaning the lower the ranking value, the higher is the priority. By the community survey, various problems related to water supply and sanitation facilities have been investigated. After that, selected problems related to water supply and sanitation facilities have been set in the questionnaire for ranking (Appendix: 01 *Questionnaire for Household Survey*). During administering the questionnaire, respondents were asked to give the priority rank against each problem according to severity to his/her perception and satisfaction. From the pre-coded list of problems the respondents were asked to answer which is number 1

problem, which is number 2, and so on. The final rank has been done by summation of total number for each problem (Appendix: 04 *Priority Ranking Matrix)*. Priority rank-1 means number one problem by perceived seriousness. Nevertheless, a visual technique and a photographic representation also have been adopted to depict the actual scenario of water supply and sanitation facilities for urban poor in Dhaka City provided by different organizations.

1.4 Rationale of the Study

Bangladesh is economically a poor country. Rapid growth of urban population has increased the urban poor quickly in every urban center in this country, and the criterion is very much related to the major metropolitan cities. Dhaka is the capital as well as a major administrative, business, commercial, and industrial center of Bangladesh. Due to large total urban population, poor are also in large numbers in this city. Most of the poor in this city live in slums and squatters. The total physical environment and neighborhood facilities are very poor in these slums and squatters. Maximum dwellers' of these urban poor areas do not get the urban facilities such as water supply, electricity, sewerage, sanitation etc. Many efforts have been taken in this country by the GOs and NGOs for eradicating the rural poverty since independence. However, the rural poverty remain static and rural to urban migration remain unchanged. In the recent time, some NGOs and GOs have come forward to eradicate the urban poverty with different approaches and programs. Among the various approaches, water supply and sanitation facilities are also important programs provided by GOs and NGOs. So, it is an urgent task to study the impact of these programs provided by different organizations. The present study has been made an attempt to study the water supply and sanitation facilities provided by GOs and NGOs and the study will try to compare the management system of concerned GOs and NGOs, which may help to formulate some policy guidelines for improving the overall conditions of water supply and sanitation facilities for urban poor in this country.

1.5 Organization of the Study

The organizational setup of the study is as follows-

Chapter: 01 Introduction has covered the various descriptions about statement of the problem, aims and objectives of the study, methodology, rationale of the study,

organizational setup, and limitations of the study. *In Chapter: 02 Theoretical Perspectives and Literature Review*, has described the various theoretical aspects of this study such as definition of environmental sanitation and safe water supply, urban poor and poverty, overall water and sanitation conditions of urban areas in Bangladesh, GO's and NGO's activities in this sector etc. *Chapter: 03 General Condition of the Study Area* has described the location of the sites, physical and environmental condition of the sites and socio-economic characteristics of the population etc. *Chapter: 04 Water Supply Facilities in the Study Area* describe the various aspects of water supply facilities such as types of facilities, provision standards, performance standards, maintenance and management systems, cost recovery system and dwellers' satisfaction and problems etc. *Chapter: 05 Sanitation Facilities in the Study Area* has described the various aspects of sanitation facilities such as types of facilities, provision standards, performance standards, maintenance and management systems, cost recovery system and dwellers' satisfaction and problems etc. *Chapter: 06 Summary Findings and Recommendations*, has described the summary of the findings, recommendations on the basis of fact-findings, and a brief conclusion

1.6 Limitations of the Study

Every research has some limitations and this study is not beyond that limitations. It is quite tough to find out the fully GO managed or fully NGO managed urban poor areas in Dhaka City, because recently for eradicating the urban poverty some GOs and NGOs are working with different programs. Even they (GOs and NGOs) are working together in one urban poor area. There is a lack of relevant literature especially research article in the published journal of this aspect. Maximum respondents have been found in study areas as illiterate, who are quite unable to respond perfectly about their demand in a reasonable way. The study is based on questionnaire survey and household head has been taken as respondents, which is not an easy task to get them as respondents at day hour and on that time there was no way to take them as respondents. On the other hand, a long questionnaire has been framed for administering and interviewing and such type of questionnaire is a matter of patience both for interviewer and respondent. Another problem is that the poor in Dhaka City are bored up with such kind of interview because they have given several interviews to the officials of GOs and NGOs, researchers and so

on. If the poor do not have any interest in respect of economic or social or socio-political aspects, they do not want to give the time for such kind of research. For lack of modern computing facilities the researcher had to process the data by manually in many cases, which was time consuming. For a comparative study, two sites for GO managed and two sites for NGO managed are not enough to investigate in the city like Dhaka. Meanwhile, the sites have been taken arbitrarily on the basis of locational analysis.

1.7 Conclusion

The research has been made an attempt to study the GO managed and NGO managed water supply and sanitation facilities for urban poor in Dhaka City with a comparative view. There will be a variation between GO managed and NGO managed areas in respect of types of facilities, performance standards, provision standards, maintenance and management, and cost recovery system of water supply and sanitation facilities provided for the urban poor in Dhaka City. Nevertheless, the study is expected to provide some policy guidelines, which may help governmental and non-governmental organizations to improve the water supply and sanitation facilities and make them sustainable for the urban poor.

Chapter: 02 Theoretical Perspective and Literature Review

2.1 Introduction

In Dhaka City except some areas, the quality and standard of housing is very poor. It is estimated that 50 percent of the urban population live below the poverty line, mostly in slums and squatter settlements (Shafi, 1999). Given the present condition, the concept of owning a permanent dwelling is alien to poor migrants. Temporary shelters are becoming the mainstays of the cities. In 1989 the Bangladesh Bureau of Statistics (BBS) estimated 75 percent of the structures in the urban areas to be made of semi-*pucca* (semi-permanent) and *kutcha* (temporary) materials. The formal sector's contribution to housing delivery is estimated to be around 5 percent and rest of the supply dependent on private sector. Both formal and informal shelter development has progressed without any planning for balanced physical and social needs. Now, the major cities face severe crisis in terms of housing, health, water, sanitation and service deficiencies.

2.2 Definition of Safe Drinking Water Supply and Sanitation Facilities

According to Government's National Policy for Safe Water Supply and Sanitation (1998), Safe Water Supply means withdrawal or abstraction of either ground or surface water as well as harvesting of rain water; its subsequent treatment, storage, transmission and distribution for domestic use, and Sanitation means human excreta and sludge disposal, drainage and solid waste management.

According to Department for International Development (DFID) (1998), the term 'Water Supply', means those basic needs which include access to a safe supply of water for domestic use, meaning water for drinking, food preparation, bathing, laundry, dishwashing and cleaning. In many cases, domestic water may also be used for watering animals and vegetable plots or gardens. Definition of 'access' means distance to the nearest water-point and per capita availability and 'safe' means water quality, which may vary from country to country. On the other hand, the word 'Sanitation' alone is taken to mean the safe management of human excreta. It therefore includes both the hardware (e.g. latrines and sewers) and the software (e.g. regulation and hygiene promotion)

needed to reduce faecal-oral disease transmission. It encompasses the re-use and ultimate disposal of human excreta.

The term 'Environmental Sanitation' is used to cover the wider concept of controlling all the factors in the physical environment, which may have deleterious impacts on human health and well being. In developing countries it normally includes drainage, solid waste management, and vector control, in addition to the activities covered by the definition of sanitation. Safe excreta disposal for poor people usually involves the use of a family latrine, which the family themselves keep clean. The latrine will use one of many various designs of pit, slab, and superstructure, and may also include a lid, vent pipe, or water seal to control flies and odor. The software components will include such things as hygiene promotion and the training of operatives, water committees, and caretakers (DFID, 1998).

2.3 Definition and Magnitude of Urban Poor and Urban Poverty

The urban poor reflect the poverty situation, which prevails in the urban areas of Bangladesh. Urban poverty in the country is partly a manifestation of rural poverty, as majority of the urban poor is still recent migrants from rural areas. Thus urban poverty is largely due to the transfer of the rural poor to urban areas (Mohit, 1999). But manifestation of urban poverty is often more appalling than that of rural poverty. However, for studying urban poverty situation, it is essential to know the nature and magnitude of poverty that prevails in urban areas.

Researchers have found it difficult to give a satisfactory definition as to who are 'urban poor' or to provide a measurement of 'urban poverty' or therefore its magnitude. The Centre for Urban Studies (CUS) has however put forward a working definition of the urban poor in Bangladesh for a review undertaken in 1990 (CUS, 1990). This definition is as follows-

> "The urban poor are people living in urban areas who can not afford to meet the basic needs requirements with their own incomes." Basic needs requirement include food or nutrition, clothing, primary health care, education and shelter.

The squatter settlements and the slums of south Asian cities are in fact, the symptoms of much wider problems amongst which are included the outcome of these cities failure to coordinate the economic development in the urban and rural sectors (Karim, 1999). There is a difference between the two terms, slums and squatters, mainly from the point of view of their legal status. These urban poor are mainly the residents of slums and squatters in Dhaka City. According to Murphy (1974)-

> "A slum seems to be generally defined as an area where dwellings predominate which are so inferior as to be detrimental to safety, health or morals".

According to CUS-ICDDR,B (1991)-

> "Slum means the area which has the characteristics of poor housing (i.e. shacks or *jhupris, kutcha* flimsy structures, semi-*pucca* flimsy structures, dilapidated old buildings in bad condition and so on), very high population density (300 persons per acre); high room crowding (3 or more adults per room); poor sewerage and drainage conditions; inadequate water supply; irregular or no clearance of garbage; little or no paved roads; insufficient or no street lighting; and little or no access to gas facility. Squatter settlements are developed when located on illegally occupied land belonging to government, semi-government, autonomous and other organizations".

According to Islam (2000)-

> "Slums are generally substandard settlements on privately owned land and squatter settlements are developed on illegally occupied or invaded public or semipublic land. Some squatter settlements also seen on privately owned land."

However, the residential patterns of urban poor in Dhaka City are not only slums and squatter settlements and they may be household maids/servants living in high or middle class residence, floating population, garments workers living outside the slums and squatters, people living in institutional buildings, people living in construction areas, and poor families living outside the slum settlements under various arrangements (GOB-ADB, 1996) (Table: 2.1).

Table: 2.1 Residential Patterns of Urban Poor in Dhaka City

Nature of Residential Pattern	Estimated No of persons	Percentage of Total Poor Population
01. Slum and Squatter Settlements of 10 HHs or More	13,17,000	47.5
02. Household Maids/Servants Living in High/Middle Class Residence	300,000	10.8
03. Floating Population	50,000	1.8
04. Garments Worker Living Outside the Slums and Squatters	200,000	7.2
05. People Living in Institutional Buildings	75,000	2.7
06. People Living in Construction Areas, *Kutcha Bazars*, on Trucks, Buses, and other Vehicles	80,000	2.9
07. Poor Families Living Outside the Slum Settlements under Various Arrangements	750,000	27.1
Total	**27,72000**	**100.0**

Source: Survey of Slum and Squatter Settlements in Dhaka City, 1996
Center for Urban Studies, for UPRP, GOB-ADB

The total numbers of slums and squatter settlements are 3007 in Dhaka Metropolitan Area recorded by the UPRP-CUS survey in 1996. Of these 2328 (77.42 %) are slums and the rest of the 679 (22.58 %) are squatter settlements. The slums and squatters are found all over the city, especially within the DCC areas. It should be mentioned here that 96 percent of all slums and squatters are located within DCC boundary. All these 3007 slums and squatter settlements occupy about 1038 acres of land area (1.62 sq. mile or 4.20 sq. km) (BOG-ADB, 1996). The estimated population in that survey was 559933 (50.69 %) in slums and 544667 (49.31 %) in squatter areas.

Poverty is widely recognized as a multi-dimensional problem involving income, consumption, nutrition, health, education, housing, crisis-coping capacity, insecurity etc (Mohit, 1999). Poverty has been defined in different ways based on different criteria. A recently concluded GOB-ADB (1996) study on urban poverty has attempted to define urban poverty in absolute sense by adopting a pragmatic approach.

Poverty line is a measure of the magnitude of the poverty situation in a country. Different approaches have been developed to determine poverty line, among them one is calorie

intake of costing of nutritionally adequate diet and another is standard of income or expenditure. Poverty line has been determined by GOB-ADB (1996) on the basis of income or expenditure whereas demographic, social and other non-material indicators have been used as supplementary to income based poverty measure. Thus, while the main trust of earlier studies was on specified calorie intake for measuring poverty line, the GOB-ADB study attached importance to income/expenditure, which is deemed adequate for meeting the minimum requirement of a household. Thus by considering a family of 6 members, it has been estimated that a monthly household income of Tk. 3,500/- is just enough to meet the expenditure on food for a daily normative 2112 K. Calories and non-food items (25 percent of food cost) and as such the 'absolute' poverty line has been set at Tk. 3,500/- and on the other hand poverty line for 'hard core' poor has been set at Tk. 2,500/-, which covers expenditure for 1805 K. Calories and non-food items (Islam, 1997). From the study it is estimated that 61.3 percent of urban household in Bangladesh fall below the absolute poverty line and 40.2 percent fall bellow the hard core poverty line. The corresponding figures for Dhaka are 54.9 percent and 31.9 percent respectively. Urban poverty is also measured by head count ratio where absolute poverty stood at 60.86 percent with 40.2 percent fall below hard core poverty line. The corresponding figures for Dhaka are 54.85 percent and 31.88 percent respectively. Large part of the urban poor live in slums and squatters in urban areas of Bangladesh.

Table: 2.2 Magnitude of Urban Poor Population in Bangladesh

Year	Total Urban Population (million)	Percentage of Urban Population		Total Urban Population (million)	
		Under Poverty Level I	Under Poverty Level II	Under Poverty Level I	Under Poverty Level II
1990	22.9	50	30	11.45	6.87
2000	37.3	45	25	16.76	9.00
2010	56.8	40	20	22.72	10.80

Source: World Bank, *Bangladesh Economic and Social Development Prospect.* Vol III (Report No. 5409), April, 1985, p. 126, Table 9.8. Cited in Islam, 1994.

The magnitude of poverty also varies by city sizes. The distribution of slums and squatters provide an indication to the proportion of poor which in large cities than in small towns and hence poverty situation is worse in large cities than in small towns. Thus

15-25 percent of population in small towns may be considered the hard core poor and 40-45 percent of the population to be absolute poor. However, for large cities like Dhaka the hard core poor constitute 30 percent and absolute poor about 60 percent of the population (Islam, 1996).

2.4 Causes and Incidence of Urban Poverty

The major causes of poverty of Bangladesh are low economic growth, inequitable distribution of income, unequal distribution of productive assets, unemployment and underemployment, high rate of population growth, low level of human resources development, natural disaster and limited access to public services (Planning Commission, 1998). The incidence of poverty is higher in urban than in rural areas of Bangladesh because of social, political and economic reasons. The socio-economic conditions facing the urban poor are often harsher than those being faced by the rural poor because of densely living condition. Environmental problems faced by urban poor appalling and worse than their rural counterparts. Urban poor are more exposed to poverty situation than rural poor who have some safety net (Mohit, 1999). Islam (1994) in his paper entitled "Review of Research on Urban Poverty and the Urban Poor in Bangladesh" has identified the following to be the causes of poverty in Bangladesh-

i. Historical Factors: The country's colonial background and its exploitation by colonial rules.

ii. Environmental Factors: Recurrence of natural hazards especially cyclones, floods, droughts, and riverbank erosions.

iii. Resources and Demographic Factors: Limited natural resources and small size of the country against a very large population. Unfavorable and low land-man ratio.

iv. Dependence on foreign aids and loans, drain of resources from the country (material, monetary and brain drain). Neo-colonial exploitation through metropolitan capital, multi-national and foreign NGOs.

v. Poor Quality of Human Resources: Due mainly to poor health, illiteracy and low skill.

vi. The Socio-economic Political Superstructure: Particularly the power structure, the oppressive and exploitive role of the ruling power elite, social oppression in rural areas and unequal resource structure.

vii. Lack of people's participation in development activities.

viii. Administrative and managerial weakness and widespread corruption.

ix Stagnation of productive forces and production over time.

x. Rich-biased government politics, lack of sufficient government support for the poor.

xi. Lack of political awareness and organization of the poor (or for the poor).

xii. Behavioral factors (both individual and societal behavior).

The above factors explain both urban and rural poverty in Bangladesh.

2.5 Present Status of Water Supply and Sanitation Facilities for Urban Poor

It is revealed that 58.4 percent of the people in slums of Dhaka City have access to tubewell water at least for drinking purpose (Table: 2.3). Most widely used Hand Pumps Systems (HPSs) are shallow tubewells. Deep tubewells are used by only 3 percent. Coverage of other types like pond, sand filters and ring wells are very low (Mitra and Associates, 1992).

Table: 2.3 Distribution of Households by Sources of Drinking Water in Metro Slums

Sources of Drinking Water	Metro Slums (in percentage)
Tubewell	58.4
Pond	0.4
River	0.2
Other	40.9
Total	**100.0**

Source: BBS, 1994, Cited in Mahmood and Islam, 1999.

But the hand pump users do not have more than 50 percent of the full requirement of water from the hand pump system. The proportion of the households drawing full

requirements of water is 39.3 percent using public hand pump systems, and 64 percent using private hand pump system (Table: 2.4).

Table: 2.4 Percentage Distribution of Households in Urban Slums and Fringes Using Hand Pump Systems by Uses of Water from the Systems of Private and Public

Uses	Public (% H/H)	Private (% H/H)
For Drinking and All Domestic Purposes	39.3	64.0
For Drinking and Some Domestic Purposes	50.0	27.5
Only for Drinking	10.7	8.5
Total	**100.0**	**100.0**

Source: Mitra and Associates, 1992, Cited in Mahmood and Islam, 1999.

In urban slums, 98 percent households have latrines and 40 percent are hygienic latrines. Most commonly used hygienic latrine is pit latrine followed by water sealed. Proportionately unhygienic latrines are more than the hygienic and 57.9 percent are hanging type latrines and open latrines (Table: 2.5). With regard to sanitation, the use of different types of technology varies significantly between the urban and rural areas. For instance, 7.4 percent of the rural households use water sealed latrines, while the same for urban area is 47.7 percent (Mahmood and Islam, 1999).

Table: 2.5 Percentage Distribution of Households by Use of Latrine in Metro Slums

Type of Latrine	Percentage
Water Sealed	15.0
Pit	25 2
Hanging	57 9
Other including none	1.9
Total	**100.0**

Source: BBS, 1994, Cited in Mahmood and Islam, 1999.

2.6 GO Managed Water Supply and Sanitation Facilities in Dhaka City

The government of Bangladesh has given higher priority to poverty alleviation but most of the programs and projects were rural based since independence. Only in recent years, emphasis is also given on urban poverty alleviation and improvement of settlements of the urban poor. There is clear policy guidelines (as in the National Housing Policy, 1993 and the revised in 1997) for the government taking a positive view of slums and squatters and not evicting without proper rehabilitation (Islam, 2000).

The government has taken up some plans recently to alleviate the poverty of the slum dwellers. The government has initiated a number of projects and programs to rehabilitate the squatter families out the city and some even within the city (Islam, 2000). Already the government has invested large sums of money in these activities. The government not only continues with UBSDP in 25 cities, it has also taken up a 5-year project in 11 secondary cities with UNDP support to improve conditions of urban poor settlements. These are definitely positive efforts by the governments. Specifically, government is trying to manage water for urban poor in Dhaka City, and for this purpose, there are some water points installed in Dhaka's slums. However, the management systems of these water points are very poor (Shimul, 1999). Dhaka City Corporation (DCC) has its own Slum Improvement Department, which is responsible for providing water supply and sanitation facilities for urban poor in some locations in this city. Unfortunately, some GOs such as Local Government Engineering Department (LGED) and Department of Public health Engineering (DPHE) are providing low-cost or cost-free tubewells and sanitary latrines for urban poor in secondary cities in Bangladesh except Dhaka. But technical help is being provided by LGED to four City Corporations.

2.7 NGO Managed Water Supply & Sanitation Facilities in Dhaka City

Non-governmental Organizations (NGOs) are an integral part of the development process of Bangladesh. They have emerged as significant actors in the development since the 1970s. During the course of the last quarter of the century, their number, organizational membership, area and program coverage have multiplied. However, international donors had played an important role in the massive proliferation of NGOs in Bangladesh.

Non-governmental Organization (NGO) is a term which denotes all kinds of organizations, ranging from small to medium scale operatives, clubs, a host of voluntary activities at the local level, working in areas like, health care, nutrition, sanitation, family planning, education, agriculture, human rights and legal aids organizations, research and documentation networks, lobby groups, etc. Within the scope of such a broad definition, there are at least 25,000 NGOs operating in Bangladesh (Siddiqui, 1999). There is no way of knowing the actual number of development oriented NGOs in Bangladesh. However,

development oriented NGOs along with human rights and charity organizations, who receive foreign funding are registered with the NGO Affairs Bureau of Bangladesh (NGOAB).

In 1970, there were only 40 NGOs in Bangladesh who operated with foreign donations. Their number has increased since then. In December 1998 the number stood at 1195. Up to 1975, the number of foreign NGOs was either equal to or more compared to the native ones. Since then the number of foreign NGOs did not increase the way that native NGOs did. This might have been outcome of policy decisions of international NGOs not to implement the program at the grass root level, rather help the growth process of native NGOs (Siddiqui, 1999). The NGOAB also keeps records of all foreign funds channeled through that NGOs. Funding sources of NGOs are quite diversified. International NGOs, foundations, churches, foreign governments, multilateral financial institutions, UN bodies, local banks, intermediary financial institutions are some of the sources of NGO funds. Historically, one of the principal sources of fund for Bangladeshi NGOs has been the international NGOs. OXFAM of USA and UK, Novib, ECCO, CEBEMO of the Netherlands, Church World Service, Freedom from Hunger Campaign, Christian Relief Service, War on Want are some of the examples of fund disbursing NGOs. According to Siddiqui (1999), almost all the bilateral and multilateral donors credit the NGOs with certain values. These include-

i. NGOs are geared specifically to the needs of the poor.
ii. Can ensure beneficiary participation in development.
iii. Are relatively free from bureaucratic hierarchy, and
iv. Are reflexive and innovative in their approaches.

Most of the NGOs in Bangladesh are working at village level with micro credit, income generation, savings, education, health and family planning, women's development and training, water and sanitation. Recently NGOs are working for alleviating urban poverty with the same facilities at villages. In some places, NGOs may be extending water and sanitary facilities, however, they extensively provide credit, health and education services and try to mobilize and empower the poor socially and politically (Islam, 2000).

According to Rahman (1998), slum dwellers are buying water-sealed latrines at higher price and similarly they are paying for taking water connections from NGOs because they benefited immensely from the utilities. *Proshika* is a renowned NGO in Bangladesh started its urban program in 1990, includes a component that focuses on the improvement of water, sanitation and electricity for urban poor, in integrated squatter areas. Whereas another leading NGO in this country is BRAC and its urban program begun in 1991which focus on education of city children. It is now proposing to extend its urban work to economic development, health in particular, water and sanitation, and other services (Hoek-Smit, 2000). Table 2 6 is shown the NGOs who are working in water and sanitation sectors for urban poor in Dhaka City.

2.8 Experiences from Developing Countries

A modern *tale of two cities* is unfolding around the world. On peripheries of urban centers millions live in slums and squatters settlements ignored by city authorities. They have no legal tittle to their makeshift homes, as their entire communities are technically "illegal". Usually these informal cities have no services such as water, sewerage, electricity and garbage removal. The formal city meanwhile, enjoys the advantages of urban life, often at the expenses of the informal one. Even one city is alienated from and marginalized by the other, they remain mutually dependent. But in many of these slums settlements, small revolutions are under way. Community councils and other groups have organized themselves and obtained support from outside to improve living conditions. They have built water and drainage system or upgraded their homes. In Jakarta, for example, the Indonesian government working with the World Bank upgraded slums and improved the living conditions of 15 million people over a 25-year period, at a modest cost of $20 to $120 per person. The program has been extended to other Indonesian cities, and has encouraged private household investment in shelter (Shafik, 1999).

Many success stories demonstrate that community based efforts supported by national governments and global agencies can dramatically improve living conditions in even the worst slums. For example, Surat, India, grabbed headline in 1994 with an outbreak of plague spread by rats in these dirty, congested slums.

Table: 2.6 List of NGOs Working in Water Supply and Sanitation Sectors for Urban Poor in Dhaka City

Name of the NGOs	Geographical Coverage (Ward Basis)	YE	YC	Type
1. Action Aid DA-2	42-47	86	86	I
2. Al-Falah Bangladesh	44-45	80	91	N
3. Association for Realization of Basic Needs (ARBAN)	Dhaka City	84	88	N
4. Assistance for Slum Dwellers (ASD)	41,43,46	88	91	N
5. Bangladesh Manabdhikar Sangbadik Forum (BMSF)	4,6,9,41	91	93	N
6. Bangladesh Agricultural Working Peoples Association (BAWPA)	2,3,6,19,20,41,43,46,47	91	93	N
7. BRAC	Dhaka City	72	92	N
8. Bangladesh Nari Pragati Sangha (BNPS)	24-26,47,48,57	86	86	N
9. Bangladesh Association of Women for Self Empowerment (BAWSE)	24-26	96	96	L
10. Bastuhara Samaj Kallayan Samity (BSKS)	Dhaka City	83	85	N
11. Concern for Environmental Development and Research (CEDAR)	43,44,52	89	94	N
12. Community Health Care Project (CHCP)	23,34,35,37-41,51,54,55	74	76	N
13. Dhaka Ahsania Mission (DAM)	39,40,42,56,71,73	78	81	N
14. Dustha Sastha Kendra (DSK)	Dhaka City	89	89	N
15. Employment and Technology Development Agency (ETDA)	Dhaka City	84	90	N
16. Human Development Service Society (HDSS)	2,6,46	83	83	N
17. Hotanshi Bangladesh	27,30,34,38,54,75,85	93	96	N
18. Jagoroni Chakra	42,43,100	76	91	N
19. Juba Jiban Advancement Committee (JAC)	9-13,35,37,38	84	85	N
20. Manobik Sahajra Sangstha (MSS)	Dhaka City	74	74	N
21. Nari Maitree	19,25,39,50	83	83	N
22. Organigation for Mother and Infants (OMI)	11,45,46,47,48	92	92	N
23. Participatory Development Action Research Program (PDAP)	2-7	93	93	I
24. Plan International	5,40,41	92	95	I
25. Population Services and Training Center (PSTC)	22,25-29,31,34-35,54,56,84,85	91	93	N
26. PROSHIKA	All Dhaka City	76	90	N
27. Promotion Research Advocacy Training Action Yard (PRATAY)	6,9,41,46,57	91	91	L
28. PRODIPAN	2,3,60-62,81-87	91	93	N
29. Rural Health and Development Societies (RHDS)	44,47,48,54,55	92	93	N
30. SUROVI	2,5,22,41,42,49,66,92	79	79	N
31. TMSS	7,8,19,24,25,38,39,41	80	94	N
32. Village Integrated Development Association (VIDA)	37,39,40,43,44,45	88	96	N

Source: Directory of NGOs Working in Dhaka City'2000-2001, Coalition for Urban Poor (CUP)

Note: I=International, N=National, L=Local

YE=Year of Establishment, YC=Year of Commencement

An overhaul of the city's administration was launched with residents participating directly in planning. Two years later, a study found that Surat was India's second cleanest city. In 1998, floods hit the city, but efficient cleanup systems had life back to normal in a week. And in Dakar, in Senegal, where shantytown dwellers once faced a long tiring and time consuming daily walk to and from jobs downtown, a petit train bleu utilizing old rail cars purchased from France now transports 22000 commuters a day. This saves the slum dwellers the several hours a day in travel time, increasing their quality of life and productivity. In recent years, World Bank and UNCHS efforts have responded to a worldwide trend among national governments to move decision making powers on urban affairs to local and municipal council and to encourage community participation in them. This is part of a new partnership approach to help cities design their own development strategies, involving businesses, local government, community group and citizens. If cities own their development strategies and if city dwellers pay municipal taxes to accountable governments headed by councils they themselves elected the prospects for healthy and sustainable urban development are much brighter. When they are well managed, cities are solutions, not problems as they are engines for economic growth, job creation and environmental protection. Sri Lanka has reportedly succeeded in coping with the problem by going for low-cost housing under a long-term project. Indian experience with low-cost housing reportedly has also yielded positive results.

Now a days rainwater harvesting is a popular water treatment process in the developed and less developed countries. As for example, in Kenya, concrete tanks are used as storage of rainwater said to be appropriate technology for rainwater harvesting at the UNICEF Center for Appropriate Technology. Their popularity is going among villagers in Thailand where the construction and maintenance of these units is undertaken by technicians of the sanitation division of the Department of the Health. The technician directs the voluntary labors of villages in constructing concrete storage tanks reinforced with steel wire or bamboo. The villagers then repay the costs of the tanks in 12 months installments. The owners of these tanks having contributed so much of their time and money into their construction are usually very keen to operate and maintain it properly (Hoque, 1998). These kinds of rainwater harvesting program can be implemented in the

slums of Dhaka City especially where roofs of the houses are made of tin. Bermuda is one of the places that has a long history of rainwater collection system. These systems are described in early seventeenth century, and today it is required by law that all buildings shall be provided with a tank or tanks and catchment that securing the supply and storage of rainwater for use of persons occupying the building.

2.9 Conclusion

Bangladesh is a rural based agrarian country where 75 percent people live in villages and only 25 percent live in the urban areas. However, the present rate of urbanization is very high in metropolitan cities than in districts and town centers which was the scenario of last few decades in this country. In this context, Dhaka the capital is not an exception, moreover, that rates is very high in here than other metropolitan cities. Rural to urban migration is mainstream of overgrowth of population followed by the natural increases and aerial expansion of the cities. Most of the migrated people in this city integrated to slums and squatter settlements and live without or with minimum urban facilities. where overall environmental conditions are very poor. In this respect, water supply and sanitation facilities not only for urban poor but also for the total citizens in this city are a prime issue. However, the study has been made an effort to analyze the GO managed and NGO managed water supply and sanitation facilities for urban poor in Dhaka City with a comparative view.

Chapter: 03 General Condition of the Study Area

3.1 Introduction

This chapter has focused the general condition of the study area, which includes location of the sites, physical and environmental condition of the sites, and socio-economic condition of the population. The study of general condition of the sites is based on community survey, visual inspection, and questionnaire survey.

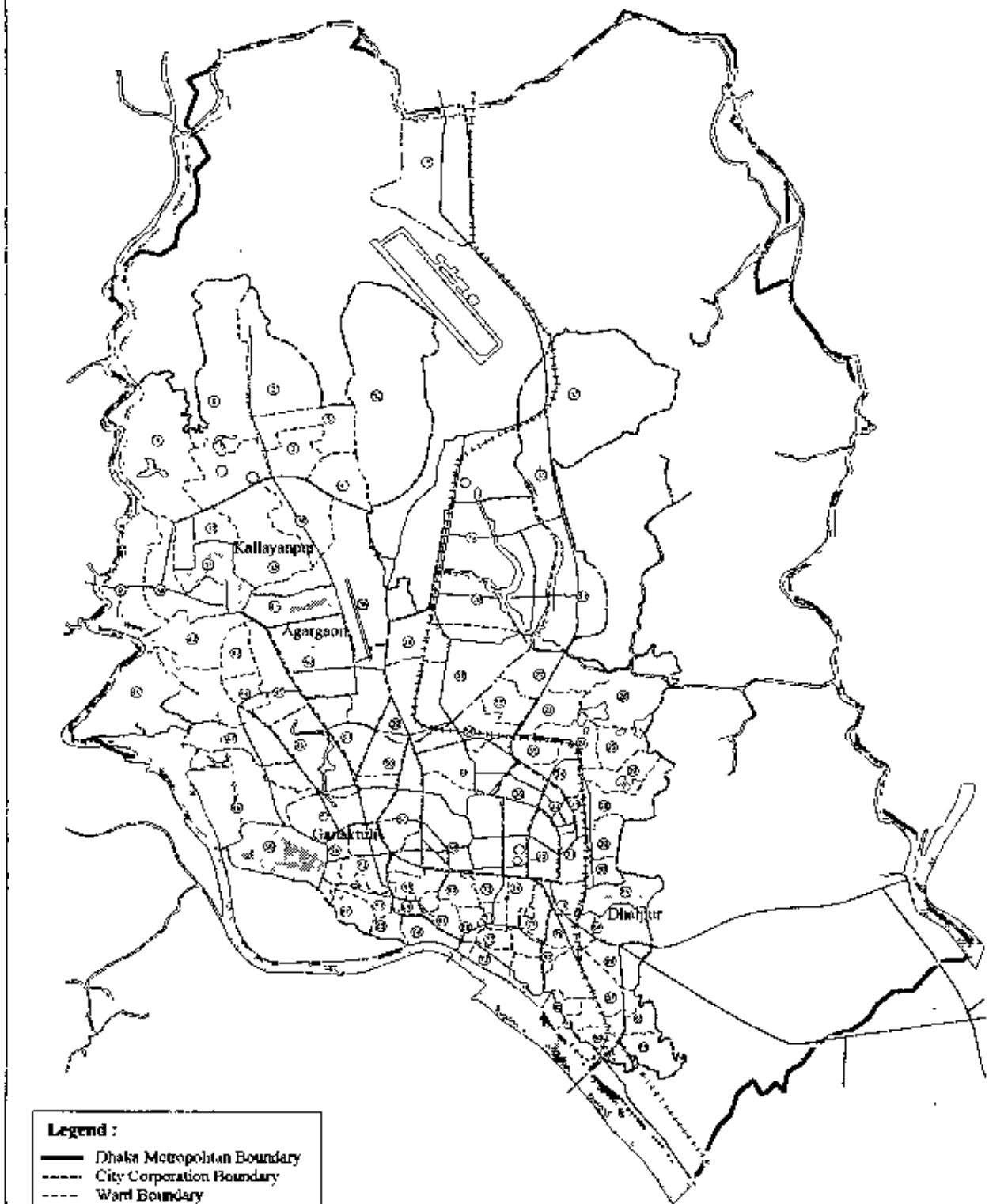
3.2 Location of the Sites

Ganaktuli Sweeper Colony is located in older and western part of Dhaka City under Ward no 58. There are five clusters in Ganaktuli and these are Muslim or *Baro Bastee*, Hindu *Bastee*, Lalbagh *Bastee*, Madhapara, and Bailkhan *Bastee* Meanwhile, another GO managed area, Dhalpur City Palli is located on eastern part of this city under Ward no 85. Various clusters in Dhalpur are 1 no City Palli, Rahman's *Bastee*, Aynul's *Bastee*, 14 no Out Fall etc. On the other hand, two NGO managed areas are located in somewhat newer part of this city. Agargaon *Bastee* is located on middle portion of Dhaka City under Ward no 41 and Kallaynpur *Pora Bastee* is located in western part of this city under Ward no 11. Seventeen clusters in Agargaon are Tulatali, Pangu Hospital, Amhar's, Sukkur's, Maulabir, Farid's, Nur Mohammad's, Gandhi's Notunmati Namapara, Hatem's, Ramzan Ali's, Amzad's, Kashem's, Montu Khan's, Nagor Shaitan's, Mymensigh Babur, Motaher's *Bastees*, etc. Actually, these types of name have been formed according to the name of the landowner who settled here since long years. On the other hand, there are 9 clusters in Kallaynpur slum and these are according to number such as no 1 *Bastee* to no 9 *Bastee* (Map: 02 and Map: 03).

3.3 Physical and Environmental Condition of the Sites

Most of the residents in these urban poor areas are engaged with informal activities such as rickshaw pulling, van pulling, day laboring, construction work, household work, transport work, garments & factory work, petty business, and so on. However, in GO managed areas some respondents have identified who are engaged with government services.

Map : 02 Location of the Study Areas



Legend :

- Dhaka Metropolitan Boundary
- City Corporation Boundary
- Ward Boundary
- Rail Line
- Embankment
- Major Road
- Location of the Study Areas
- River/Water Bodies

Based map supplied by Dhaka City Corporation

Slum & Squatters Data Source : Urban Basic Service Delivery Project (UBSDP), 1999

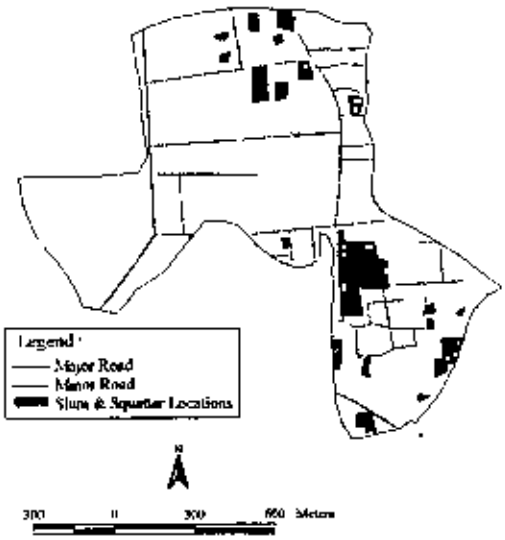
GSRC

Geographical Solutions Research Center

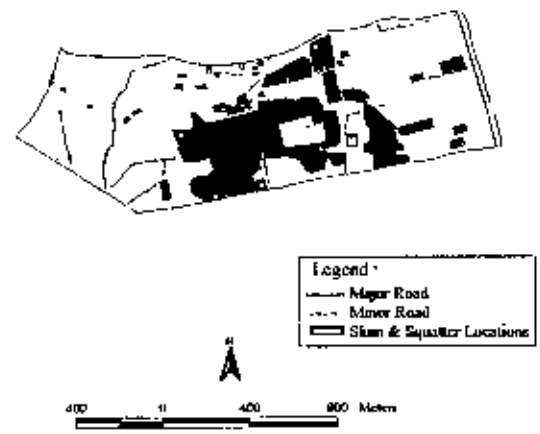
871 Aurangajeb Road (2nd floor)
Mohammadpur, Dhaka - 1207, Bangladesh
Phone - 8128815, 8124975, e-mail - gsrc@accesstel.net

Map : 03 Distribution of Urban Poor Areas in Selected Wards within Dhaka City

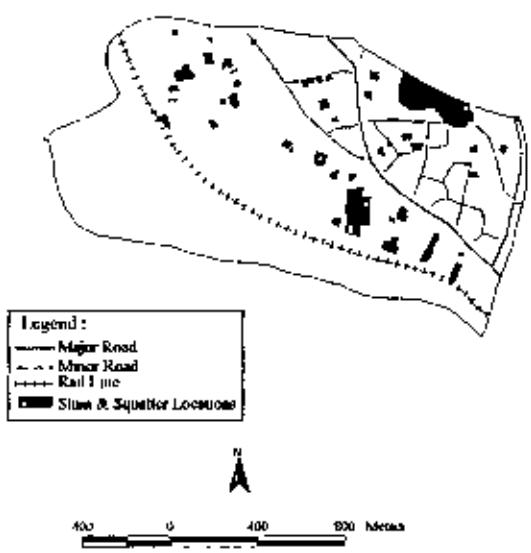
Ward 11 Kallayanpur



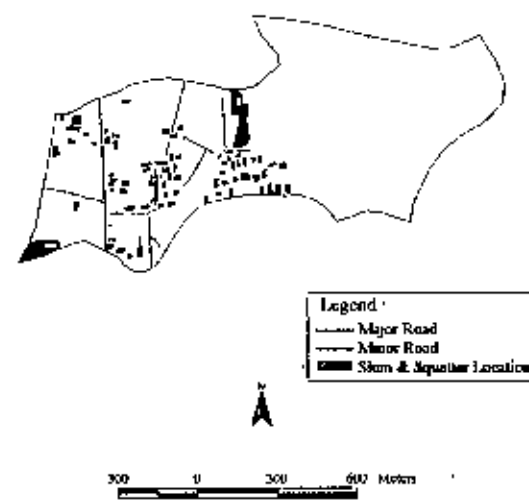
Ward 41 Agargaon



Ward 58 Ganaktuli



Ward 85 Dhalpur



Based map supplied by Dhaka City Corporation

Slum & Squatters Data Source : Urban Basic Service Delivery Project (UBSDP), 1999

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In Ganaktuli and in Dhalpur, one-third residents are sweepers, cleaners, night guard, peon, driver etc. as fourth class employees under Dhaka City Corporation (DCC). Whatever it may be, the residents of these four sites are very low paid worker and their monthly income lie between TK. 1000 to TK. 3000 only. They can hardly mange their basic need with the poor income, which is equal to their monthly expenditure.

The overall environmental condition is quite unsatisfactory, because a large population lives in a small portion of land. Even their per capita living space is also very low. Huge crowdness of population creates an adverse effect on urban basic services as limited services are provided for them by the different organizations especially in electricity, sewerage, garbage disposal, and water and sanitation sectors. Malnutrition and water born diseases are rife in slums and squatters. Fouled water supply is the number one environmental problem and it is caused even more by untreated domestic sewage than by industrial waste. In these slums, poor drainage system encourages water logging and rainwater stagnation even on the access roads. The situation is very serious in Ganaktuli than in other three areas, because there is no water bodies like pond, ditches etc for collecting the rainwater. Some ditches exist in other three areas, water of which is not safe even for washing utensils or bathing, but the residents are using this water for all purposes except drinking. In Ganaktuli, drains are always filled up with dirty water that encourage the mosquito's breeding place and vulnerable for resident's health. Among the three urban poor areas, Ganaktuli's housing structures are better, because three stuff buildings are located there, which are generally known as Ganaktuli Sweeper Colony. However, only a few people live in these buildings compared to total population of the area. On the other hand, in Dhalpur, in Agargaon, and in Kallayanpur housing structures are very poor and maximum are *kutcha* type i.e. made by bamboo/tin roof, bamboo/thatched wall and mud plinth. There is no touch of vegetation coverage and congested housing structure capture all the open spaces where children playground is only an imagination. Air quality especially air smell comes out due to open clogged drain and dirty environment and sufferer are mainly children, which is the common phenomenon for every slum. Noise occurs due to densely built up houses attached to one another and radio/TV is the only recreational facilities. Overall literacy rate is very poor

and some portions of population have passed primary education only. Most of the residents in these urban poor areas can not bear the educational expenses of their children, on the contrary parents force them to earn money and for these reasons, children are also reluctant to go to the school. So, after taking free primary education from GO/NGO School, children are bound to leave the education. A number of NGOs are working for education in these slums and dwellers are also happy with these NGOs education but the total number is very little according to the demand. Possessing only primary level of education is the main problem of these NGO's school. In Dhaka City, urban health care delivery services are running by the program of DCC and UNICEF namely Urban Basic Service Delivery Project (UBSDP) in each and every Ward (according to Slum Improvement Project, 1999). But in reality poor people don't get the service in free of cost and sometimes they are short of the facilities. The residents have well social contact with each other as they are living in urban villages. Musclemen or *mastan* is a common problem in these urban poor areas and these types of musclemen are controlling the total slum politics. They run some activities in these poor areas such as drug dealings, terrorism, undue interference, land owning etc., which are the common scenes in Agargaon and in Dhalpur. In all slums, solid waste disposal system is very unsatisfactory. Urban hazards are their way of daily life. A recent incident at Kallaynpur and Agaragaon slums can be cited as example. Kallaynpur slum was gutted by fire and eight people including women and children were killed in that fire hazards. Safety and security are something unknown in the city slums. They live in constant fright of life for the bulldozer and extortionists. Women and girls here are molested, trafficked, and kidnapped. All these are going on here under the very nose of the law enforcers.

3.4 Socio-economic Characteristics of the Population

3.4.1 Type of Family

In all surveyed urban poor areas in this study, it has been found that single family type is dominated than combined. In Ganaktuli, 82.5 percent families were identified as single and only 17.5 percent were combined. In Dhalpur, it has been identified that 90 percent families are single and only 10 percent are combined. Total in GO managed areas 86.7 percent families have been found as single and 13.3 percent are combined. In Agargaon,

86.7 percent families were identified as single and 13.3 percent were combined. In Kallayanpur, no family was found as combined (Table: 3.1). Total in NGO managed areas 92.7 percent families have been found as single and 7.3 percent are combined. So, in these urban poor areas single-family concept is rather effective than combined or large family.

Table: 3.1 Type of the Family

Type	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Single	33	82.5	45	90 0	78	86.7	52	86.7	50	100.0	102	92.7
Combined	7	17.5	5	10.0	12	13.3	8	13.3	-	-	8	7.3
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

3.4.2 Residential Status

In Ganaktuli, 55 percent families were identified to be owner and the others had status as tenant (35 %), freehold (5 %) and leasehold (2.5 %). On the other hand, in Dhalpur, 54 percent families were found as tenant and the others had status as owner (32 %), leasehold (8 %) and freehold (6%) (Table: 3.2). Proportionately higher level (68 %) of owned residential status families have been found in Kallayanpur than in Agargaon (61.7 %). In comparative analysis, a mixture of residential statuses have been investigated in GO managed areas than in NGO managed areas.

Table: 3.2 Residential Status of the Respondents

Type	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Owned	22	55.0	16	32.0	38	42.2	37	61.7	34	68 0	71	64.5
Tenant	14	35.0	27	54.0	41	45 6	23	38.3	16	32.0	39	35 5
Freehold	2	5.0	3	6.0	5	5.6	-	-	-	-	-	
Leasehold	1	2.5	4	8.0	5	5.6	-	-	-	-	-	
Not Responded	1	2.5	-	-	1	1.1	-	-	-	-	-	
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

3.4.3 Age Structure of the Respondents

It was found that 32.6 percent population in Kallayanpur, 32 percent in Dhalpur, 28.9 percent in Agargaon, and 27.5 percent in Ganaktuli were of 10 and below age group.

Meanwhile, 28.1 percent population in Ganaktuli, 24.7 percent in Agargaon, 22.7 percent in Kallayanpur and 22.3 percent in Dhalpur were in 11-20 age group (Table: 3.3).

Table: 3.3 Age Structure of the Respondents

Age Structure	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
10 and Below	54	27 5	60	32 0	114	29 7	69	28.9	76	32 6	145	30 7
11 – 20	55	28 1	42	22.3	97	25.3	59	24 7	53	22 7	112	23 7
21 – 30	37	18 9	45	24.0	82	21 4	56	23 4	41	17.6	97	20.5
31 – 40	25	12 8	35	18 6	60	15 6	32	13 4	30	13.0	62	13.1
41 – 50	13	6 6	4	2 1	17	4 4	13	5.4	21	9.0	34	7.2
51 – 60	8	4 1	1	0.5	9	2.3	6	2.5	7	3.0	13	2.7
61 and Above	4	2 0	1	0.5	5	1.3	4	1.7	5	2.1	9	1.9
Total	**196**	**100.0**	**188**	**100.0**	**384**	**100.0**	**239**	**100.0**	**233**	**100.0**	**472**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

It has also been found that 17.6 percent population in Kallayanpur, 24 percent in Dhalpur, 23.4 percent in Agargaon, and 18.9 percent in Ganaktuli were in 21-30 age group. On the other hand, 12.8 percent population in Ganaktuli, 13.4 percent in Agargaon, 13 percent in Kallayanpur and 18.6 percent in Dhalpur were in 31-40 age group. Only 2 percent population in Ganaktuli, 1.7 percent in Agargaon, 2.1 percent in Kallayanpur and 0.5 percent in Dhalpur were above age of 61 years. Total in GO managed areas about 30 percent population were of 10 and below age group, 25.3 percent were in 11-20 age group, 21.4 percent were in 21-30 age group and 15.6 percent were in 31-40 age group. On the other hand, total in NGO managed areas about 31 percent population were of 10 and below age group, about 24 percent were in 11-20 age group, 20.5 percent were in 21-30 age group and about 13 percent were in 31-40 age group. So, it can be said that the number of middle as well as child age group people were found to be maximum in comparison to older age people in all the four study areas.

3.4.4 Sex Status of the Respondents

In Ganaktuli, it was found that 56.6 population were male and 43.4 percent were female, in Dhalpur 52.1 percent population were found to be male and 47.9 percent were female. In Agargaon, 54.4 percent population were identified as male and 45.6 percent were female (Table: 3.4). In Kallayanpur, it was found that 55.8 percent population were male and 44.2 percent were female. So, in all four study areas the number of male respondents

were higher than the female but the variation between number of male and female population is not so high.

Table: 3.4 Sex Status of the Respondents

Type	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Male	111	56.6	98	52.1	209	54.4	130	54.4	130	55.8	260	55.1
Female	85	43.4	90	47.9	175	45.6	109	45.6	103	44.2	212	44 9
Total	**196**	**100.0**	**188**	**100.0**	**384**	**100.0**	**239**	**100.0**	**233**	**100.0**	472	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

3.4.5 Education of the Respondents

The proportions of illiterate population were higher than the literate persons in all the study areas. 65.7 percent population in Kallayanpur, 59 percent in Dhalpur, 54 percent in Agargaon and 41.4 percent in Ganaktuli were found to be illiterate. In respect of having education, maximum of the population had education up to primary level. In GO managed areas 50 percent population were found to be literate and in NGO managed areas about 40 percent were literate. It was found from the survey that 39.3 percent population in Agargaon, 36.7 percent in Ganaktuli, 29.8 percent in Dhalpur and 27.9 percent in Kallayanpur have passed the primary level of education. On the other hand, 17.4 percent population in Ganaktnli, 9.6 percent in Dhalpur, 5.9 percent in Agargaon and 4.3 percent in Kallayanpur had secondary level of education (Table: 3.5).

Table: 3.5 Education of the Respondents

Status	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Illiterate	81	41.1	111	59.0	192	50.0	129	54.0	153	65.7	282	59.7
Primary	72	36 7	56	29.8	128	33.3	94	39 3	65	27.9	159	33 7
Secondary	34	17.4	18	9.6	52	13 5	14	5.9	10	4.3	24	5.1
S S.C	4	2 0	3	1.6	7	1.8	1	0 4	4	1.7	5	1.1
H S.C	-	-	-	-	-	-	1	0.4	1	0.4	2	0 4
Graduate	3	1 5	-	-	3	0.8	-	-	-	-	-	-
Others	2	1.0	-	-	2	0.5	-	-	-	-	-	-
Total	**196**	**100.0**	**188**	**100.0**	**384**	**100.0**	**239**	**100.0**	**233**	**100.0**	**472**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

Population having education above secondary level are very insignificant in all the four study areas. However, in respect of literacy, GO managed areas are somewhat better than NGO managed areas.

3.4.6 Occupational Status of the Population

People in these urban poor areas are engaged with various primary occupations. They are day labor, rickshaw puller, garments worker, mason, govt service holder, pvt. service holder, transport worker, household worker, factory worker, petty businessman, salesman, tailor, mechanics etc. Among the total employed population, maximum were engaged in urban informal activities. In this respect, Ganaktuli sweeper colony was somewhat different than other three areas. In Ganaktuli, 23.2 percent population are engaged in govt. services and most of them were sweepers and cleaners of DCC (Table: 3.6). In Dhalpur, 11.7 percent population were engaged as rickshaw puller and 10.9 percent are engaged in petty business. In Agargaon, 16.1 percent respondents are engaged as rickshaw puller and 7.1 percent engaged in petty business. In Kallayanpur, 10.4 percent population were day labor, 7.8 percent were rickshaw puller and 8.4 percent were engaged in garments, and 6.5 percent were in petty business.

Table: 3.6 Occupational Status of the Respondents

Educational Status	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Day Labor	3	2.1	5	3.9	8	3.0	7	4.2	16	10.4	23	7.1
2. Rickshaw Puller	4	2.8	15	11.7	19	7.0	27	16.1	12	7.8	39	12.1
3. Garments Worker	1	0.7	1	0.8	2	0.7	6	3.6	13	8.4	19	5.9
4. Mason	-	-	-	-	-	-	4	2.4	4	2.6	8	2.5
5. Govt. Service	33	23.2	5	3.9	38	14.1	3	1.8	1	0.7	4	1.2
6. Pvt. Service	5	3.5	6	4.7	11	4.1	3	1.8	2	1.3	5	1.5
7. Transport Service	1	0.7	5	3.9	6	2.2	6	3.6	6	3.9	12	3.7
8. HH Worker	3	2.1	3	2.9	6	2.2	5	3.0	12	7.8	17	5.3
9. Factory Worker	2	1.4	-	-	2	0.7	4	2.4	3	2.0	7	2.2
10. Petty Business	1	0.7	14	10.9	15	5.5	12	7.1	10	6.5	22	6.8
11. Salesman	-	-	1	0.8	1	0.4	3	1.8	2	1.3	5	1.5
12. Tailor	-	-	1	0.8	1	0.4	-	-	-	-	-	-
13. Mechanic	-	-	1	0.8	1	0.4	1	0.6	-	-	1	0.3
14. Beggar	-	-	1	0.8	1	0.4	1	0.6	-	-	1	0.3
15. Student	16	11.3	13	10.2	29	10.7	17	10.0	9	5.8	26	8.1
16. Unemployed	32	22.6	21	16.4	53	19.6	32	19.0	37	24.0	69	21.4
17. Others	41	28.9	36	28.1	77	28.5	37	22.0	27	17.5	64	19.9
Total	**142**	**100.0**	**128**	**100.0**	**270**	**100.0**	**168**	**100.0**	**154**	**100.0**	**322**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

There were large number of unemployed respondents both in GO managed (19.6 %) as well as in NGO managed (21.4 %) areas.

3.4.7 Household Income Pattern

Urban poor earn a low monthly income. In Ganaktuli, it was found that 22.4 percent families had monthly household income TK. 3501-4000, 20 percent families had monthly household income TK. 2001-2500, 17.5 percent families had monthly household income TK. 2501-3000 and 10 percent families had monthly household income TK. 4001-4500. In Dhalpur, it was found that 28 percent families had monthly household income TK. 2001-2500, 22 percent families had monthly household income TK. 2501-3000, 16 percent families had monthly household income TK. 3001-3500 and 16 percent families had monthly household income TK. 501-2000 (Table: 3.7). In Agargaon, it was found that 31.7 percent families had monthly household income TK. 2501-3000, 18.3 percent families had monthly household income TK. 2001-2500, 15 percent families had monthly household income TK 2001-2500 and 13 percent families had monthly household income TK. 1001-1500. In Kallayanpur, it was found that 28 percent families had monthly household income TK. 2501-3000, 20 percent families had monthly household income TK. 1501-2000, 18 percent families had monthly household income TK. 2001-2500 and 10 percent families had monthly household income TK. 3501-4000. In GO managed areas maximum families' monthly household income is TK. 2001-4000 where as in NGO managed areas maximum families' monthly household income is TK. 1001-3000. So, it can be said that dwellers in GO managed areas had income somewhat better than in NGO managed areas.

Table: 3.7 Household Income (Per Month) of the Respondents

Income (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
501 – 1000	2	5.0	3	6.0	5	5.2	1	1.7	1	2.0	2	1.8
1001 – 1500	-	-	2	4.0	2	2.2	8	13.3	2	4.0	10	9.1
1501 – 2000	3	7.5	3	6.0	6	6.7	11	18.3	10	20.0	21	19.1
2001 – 2500	8	20.0	14	28.0	22	24.4	9	15.0	8	16.0	17	15.4
2501 – 3000	7	17.5	11	22.0	18	20.0	19	31.7	15	30.0	34	30.9
3001 – 3500	5	12.5	8	16.0	13	14.4	4	6.7	4	8.0	8	7.3
3501 – 4000	9	22.5	4	8.0	13	14.4	2	3.3	5	10.0	7	6.4
4001 – 4500	4	10.0	3	6.0	7	7.8	3	5.0	2	4.0	5	4.5
4501 – 5000	-	-	1	2.0	1	1.1	2	3.3	2	4.0	4	3.6
5001 & Abv.	2	5.0	1	2.0	3	3.3	1	1.7	1	2.0	2	1.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage TK = *Taka*

3.4.8 Household Expenditure Pattern

In Ganaktuli, it was found that 25 percent families' per month household expenditure was TK. 3001-3500, 25 percent families' per month household expenditure was TK. 3501-4000, 22.5 percent families' per month household expenditure was TK. 2501-3000, and 10 percent families' per month household expenditure was TK. 4001-4500. In Dhalpur, it was found that 24 percent families' per month household expenditure was TK. 3001-3500, 22 percent families' per month household expenditure was TK. 2501-3000, 20 percent families' per month household expenditure was TK. 2001-2500, and 12 percent families' per month household expenditure was TK. 1501-2000 (Table: 3.8). Total in GO managed areas, 24.4 percent families had monthly household expenditure TK. 3001-3500, 22.2 percent families had monthly household expenditure TK. 2501-3000, 16.7 percent families had monthly household expenditure TK. 2001-2500, and 15.5 percent families had monthly household expenditure TK. 3500-4000.

Table: 3.8 Household Expenditure (Per Month) of the Respondents

Income (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
501 – 1000	1	2.5	3	6.0	4	4.4	-	-	1	2.0	1	0 9
1001 – 1500	-	-	2	2.0	2	2.2	6	10	2	4.0	8	7.3
1501 – 2000	2	5 0	6	12.0	8	8 9	13	21.7	10	20.0	23	20.9
2001 – 2500	5	12.5	10	20 0	15	16 7	7	11 6	11	22.0	18	16.4
2501 – 3000	9	22.5	11	22.0	20	22.2	23	38.3	14	14.0	37	33.6
3001 – 3500	10	25.0	12	24.0	22	24 4	4	6 7	4	8.0	8	7.3
3501 – 4000	10	25 0	4	8.0	14	15.5	3	5.0	5	10.0	8	7.3
4001 – 4500	-	-	-	-	-	-	2	3.3	1	2.0	3	2 7
4501 – 5000	-	-	2	4.0	2	2.2	1	1.7	2	4.0	3	2.7
5001 and Abv.	3	7.5	-	-	3	3.3	1	1 7	-	-	1	0.9
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage TK = *Taka*

In Agargaon, it was found that 38 percent families' per month household expenditure was TK. 2501-3000, 21.7 percent families' per month household expenditure was TK. 1501-2000, 11.6 percent families' per month household expenditure was TK. 2001-2500, and 10 percent families' per month household income was TK. 1001-1500. In Kallayanpur, it was found that 24 percent families' per month household expenditure was TK. 2001-2500, 26 percent families' per month household expenditure was TK. 2501-3000, 20

percent families' per month household expenditure was TK. 1501-2000, and 10 percent families' per month household income was TK. 3501-4000. Total in NGO managed areas, 33.6 percent families had monthly household expenditure TK. 2501-3000, 20.9 percent families had monthly household expenditure TK. 1501-200, and 16.4 percent families had monthly household expenditure TK. 2001-2500 In GO managed areas maximum families' monthly household expenditure was TK. 2001-4000 where as in NGO managed areas maximum families' monthly household expenditure was TK. 1501-3000. So, as like monthly household income, dwellers in GO managed areas expend more money than in NGO managed areas. However, without some exception, in these poor areas family's monthly income more or less equals the monthly expenditure.

3.4.9 Cost of the Houses

From the study, it was found that 50.5 percent respondents had their own houses. In this respect, cost of the owned houses was an important aspect because cost varied from house to house according to the structure especially in urban poor areas. In Ganaktuli, 27.3 percent houses were identified to have cost TK. 5001-10000, 18.2 percent houses had cost TK. 10001-15000, 13.6 percent houses had cost TK. 501-5000 and 9.1 percent houses had cost TK. 15001-20000. In Dhalpur, it was found that 56.2 percent houses had cost TK. 501-5000, 12.5 percent houses had cost TK. 5001-10000, and 12.5 percent houses had cost TK. 15001-20000 (Table: 3.9).

Table: 3.9 Cost of the Houses

Cost (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
501 – 5000	3	13 6	9	56.2	12	31 6	7	23.3	5	15.2	12	19.0
5001 – 10000	6	27.3	2	12.5	8	21.1	7	23.3	10	30.3	17	27.0
10001 – 15000	4	18.2	1	6.3	5	13 2	7	23 3	6	18.2	13	20.6
15001 – 20000	2	9 1	2	12.5	4	10 5	4	13.3	3	9 1	7	11.1
20001 – 25000	1	4.5	1	6.3	2	5.3	2	6.7	1	3.0	3	4 8
25001 & Above	2	9.1	1	6.3	3	7.9	3	10.0	8	24.2	11	17.5
Don't Know	4	18.2	-	-	4	10.5	-	-	-	-	-	-
Total	**22**	**100.0**	**16**	**100.0**	**38**	**100.0**	**30**	**100.0**	**33**	**100.0**	**63**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage TK = *Taka*

In Agargaon, 23.3 percent house were identified to have cost TK. 501-5000., 23.3 percent houses had cost TK. 5001-10000, 23.5 percent houses had cost TK. 15001-20000 and

13.3 percent houses had cost TK. 15001-20000. In Kallayanpur, 30.3 percent house were identified to have cost TK. 5001-1000, 24.2 percent houses had cost TK. 25001 & above, 18.2 percent houses had cost TK. 10001-15000, 15.2 percent houses had cost TK. 501-5000 and 9.1 percent houses had cost TK. 15001-20000 (Table: 3.9). In urban poor areas, it is surprising to find that people invest huge amount of money for buying or building a house especially in squatting places. In comparison, cost of the owned house in NGO managed areas are higher than in GO managed areas.

3.4.10 Monthly Rent of the Houses

According to the living status of the dwellers, 44 percent households were found to be tenant in these poor areas. In Ganaktuli and in Agargaon, house rent is higher than in other two areas. It was found that in Ganaktuli 71.4 percent households paid monthly house rent TK. 301-600, 14.3 percent paid TK. 601-900 and 7.1 percent paid TK. 101-300 and another 7.1 percent paid TK. 901-1200 (Table: 3.10).

Table: 3.10 Monthly Rent of the Houses

Rent (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
101 – 300	1	7.1	25	92.6	26	63.4	10	33.3	12	70.6	22	46.8
301 – 600	10	71.4	1	3.7	11	26.8	15	50.0	4	23.5	19	40.4
601 – 900	2	14.3	1	3.7	3	7.3	4	13.3	1	5.9	5	10.6
901 – 1200	1	7.1	-	-	1	2.4	1	3.3	-	-	1	2.1
Total	**14**	**100.0**	**27**	**100.0**	**41**	**100.0**	**30**	**100.0**	**17**	**100.0**	**47**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage TK = *Taka*

In Dhalpur, 92.6 percent households paid monthly house rent TK. 101-300, 3.7 percent paid TK. 301-600 and 3.7 percent paid TK. 901-1200. Total in GO managed, 63.4 percent households paid monthly house rent TK. 101-300, 26.8 percent paid TK. 301-600 and 7.3 percent paid TK. 601-900. In Agargaon, 50 percent households paid monthly house rent TK. 301-600, 33.3 percent paid TK. 101-300 and 13.3 percent paid TK. 901-1200. In Kallayanpur, it was found that 70.6 percent households paid monthly house rent TK. 101-300, 23.5 percent paid TK. 301-600 and 5.9 percent paid TK. 901-1200. Total in NGO managed, 46.8 percent households paid monthly house rent TK. 101-300, 40.4 percent paid TK. 301-600 and 10.6 percent paid TK. 601-900. In the context of urban poor areas, house rent varied from place to place on the basis of location and duration of

establishment of slums. So, it can be said that per month house rent in NGO managed areas was slightly higher than in GO managed areas.

3.4.11 Rent Collection

In case of rent collection, a variety of rent collectors were identified in these urban poor areas and they were house owner, landowner, musclemen, DCC, and others. In Ganaktuli, 64.3 percent rent were collected by DCC, 14.3 percent were collected by house owner and 21.4 percent were collected by others. In Dhalpur, 48.1 percent rent were collected by DCC, 29.6 percent were collected by house owner, 11.1 percent were collected by landowner and 11.1 percent were collected by others. Total in GO managed areas, 53.7 percent rent were collected by DCC, 24.4 percent were collected by house owner, 7.3 percent were collected by landowner and 14.6 percent were collected by others. In Agargaon, 70 percent rent were collected by others, and 30 percent were collected by house owner (Table: 3.11). In Agargaon, 58.8 percent rent were collected by house owner and 41.2 percent rent were collected by others. Total in NGO managed areas, about 60 percent rent were collected by others and about 40 percent rent were collected by the house owners. No respondent of these slums want to say that they gave their rent to the *mastan* (musclemen). For that reason, this type of collector was identified as "others". In this context, musclemen as a rent collector was higher in the NGO managed areas than in the GO managed areas.

Table: 3.11 Collector of the Rent

Status	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
House Owner	2	14.3	8	29.6	10	24.4	9	30	10	58 8	19	40 4
Land Owner	-	-	3	11 1	3	7.3	-	-	-	-	-	-
DCC	9	64.3	13	48.1	22	53.7	-	-	-	-	-	-
Others	3	21 4	3	21.4	6	14.6	21	70	7	41.2	28	59.6
Total	**14**	**100.0**	**27**	**100.0**	**41**	**100.0**	**30**	**100.0**	**17**	**100.0**	**47**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

3.5 Conclusion

Actually, the physical and environmental condition of the urban poor areas in Dhaka City are somewhat similar, which is focused on the above description through the study of two GO managed and two NGO managed areas. However, according to visual inspection, physical and environmental conditions such as level of land, access roads in the internal areas, drainage condition, and housing structure are better in Ganaktuli followed by Agargaon, Dhalpur and Kallayanpur. On the other hand, socio-economic condition of the respondents revealed their illiteracy, employment in informal activities, poverty, and so on.

4.1 Introduction

In this chapter water supply facilities has been described in respect of types of facilities, provision standards, performance standards, maintenance and management systems, and cost recovery system etc. Nevertheless, the dwellers satisfaction about water supply facilities have been investigated by using a satisfaction index and problems related water supply facilities have been ranked by using priority ranking technique.

4.2 General Condition of Water Supply in the Sites

The general conditions of water supply in the sites are described below.

4.2.1 Ganaktuli

Residents of Ganaktuli use piped water supplied by DWASA. Water supply facility in this slum provided through public water point or stand point started after independence in 1971. The water supply facilities were improved under Slum Improvement Project (SIP) in 1991. There are 17 water points in Ganaktuli and among the total facilities 14 water points were found to be working. An excellent water facilities has been identified in this slum i.e. water reservoir. There are 8 water reservoirs in this study area and all were found to be working properly (Table: 4.1).

Table: 4.1 Water Provision for Urban Poor in Ganaktuli Study Area

Cluster Name	No. of HHs	No. of Water Points			Ratio per WWP	No. of Reservoirs	Ratio per Reservoir
		W	NW	T			
Muslim Bastee	300	4	2	6	75	1	300
Hindhu Bastee	440	3	0	3	147	3	147
Lalbag Bastee	300	2	1	3	150	2	150
Madhapara Bastee	60	3	0	3	20	1	60
Baikhan Bastee	250	3	0	3	83	1	250
Total	**1350**	**14**	**3**	**17**	**96**	**8**	**169**

Source: Community Survey, 2000

Note: HHs = Households, W = Working, NW = Not Working, T = Total, WWP = Working Water Point

Residents of Ganaktuli get sufficient water supply when WASA's water supply remains regular. Due to the existence of water reservoir located in every cluster, the residents collect excessive water and use it later. According to the respondents they get sufficient

water at wet season but don't get sufficient at dry season. On that time they collect water from BDR gate (near to the slum) without any cost and many of them collect water from neighboring houses. The residents use water of standpoint for drinking and cooking and on the other hand, they use reservoir water for bathing and washing. Platform conditions of the water sources have been found tilted damaged and cracked down with moderate drainage condition. Mainly women and children collect water for household work and they have to wait in line two or three times a day for 30-40 minutes in each time (Community survey, 2000). DCC is responsible for maintenance of the water supply facilities. However, they rarely visit the area. For this reason, nobody of the community wants to take the responsibilities for repairing the facilities. For small repairing the community people collect 5 to 10 taka from each family but for any kind of major repair work they have to complain it to the DCC's concerned Officials. According to the residents of Ganaktuli concerned authority i.e. DCC does not take proper steps for maintenance or management of the water supply facilities. However, the dwellers have to pay regular monthly water bill to DCC. Every 4th class employee of DCC has to pay TK. 50 per month for water.

4.2.2 Dhalpur

DCC is responsible for providing water supply facilities for urban poor in Dhalpur slum Residents in this slum collect DWASA's piped water but the system is not the stand point or household connection. Tubewell has been set up on the WASA's water pipe and dwellers can collect water when water is available in the pipeline, otherwise they have to wait. In maximum time, water supply remains available at night and for collecting the whole day's water they have to wait for that time. In maximum cases, the water is collected by the women or the children of the households. The residents in this slum are DCC's 4th class employees such as driver, sweeper, cleaner, night guard etc. They have to pay the bill (50 taka per month) of water to the DCC. A number of 500 families No. 1 City *Palli* use 4 tubewells to collect water for all purposes, in which the number of families per tubewell is 125. On the other hand, in Aynul's *Bastee* 500 families use 7 tubewells to collect water for all purposes, where the number of families per tublewell is 71, which is the lowest ratio for all clusters in Dhalpur (Table: 4.2).

Table: 4.2 Water Provision for Urban Poor in Dhalpur Study Area

Cluster Name	No. of HHs	No. of Water Points			Ratio per WWP
		W	NW	T	
1 No City Palli	500	4	0	4	125
Rahman's Bastee	550	7	2	9	78
Aynul's Bastee	500	7	0	7	71
Total	**1550**	**19**	**2**	**20**	77

Source: Community Survey, 2000
Note: HHs = Households, W = Working, NW = Not Working, T = Total, WWP = Working Water Point

So, there is variation in provision of water supply facilities in Dhalpur slums in different clusters. For this reason, provision of water supply is also different for those clusters. However, all the tubewells found working in this urban poor area. DCC is responsible for caretaking the water supply facilities. Generally, community people do not want to take the responsibility of any major repair. However, when concerned authority does not come to repair the facilities then the community people have to take the responsibilities. In this context, they collect TK. 5 to 10 from each household and then repair the tubewells. Though the management body is DCC but concerned officials rarely visit to check the facilities.

4.2.3 Agargaon

An international NGO namely Plan International (PI) is working in Agargaon for providing water supply facilities since 1995. For water supply PI provide shallow hand tubewell. PI provided 1 tubewell for every 20 or 30 families, and with a condition that each family must have a child of 5-8 year age limit as primary school going boys or girls. Those families who do not have any child within that age limit they are the renter of these facilities and they have to pay 30 taka (per family) in every month as water charge. Among 17 clusters, 4 clusters have been surveyed in Agargaon. Though PI provide one tubewell for every 20-30 families, except in Tulatali cluster, this ratio has been found very high. In Kashem's *Bastee* the ratio was found 171 families against one tubewell (Table: 03). PI selects 20/30 families for one tubewell with a woman leader for caretaking only the water collection facilities.

Table: 4.3 Water Provision for Urban Poor in Agargaon Study Area

Cluster Name	No. of HHs	No. of Water Points			Ratio per WWP
		W	NW	T	
Tulatali Bastee	440	15	0	15	29
Gandhi's Bastee	500	14	0	14	35
Kashem's Bastee	1200	7	5	12	171
N. Mohammad's Bastee	600	8	4	12	75
Total	**2740**	**44**	**9**	**53**	**62**

Source: Community Survey, 2000
Note: HHs = Households, W = Working, NW = Not Working, T = Total, WWP = Working Water Point

For any kind of major repairing, she has to report to the concerned officials, but if it is not major repair, then PI has given her the authority to collect money from community members on equal share for repairing the tubewell. According to the respondents they could not get sufficient water from shallow tubewell in all seasons and during the lean period they have to collect water from other community's tubewell or have to buy. In this slum, the another source of water is WASA's illegal connections. In maximum cases, musclemen are the owners of these illegal connections, which are located near to their house. They (musclemen) have established these connections with the help of some dishonest WASA employees. In dry season, when water crisis happened they sale water (one jar water is one *taka*) from these illegal connections to the residents. PI is the main management body of these facilities and the concerned officials regularly visit to look after the tubewells. The area of intervention of PI is huge, and now in every cluster in Agargaon, this NGO provides water supply facilities. Except in some cases, the water supply is working very well as expressed by the residents.

4.2.4 Kallaynpur

Some local NGOs namely FULKI, BAUPA, PROSHIKA etc. and an international NGO namely Plan International (PI) are responsible for providing water supply facilities for urban poor in Kallayanpur slum. For water supply facilities they provide shallow hand tubewell. However, all NGOs working here in this slum do not provide both water supply and sanitation facilities. Only Plan International and FULKI provide both water supply and sanitation facilities. They provided one tubewell for every 20 families during the

establishment period. However, the present condition is totally different and on an average more than 50 families use one tubewell (Table: 4.4).

Table: 4.4 Water Provision for Urban Poor in Kallayanpur Study Area

Cluster Name	No. of HHs	No. of Water Points			Ratio per WWP
		W	NW	T	
Bastee No 1	250	4	1	5	62
Bastee No 2	400	8	2	10	50
Bastee No 4	495	10	4	14	50
Total	**1145**	**22**	**7**	**29**	**52**

Source: Community Survey, 2000
Note: HHs = Households, W = Working, NW = Not Working, T = Total, WWP = Working Water Point

PI always maintains their rules and regulations in any urban poor area in Dhaka City. Kallaynpur *Pora Bastee* has 9 different clusters and among them 4 clusters have been surveyed. There is acute water crisis in this slum. For this reason, some residents have made ring well by digging soil. The quality of water of these wells is very poor, turbid and dirty. However, the dwellers use this water for cooking, washing and bathing also. Among the all tubewells, some were found to be non-working. Performance of water supply is better than sanitation facilities in this slum because all the NGOs working here are providing water supply facilities. FULKI collects 2800 taka for each tubewell from 20 or 40 families. PROSHIKA provides one tubewell for 10-15 families with the cost of 2500 taka. For repairing the facilities community people have to take the responsibilities. All NGOs are the main management body of these water supply facilities. According to NGO's concerned officials, they always visit the urban poor area of their jurisdiction. On the contrary, the dwellers reported that they rarely visit the slum for caretaking the facilities.

4.2.5 Overall Management System

The average families per cluster in GO managed areas are 394. The lowest average is 270 in Ganaktuli and highest is 517 in Dhalpur. Where as the average families per cluster in NGO managed areas (534) is higher than GO managed areas (394). In NGO managed areas, lowest average is 382 in Kallayanpur and highest average is 685 in Agargaon. The average number of families per water point in Ganaktuli is the highest (96) and in

Kallaynpur is the lowest (52) in GO managed as well as in NGO managed areas. The average number of families per water point in GO managed areas is 87 and in NGO managed areas is 57 respectively. So, in case of water supply facilities NGO managed areas are comparatively better than GO managed areas (Table: 4.5).

Table: 4.5 Comparative Situation of Water Supply Provision in all Study Areas

Management Body	Area/Site	Av. Families per Cluster	Av. Families per Water Point	Av. Families per Reservoir
Gos	Ganaktuli	270	96	169
	Dhalpur	517	77	*
Av. For GO Managed Area		**394**	**87**	**85**
NGOs	Agargaon	685	62	*
	Kallayanpur	382	52	*
Av. For NGO Managed Area		**534**	**57**	*

Source: Community Survey, 2000 **Note:** * = No Reservoir, Av. = Average

The various problems related to water supply facilities faced by the dwellers are insufficient water supply, inaccessibility of water supply facilities, long waiting time to collect water from the sources, turbid water which are unsafe, insufficient water during dry season, excess payment than that of actual, lack of storage provisions, poor drainage condition of water sources, poor maintenance system, either absent or cracked platform condition, poor management system, etc. These problems were investigated through community surveys, and have been ranked by using priority-ranking technique in the analytical portion of this chapter.

4.3 Water Supply Facilities in the Sites

4.3.1 Different Sources of Water for Different Purposes

In every aspect of life water is badly needed. In urban poor areas water sources may differ in types as well as uses due to lack of access to adequate water supply Different types of water sources have been identified in these poor areas and these are public water point, tubewell managed by GOs, tubewell managed by NGOs, tubewell managed privately, and other sources. In Ganaktuli, it has been found that 82.5 percent respondent

use water from public water point provided by DCC through DWASA and some residents (7.5 %) use other sources of water for all purposes. In Dhalpur, it has been found that 94 percent respondents use public tubewells installed by DCC on DWASA's water connection (Table: 4.6 a). Total in GO managed areas, 52.2 percent residents use public tubewells, 37.8 percent use public water points and only 5.6 percent use other sources of water for all purposes.

Table: 4.6 a Different Sources of Water for Different Purposes in GO Managed Areas

Water Sources	Ganaktuli			Dhalpur			Total		
	D %	B %	A %	D %	B %	A %	D %	B %	A %
Piped Water: Public Water Point	1 2.5	3 7 5	33 82 5	-	-	1 2 0	1 1 1	3 3.3	34 37.8
Tube Well (GO)	-	-	-	-	-	47 94.0	-	-	47 52.2
Tube Well (NGO)	-	-	-	-	-	-	-	-	-
Others	-	-	3 7.5	-	-	2 4.0	-	-	5 5.6
Total	**1 2.5**	**3 7.5**	**36 90.0**	**-**	**-**	**50 100.0**	**1 1.1**	**3 3.3**	**86 95.6**

Source: Field Survey, 2000
Note: D = For Drinking and Cleaning Purpose Only,
B = For Cleaning and Bathing Purpose Only,
A = For All Purposes

In Agargaon, 86.7 percent dwellers use tubewell water installed by NGO. and 5 percent use public water points for all purposes. In Kallayanpur, it has been found that 70 percent dwellers use tubewell water installed by different NGOs and 4 percent use other sources of water for all purposes (Table: 4.6 b). Total in NGO managed areas, 79.1 percent dwellers use NGO managed tubewell water and 3.6 percent use public water points for all purposes. Comparative analysis shows that dwellers of GO managed areas mostly depend on public water points whether the types of facilities are water points or tubewells. However, the dwellers of NGO managed areas, beside tubewells installed by NGOs depend on various sources.

Table: 4.6 b Different Sources of Water for Different Purposes in NGO Managed Areas

Water Sources	Agargaon			Kallayanpur			Total		
	D %	B %	A %	D %	B %	A %	D %	B %	A %
Piped Water: Public Water Point	1 1.7	1 1.7	3 5.0	3 6.0	-	1 2.0	4 3.6	1 0.9	4 3.6
Tube Well (GO)	-	-	3 5 0	-	-	-	-	-	3 2 7
Tube Well (NGO)	-	-	52 86.7	5 10 0	1 2.0	35 70.0	5 4.5	1 0 9	87 79.1
Others	-	-	-	-	3 6.0	2 4.0	-	3 2 7	2 1 8
Total	**1** **1.7**	**1** **1.7**	**58** **96.7**	**8** **16.0**	**4** **8.0**	**38** **76.0**	**9** **8.2**	**5** **4.5**	**96** **87.3**

Source: Field Survey, 2000

Note: D = For Drinking and Cleaning Purpose Only,
B = For Cleaning and Bathing Purpose Only,
A = For All Purposes

4.3.2 Cost of the Water

In urban areas, water is not free of cost, everybody has to pay for using the piped water supply from city authority and in this respect, urban poor are not an exception. Sometimes they (urban poor) have to pay more than the well-off dwellers. In Ganaktuli, it was found that 25 percent families paid TK. 101-150, 10 percent paid TK. 1-50, another 10 percent paid TK. 51-100 and 5 percent paid TK. 151-200 in the last three months. In Dhalpur, it was found that 8 percent families paid TK. 1-50, 2 percent paid TK. 51-100, and another 2 percent paid TK. 101-150 in the last three months (Table: 4.7).

Table: 4.7 Cost of the Water (When Water is not Free of Cost) for 3 Months

Cost (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 50	4	10.0	4	8.0	8	8.9	27	45.0	21	42.0	48	43.6
51 – 100	4	10.0	1	2.0	5	5.5	1	1.7	-	-	1	0.9
101 – 150	10	25.0	1	2.0	11	12 2	-	-	1	2.0	1	0 9
151 – 200	2	5.0	-	-	2	2.2	1	1.7	-	-	1	0.9
201 – 250	1	2 5	-	-	1	1.1	-	-	1	2.0	1	0 9
251 & Above	-	-	-	-	-	-	-	-	1	2.0	1	0.9
Don't Pay Separately	10	25.0	14	28.0	24	26 7	3	5	3	6 0	6	5.4
Free of Cost	9	22.5	30	60.0	39	43.3	28	46.6	23	46.0	51	46 4
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, TK = *Taka*

Total in GO managed areas, 43.3 percent households did not pay any *taka*, 26.7 percent paid the water bill with house rent and 12.2 percent paid TK. 101-150 for water from the public water points in the last three months. In Agargaon, it was found that 45 percent families paid TK. 1-50, about 2 percent paid TK. 51-100 and about 2 percent paid TK. 151-200 in the last three months. In Kallayanpur, it was found that 42 percent families paid TK. 1-50, 2 percent paid TK. 101-150, 2 percent paid TK. 201-250 and 2 percent paid TK. 300 and above in the last three months. Though the water is not free of cost, some families in these poor areas were found who didn't pay anything for collecting water from different sources. 22.5 percent households in Ganaktuli, 60 percent in Dhalpur, 46.6 percent in Agargaon and 46 percent in Kallayanpur were identified who didn't pay any *taka* to collect water in the last three months. Total in NGO managed areas, 46.4 percent households did not pay any *taka*, and 43.6 percent paid TK. 1-50 for using the tubewells water installed by NGOs in the last three months. So, it is revealed that higher cost payee households are more in GO managed areas than in NGO managed areas in getting water supply facilities.

4.3.3 Sufficiency of Supply of Water

Urban water crisis is not only a common phenomenon in Dhaka City, especially in low-income areas. In Ganaktuli, 52.5 percent users were found to get sufficient supply of water and 47.5 percent did not get sufficient water. In Dhalpur, it was found that only 26 percent users got sufficient supply of water and 74 percent did not get sufficient water. Total in GO managed areas, 62.2 percent did not get sufficient supply of water and 37 8 percent got sufficient supply of water (Table: 4.8).

Table: 4.8 Sufficient Supply of Water

Comment	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Yes	21	52.5	13	26.0	34	37.8	35	58.3	24	48.0	79	53.6
No	19	47 5	37	74.0	56	62.2	25	41 7	26	52 0	51	46 4
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Agargaon, 58.3 percent users were found to get sufficient supply of water and 41.6 percent didn't get sufficient water. In Kallayanpur, 48 percent users were found to get sufficient supply of water and 52 percent did not get sufficient water. Total in NGO

managed areas, 53.6 percent got sufficient supply of water and 46.4 percent did not get sufficient supply of water. In case of getting sufficient supply of water, dwellers of NGO managed areas are getting better supply than the dwellers of GO managed areas.

4.3.4 Case of Insufficient Water Supply

In total, about 54 percent users do not get sufficient water in these urban poor areas. In case of insufficient supply of water, the users have to buy or to collect from other sources for fulfilling their requirements. Only 5.3 percent users have been found in Ganaktuli, 24.3 percent in Dhalpur, 48 percent in Agargaon and 73.1 percent in Kallaynpur who fulfill their requirements by paying extra amount of money. On the other hand, 89.4 percent users have been found in Ganaktuli, 75.7 percent in Dhalpur, 52 percent in Agargaon and 26.9 percent in Kallaynpur who fulfill their requirements without paying extra amount of money but by other ways (Table: 4 9). Total in GO managed areas, 80 4 percent users did not pay for fulfilling the requirements and only about 18 percent pay for extra amount. On the other hand, in NGO managed areas, 60.8 percent users had to pay and 39.2 percent did not pay for fulfilling the requirements. In this respect, users of GO managed areas are more unwilling to pay for extra amount water than the users of NGO managed areas.

Table: 4.9 In Case of Insufficient Water Supply Whether the Users have to Buy/Pay to meet the Requirements

Comment	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Yes	1	5.3	9	24.3	10	17.9	12	48.0	19	73.1	31	60.8
No	17	89.4	28	75.7	45	80 4	13	52.0	7	26.9	20	39.2
Others	1	5.3	-	-	1	1.8	-	-	-	-	-	-
Total	**19**	**100.0**	**37**	**100.0**	**56**	**100.0**	**25**	**100.0**	**26**	**100.0**	**51**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

4.3.5 Cost of the Additional Water

In Ganaktuli, it was found that only 1 family out of 19 needed additional water, and spent TK. 1-30 per month for fulfilling the requirements. In Dhalpur, 44.5 percent users spent TK. 31-60, 33.3 percent spent TK. 121 and above, 11.1 percent spent TK. 1-30 and another 11.1 percent spent TK. 61-120 per month for fulfilling the additional requirements of water (Table: 4.10). Total in GO managed areas, 40 percent users spent

TK. 31-60, 30 percent spent TK. 121 and above, and 20 percent spent TK. 1-30 for fulfilling the additional requirement of water. In Agargaon, maximum respondents (83.3 %) spent less than TK. 30 per month for fulfilling the additional requirement of water, however, only 8.3 percent spent more than TK. 121 per month and another 8.3 percent spent TK. 31-60 for additional water. In Kallayanpur, it was found that 36.8 percent users spent TK. 1-30, another 36.8 percent spent TK. 61-121, and 26.3 percent spent TK. 31-60 per month for fulfilling the additional requirement of water. Total in NGO managed areas, 54.8 percent users spent TK. 1-30, 22.6 percent spent TK. 61-120, and 19.3 percent spent TK. 31-60 for fulfilling the additional requirements of water. In the comparative statements, cost of the additional water in GO managed areas is higher than in NGO managed areas.

Table: 4.10 Cost of the Additional Water

Cost (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 30	1	100.0	1	11.1	2	20.0	10	83.4	7	36.8	17	54.8
31 – 60	-	-	4	44.5	4	40 0	1	8 3	5	26.4	6	19 3
61 – 120	-	-	1	11.1	1	10.0	-	-	7	36.8	7	22 6
121 and Above	-	-	3	33.3	3	30 0	1	8 3	-	-	1	3.2
Total	**1**	**100.0**	**9**	**100.0**	**10**	**100.0**	**12**	**100.0**	**19**	**100.0**	**31**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, TK = *Taka*

4.3.6 Seasonal Variation of Water supply at the Existing Water Sources

Demand and supply of water are not equal for all the seasons. In our country, in hot summer season people usually use more water than in the winter. However, in the dry season water supply remain low due to fall of water level in the ground water table. In Ganaktuli, it was found that 55 percent users did not get sufficient water supply in dry season, 22.5 percent did not get at all the seasons and only 22.5 percent got the sufficient water in all the seasons. In Dhalpur, 60 percent users did not get sufficient water supply in all the year round but 36 percent got sufficient water in wet seasons, but not in dry season and only 4 percent got sufficient in all the seasons (Table: 4.11). Total in GO managed areas, 44.4 percent got sufficient water supply in wet season, but not in dry season, 43.3 percent did not get sufficient water in all the year round and only 12.2 percent got sufficient water in all the seasons. In Agargaon, it was found that 40 percent

users did not get sufficient water supply in dry season, 10 percent did not get in all the seasons and only 46.7 percent got the sufficient water in all the seasons. In Kallayanpur, it was found that 32 percent users did not get sufficient water supply in dry season, 28 percent did not get in all the seasons and only 40 percent got the sufficient water in all the seasons.

Table: 4.11 Comments about Sufficient Water supply at the Existing Water Sources

Comments	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Sufficient for all Seasons	9	22.5	2	4.0	11	12.2	28	46.7	20	40.0	48	43.6
2. Sufficient for wet Season not for Dry Seasons	22	55.0	18	36.0	40	44.4	24	40.0	16	32.0	40	36.4
3. Do not get Sufficient for any Seasons	9	22.5	30	60.0	39	43.3	6	10.0	14	28.0	20	18.2
4. Others	-	-	-	-	-	-	2	3.3	-	-	2	1.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

Total in NGO managed areas, 43.6 percent got sufficient water supply in all the seasons, 36.4 percent got sufficient water in wet season, but not in dry season and only 13.2 percent did not get sufficient water in all the seasons. So, in the context of getting sufficient water supply from existing water sources, dwellers of NGO managed areas are getting better supply than GO managed areas.

4.3.7 Alternative Sources of Water supply for all the Seasons or for the Dry Season

From the study, it was found that in Ganaktuli, among the families who did not get sufficient water supply (all the year round or in the dry season), 32.2 percent of them collect extra water from WASA's illegal connection, 25.8 percent collect water from neighbor's house, another 25.8 percent collect water from other sources. In Dhalpur, among the families who did not get sufficient water supply, 18.8 percent of them collect extra water from WASA's illegal connection, 20.8 percent collect water from neighbor's house, another 20.8 percent collect water from other sources. In Agargaon, among the families who did not get sufficient water supply, 33.3 percent of them collect extra water from WASA's illegal connection, 36.7 percent collect water from neighbor's house, another 16.7 percent collect water from other sources (Table: 4.12).

Table: 4.12 Alternative Sources of Water supply for all the Seasons or for the Dry Season

Alternative Sources	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 Neighbor's House	8	25.8	10	20 8	18	22 2	11	36.7	4	13 3	15	25 0
2. Another House	1	3.2	10	20.8	11	13 6	4	13 3	3	10 0	7	11 7
3. Pond/River/ Canal	1	3.2	4	8.3	5	6 2	-	-	2	6 7	2	3.3
4 Illegal WASA's Connection	10	32 2	9	18.8	19	23.5	10	33 3	14	46.7	24	40.0
5 Depend on Fate	3	9 7	9	18.8	12	14 8	-	-	3	10 0	3	5.0
6 Others	8	25 8	6	12.5	16	19.7	5	16.7	4	13 3	9	15 0
Total	**31**	**100.0**	**48**	**100.0**	**79**	**100.0**	**30**	**100.0**	**30**	**100.0**	**60**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Kallayanpur, among the families who did not get sufficient water, about 47 percent of them collect extra water from WASA's illegal connection, 13.3 percent collect water from neighbor's house, another 13.3 percent collect water from other sources, 10 percent collect water from another house and 10 percent depend on fate. So, it is clear that most of the dwellers of NGO managed areas who did not get sufficient water depend on WASA's illegal connection and then on neighbor houses for extra water. However, dwellers of GO managed areas depend on various alternative sources

4.3.8 Present Condition of the Water Sources

It has been found that on an average about 80 percent water sources are in running condition and the rest are out of order in these urban poor areas provided by GOs and NGOs. In Ganaktuli, 85 percent water sources were found to be in running condition, where as 15 percent are choked up partially. In Dhalpur, it has been found that 62 percent water sources are running, and 38 percent are choked up partially. Total in GO managed areas, 72.2 percent water sources are running, where as 27.8 percent are choked up partially (Table: 4.13). In Agargaon, 90 percent water sources are running, where as 10 percent are choked up partially. In Kallayanpur, 78 percent water sources are running, 10 percent are choked up partially, 2 percent are choked up completely and 6 percent are temporarily out of order. Total in NGO managed areas, 84.5 percent water sources were found to be in running condition, where as 10 percent are choked up partially. So, it is obvious that in the context of present condition of water sources NGO managed areas are a little bit better than GO managed areas.

Table: 4.13 Present Condition of the Water Sources

Conditions	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Running	34	85.0	31	62.0	65	72.2	54	90.0	39	78.0	93	84.5
2. Choked up Partially	6	15.0	19	38.0	25	27.8	6	10.0	5	10.0	11	10.0
3. Choked up Completely	-	-	-	-	-	-	-	-	1	2.0	1	0.9
4. Temporarily out of Order	-	-	-	-	-	-	-	-	3	6.0	3	2.7
5. Others	-	-	-	-	-	-	-	-	2	4.0	2	1.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

4.3.9 Platform Condition of the Water Sources

Platform condition of the water sources is an important aspect for easy collection of safe water. In Ganaktuli, it has been found that 60 percent platforms of the water sources are in good condition, 32.5 percent are cracked, 5 percent are tilted damaged and 2.5 percent do not exist (Table: 4.14). In Dhalpur, 48 percent platforms of the water sources have been found in good condition, 46 percent are cracked, 4 percent are tilted damaged and 2 percent do not exist. Total in GO managed areas, 53.3 percent platforms of the water sources have been found in good condition, 40 percent are cracked, 4.4 percent are tilted damaged and 2.2 percent do not exist. In Agargaon, it has been found that 68.4 percent platforms of the water sources are in good condition, 28.3 percent are cracked, and 3.3 percent do not exist. In Kallayanpur, 44 percent platforms of the water sources have been found in good condition, 30 percent are cracked, 6 percent are tilted damaged and 16 percent do not exist. Total in NGO managed areas, 57.3 percent platforms of the water sources have been found in good condition, 29.1 percent are cracked, 2.7 percent are tilted damaged and 9.1 percent do not exist.

Table: 4.14 Platform Condition of the Water Sources

Conditions	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Good	24	60.0	24	48.0	48	53.3	41	68.4	22	44.0	63	57.3
2. Cracked	13	32.5	23	46.0	36	40.0	17	28.3	15	30.0	32	29.1
3. Tilted damaged	2	5.0	2	4.0	4	4.4	-	-	3	6.0	3	2.7
4. Not Exist	1	2.5	1	2.0	2	2.2	2	3.3	8	16.0	10	9.1
5. Others	-	-	-	-	-	-	-	-	2	4.0	2	1.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

So, in case of platform condition of the water sources Ganaktuli in GO managed areas and Agargaon in NGO managed areas are somewhat better than other GO managed and NGO managed areas.

4.3.10 Drainage Condition of the Water Sources

Without well drainage network water cannot drain out and for this reason, water stagnation occurs. This condition creates an adverse situation on the total environment of the locality. In Ganaktuli, drainage condition of 55 percent of the water sources were in good condition, 27.5 percent were moderate and 17.5 percent were poor/bad condition. In Dhalpur, it was found that drainage conditions of 50 percent of the water sources were moderate, 30 percent were poor and 20 percent were good condition. Total in GO managed areas, drainage condition of 35.6 percent of the water sources were in good condition, 40 percent were moderate and 24.4 percent were poor/bad condition. In Agargaon, drainage conditions of 41.7 percent of the water sources were found in good condition, 18.3 percent were moderate and 40 percent were poor/bad condition. In Kallayanpur, drainage conditions of 60 percent of the water sources were found in poor condition, 20 percent were moderate and 20 percent were good (Table: 4.15). Total in NGO managed areas, drainage condition of about 32 percent of the water sources were found in good condition, 19.1 percent were moderate and 74.3 percent were poor/bad condition. Therefore, it reveals that drainage condition of the water sources of GO managed areas is better than NGO managed areas.

Table: 4.15 Drainage Condition of the Water Sources

Conditions	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Good	22	55.0	10	20.0	32	35.6	25	41.7	10	20.0	35	31.8
2 Moderate	11	27.5	25	50.0	36	40.0	11	18.3	10	20.0	21	19.1
3. Bad	7	17.5	15	30.0	22	24.4	24	40.0	30	60.0	52	47.3
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

4.3.11 Wait In Line to Collect the Water

In all these poor areas the number of water points are much less than the requirement. As a result, most of the users are required to wait in line in order to collect water from the

water sources. In Ganaktuli, 90 percent users had to wait in line to collect the water, whereas only 10 percent did not have to wait in line. In Dhalpur, 92 percent users have to wait in line to collect the water, whereas only 8 percent did not have to wait in line. Total in GO managed areas, 91.1 percent users had to wait in line to collect the water, whereas only 8.9 percent did not have to wait in line. In Agargaon, 66.7 percent users had to wait in line to collect the water whereas only 33.3 percent don't have to be waited in line. In Kallayanpur, 70 percent users had to wait in line to collect the water, whereas only 30 percent did not have to wait in line (Table: 4.16). Total in NGO managed areas, 68.2 percent users had to wait in line to collect the water, whereas only 31.8 percent did not have to wait in line. So, it is obvious that NGO managed areas were somewhat better than GO managed areas in the respect of by the users for water collection.

Table: 4.16 Wait in Line to Collect the Water

Comment	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Yes	36	90.0	46	92.0	82	91.1	40	66.7	35	70.0	75	68.2
2. No	4	10.0	4	8.0	8	8.9	20	33.3	15	30.0	35	31.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency % = Percentage

4.3.12 Waiting Time (Duration) to collect the Water in a Day

The users of water in these poor areas require to wait several times a day for the collection of water and total loss of time in waiting varies from several minutes to more than an hour. In Ganaktuli, it was found that 47.2 percent users had to wait for 21-30 minutes, 19.4 percent for 11-20 minutes, 19.4 percent one hour & above and 14 percent for 51-60 minutes in a day. In Dhalpur, the condition is rather serious, where 37 percent users had to wait in line for one hour & more, 17.4 percent for 11-20 minntes, 17.4 percent for 51-60 minutes and 13 percent for 31-40 minutes in a day. Total in GO managed areas, it was found that 29.3 percent users had to wait for 1 hour and more, 26.8 percent for 21-30 minutes, 18.3 percent for 11-20 minutes in a day. In Agargaon, it was found that 27.5 users had to wait for 11-20 minutes, 22.5 percent for 21-30 minutes, 15 percent for 31-40 minutes and 15 percent for one hour and more in a day. In Kallayanpur,

31.4 percent users had to wait in line for 11-20 minutes, 25.7 percent for 21-30 minutes, 14.2 percent for 51-60 minutes in a day (Table: 4.17).

Table: 4.17 Waiting Time (duration) to collect the Water in a Day

Duration of Waiting Time	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 10 minutes	-	-	-	-	-	-	3	7 5	3	8.6	6	8.0
11 – 20 minutes	7	19 4	8	17.4	15	18.3	11	27.5	11	31.4	22	29 3
21 – 30 minutes	17	47 2	5	10.9	22	26 8	9	22.5	9	25 8	18	24 0
31 – 40 minutes	-	-	6	13.0	6	7.3	6	15.0	5	14 2	11	14.7
41 – 50 minutes	-	-	2	4.3	2	2.4	3	7.5	3	8.6	6	8.0
51 – 60 minutes	5	14.0	8	17 4	13	15.8	2	5.0	2	5.7	4	5 3
1 hr & Above	7	19 4	17	37.0	24	29 3	6	15.0	2	5.7	8	10.7
Total	**36**	**100.0**	**46**	**100.0**	**82**	**100.0**	**40**	**100.0**	**35**	**100.0**	**75**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

Total in NGO managed areas, it was found that 29.3 percent users had to wait for 11-20 minutes, 24 percent for 21-30 minutes, 14.7 percent for 31-40 minutes in a day So, it can be said that dwellers of NGO managed areas spend less time than GO managed areas.

4.3.13 Caretaker of the existing Water Sources

Due to huge pressure in limited water sources, frequent damage or disorder of those sources has been investigated in these poor areas. In maximum cases, dwellers of these slums or community people take the responsibilities for caretaking the water sources. In Ganaktuli, it has been found that in 60 percent cases caretaking responsibilities are on community member, 10 percent are on musclemen, 6 percent are on concerned GO's officials and 6 percent are on Ward Commissioners (Table: 4.18).

Table: 4.18 Caretaker of the existing Water Sources

Caretaker	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Community Member	24	60 0	42	84.0	66	73 3	41	68.3	29	58 0	70	63.6
2. Land/House Owner	-	-	4	8.0	4	4.4	8	13.3	11	22 0	19	17.3
3. Muscleman	4	10 0	3	6 0	7	7.8	3	5 0	1	2.0	4	3 6
4. Concern GO/NGO Official	6	15.0	-	-	6	6.7	3	5 0	2	4 0	5	4.5
5. Ward Commissioner	6	15.0	-	-	6	6 7	-	-	-	-	-	-
6. Others	-	-	1	2 0	1	1.1	5	8 3	7	14.0	12	10 9
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Dhalpur, in 84 percent cases caretaking responsibilities are on community member, 6 percent are on musclemen, 8 percent are on land or house owner. In Agargaon, 68.3 percent caretaking responsibilities are on community member, 13.3 percent are on land or house owner, 5 percent are on musclemen, 5 percent are on concerned NGO's officials. In Kallayanpur, it has been found that in 58 percent cases caretaking responsibilities are on community member, 22 percent are on land or house owner, 13 percent are on others, 4 percent are on concerned NGO's officials. So, it is obvious that caretaking responsibilities greatly depend on community member of these poor areas.

4.3.14 Repairing of Water sources

After braking down any water source, someone has to be repaired the source for getting water again. In this respect, repairman may be the caretaker of the water sources, rented repairman, GO/NGO provided repairman, anybody of the community and others may take the responsibilities. In Ganaktuli, it has been found that in 42.5 percent cases rented repairman, in 32.5 percent cases GO's rented repairman, in 12 5 percent cases anybody of the community, and in 10 percent cases concerned caretaker repair the water sources (Table: 4.19). In Dhalpur, in 36 percent cases anybody of the community, in 32 percent cases rented repairman, and in 18 percent cases concerned caretaker repair the water sources.

Table: 4.19 Repairing of Water Sources

Repairman	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Caretaker	4	10.0	9	18.0	13	14.4	12	20.0	9	18.0	21	19.1
2 Rented Repairman	17	42 5	16	32.0	33	36.7	18	30.0	14	28 5	32	29.1
3 GO/NGO Repairman	13	32 5	-	-	13	14.4	15	25 0	7	14.0	22	20 0
4. Anybody of the Community	5	12.5	18	36 0	23	25.5	12	20 0	13	26 0	25	22.7
5. Don't Take any Initiative	1	2.5	6	12.0	7	7 8	3	5 0	7	14.0	10	9 1
6. Others	-	-	1	2.0	1	1.1	-	-	-	-	-	-
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Agargaon, it has been found that in 30 percent cases rented repairman, in 25 percent cases NGO's rented repairman, in 20 percent cases concerned caretaker, and in 20 percent cases anybody of the community repair the water sources. In Kallayanpur, in 28 percent cases rented repairman, in 26 percent cases anybody of the community, and in 18 percent cases concerned caretaker repair the water sources, and in 14 percent cases do not take any initiative (Table: 4.21). So, it is obvious from the survey that after breaking down any water source GO/NGO repairman's performances are least satisfactory, however, in maximum cases, rented repairman and anybody of the community had to take the responsibilities.

4.3.15 Cost of Maintenance in last three months

In Ganaktuli, it has been found that half of the dwellers do not know about the cost of the maintenance and on the other hand, 30 percent users spent TK. 1-30, 5 percent spent TK. 31-60, and 5 percent spent TK. 61-120 in last three months. In Dhalpur, 52 percent users spent TK. 1-30, 14 percent spent TK. 31-60, where as only 2 percent did not spend any money in last three months (Table: 4.20). Total in GO managed areas, 42.2 percent users spent TK. 1-30, and 10 percent spend TK. 31-60 in last three months.

Table: 4.20 Cost of Maintenance (water source/family) in last three months by the Dwellers

Cost (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 30	12	30 0	26	52 0	38	42.2	16	26.7	8	16 0	24	21.8
31 – 60	2	5.0	7	14.0	9	10 0	16	26.7	3	6.0	19	17.3
61 – 90	-	-	3	6.0	3	3.3	2	3.3	-	-	2	1.8
91 – 120	1	2.5	4	8.0	5	5 5	1	1.7	1	2.0	2	1.8
121 – 150	1	2.5	1	2.0	2	2.2	2	3.3	1	2.0	3	2.7
151and Above	-	-	1	2.0	1	1 1	2	3.3	2	4.0	4	3 6
Don't Know	20	50.0	7	14.0	27	30 0	7	11.7	9	18.0	16	14.5
Didn't Pay	4	10.0	1	2.0	5	5.5	14	23.3	26	52.0	40	36 4
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In NGO managed areas, in Agargaon, about 53 percent users spent TK. 1-60 in last three months, where as in Kallayanpur, 52 percent users did not spend any money and only 22 percent users spent TK. 1-60 in last three months. Total in NGO managed areas, 21.8 percent users spent TK. 1-30, 17.3 percent spent TK. 31-60 in last three months. From the

comparative study, it can be said that cost payee users are somewhat higher in GO managed areas than in NGO managed areas in respect of maintenance of the existing water sources.

4.4 Level of Satisfaction of the Dwellers' about Water Supply Facilities

Dwellers' satisfaction about provided water supply facilities have been investigated on eleven variables. These are, availability of water, accessibility of water sources, platform condition of the water sources, drainage condition, location of the water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation and storage provision. Dwellers' satisfaction about provided water supply facilities of GO managed and NGO managed areas are described below.

4.4.1 Level of Satisfaction about Availability of Water Supply

In Ganaktuli, 50 percent of the total dwellers are satisfied and 27.5 percent are unsatisfied with availability of water supply, but in Dhalpur most of the respondents (64 %) are unsatisfied with the supply. In total, in GO managed areas, 47 percent users are unsatisfied and 24 percent are satisfied with availability of water (Table: 4.21). In Agargaon 50 percent users are satisfied with availability of water supply and 30 percent are unsatisfied. On the other hand, in Kallayanpur 50 percent users are unsatisfied and 40 percent are satisfied with availability of water supply. In total, in NGO managed areas, 45 percent users are satisfied and 39 percent are unsatisfied with that supply (Table: 4.22). So, it is obvious that in respect of availability of water users of NGO managed areas are more satisfied than the users of GO managed areas.

4.4.2 Level of Satisfaction about Accessibility of the Water Sources

In Ganaktuli, 42 percent users are satisfied and 25 percent are unsatisfied with accessibility of the water sources, where as in Dhalpur, 50 percent users are unsatisfied and only 12 percent are satisfied with the accessibility. In total in GO managed areas, 44 percent users are unsatisfied and 17 percent are satisfied with the quality of accessibility of the water sources (Table: 4.21). In Agargaon, about 43 percent users are unsatisfied and 32 percent are satisfied with the quality of accessibility and in Kallayanpur, 58 percent users are unsatisfied and only 22 percent are satisfied with the quality of

accessibility. In total, in NGO managed areas, 50 percent users are unsatisfied and 27 percent are satisfied with accessibility of water sources (Table: 4.22). So, no area has been found better than other in the context of accessibility of the water sources.

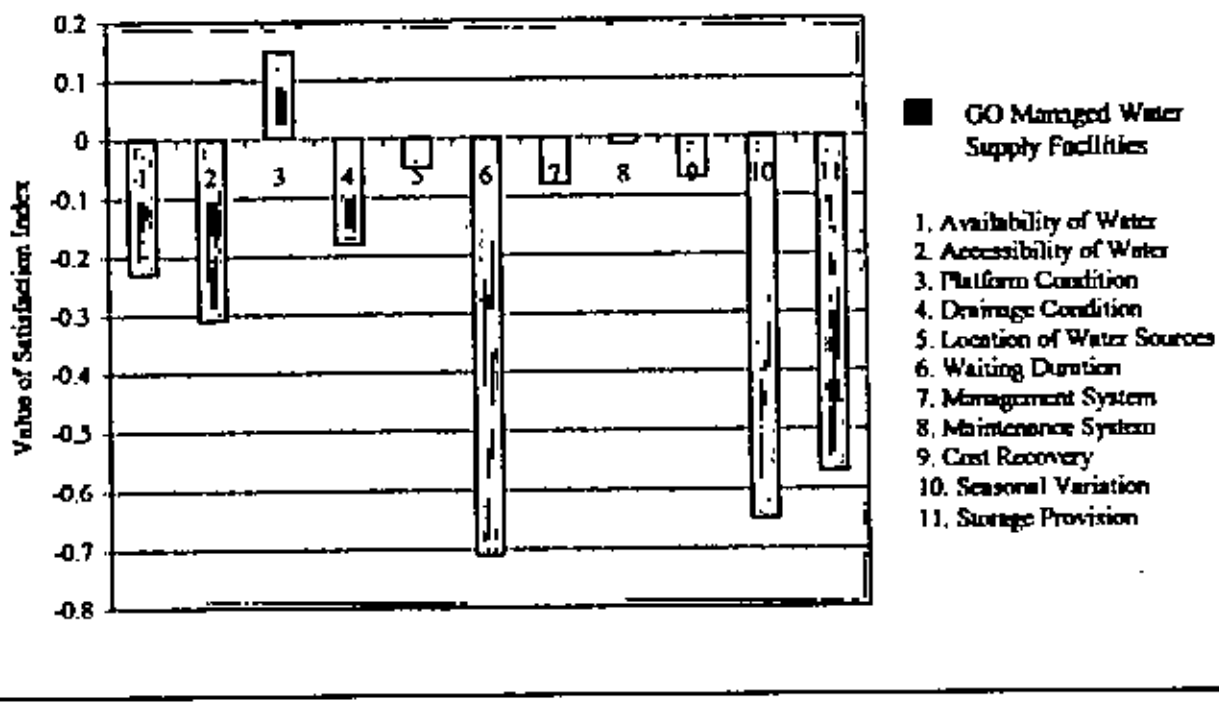
Table: 4.21 Level of Satisfaction of the Dwellers about provided Water Supply Facilities in GO Managed Areas

Variables	Dwellers' Satisfaction (by number) about Provided Water Supply Facilities								
	Ganaktuli			Dhalpur			Total		
	ST	AC	UST	ST	AC	UST	ST	AC	UST
1. Availability	20	9	11	2	16	32	22	11	27
2 Accessibility	10	13	17	6	17	27	16	19	44
3 Platform Condition	22	7	11	22	9	19	44	16	30
4 Drainage Condition	18	4	18	9	15	26	27	19	44
5 Location	15	8	17	20	7	23	35	15	40
6. Waiting Time	5	5	30	3	5	42	8	10	72
7. Management	12	20	8	17	4	29	29	24	37
8. Maintenance	17	17	6	18	4	28	35	21	34
9. Cost Recovery	18	13	9	16	2	32	34	15	41
10 Seasonal Variation	9	11	20	1	0	49	10	11	69
11 Storage Provision	14	8	18	1	0	49	15	8	67
Total	**160**	**115**	**165**	**115**	**79**	**356**	**275**	**194**	**521**
Dwellers' Satisfaction (by percentage) about Provided Water Supply Facilities									
1 Availability	50	22 5	27 5	4	32	64	24 4	27 8	47 8
2 Accessibility	25	32 5	42.5	12	34	54	17 8	33 3	48 9
3 Platform Condition	55	17 5	27 5	44	18	38	48.9	17 8	32 3
4. Drainage Condition	45	10	45	18	30	52	30 0	21 1	48 9
5. Location	37 5	20	42 5	40	14	46	38.9	16 7	44 4
6 Waiting Time	12 5	12 5	75	6	10	84	8 9	11 1	80.0
7. Management	30	50	20	34	8	58	32.2	26 7	41.1
8 Maintenance	42 5	42 5	15	36	8	56	38 9	23.3	37.8
9 Cost Recovery	45	32.5	22 5	32	4	64	37.8	16.7	45.5
10 Seasonal Variation	22.5	27 5	50	2	0	98	11.1	12.2	76.7
11 Storage Provision	35	20	45	2	0	98	16 7	8 9	74 4
Total	**36.4**	**26.1**	**37.5**	**21.0**	**14.4**	**64.6**	**27.8**	**19.6**	**52.6**
Dwellers' Satisfaction (by using a Satisfaction Index) about Provided Water Supply Facilities									
Variables	f_s	F_d	I_s	f_s	f_d	I_s	f_s	f_d	I_s
1. Availability	20	11	0 22	2	32	0 6	22	27	-0 23
2 Accessibility	10	17	-0 17	6	27	-0 42	16	44	-0 31
3. Platform Condition	22	11	0.27	22	19	0 06	44	30	0 15
4 Drainage Condition	18	18	0	9	26	-0 34	27	44	-0 18
5. Location	15	17	-0 05	20	23	-0 06	35	40	-0 05
6. Waiting Time	5	30	-0 62	3	42	-0 78	8	72	-0 71
7 Management	12	8	0 1	17	29	-0.24	29	37	-0 08
8 Maintenance	17	6	0 27	18	28	-0.20	35	34	-0 01
9. Cost Recovery	18	9	0 22	16	32	-0 32	34	41	-0 07
10. Seasonal Variation	9	20	-0.27	1	49	-0 96	10	69	-0.65
11. Storage Provision	14	18	-0 10	1	49	-0 96	15	67	-0.57
Total	160	165	-0.01	115	356	-0.43	275	521	-0.24

Source: Field Survey, 2000

Note: ST = Satisfactory, AC = Acceptable, UST = Unsatisfactory, f_s = Satisfied Respondent, f_d = Unsatisfied Respondents, I_s = Satisfaction Index

Figure: 4.1 Dwellers' Satisfaction (by Satisfaction Index) about Water Supply Facilities Provided in GO Managed Areas



4.4.3 Level of Satisfaction about Platform Condition of the Water Sources

In Ganaktuli, 55 percent users are satisfied with platform condition of the water sources and about 28 percent are unsatisfied. In Dhalpur, 44 percent users are satisfied and 39 percent are unsatisfied with the quality of platform condition of the water sources. Total in GO managed areas, about 49 percent users are satisfied and 33 percent are unsatisfied with the quality (Table: 4.21). In Agargaon, 50 percent users are satisfied and 32 percent are unsatisfied with platform condition of the water sources, where as in Kallayanpur, 54 percent users are unsatisfied and 30 percent are satisfied with the quality. Total in NGO managed areas, about 42 percent users are unsatisfied and about 41 percent are satisfied with the quality of platform condition (Table: 4.22). In this respect, GO managed areas are somewhat better than NGO managed areas.

4.4.4 Level of Satisfaction about Drainage Condition of the Water Sources

In Ganaktuli, percentages (45 %) of satisfied and unsatisfied users are equal as to the drainage condition of the water sources. Where as in Dhalpur, the condition is worse and it was found that 52 percent users are unsatisfied and only 18 percent are satisfied with the quality. Total in GO managed areas, about 49 percent users are unsatisfied and 30 percent are satisfied with the quality of drainage condition (Table: 4.21). In Agargaon, 40 percent users are unsatisfied and about 37 percent are satisfied with drainage condition of the water sources, where as in Kallaynpur, 68 percent users are unsatisfied and only 12 percent are satisfied with the quality. Total in NGO managed areas, about 53 percent users are unsatisfied and 25 percent are satisfied with the quality (Table: 4.22). In the context of drainage condition of the water sources, all GO managed and NGO managed areas have been shown the worst result.

4.4.5 Level of Satisfaction about Location of the Water Sources

In Ganaktuli, 42.5 percent users are unsatisfied and 37.5 percent are satisfied with the location of the water sources, where as in Dhalpur, 52 percent users are unsatisfied and only 18 percent are satisfied with that quality. Total in GO managed areas, 44 percent users are unsatisfied and about 39 percent are satisfied with the location of water sources (Table: 4.21). In Agargaon, users are quite satisfied (about 62 %) with the location of the

water sources and only 28 percent are unsatisfied. In Kallayanpur, 42 percent users are satisfied and 36 percent are unsatisfied with the location. Total in NGO managed areas, about 53 percent respondents are satisfied with the quality of location of water sources (Table: 4.22). So, in the context of location of the existing water sources, NGO managed areas are quite better than GO managed areas.

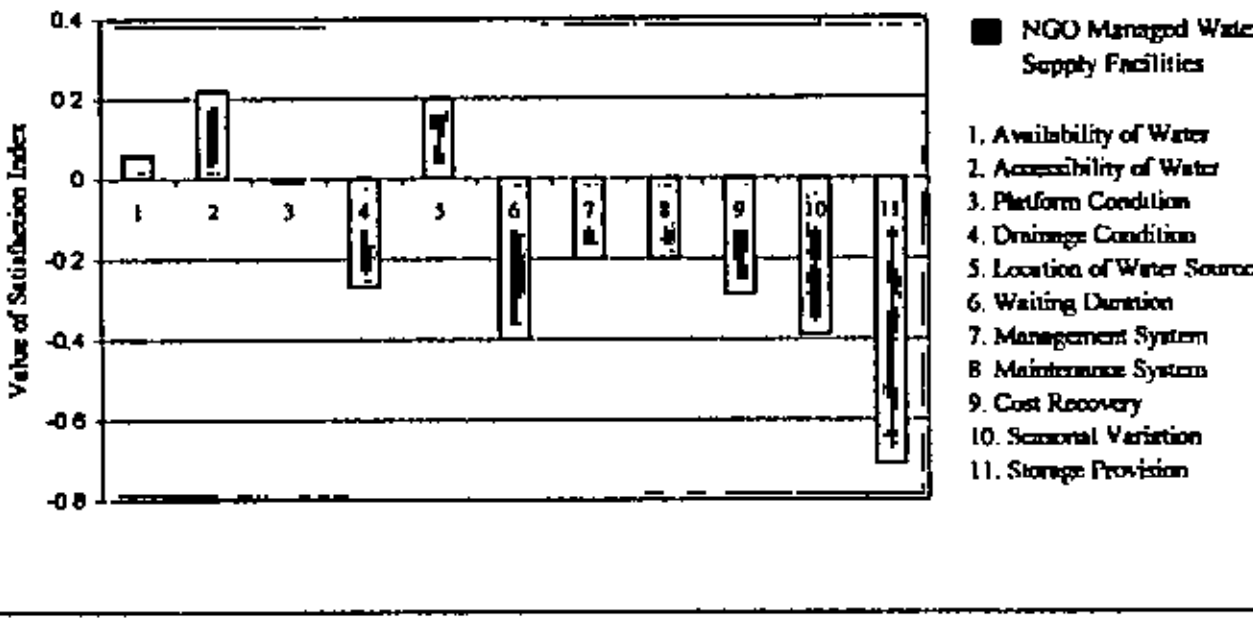
Table: 4.22 Level of Satisfaction of the Dwellers about provided Water Supply Facilities in NGO Managed Areas

Variables	Dwellers' Satisfaction (by number) about Provided Water Supply Facilities								
	Agargaon			Kallayanpur			Total		
	ST	AC	UST	ST	AC	UST	ST	AC	UST
1. Availability	30	12	18	20	5	25	50	17	43
2 Accessibility	19	15	26	11	10	29	30	25	55
3 Platform Condition	30	11	19	15	8	27	45	19	46
4 Drainage Condition	22	14	24	6	10	34	28	24	58
5 Location	37	6	17	21	11	18	58	17	35
6 Waiting Time	15	11	34	6	14	30	19	25	64
7 Management	18	20	22	8	15	27	26	35	49
8 Maintenance	16	21	23	9	16	25	25	37	48
9 Cost Recovery	18	6	36	13	10	27	31	16	63
10 Seasonal Variation	12	23	25	2	16	32	14	39	57
11 Storage Provision	4	11	45	2	8	40	6	19	85
Total	**221**	**150**	**289**	**113**	**123**	**314**	**334**	**273**	**603**
Dwellers' Satisfaction (by percentage) about Provided Water Supply Facilities									
1 Availability	50 0	20 0	30 0	40 0	10 0	50.0	45 4	15 4	39 1
2 Accessibility	31 7	25 0	43 3	22.0	20 0	58 0	27.3	22.7	50 0
3. Platform Condition	50 0	18 3	31.7	30 0	16 0	54 0	40 9	17 7	41 8
4. Drainage Condition	36 7	23 3	40 0	12 0	20 0	68 0	25 4	21 8	52 7
5 Location	61 7	10 0	28 3	42 0	22.0	36 0	52 7	15 4	31.1
6 Waiting Time	25 0	18 3	56 7	12 0	28 0	60 0	17 3	22 7	58 2
7. Management	30 0	33 3	36.7	16 0	30.0	54 0	23 6	31 8	44 5
8 Maintenance	26 7	35 0	38 3	18 0	32 0	50 0	22.7	32.6	43 6
9 Cost Recovery	30 0	10 0	60 0	26 0	20 0-	54 0	28.2	14 5	57 3
10 Seasonal Variation	20 0	38 3	50.0	4 0	32 0	64 0	12 7	35 4	51.8
11. Storage Provision	6 7	18.3	90.0	4 0	16 0	80 0	5.4	17 3	77 3
Total	**33.5**	**22.7**	**53.8**	**20.5**	**22.4**	**57.1**	**23.3**	**34.5**	**42.2**
Dwellers' Satisfaction (by using a Satisfaction Index) about Provided Water Supply Facilities									
	f_s	f_d	I_s	f_s	f_d	I_s	f_s	f_d	I_s
1 Availability	30	18	0 20	20	25	-0.10	50	43	0 06
2. Accessibility	19	26	-0 02	11	29	-0 36	30	55	0 22
3 Platform Condition	30	19	0 18	15	27	-0 24	45	46	-0 01
4 Drainage Condition	22	24	0.03	6	34	-0 56	28	58	-0.27
5. Location	37	17	0 33	21	18	0 06	58	35	0 20
6 Waiting Time	15	34	-0.32	6	30	-0 48	19	64	-0.40
7. Management	18	22	-0 07	8	27	-0 38	26	49	-0 20
8. Maintenance	16	23	-0.12	9	25	-0 32	25	48	-0 20
9. Cost Recovery	18	36	-0 30	13	27	-0 28	31	63	-0 29
10 Seasonal Variation	12	25	-0 22	2	32	-0 60	14	57	-0 39
11 Storage Provision	4	45	-0.68	2	40	-0 76	6	85	-0 71
Total	**221**	**289**	**-0.10**	**113**	**314**	**-0.36**	**334**	**603**	**-0.18**

Source: Field Survey, 2000

Note: ST = Satisfactory, AC = Acceptable, UST = Unsatisfactory, f_s = Satisfied Respondent, f_d = Unsatisfied Respondents, I_s = Satisfaction Index

Figure: 4.2 Dwellers' Satisfaction (by Satisfaction Index) about Water Supply Facilities Provided in NGO Managed Areas



4.4.6 Level of Satisfaction about Waiting Time

Maximum users in GO managed areas are unsatisfied with duration of waiting time. In Ganaktuli, 75 percent users are unsatisfied and only 12.5 percent are satisfied with waiting time, where as in Dhalpur, 84 percent users are unsatisfied and only 6 percent respondents are satisfied. Total in GO managed areas, 80 percent users are unsatisfied and only about 9 percent are satisfied with waiting duration (Table: 4.21). In Agargaon, 57 percent users are unsatisfied and 25 percent are satisfied with waiting time. On the other hand, in Kallayanpur, 60 percent users are unsatisfied and only 12 percent satisfied with waiting duration. Total in NGO managed areas, 58 percent users are unsatisfied and 17 percent are satisfied with waiting duration (Table: 4.22). So, none of the area was found satisfactory in the context of waiting duration in all GO managed and NGO managed areas.

4.4.7 Level of Satisfaction about Management of the Water Sources

Half of the total respondents are accepted the management system in Ganaktuli, where as 30 percent respondents are satisfied and 20 percent are unsatisfied. In Dhalpur, 58 percent respondents are unsatisfied and 34 percent are satisfied with the quality of management system. Total in GO managed areas, 41 percent respondents are unsatisfied and 32 percent are satisfied with the quality (Table: 4.24). In Agargaon, 37 percent are unsatisfied and 30 percent are satisfied with the quality of management system. Total in NGO managed areas, about 45 percent respondents are unsatisfied and about 24 percent are satisfied with the quality of management system (Table: 4.25). So, only Ganaktuli has been shown somewhat better result in GO managed as well as in NGO managed areas in respect of management of the water sources.

4.4.8 Level of Satisfaction about Maintenance of the Water Sources

In Ganaktuli, 42.5 percent users are satisfied with the quality of maintenance system of the water sources, where as only 15 percent users are unsatisfied. In Dhalpur, 56 percent users are unsatisfied and 36 percent are satisfied with maintenance system. Total in GO managed areas, about 39 percent users are satisfied and about 38 percent unsatisfied with the quality of maintenance system (Table: 4.21). In Agargaon, 38 percent users are

unsatisfied and 27 percent are satisfied with that quality, where as in Kallayanpur, 50 percent users are unsatisfied and 18 percent are satisfied with the quality of maintenance. In Total, in NGO managed areas, about 44 percent users are unsatisfied and about 23 percent are satisfied with the maintenance (Table: 4.22). So, in the context of maintenance system, GO managed areas (especially in Ganaktuli) are slightly better than NGO managed areas.

4.4.9 Level of Satisfaction about Cost Recovery System

In Ganaktuli, 45 percent users are satisfied and 22.5 percent are unsatisfied with cost recovery system, where as in Dhalpur, the scenario is different, where 64 percent users are unsatisfied with that system. Total in GO managed areas, about 46 users are unsatisfied and about 38 percent are satisfied with cost recovery system (Table: 4.21). In Agargaon, 60 percent users are unsatisfied and 30 percent are satisfied with the quality of cost recovery. In Kallayanpur, 54 percent users are unsatisfied and 26 percent are satisfied with that system. Total for the NGO managed areas, 57 percent users are unsatisfied and 28 percent are satisfied with cost recovery (Table: 4.22). Only the users in Ganaktuli are quite satisfied with the cost recovery system imposed by DCC.

4.4.10 Level of Satisfaction about Seasonal Variation of Water Supply

In Ganaktuli, 60 percent users are unsatisfied and 22.5 percent are satisfied with the seasonal variation, where as in Dhalpur, 98 percent users are unsatisfied with that quality of seasonal variation. In total in GO managed areas, about 77 percent users are unsatisfied and only 11 percent are satisfied with the seasonal variation of water supply (Table 4.21). In Agargaon, 50 percent users are unsatisfied and 20 percent are satisfied with that quality. In Kallayanpur, 64 percent users are unsatisfied and only 4 percent are satisfied with the seasonal variation. Total in NGO managed areas, 52 percent users are unsatisfied and about 13 percent are satisfied with the quality of seasonal variation of water supply (Table: 4.22). So, all the areas have revealed unsatisfactory situation in seasonal variation for water supply.

4.4.11 Level of Satisfaction about Storage Provision

Except in Ganaktuli, the storage provision is very poor in all study areas. In Ganaktuli, 45 percent users are unsatisfied with the storage provisions of water, where as 98 perecnt users in Dhalpur, 90 percent users in Agargaon and 80 percent in Kallayanpur are unsatisfied with the quality of storage provisions (Table: 4.21).

In aggregate results, for all eleven variables, 37.5 percent users are unsatisfied, 36.4 percent are satisfied and 26.1 percent are accepted the overall situation in Ganaktuli. In Dhalpur, about 65 percent users are unsatisfied and 21 percent are satisfied with overall quality of water supply facilities. Total in GO managed areas, 52.6 percent users are unsatisfied and 27.8 percent are satisfied with the overall quality of water supply facilities (Table: 4.21). In Agargaon, about 44 percent users are unsatisfied and 33.5 percent are satisfied with overall quality of water supply facilities. In Kallayanpur, 57 percent users are unsatisfied and 20.5 percent are satisfied with the overall quality of water supply facilities. Total in NGO managed areas, 42.2 percent users are unsatisfied and 23.3 percent are satisfied with the overall quality of water supply facilities (Table: 4.22).

4.5 Dwellers' Satisfaction about Provided Water Supply Facilities

By using a satisfaction index dwellers' satisfaction about provided water supply facilities has been investigated on eleven different variables. These are availability of water, accessibility of water sources, platform condition of the water sources, drainage condition, location of the water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation and storage provisions.

In Ganaktuli, five variables out of eleven have shown the negative index of satisfaction. The variables of negative index are accessibility of water sources, location of the water sources, waiting time to collect water, seasonal variations and storage provision. The variables of positive index are availability of water, platform condition of the water sources, management and maintenance systems, and cost recovery system. In Ganaktuli equal proportions of users are satisfied and unsatisfied with quality of drainage condition. For this reason, the index has been shown 0 value. Among the negative variables, waiting time (-0.62) to collect the water has shown the highest and other variables according to

least index are seasonal variation (-0.27), accessibility of existing water sources (-0 17), storage provision (-0.1), and location of the water sources (-0.05). Among the variables of positive index, platform condition (0.27) and maintenance system (0.27) have shown the highest positive value and other positive variables according to rank are availability of water (0.22), cost recovery (0.22) and management system (0.1). For all eleven variables combinedly have shown the negative value (-0.01) for the satisfaction index in Ganaktuli (Table: 4.21).

In Dhalpur, nine variables out of eleven have shown the negative index of satisfaction. The negative variables are accessibility of water sources, drainage condition, location of the water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation and storage provisions. The positive variables are availability of water and platform condition of the water sources. Among the total variables, seasonal variation (-0.96) and storage provision (-0.96) have shown the highest value of negative index. These two variables have shown highest negative value of satisfaction index among all variables of the four study areas. The other negative variables according to least satisfaction are waiting time to collect the water (-0.78), accessibility of water sources (-0.42), drainage condition (-0.34), cost recovery (-0.32), management of the water sources (-0.24), maintenance system (-0.2), and location of the water sources (-0.06). The highest value of positive index has shown for availability of water (0.6) and than for platform condition (0.06) of the water sources. For all the variables combinedly, the index has shown the negative value (-0.43) in Dhalpur (Table: 4.21).

In Agargaon, seven variables out of eleven have shown the negative value of satisfaction index. The negative variables are accessibility of water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation and storage provisions. The positive variables are availability of water, platform condition, drainage condition and location of the water sources. Among the variables, storage provision of the water (-0.68) has shown the highest value of negative index of satisfaction. The other negative variables according to rank are waiting time (-0.32), cost recovery (-0.30), seasonal variation (-0.22), maintenance system (-0.12), management

These problems have been ranked according to the perception of the users and have been shown in Table 4.23.

In Ganaktuli, among the various problems, long waiting time to collect water (146) rank the number one problem and other priority problems according to rank are insufficient water supply (170), inaccessibility of water sources (196), turbid water supply (204), insufficient water in dry season (262), poor storage provision (278), distant location (279), etc. In Dhalpur, among the various problems, long waiting time to collect water (145) rank the top most problem and other priority problems according to rank are insufficient water supply (186), poor storage system (207), inaccessibility of water sources (313), insufficient water in dry season (322), poor drainage (334), etc.

Table: 4.23 Problems related to Water Supply (according to rank) Facilities for Selected Urban Poor Areas

Problems	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	RV	R	RV	R	RV	R	RV	R	RV	R	RV	R
1 Insufficient Water Supply	170	2	186	2	356	2	421	9	327	6	748	8
2. Inaccessibility of Water	196	3	313	4	509	4	352	4	350	7	702	7
3 Cracked Platform	306	10	344	7	650	9	244	1	352	8	596	4
4. Poor Drainage	283	8	334	6	617	7	389	5	157	1	546	2
5. Distant Location	279	7	370	9	649	8	425	10	388	12	813	12
6. Long waiting Time	146	1	145	1	291	1	288	3	271	4	559	3
7 Poor Management	326	11	403	11	729	11	426	11	380	9	806	11
8 Poor maintenance	297	9	412	12	709	10	395	6	384	10	779	9
9. Hard Cost Recovery System	354	12	395	10	749	12	404	8	385	11	789	10
10. Insufficient Water in Dry Season	262	5	322	5	584	6	401	7	300	5	701	6
11. Poor/Absence of Water Storage	278	6	207	3	485	3	246	2	220	3	486	1
12. Turbid Water Supply	204	4	364	8	568	5	450	12	216	2	666	5

Source: Field Survey, 2001
Note: RV = Relative Value, R = Rank

In Agargaon, poor platform condition (244) rank the top most problem and other problems according to rank are absence of water storage (246), long waiting time (288), inaccessibility of water sources (352), poor drainage of the existing water sources (389), poor maintenance system (395), etc. In Kallayanpur, among the various problems, poor drainage of the water sources (157) ranks the top most position. The other priority problems in Kallayanpur according to rank are turbid water supply (216), absence of

system (-0.07) and accessibility of water sources (-0.02). Among the total variables of positive variables, location of the water sources (0.33) has shown the highest value of positive index and the others are availability of water supply (0.2), platform condition (0.18), and drainage condition (0.03). For all the variables combinedly, the satisfaction index has shown the negative value (-0.10) in Agargaon (Table: 4.22).

In Kallayanpur, ten variables out of eleven have shown the negative value of satisfaction index. The negative variables are availability of water, accessibility of water sources, platform condition, drainage condition, location of the water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation and storage provisions. The only positive variable is location of the water sources (0.06). Among the total negative variables, storage provision of the water sources (-0.76) has shown the highest negative value. Others negative variables are seasonal variation (-0.6), drainage condition (-0.56), waiting time (-0.48), management (-0.38), accessibility of water sources (-0.36), maintenance (-0.32), cost recovery (-0.28), platform condition (-0.24), and availability of water (-0.1). For all variables combinedly, the satisfaction index has shown the negative value (-0.36) in Kallayanpur (Table. 4.22).

Total in GO managed areas, only one variable (platform condition) has shown the positive value (0.15), where as total in NGO managed areas, three variables (availability, accessibility and location of the water sources) have shown the positive value (0.06, 0.22 and 0.20). Moreover, total satisfaction index (which is negative) for all the variables of water supply facilities in GO managed is somewhat higher (-0.24) than the index (-0.18) in NGO managed areas, which is also negative.

4.6 Problems related to Water Supply Facilities

Various types of problems related to water supply facilities have been identified in these four urban poor areas in Dhaka City. These are insufficient water supply, inaccessibility of water sources, cracked platform, poor drainage, distant location of the water sources, long waiting time, poor management and maintenance systems, hard cost recovery system, insufficient water in dry season, poor storage provisions, and turbid water supply.

water storage provision (220), long waiting time (271), insufficient water in dry season (300), insufficient water supply at all the seasons (327), etc.

Total in GO managed areas, among the various problems, long waiting time (291) rank the top and other problems are insufficient water supply (356), poor storage provision (485), inaccessibility of the water sources (509), turbid water (568), etc. Total in NGO managed areas, among the various problems, poor/absence of storage provision (486) rank the top and other priority problems are poor drainage (546), long waiting time (559), cracked platform (596), turbid water (666), etc.

Chapter: 05 Sanitation Facilities in the Study Area

5.1 Introduction

In this chapter, sanitation facilities are discussed on the basis of types of facilities, provision standards, performance standards, maintenance and management system, and cost recovery system. On the other hand, the dwellers' satisfaction about sanitation facilities have been investigated by using a satisfaction index and problems related to sanitation facilities have been ranked by using priority ranking technique.

5.2 General Condition of Sanitation Facilities in the Sites

General conditions of the sanitation facilities in the study areas are described below.

5.2.1 Ganaktuli

For sanitation facilities, the residents of Ganaktuli use sanitary toilets connected through sewerage line. These facilities were improved under Slum Improvement Project (SIP) in 1991 In total 28 sanitary latrines have been found in this slum and among these 25 were found working. On an average, 54 families use one sanitary latrine (Table: 5.1).

Table: 5.1 Sanitation Provision for Urban Poor in Ganaktuli Study Area

Cluster Name	No. of HHs	Number of Latrines			Ratio per Latrine
		W	NW	T	
Muslim Bastee	300	12	0	12	25
Hindhu Bastee	440	3	2	5	147
Lalbag Bastee	300	5	0	5	60
Madhapara Bastee	60	2	0	2	30
Bailkhan Bastee	250	3	1	4	80
Total	**1350**	**25**	**3**	**28**	**54**

Source: Community Survey, 2000
Note: HHs = Households, W = Working, NW = Not Working, T = Total

DCC is responsible for caretaking the sanitation facilities. However, they rarely visit the area. For this reason, nobody of the community wants to take the responsibilities for repairing the facilities. For small repairing the community people collect TK. 5-20 from each family but for major repair they have to complain it to the DCC's concerned officials. Frequency of maintenance has been found very unsatisfactory in sanitation sector and in this sector residents have to pay TK. 20-30 every month as an extra amount. Since many people use one latrine, users were found unsatisfied with the quality of

sanitation facilities especially in respect of cleanliness. Among five clusters in Ganaktuli, only two clusters have separate latrines for men and women. Everybody has to wait in line especially in the morning hour. There is no water source found inside the latrine and dwellers cannot use sufficient water to clean up the commode and surface of the platform, which was found dirty. The platforms of the latrines have been found cracked, tilted damaged and with moderate drainage system. According to the residents of Ganaktuli the concerned authority and management body i.e. DCC is not taking proper care for maintenance or management of the sanitation facilities, and DCC officials do not visit the area regularly. However, the dwellers have to pay every month's sanitation bill to DCC. Every employee of DCC has to pay TK. 20 as latrine bill (Community Survey, 2000).

5.2.2 Dhalpur

DCC is responsible for providing sanitation facilities for urban poor in Dhalpur slum. The sanitation provided by DCC is somewhat better than other GO managed slums in Dhaka City. DCC has made 5-6 latrines in one row and their structural arrangements are also good. However, there is no water connection inside the latrine and for this reason, dwellers cannot use necessary water after using the latrine. Excessive use of the latrine makes them unclean, dirty, and unfit. The users have to pay the bill of 100 taka for electricity, water and sanitation. Sanitation facilities have been found satisfactory in 1 no City *Palli*, where the number of families per sanitary latrine is only 13 and on the contrary, in Rahman's *Bastte* the ratio is 78 (Table: 5.2). These two figures are lowest and highest for all clusters in Dhalpur Slums for sanitation facilities. 72 percent sanitary latrines have been identified as working here.

Table: 5.2 Sanitation Provision for Urban Poor in Dhalpur Study Area

Cluster Name	No. of HHs	Number of Latrines			Ratio per Latrine
		W	NW	T	
1 No City Palli	500	37	15	52	13
Rahman's Bastee	550	7	9	16	78
Aynul's Bastee	500	18	0	18	28
Total	**1550**	**62**	**24**	**86**	**25**

Source: Community Survey, 2000
Note: HHs = Households, W = Working, NW = Not Working, T = Total

DCC is responsible for caretaking the facilities of sanitation. For this reason, community people do not want to take the responsibility for any major repairing. However, when concerned authority does not come to repair the facilities then the community people have to take the responsibilities. In this context, they collect TK. 5-10 from each household and then repair the facilities. Though the management body is DCC but concerned officials rarely visit to check the facilities. Structurally the sanitation facilities in Dhalpur are quite satisfactory, but the maintenance system is very poor. Drainage condition of these latrines is also very poor. Sewage comes out in the open areas and pollute the total environment. Generally, children do not get the chance to use the latrine and they defecate on the open space. There is no provision of separate latrine for man and woman, whereas some musclemen use separate latrine for their family only.

5.2.3 Agargaon

An international NGO namely Plan International (PI) is working in Agargaon for providing sanitation facilities since 1995. PI provides pit latrine for sanitation facilities with bio gas plant. However, bio gas plant could not get acceptance of the dwellers because this type of gas is produced from human excreta. PI provides one latrine for every 20 or 30 families with the condition that each family must have a child with 5-8 year age limit as primary school going boys or girls. Those families who do not have any child within that age limit they are the renter of these facilities and they have to pay TK. 30 (per family) in every month. Among 17 clusters, 4 clusters have been surveyed. Though the NGO provides one sanitary latrine for every 20-30 families, but this ratio has been found very high in most of the areas. In Kashem's *Bastee* the ratio was found 300 families against one latrine (Table: 5.3).

Table: 5.3 Sanitation Provision for Urban Poor in Agargaon Study Area

Cluster Name	No. of HHs	Number of Latrines			Ratio per Latrine
		W	NW	T	
Tulatali Bastee	440	28	2	30	16
Gandhi's Bastee	500	0	20	20	*
Kashem's Bastee	1200	4	0	4	300
N. Mohammad's Bastee	600	0	27	27	*
Total	**2740**	**32**	**49**	**81**	**86**

Source: Community Survey, 2000

Note: HHs = Households, W = Working, NW = Not Working, T = Total, * = At least no working latrine

Most of the latrines provided by PI have been found filled up by excreta. For this reason, these latrines are not fit for use in maximum time and dwellers of this slum use handmade open hanging latrine on the ditches or low laying areas. Platform conditions of provided latrines are satisfactory however, the drainage condition and upper structure (bamboo built) are unsatisfactory. There is no separate latrine for men and women. Plan International is the main management body of these facilities and the concerned officials regularly visit to look after the latrines. The area of intervention is huge now and in every cluster in Agargaon, this NGO provides sanitation facilities. Except in some cases, the sanitation project is going to be unsuccessful one, as expressed by the residents. The latrines provided by PI are free of cost.

5.2.4 Kallaynpur

Some local NGOs namely FULKI, BAUPA, PROSHIKA etc. and an international NGO namely Plan International (PI) are responsible for providing sanitation facilities for urban poor in Kallayanpur slum. For sanitation facilities they provide pit latrine. However, all NGOs working here in this slum do not provide both water supply and sanitation facilities. Only PI and FULKI provide both water supply and sanitation facilities. They provide one sanitary latrine for every 30 families during the establishment period. However, the present condition is totally different and on an average more than 75 families use one pit latrine (Table: 5.4). PI always maintains their rules and regulations in any urban poor area in Dhaka City. Kallaynpur *Para Bastee* has 9 different clusters and among them 4 clusters have been surveyed. Acute sanitation crisis has been identified in this slum. For this reason, some residents have made open latrines.

Table: 5.4 Sanitation Provision for Urban Poor in Kallayanpur Study Area

Cluster Name	No. of HHs	Number of Latrines			Ratio per Latrine
		W	NW	T	
Bastee No 1	250	4	2	6	62
Bastee No 2	400	7	1	8	57
Bastee No 4	495	10	2	12	50
Total	**1145**	**21**	**5**	**26**	**55**

Source: Community Survey, 2000

Note: HHs = Households, W = Working, NW = Not Working, T = Total

The latrines are made of gunny bags and bamboo, which are open and harmful to the environment. Among the latrines provided by NGOs some are found to be non-working. Some few years' back, FULKI gave sanitary latrine to the dwellers free of cost but recently it collects 650 taka for each sanitary latrine from the families. For repairing the facilities community people have to take the responsibilities. All NGOs are the main management body of these sanitation facilities. However, they rarely visit the slum for caretaking the facilities according to the dwellers.

5.2.5 Overall Management System

The average families per sanitary latrine is highest in Agargaon (86) which is a NGO managed area and is lowest in Dhalpur (25) which is a GO managed area. However, the average ratio in GO managed areas is 40 and in NGO managed area is 71 respectively. So, in case of sanitation facilities GO managed areas are getting better services than NGO managed areas (Table: 5.5).

The various problems related to sanitation facilities faced by the dwellers are spreading of stench and air pollution, long waiting time to use the latrine, unclean platform condition, visible stool, inferior quality of latrine materials, poor drainage system, inaccessibility, cracked down platform condition, unsatisfactory sitting arrangement, long distance location of the latrine, irregular maintenance system, poor management system, difficulty of women during peak hour, and lack of privacy due to poor structure of the latrine facilities. These problems have been investigated detail and priority ranked according to the severity of the problem.

Table: 5.5 Sanitation Provision for all Urban Poor Areas based on Management

Management Body	Area/Site	Av. Families per Cluster	Av. Families per Sanitary Latrine
GOs	Ganaktuli	270	54
	Dhalpur	517	25
Av. For GO Managed Area		**394**	**40**
NGOs	Agargaon	685	86
	Kallayanpur	382	55
Av. for NGO Managed Area		**534**	**71**

Source: Community Survey, 2000

5.3 Sanitation Facilities in the Sites

5.3.1 Residents' Perception about the condition of Sanitation Facilities

It was investigated whether the provided facilities were good or bad according to the perception of the dwellers. In Ganaktuli, 42.5 percent users felt that their sanitation facilities were bad and 35 percent felt very bad, where as only 20 percent accepted as good. In Dhalpur, 52 percent users concluded that their sanitation facilities were bad, 30 percent concluded very bad, and only 14 percent concluded as good (Table: 5.6). In Agargaon, 35 percent users conclude that their sanitation facilities were bad and 58.3 percent conclude very bad, where as only 6.7 percent accepted as good. In Kallayanpur, 30 percent users conclude that their sanitation facilities were bad and 62 percent conclude very bad, where as only 2 percent accepted as good and 6 percent concluded as fair. Total in GO managed areas, 30 percent users felt that the sanitation facilities are very bad, where as in NGO managed areas, the percentage is double on that case However, it is obvious that the dwellers of both GO managed and NGO managed areas are quite unsatisfied with the condition of sanitation facilities.

Table: 5.6 Condition of Sanitation Facilities

Rate	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
Good	8	20 0	7	14.0	15	16.7	4	6.7	1	2 0	5	4.5
Fair	1	2.5	4	8.0	5	5 5	-	-	3	6 0	3	2.7
Bad	17	42.5	26	52 0	43	47.8	21	35.0	15	30.0	36	32 7
Very Bad	14	35 0	13	30.0	27	30.0	35	58.3	31	62 0	66	60 0
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

5.3.2 Reasons behind Bad or Very Bad Condition

The users of Ganaktuli have identified various reasons for bad or very bad condition of sanitation facilities and these are, one latrine for many people (100 %), harmful and unhealthy sanitation (22.6 %), negligence in maintenance (9.7 %), lack of privacy (9.7 %), etc. In Dhalpur, the users viewed that the main reasons behind bad or very bad condition of sanitation facilities are, one latrine for many people (74.4 %), negligence in maintenance (10.3 %) and harmful to health (7.7), etc.

Table: 5.7 Reasons behind Bad or Very Bad Rate of Sanitation

Reasons	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
i. One latrine for many people	31	100.0	29	74.4	60	85.7	47	84.0	39	84.8	86	84.3
ii. Negligence in maintenance	3	9.7	4	10.3	7	10.0	12	21.4	10	21.7	22	21.6
iii. Lack of privacy	3	9.7	-	-	3	4.3	12	21.4	10	21.7	22	21.6
iv. Harmful to health	7	22.6	3	7.7	7	10.0	11	19.6	14	30.4	25	24.5
v. Others	2	6.5	-	-	2	2.9	1	1.8	-	-	1	0.9
Total	**31**	**100.0**	**39**	**100.0**	**70**	**100.0**	**56**	**100.0**	**46**	**100.0**	**102**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, Multiple answer has taken.

The users of Agargaon identified various reasons for bad or very bad condition of sanitation facilities and these are one latrine for many people (84 %), harmful and unhealthy sanitation (21.4 %), negligence in maintenance (21.4 %), lack of privacy (19.6 %), etc. In Kallayanpur the users have said that the main reasons behind bad or very bad condition of sanitation facilities are, one latrine for many people (84.8 %), negligence in maintenance (21.7 %), lack of privacy (21.7), and harmful to health (30.4 %), etc. (Table: 5.7). Finally, it has identified that the main reason for bad or very bad condition of sanitation facilities both in GO managed and NGO managed areas is one latrine for many people.

5.3.3 Separate Latrine for Men and Women

It has been found that all the latrines in four survey locations are community type. In maximum cases there is no separate latrine for man and woman. In Ganaktuli, the case is somewhat different than other three areas, and 65 percent users in Ganaktuli have separate latrine for man and woman (Table: 5.8). Total in GO managed areas, 65.5 percent users do not have any separate latrine for men and women and 34.4 percent have separate facility.

Table: 5.8 Separate Latrine for Men and Women

Variables	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Yes	26	65.0	5	10.0	31	34.4	4	6.7	-	-	4	3.6
2. No	14	35.0	45	90.0	59	65.5	56	93.3	50	100.0	106	96.4
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Dhalpur and in Agargaon, 10 percent and 6.7 percent users have separate latrine for man and woman. Meanwhile, in Kallayanpur, 100 percent users do not have any separate latrine for man and woman. Total in NGO managed areas, 96.4 percent users do not have any separate latrine for men and women and only 3.6 percent have separate facility. So, it can be said that in case of separate latrine for men and women GO managed areas (especially Ganaktuli) are somewhat better than NGO managed areas.

5.3.4 Paying Condition for using the Latrine

In Ganaktuli, 32.5 percent users paid for using the sanitary latrines and 67.5 percent did not pay. In Dhalpur, 24 percent users paid for using the latrines and 76 percent did not pay. In Agargaon, 20 percent users paid for using the latrines and 80 percent did not pay. In Dhalpur, 22 percent users paid for using the latrines and 78 percent did not pay (Table: 5.9). So, it is clear that most of the respondents did not pay for using the latrines provided by the GOs and NGOs in these urban poor areas in Dhaka City.

Table: 5.9 Paying Condition for using the Latrine

Condition	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 Yes	13	32.5	12	24.0	25	27.8	12	20.0	11	22.0	23	20.9
2 No	27	67.5	38	76.0	65	72.2	48	80.0	39	78.0	87	79.1
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

5.3.5 Monthly Cost for using the Latrine

Among the payee users in Ganaktuli, 38.5 percent pay their sanitary bill including house rent and 61.5 percent pay TK. 1-20 to others. In Dhalpur, among the payee users 41.7 percent pay their sanitary bill including the house rent, 33.3 percent pay TK. 1-20 and 8.3 percent pay TK. 41 & above to others and on the other hand 16.7 percent users do not know about sanitation bill. Total in GO managed areas, among the payee respondents, 40 percent pay their sanitation bill along the house rent to the DCC and 43 percent pay TK. 1-20 (per month) to their house owner. In Agargaon, among the payee users 91.7 percent pay TK. 1-20 and 8.3 percent pay TK. 21-40 to others. In Kallayanpur, among the payee users 72.7 percent pay TK. 1-20 and 27.3 percent pay TK. 21-40 to others (Table: 5.10). Total in NGO managed areas, 82.6 percent users pay TK. 1-20 and 17.4 percent pay TK. 21-40 (per month) to the house owner or landowner.

Table: 5.10 Monthly Cost for using the Latrine

Cost (TK.)	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 20	8	61.5	4	33.3	12	48.0	11	91.7	8	72.7	19	82.6
21 – 40	-	-	-	-	-	-	1	8.3	3	27.3	4	17.4
41 and Above	-	-	1	8.3	1	4.0	-	-	-	-	-	-
Included in House Rent	5	38.5	5	41.7	10	40.0	-	-	-	-	-	-
Don't Know	-	-	2	16.7	2	8.0	-	-	-	-	-	-
Total	**13**	**100.0**	**12**	**100.0**	**26**	**100.0**	**12**	**100.0**	**11**	**100.0**	**24**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, TK = *Taka*

5.3.6 Present Condition of the Latrine

In Ganaktuli, 40 percent latrines have been found as working well, 27.5 are filled up by stool partially, 22.5 percent are not fit for using, and 10 percent are filled up by stool completely at present. In Dhalpur, only 18 percent latrines have been found as working well, 50 are filled up by stool partially, 8 percent are not fit for using, and 4 percent are filled up by stool completely. Total in GO managed areas, about 39 percent latrines have been found as working well, 40 are filled up by stool partially, 6.7 percent are not fit for using, and 14.4 percent are filled up by stool completely. In Agargaon, 36.7 percent latrines have been found as working well, 18.3 are filled up by stool partially, 42.5 percent are not fit for using, and 16.7 percent are filled up by stool completely In Kallayanpur, 24 percent latrines have been found as working well, 20 percent are filled up by stool partially, 30 percent are not fit for using, and 26 percent are filled up by stool completely at the present (Table: 5.11).

Table: 5.11 Present Condition of the Latrine

Condition	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Running	16	40.0	19	18.0	35	38.9	22	36.7	12	24.0	34	30.9
2. Fill up by Stool Partially	11	27.5	25	50.0	36	40.0	11	18.3	10	20.0	21	19.1
3. Fill up by Stool Completely	4	10.0	2	4.0	6	6.7	10	16.7	13	26.0	23	20.9
4. Not Fit for Using	9	22.5	4	8.0	13	14.4	17	42.5	15	30.0	32	29.1
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

Total in NGO managed areas, about 31 percent latrines have been found as working well, 19.1 are filled up by stool partially, 20.9 percent are not fit for using, and 29.1 percent are

filled up by stool completely. Therefore, it is found that the present condition of the existing sanitary latrines is somewhat better in GO managed areas than NGO managed areas. However, specifically, Ganaktuli in GO managed areas and Agargaon in NGO managed areas have shown the better performance in respect of present condition of the latrine.

5.3.7 Platform Condition of the Latrines

In Ganaktuli, it has been found that 45 percent platforms of the latrines are in good condition, 52.5 percent are cracked and 2.5 percent are tilted. In Dhalpur, the condition is somewhat better than Ganaktuli and it has been found that 58 percent platforms of the latrines are in good conditions, 32 percent are cracked and 10 percent are tilted. In Agargaon, only 21.7 percent platforms of the latrines have been identified to be in good condition, 35 percent are cracked, 28.3 percent are tilted and 15 percent do not exist. In Kallayanpur, the condition is worst, where only 8 percent platforms of the latrines have been identified to be in good condition, 46 percent are cracked, 24 percent are tilted and 22 percent do not exist (Table: 5.12). So, it is obvious that platform conditions of the existing latrines are better in GO managed areas than in NGO managed areas.

Table: 5.12 Platform Condition of the Latrines

Condition	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Good	18	45.0	29	58.0	47	52.2	13	21.7	4	8.0	17	15 4
2. Cracked	21	52.5	16	32 0	37	41.1	21	35.0	23	46.0	44	40 0
3. Tilted Damage	1	2.5	5	10	6	6 7	17	28.3	12	24.0	29	26.4
4. Not Existed	-	-	-	-	-	-	9	15.0	11	22.0	20	18 2
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

5.3.8 Drainage Conditions of the Latrines

Drainage condition is one of the important aspects of well sanitation facilities. However, the drainage condition has been found to be bad in all four urban poor areas. In Ganaktuli, it has been found that the drainage condition of 57.5 percent latrines are bad, 32.5 percent are good and only 10 percent are moderate. In Dhalpur, the drainage

condition of 68 percent latrines has been found to be bad, 20 percent are good and only 12 percent are moderate (Table: 5.13).

Table: 5.13 Drainage Conditions of the Latrines

Condition	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Good	13	32 5	10	20.0	23	25.5	5	8.3	2	4.0	7	6.4
2. Moderate	4	10.0	6	12.0	10	11 1	2	3.3	4	8.0	6	5.4
3. Bad	23	57.5	34	68 0	57	63.3	53	88 4	44	88.0	97	88 2
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

In Agargaon, 88.4 percent latrines has been identified to be in bad drainage condition, 8.3 percent are good and only 3.3 percent are moderate. In Kallayanpur, 88 percent latrines has been identified to be in bad drainage conditions, only 4 percent are good and 8 percent are moderate. Total in GO managed areas, 25.5 percent latrines has been found to have good drainage condition, where as only 6.4 percent has been found in NGO managed areas. So, it is found that drainage condition of the sanitary latrines is somewhat better in GO managed areas than in NGO managed areas.

5.3.9 Wait in Line to use the Latrines

Due to heavy pressure on limited sanitary latrines provided by GOs and NGOs in urban poor areas, most of the dwellers have to wait in line to use the latrines. 85 percent users in Ganaktuli, 82 percent in Dhalpur, 85 percent in Agargaon, and 88 percent in Kallayanpur have to wait in line to use the sanitary latrines (Table: 5.14). Total in GO managed areas, 83.3 percent users have wait in line and 86.4 percent in NGO managed areas.

Table: 5.14 Wait in Line to use the Latrine

Comment	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Yes	34	85.0	41	82.0	75	83.3	51	85.0	44	88.0	95	86.4
2. No	6	15.0	9	18.0	15	16.7	9	15 0	6	12.0	15	13.6
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

members, 12 percent are land or house owner, 4 percent are concerned GO official, and 6 percent are others. Total in GO managed areas, it has been found that about 67 percent caretaker of the existing latrines are community member. In Agargaon, it has been found that 53.3 percent caretakers of the existing sanitation facilities are the community member, 11.7 percent are land or house owner, 10 percent are Ward Commissioner, 6.7 percent are concerned NGO official, and 18.3 percent are others. In Kallayanpur, 46 percent caretakers of the existing sanitation facilities are the community members, 12 percent are land or house owner, 8 percent are concerned NGO official, and 32 percent are others (Table: 5.16). Total in NGO managed areas, it has been found that about 50 percent caretaker of the existing latrines are community member. So, it is clear that in all GO managed and NGO managed areas, in most of the cases community member are the caretaker of the existing latrines.

Table: 5.16 Caretaker of the existing Sanitation Facilities

Caretaker	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Community Member	21	52.5	39	78.0	60	66.7	32	53.3	23	46.0	55	50.0
2. Land/House Owner	-	-	6	12.0	6	6.7	7	11.7	6	12.0	13	11.8
3. Muscleman	4	10.0	-	-	4	4.4	-	-	-	-	-	-
4. Concern GO/NGO Official	2	5.0	2	4.0	4	4.4	4	6.7	4	8.0	8	7.3
5. Ward Commissioner	9	22.5	-	-	9	10.0	6	10.0	1	2.0	7	6.4
6. Others	4	10.0	3	6.0	7	7.8	11	18.3	16	32.0	27	24.5
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

5.3.12 Employment of Sweepers for Cleaning the Latrines

In Ganaktuli, it has been found that cleaning of latrines are done, in 30 percent cases by rented sweeper, in another 30 percent cases by GO appointed sweeper, in 20 percent cases by the community people and in 15 percent cases by responsible caretaker appointed sweeper and in 5 percent cases none take any initiative for cleaning up. In Dhalpur, cleaning of latrines are done, in 36 percent cases by the community people, in 14 percent cases by GO appointed sweeper, in 8 percent cases by rented sweeper, and in 10 percent cases by responsible caretaker appointed sweeper and in 20 percent cases none take any initiative for cleaning up. Total in GO managed areas, the cleaning is done in most cases by community people (28.9 %), and GO appointed sweeper (21.1 %). In

5.3.10 Waiting Time (Duration) to use the Latrine in a Day

In Ganaktuli, it has been found that 35.2 percent users have to wait in line to use the latrines for 21-30 minutes, 29.4 percent for 11-20 minutes, 14.7 percent for 1-10 minutes, 11.8 percent for 1 hr & above and 3 percent for 31-40 minutes in a day. In Dhalpur, 29.4 percent users have to wait in line to use the latrines for 21-30 minutes, 26.8 percent for 11-20 minutes, 14.6 percent for 51-60 minutes, 12.2 percent for 1-10 minutes and 9.8 percent for 31-40 minutes in a day. In Agargaon, it has been found that 23.5 percent users have to wait in line to use the latrines for 11-20 minutes, 23.5 percent for 31-40 minutes, another 23.5 percent for 51-60 minutes, 21.6 percent for 21-30 minutes and 4 percent for 41-50 minutes, and another 4 percent for 1-10 minutes in a day. In Kallayanpur, 34.1 percent users have to wait in line to use the latrines for 11-20 minutes, 25 percent for 21-30 minutes, 15.9 percent for 51-60 minutes, 9.1 percent for 1 hr & above and 9.1 percent for 1-10 minutes in a day (Table: 5.15).

Table: 5.15 Waiting Time (Duration) to use the Latrine in a Day

Duration of Waiting Time	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 10 minutes	5	14.7	5	12.2	10	13.3	2	4.0	4	9.1	6	6.3
11 – 20 minutes	10	29.4	11	26.8	21	28.0	12	23.5	15	34.1	27	28.4
21 – 30 minutes	12	35.2	10	29.4	22	29.3	11	21.6	11	25.0	22	23.2
31 – 40 minutes	1	3.0	4	9.8	5	6.7	12	23.5	2	4.5	14	14.7
41 – 50 minutes	-	-	3	7.3	3	4.0	2	4.0	1	2.3	3	3.2
51 – 60 minutes	2	5.9	6	14.6	8	10.7	12	23.5	7	15.9	19	20.0
1 hr & Abv.	4	11.8	2	4.9	6	8.0	-	-	4	9.1	4	4.2
Total	**34**	**100.0**	**41**	**100.0**	**75**	**100.0**	**51**	**100.0**	**44**	**100.0**	**95**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, Abv. = Above

So, it is found that most of the users in these poor areas have to wait in line at least for 1-30 minutes in a day for using the latrines.

5.3.11 Caretaker of the existing Sanitation Facilities

In Ganaktuli, it has been found that 52.5 percent caretakers of the existing sanitation facilities are the community member, 22.5 percent are Ward Commissioner, 10 percent are musclemen, 5 percent are concerned GO official, and 10 percent are others. In Dhalpur, 78 percent caretakers of the existing sanitation facilities are the community

Agargaon, the cleaning of latrines are done, in 43.3 percent cases none take any initiative, in 21.7 percent cases by the community people, in 18.3 percent cases by rented sweeper, only 1.7 percent cases by NGO appointed sweeper, and in 3.3 percent cases by responsible caretaker appointed sweeper cleaning up. In Kallayanpur, it has been found that in 40 percent cases none take any initiative, in 30 percent cases anybody of the community, in 18 percent cases rented sweeper, and in 2 percent cases NGO appointed sweeper clean up the latrines (Table: 5.17). Total in NGO managed areas, anybody of the community (25.4 %), and rented sweeper (18.2 %) take the responsibilities for cleaning the latrine and in most of the cases (41.8 %) none take any initiative for cleaning.

Table: 5.17 For Cleaning Latrine who engage sweepers

Responsible Person	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Responsible Caretaker Clean up by sweeper	6	15.0	5	10.0	11	12.2	2	3.3	-	-	2	1.8
2. Rented Sweeper	12	30.0	4	8.0	16	17.8	11	18.3	9	18.0	20	18.2
3. GO/NGO Appointed Sweeper	12	30.0	7	14.0	19	21.1	1	1.7	1	2.0	2	1.8
4. Anybody of the Community	8	20.0	18	36.0	26	28.9	13	21.7	15	30.0	28	25.4
5. Don't Take any Initiative	2	5.0	10	20.0	12	13.3	26	43.3	20	40.0	46	41.8
6. Others	-	-	6	12.0	6	6.7	7	11.7	5	10.0	12	10.9
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

After providing any sanitation facility to the urban poor, both GOs and NGOs, with some exception, become very reluctant with the cleaning and proper maintenance of the latrines.

5.3.13 Frequency of the Maintenance of existing Latrines

Frequency of maintenance of the existing latrines provided by GOs and NGOs are not satisfactory in these urban poor areas. In Ganaktuli, it has been found that in 45 percent cases maintenance of the existing sanitation facilities are frequent, in 27.5 percent cases are moderately frequent, and 27.5 percent cases are not frequent. In Dhalpur, in 24 percent cases maintenance of the existing sanitation facilities are frequent, in 20 percent cases are moderately frequent, and 56 percent cases are not frequent. In total in GO managed areas, in 33.3 percent cases maintenance of the existing sanitation facilities are

frequent, in 23.3 percent cases are moderately frequent, and in 43.3 percent cases are not frequent (Table: 5.18).

Table: 5.18 Frequency of the Maintenance of existing Latrines

Degree of frequency	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1. Frequently	18	45.0	12	24.0	30	33.3	10	16.7	9	18.0	19	17.3
2. Moderately Frequently	11	27.5	10	20.0	21	23.3	15	25.0	14	28.0	29	26.4
3. Not Frequently	11	27.5	28	56.0	39	43.3	35	58 3	27	54.0	62	56.4
Total	40	100.0	50	100.0	90	100.0	60	100.0	50	100.0	110	100.0

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage

Agargaon, only in 16.7 percent cases maintenance of the existing sanitation facilities are frequent, in 25 percent cases are moderately frequent, and 58.3 percent cases are not frequent. In Kallayanpur, it has been found that only in 18 percent cases maintenance of the existing sanitation facilities are frequent, in 28 percent cases are moderately frequent, and in 54 percent cases are not frequent. Total in NGO managed areas, only in 17.3 percent cases maintenance of the existing sanitation facilities are frequent, in 26.4 percent cases are moderately frequent, and in 56.4 percent cases are not frequent. So, it is found that in most cases, the maintenance of the existing sanitary latrines is not frequent, however, in this respect GO managed areas are somewhat better than NGO managed areas.

5.3.14 Cost of Maintenance in last three months by the Dwellers

About one-third of the users did not spend any money for maintenance purposes in the last three months in the four study areas. In Ganaktuli, 37.5 percent users have spent TK. 1-30, 5 percent spent TK. 31-60, 5 percent spent TK. 91-120, 2.5 percent spent TK. 151 and more for maintenance purposes in last three months, where as 12.5 percent users did not know about the cost of maintenance. In Dhalpur, 58 percent users have spent TK. 1-31, 14 percent spent TK. 31-60, 4 percent spend TK. 61-90 for maintenance purposes in last three months, where as only 14 percent did not pay any *taka* for that purposes. In Agargaon, 28.3 percent users have spent TK. 1-30, about 2 percent spent TK. 31-60, 3.3 percent spent TK. 151 and more, another 3.3 percent spent TK. 121-150 for maintenance

purposes in last three months, where as 28.3 percent users did not know about the cost of maintenance. In Kallayanpur, 46 percent users have spent TK. 1-30, 6 percent spent TK. 31-60, 2 percent spent TK. 121-150, 6 percent spent TK. 151 and more for maintenance purposes in last three months, where as 32 percent users did not know about the cost of maintenance (Table: 5.19). About 49 percent users in GO managed and 36.4 percent in NGO managed areas have paid TK. 1-30 in the last three months. So, with some exception, dwellers of these poor areas did not spend large amount of money in the last three months for the maintenance purposes of provided sanitary latrines.

Table: 5.19 Cost of Maintenance in last three months by the Dwellers

Cost (TK.)	GO Managed Areas				Total		GO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	F	%	F	%	F	%	F	%	F	%	F	%
1 – 30	15	37.5	29	58.0	44	48.9	17	28.3	23	46.0	40	36.4
31 – 60	2	5.0	7	14.0	9	10.0	1	1.8	3	6.0	4	3.6
61 – 90	-	-	2	4.0	2	2.2	-	-	-	-	-	-
91 – 120	2	5.0	1	2.0	3	3.3	-	-	-	-	-	-
121 – 150	-	-	-	-	-	-	2	3.3	1	2.0	4	3.6
151 and Above	1	2.5	-	-	1	1.1	2	3.3	3	6.0	5	4.5
Don't Know	5	12.5	4	8.0	9	10.0	17	28.3	6	12.0	23	20.9
Didn't Pay	15	37.5	7	14.0	22	24.4	21	35.0	14	28.0	35	31.8
Total	**40**	**100.0**	**50**	**100.0**	**90**	**100.0**	**60**	**100.0**	**50**	**100.0**	**110**	**100.0**

Source: Field Survey, 2000 **Note:** F = Frequency, % = Percentage, TK = *Taka*

5.4 Level of Satisfaction of the Dwellers' about Provided Sanitation Facilities

Level of satisfaction of the dwellers' about provided sanitation facilities have been investigated on thirteen variables. The variables are location of the satiation facilities, accessibility, waiting time, structural condition of the latrines, platform condition, sitting condition, performance of cleanliness, drainage condition, maintenance and management system, cost recovery, visible condition, and acceptance for woman. Based on four urban poor areas these are described below in respect of level of satisfaction.

5.4.1 Level of Satisfaction about Location of the Sanitation Facilities

In Ganaktuli, it has been found that 55 percent users are satisfied and 37.5 percent are unsatisfied with location of sanitation facilities. In Dhalpur, 55 percent users are satisfied and 20 percent are unsatisfied with the location. Total in GO managed areas, 54 percent users are satisfied and about 28 percent are unsatisfied with location of sanitation facilities (Table: 5.20). In Agargaon, 55 percent users are satisfied and 38 percent are

unsatisfied with the location of latrines, where as in Kallayanpur, 46 percent users are unsatisfied and 34 percent are satisfied with the location. Total in NGO managed areas, 45 percent users are satisfied and about 42 percent are unsatisfied with the location of the provided latrines (Table: 5.21). So, it is clear that users of all four urban poor areas are somewhat satisfied with the location of existing sanitation facilities.

5.4.2 Level of Satisfaction about Accessibility of the Sanitation Facilities

About 38 percent users are unsatisfied and 35 percent are satisfied with accessibility of sanitation facilities in Ganaktuli. In Dhalpur, 44 percent users are satisfied and 38 percent are unsatisfied with accessibility of water sources. Total in GO managed areas, 40 percent users are satisfied and about 38 percent are unsatisfied with the accessibility of sanitation facilities (Table: 5.20). In Agargaon, 68 percent users are unsatisfied and 15 percent are satisfied with the accessibility. In Kallayanpur, 74 percent users are unsatisfied and 12 percent are satisfied with accessibility of sanitation facilities. Total in NGO managed areas, about 71 percent users are unsatisfied and about 14 percent respondents are satisfied with that facility (Table: 5.21). So, GO managed areas are better in respect of accessibility of sanitation facilities than NGO managed areas.

5.4.3 Level of Satisfaction about Waiting Time

In Ganaktuli, 72.5 percent users are unsatisfied and only 10 percent are satisfied with waiting duration, where as in Dhalpur, 68 percent users are unsatisfied and 16 percent are satisfied with the waiting duration. Total for the GO managed areas, 70 percent users are unsatisfied and 13 percent are satisfied with waiting duration (Table: 5.20). The condition of waiting is very hazardous in NGO managed areas, in Agargaon, 85 percent users and in Kallayanpur, 94 percent users are unsatisfied respectively with waiting duration for using the latrine. Total in NGO managed areas, 89 percent users are unsatisfied and only 6 percent are satisfied with waiting duration (Table: 5.21). In this respect none of the area has been found satisfactory.

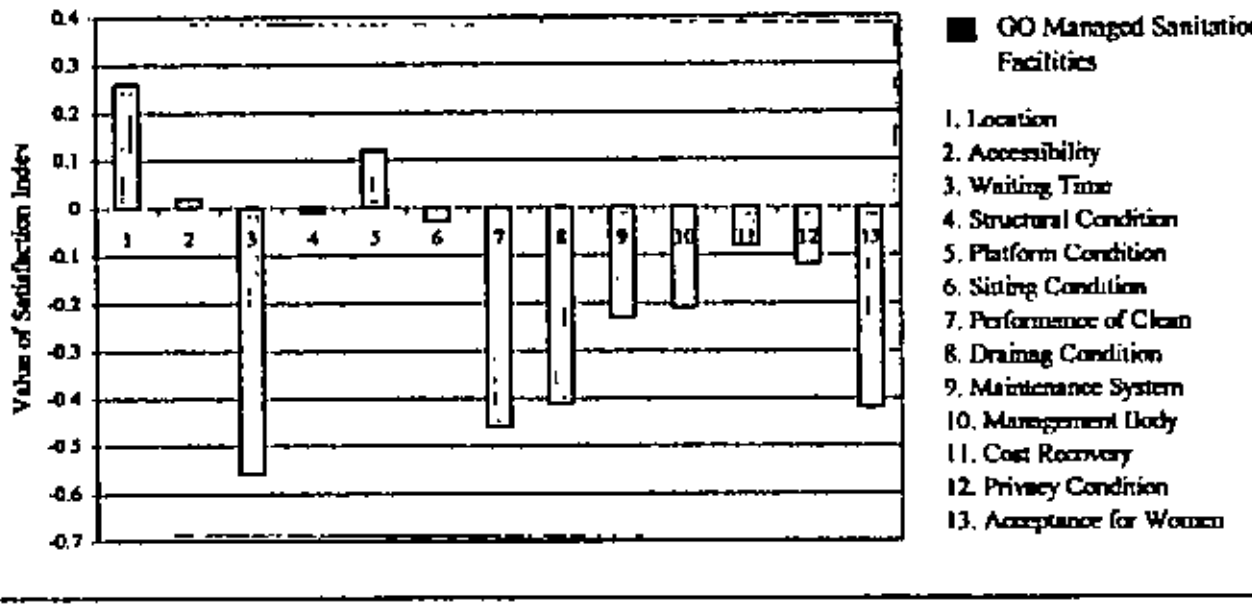
Table: 5.20 Level of Satisfaction of the Dwellers about provided Sanitation Facilities in GO Managed Areas

Variables	Dwellers' Satisfaction (by number) about Provided Sanitation Facilities								
	Ganaktuli			Dhalpur			Total		
	ST	AC	UST	ST	AC	UST	ST	AC	UST
1 Location	22	3	15	27	13	10	49	16	25
2 Accessibility	14	11	15	22	9	19	36	20	34
3. Waiting Time	4	7	29	8	8	34	12	15	63
4 Structural Condition	14	10	16	21	9	20	35	19	36
5. Platform Condition	18	7	15	26	6	18	44	13	33
6. Sitting Condition	12	10	18	21	11	18	33	21	36
7. Performance of Clean	7	13	20	7	7	36	14	20	56
8 Drainage Condition	11	7	22	9	6	35	20	13	57
9 Maintenance System	10	14	16	15	5	30	25	19	46
10 Management Body	10	15	15	16	4	30	26	19	45
11 Cost Recovery	13	17	10	18	3	29	31	20	39
12 Privacy Condition	15	6	19	18	7	25	33	13	44
13 Acceptance for Women	10	10	20	10	2	38	20	12	58
Total	**160**	**130**	**230**	**218**	**90**	**342**	**378**	**220**	**572**
Dwellers' Satisfaction (by percentage) about Provided Sanitation Facilities									
1 Location	55 0	7 5	37.5	54 0	26 0	20	54 4	17 9	27 8
2 Accessibility	35 0	27 5	37.5	44 0	18 0	38	40 0	22 2	37 8
3 Waiting Time	10 0	17 5	72.5	16 0	16 0	68	13.3	16 7	70 0
4 Structural Condition	35 0	25 0	40 0	42 0	18.0	40	38 9	21 1	40 0
5 Platform Condition	45.0	17 5	37.5	52 0	12 0	36	38.9	14 4	36 7
6 Sitting Condition	30 0	25 0	45.0	42 0	22.0	36	36 7	23 3	40 0
7 Performance of Clean	17.5	32 5	50.0	14 0	14 0	72	15.5	22 2	62 2
8 Drainage Condition	27 5	17 5	55 0	22 5	12.0	70	22 2	14 4	63.3
9 Maintenance System	25 0	35 0	40.0	30 0	10 0	60	27.8	21.1	51.1
10 Management Body	25 0	37 5	37.5	32.0	8.0	60	28 9	21 1	50.0
11 Cost Recovery	32 5	42 5	25.0	36 0	6 0	58	34 4	22 2	43.3
12 Privacy Condition	37 5	15.0	47.5	36 0	14 0	50	22 2	13 3	64.4
13 Acceptance for Women	25 0	25 0	50.0	20 0	4 0	76	38 2	22 2	57.8
Total	**30.8**	**25.0**	**44.2**	**33.5**	**13.8**	**52.6**	**32.3**	**18.8**	**48.8**
Dwellers' Satisfaction (by a Satisfaction Index) about Provided Sanitation Facilities									
	f_s	f_d	I_s	f_s	f_d	I_s	f_s	f_d	I_s
1. Location	22	15	0 17	27	10	0 34	49	25	0 26
2. Accessibility	14	15	-0 02	22	19	0 06	36	34	0 02
3. Waiting Time	4	29	-0.62	8	34	-0 52	12	63	-0 56
4 Structural Condition	14	16	-0 05	21	20	0 02	35	36	-0.01
5. Platform Condition	18	15	0 07	26	18	0 16	44	33	0 12
6. Sitting Condition	12	18	-0 15	21	18	0 06	33	36	-0 03
7. Performance of Clean	7	20	-0 32	7	36	-0 58	14	56	-0 46
8. Drainage Condition	11	22	-0.27	9	35	-0 52	20	57	-0 41
9 Maintenance System	10	16	-0 15	15	30	-0.30	25	46	-0 23
10 Management Body	10	15	-0 12	16	30	-0 28	26	45	-0 21
11. Cost Recovery	13	10	0 07	18	29	-0 22	31	39	-0 08
12 Privacy Condition	15	19	-0 10	18	25	-0.14	33	44	-0.12
13 Acceptance for Women	10	20	-0 25	10	38	-0 56	20	58	-0.42
Total	**160**	**230**	**-0.13**	**218**	**342**	**-0.19**	**378**	**572**	**-0.19**

Source: Field Survey, 2000

Note: ST = Satisfactory, AC = Acceptable, UST = Unsatisfactory, f_s = Satisfied Respondent, f_d = Unsatisfied Respondents, I_s = Satisfaction Index

Figure: 5.1 Dwellers' Satisfaction (by Satisfaction Index) about Sanitation Facilities Provided in GO Managed Areas



5.4.4 Level of Satisfaction about Structural Conditions of the Latrines

In Ganaktuli and in Dhalpur, 40 percent users are unsatisfied respectively with the quality of structural condition of the latrines. Where as in Ganaktuli 35 percent users are satisfied and in Dhalpur 40 percent are satisfied with that quality. Total in GO managed areas, 40 percent users are unsatisfied and about 39 percent are satisfied with the structural quality of sanitation facilities (Table: 5.20). In Agargaon, 83 percent users and in Kallayanpur, 90 percent users are unsatisfied with the structural condition of the sanitation facilities respectively. Total in NGO managed areas, 86 percent users are unsatisfied and 8 percent are satisfied with the structural condition (Table: 5.21). In this respect, GO managed areas are somewhat better than NGO managed areas.

5.4.5 Level of Satisfaction about Platform Condition

In Ganaktuli, 45 percent users are satisfied and 37.5 percent are unsatisfied with platform condition of the sanitation facilities, where as in Dhalpur, 52 percent users are satisfied and 36 percent are unsatisfied with that quality. Total in GO managed areas, about 39 percent users are satisfied and about 37 percent are unsatisfied with the platform condition (Table: 5.20). In Agargaon, 80 percent users and in Kallayanpur, 84 percent users are unsatisfied with the platform condition of the provided sanitation facilities. Total in NGO managed areas, 89 percent users are unsatisfied and about 1 percent is satisfied with that quality (Table: 5.21). So, in the context of platform condition of sanitation facilities GO managed areas are quite better than NGO managed areas.

5.4.6 Level of Satisfaction about Sitting Condition of the Sanitation Facilities

In Ganaktuli, 45 percent users are unsatisfied and 30 percent are satisfied with the sitting condition of the latrines. In Dhalpur, 46 percent users are satisfied and 36 percent are unsatisfied with that quality. In total in GO managed areas, 40 percent users are unsatisfied and about 37 percent are satisfied with the quality of sitting condition (Table: 5.20). In Agargaon, 75 percent users are unsatisfied and 13 percent are satisfied with the sitting condition, where as in Kallayanpur, 88 percent users are unsatisfied and only 8 percent are satisfied with the sitting condition. Total in NGO managed areas, about 81 percent users are unsatisfied about 11 percent are satisfied with the quality of sitting condition (Table: 5.21). Sitting condition of the sanitation facilities is related to structural

condition and the result has shown the same picture, in which GO managed areas are somewhat better than NGO managed areas.

5.4.7 Level of Satisfaction about Performance of Cleanliness

One of the most hazardous conditions is uncleanliness of latrines in urban poor areas due to frequent use by large number dwellers. In Ganaktuli, 50 percent users are unsatisfied and 17.5 percent are satisfied with performance of cleanliness. On the other hand, in Dhalpur, 72 percent users are unsatisfied and 14 percent are satisfied with the cleanliness of latrines. Total in GO managed areas, 62 percent users are unsatisfied and 15 percent are satisfied with that quality (Table: 5.20). In Agargaon and in Kallayanpur, the condition is found to be worse where 83 percent and 96 percent are unsatisfied respectively with the quality of cleanliness. Total in NGO managed areas, 89 percent users are unsatisfied and only about 1 percent are satisfied with that quality (Table: 5.21).

5.4.8 Level of Satisfaction about Drainage Condition

In Ganaktuli, 55 percent users are unsatisfied and 27.5 percent are satisfied with the quality of drainage condition. In Dhalpur, 70 percent users are unsatisfied and 14 percent are satisfied with the quality of drainage condition of the sanitation facilities. Total in GO managed areas, 63 percent users are unsatisfied and 22 percent are satisfied with that quality (Table: 5.20). In Agargaon, 94 percent users and in Kallayanpur, 82 percent are unsatisfied respectively with the quality of drainage condition. Total in NGO managed areas, 87 percent users are unsatisfied and 7 percent are satisfied with the quality of drainage condition (Table: 5.21). So, in the context of drainage condition of the sanitation facilities GO managed areas are better than NGO managed areas.

5.4.9 Level of Satisfaction about Maintenance System

In Ganaktuli, 40 percent users are unsatisfied and 25 percent are satisfied with the maintenance system, where as in Dhalpur, 60 percent are unsatisfied and 30 percent are satisfied with that quality. Total in GO managed areas, 51 percent respondents are unsatisfied and about 28 percent are satisfied with the maintenance system (Table: 5.20). In Agargaon, 70 percent users are unsatisfied and only 7 percent are satisfied with the quality of maintenance system. In Kallayanpur, 84 percent users are unsatisfied with the

maintenance system. Total in NGO managed areas, 76 percent users are unsatisfied and 5 percent are satisfied with the maintenance quality (Table: 5.21). All GO managed and NGO managed areas are in worst condition in the context of maintenance system.

5.4.10 Level of Satisfaction about Management System

In Ganaktuli, 37.5 percent users are unsatisfied and 25 percent are satisfied with the management system, where as in Dhalpuur, 60 percent are unsatisfied and 32 percent are satisfied with that quality. Total in GO managed areas, 50 percent users are unsatisfied and about 29 percent are satisfied with the management system (Table: 5.20). In Agargaon, 68 percent users are unsatisfied and only 10 percent are satisfied with the quality of management system. In Kallayanpur, 82 percent users are unsatisfied with the management system. Total in NGO managed areas, 74.5 percent users are unsatisfied and 7 percent are satisfied with the management quality (Table: 5.21). All GO managed and NGO managed areas are in worst condition in the context of management system.

5.4.11 Level of Satisfaction about Cost Recovery

Only in Ganaktuli, dwellers are quite satisfied with the cost recovery system, where 32.5 percent users are satisfied and 25 percent are unsatisfied. In Dhalpur, 58 percent users are unsatisfied and 38 percent are satisfied with the cost recovery system. Total in GO managed areas, 43 percent users are unsatisfied and 34 percent are satisfied with the system (Table: 5.20). In Agargaon, 47 percent users are unsatisfied and 33 percent are satisfied with the cost recovery system, where as in Kallayanpur, 80 percent users are unsatisfied and 14 percent are satisfied with the system. Total in NGO managed areas, about 62 percent users are unsatisfied and about 25 percent are satisfied with the cost recovery system (Table: 5.21).

5.4.12 Level of Satisfaction about Privacy Condition

In Ganaktuli, 47 percent users are unsatisfied and 37.5 percent are satisfied with the privacy condition of the latrines. In Dhalpur, 50 percent users are unsatisfied and 36 percent are satisfied with the privacy condition. Total in GO managed areas, 64 percent users are unsatisfied and 22 percent are satisfied with the privacy condition (Table: 5.20).

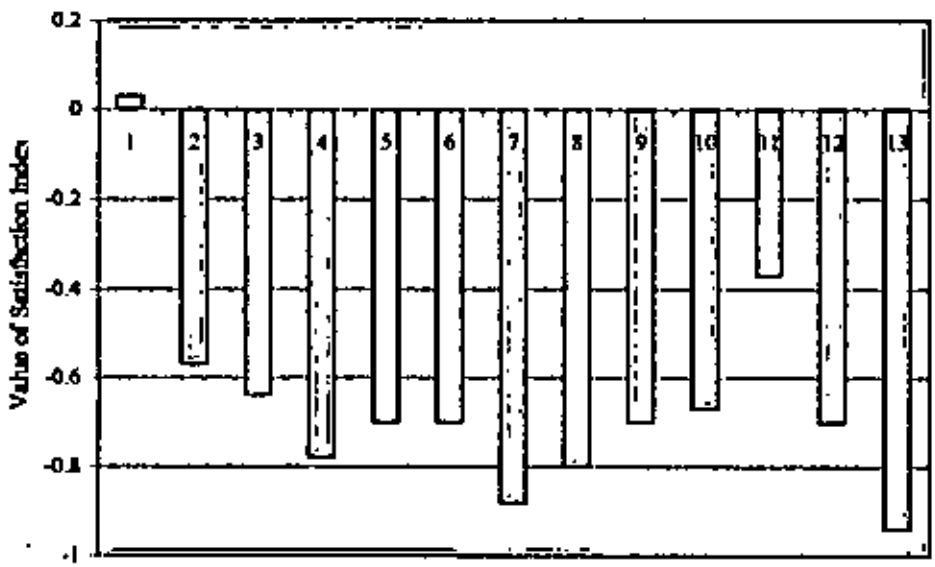
Table: 5.21 Level of Satisfaction of the Dwellers about provided Sanitation Facilities in NGO Managed Areas

Variables	Dwellers' Satisfaction (by number) about Provided Sanitation Facilities								
	Agargaon			Kallayanpur			Total		
	ST	AC	UST	ST	AC	UST	ST	AC	UST
1. Location	33	4	23	17	10	23	50	14	46
2 Accessibility	9	10	41	6	7	37	15	17	78
3. Waiting Time	5	4	51	2	1	47	7	5	98
4 Structural Condition	6	4	50	3	2	45	9	6	95
5 Platform Condition	8	4	48	5	3	42	13	7	90
6 Sitting Condition	8	7	45	4	2	44	12	9	89
7. Performance of Clean	1	9	50	0	2	48	1	11	98
8. Drainage Condition	7	4	49	1	2	47	8	6	96
9 Maintenance System	4	14	42	2	6	42	6	20	84
10 Management Body	6	13	41	2	7	41	8	20	82
11. Cost Recovery	20	12	28	7	3	40	27	15	68
12 Privacy Condition	9	3	48	2	1	41	11	4	89
13 Acceptance for Women	1	2	57	0	2	48	1	4	105
Total	**117**	**90**	**573**	**51**	**48**	**551**	**168**	**138**	**1124**
Dwellers' Satisfaction (by percentage) about Provided Sanitation Facilities									
1 Location	55 0	6.7	38 3	34 0	20 0	46 0	45.4	12 7	41 8
2 Accessibility	15 0	16 7	68.3	12.0	14 0	74 0	13 6	15.4	70 9
3. Waiting Time	8 3	6.7	85 0	4 0	2 0	94 0	6 4	4 4	89.1
4. Structural Condition	10 0	6 7	83.3	6 0	4 0	90 0	8 2	5.4	86 4
5 Platform Condition	13 3	6 7	80 0	10 0	6 0	84 0	11 8	6 4	81.8
6 Sitting Condition	13 3	11 7	75.0	8 0	4 0	88 0	10 9	8 2	80 9
7 Performance of Clean	1 7	15.0	83.3	0 0	4 0	96 0	0 9	10 0	89 1
8 Drainage Condition	11 7	6 7	81.7	2 0	4 0	94 0	7 3	5 4	87 3
9 Maintenance System	6 7	23 3	70 0	4 0	12.0	84 0	5 4	18.2	76 4
10 Management Body	10 0	21.7	68.3	4 0	14 0	82 0	7.3	18 2	74 5
11. Cost Recovery	33 3	20 0	46 7	14 0	6 0	80 0	24 5	13 6	61.8
12 Privacy Condition	15 0	5 0	80 0	4 0	2 0	82 0	10 0	3 6	80 9
13. Acceptance for Women	1 7	3 3	95 0	0 0	4 0	96 0	0.9	3 6	95 4
Total	**15 0**	**11.5**	**73.5**	**7.9**	**7.4**	**84.8**	**11.7**	**9.6**	**78.6**
Dwellers' Satisfaction (by using a Satisfaction Index) about Provided Sanitation Facilities									
	f_s	f_d	I_s	f_s	f_d	I_s	f_s	f_d	I_s
1. Location	33	23	0 17	17	23	-0.12	50	46	0.03
2 Accessibility	9	41	-0 53	6	37	-0 62	15	78	-0.57
3 Waiting Time	5	51	-0 77	2	47	-0 90	7	98	-0 64
4 Structural Condition	6	50	-0 73	3	45	-0.84	9	95	-0 78
5 Platform Condition	8	48	-0 67	5	42	-0 74	13	90	-0 70
6 Sitting Condition	8	45	-0 62	4	44	-0 80	12	89	-0 70
7 Performance of Clean	1	50	-0 82	0	48	-0.96	1	98	-0.88
8 Drainage Condition	7	49	-0.70	1	47	-0.92	8	96	-0.80
9 Maintenance System	4	42	-0 63	2	42	-0 80	6	84	-0 70
10 Management Body	6	41	-0 58	2	41	-0 78	8	82	-0 67
11. Cost Recovery	20	28	-0 13	7	40	-0 66	27	68	-0 37
12 Privacy Condition	9	48	-0 65	2	41	-0.78	11	89	-0 70
13 Acceptance for Women	1	57	-0.93	0	48	-0 96	1	105	-0 94
Total	**117**	**573**	**-0.58**	**51**	**551**	**-0.77**	**168**	**1124**	**-0.67**

Source: Field Survey, 2000

Note: ST = Satisfactory, AC = Acceptable, UST = Unsatisfactory, f_s = Satisfied Respondent, f_d = Unsatisfied Respondents, I_s = Satisfaction Index

Figure: 5.2 Dwellers' Satisfaction (by Satisfaction Index) about Sanitation Facilities Provided in NGO Managed Areas



In Agargaon, 80 percent users are unsatisfied and 15 percent are satisfied with the privacy condition, where as in Kallayanpur, 82 percent respondents are unsatisfied and 4 percent are satisfied with the privacy condition. Total in NGO managed areas, about 81percent users are unsatisfied and 10 percent are satisfied with the privacy condition of the latrines (Table: 5.25). All the dwellers of GO managed and NGO managed areas are quite unsatisfied with the privacy condition of the latrines.

5.4.13 Level of Satisfaction about Acceptance for Woman

In Ganaktuli, 50 percent users are unsatisfied and 25 percent are satisfied with the facilities provided for woman, where as in Dhalpur, 76 percent users are unsatisfied and 20 percent are satisfied with the facilities provided for woman. Total in GO managed areas, about 58 percent users are unsatisfied and 38 percent are satisfied with the facilities provided for woman (Table: 5.20). In Agargaon, 95 percent users are unsatisfied and about 2 percent are satisfied with the facilities provided for woman. In Kallayanpur, 96 percent users are unsatisfied and 25 percent are satisfied with the facilities provided for woman. Total in NGO managed areas, 95.4 percent users are unsatisfied and about 1 percent are satisfied with the facilities provided for woman (Table: 5.21). Both GO managed and NGO managed areas are in worst condition in respect of provision for woman.

In aggregate results for all variables, in Ganaktuli, about 44 percent users are unsatisfied and 31 percent are satisfied with the facilities. In Dhalpur, 52.6 percent users are unsatisfied and 33.5 percent are satisfied with the sanitation facilities provided by the different organizations for urban poor. Total in GO managed areas, 49 percent users are unsatisfied and about 32 percent are satisfied with the sanitation facilities (Table: 5.20). In Agargaon, 73.5 percent users are unsatisfied and 15 percent are satisfied with the facilities. In Kallayanpur, about 85 percent users are unsatisfied and 8 percent are satisfied with the sanitation facilities. Total in NGO managed areas, 78.6 percent users are unsatisfied and about 12 percent are satisfied with the facilities (Table: 5.21). So, unsatisfied users are higher in NGO managed areas than in GO managed areas in all aspects of sanitation facilities.

5.5 Dwellers Satisfaction about provided Sanitation Facilities

Dwellers satisfaction about provided sanitation facilities has been investigated by satisfaction index on thirteen variables. The variables are location of the satiation facilities, accessibility, waiting time, structural condition of the latrines, platform condition, sitting condition, performance of cleanliness, drainage condition, maintenance and management system, cost recovery, privacy condition, and acceptance for woman. The satisfaction index of different variables about provided sanitation facilities in the four urban poor areas are described below.

In Ganaktuli, ten variables out of thirteen have shown the negative index of satisfaction The negative variables are accessibility, waiting time, structural condition of the latrines, sitting condition, performance of cleanliness, drainage condition, maintenance and management system, privacy condition, and acceptance for woman. The positive variables are location of the sanitation facilities, platform condition and cost recovery system. Among the negative variables, waiting time (-0.63) has shown the highest value of satisfaction index. The negative variables according to least index are performance of cleanliness (-0.33), drainage condition (-0.28), acceptance for woman (-0.25), maintenance system (-0.15), sitting condition (-0.15), management system (-0.13), privacy condition (-0.1), structural condition (-0.05), and accessibility of the sanitation facilities (-0.03). Among the positive variables, location of the sanitation facilities (0.17) has shown the highest positive index and the other indices are platform condition (0 08) and cost recovery (0.08). In total for all variables of sanitation facilities, the satisfaction index has shown the negative (-0.13) value in Ganaktuli (Table: 5.20).

In Dhalpur, eight variables out of thirteen have shown the negative values of satisfaction index. The negative variables are waiting time, performance of cleanliness, drainage condition, maintenance and management system, privacy condition, and acceptance for woman. The positive variables are location of the sanitation facilities, accessibility, structural condition, platform condition and sitting arrangement. Among the negative variables, performance of cleanliness (-0.58) has shown the highest value of negative index. The other negative variables are according to least rank acceptance for woman,

waiting time (-0.56), drainage condition (-0.52), maintenance system (-0.3), management body (-0.28), cost recovery (-0.22), privacy condition (-0.14). Among the positive variables, location of the sanitation facilities (0.34) has shown the highest value and the other positive values according to rank platform condition (0.16), accessibility (0.06), sitting condition (0.06) and structural condition (0.02). In total for all variables of sanitation facilities, satisfaction index has shown the negative index (-0.19) in Dhalpur (Table: 5.20).

In Agargaon, twelve variables have shown the negative index of satisfaction. The negative variables are accessibility, waiting time, structural condition of the latrines, platform condition, sitting condition, performance of cleanliness, drainage condition, maintenance and management system, cost recovery, privacy condition, and acceptance for woman. The only positive variable is location of sanitation facilities (0.17). Among the total negative variables, acceptance for woman (-0.93) has shown the highest value of negative index. The other negative variables according to least index are performance of cleanliness (-0.82), waiting time (-0.77), structural condition (-0.73), drainage condition (-0.70), platform condition (-0.67), privacy condition (-0.65), maintenance system (-0.63), sitting condition (-0.62), management system (-0.58), accessibility (-0.53) and cost recovery system (-0.13). In total for all variables of sanitation facilities, the satisfaction index has shown the negative value (-0.58) in Agargaon (Table: 5.21).

In Kallayanpur, all variables have been shown the negative value of satisfaction index. Among all the negative variables, performance of cleanliness (-0.96) has shown the highest value of satisfaction index. The other negative variables, according to least index, are drainage condition (-0.92), waiting time (-0.90), structural condition (-0.84), maintenance system (-0.80), sitting condition (-0.78), management system (-0.78), privacy condition (-0.74), platform condition (-0.62), accessibility (-0.66), cost recovery system (-0.66), and location of the sanitation facilities (-0.12) (Table: 5.21).

Total in GO managed areas, out of thirteen variables, only three variables have shown the positive value. The positive indices according to the rank are location of the latrine (0.26), platform condition (0.12), and accessibility of the latrine (0.02). Among the ten

negative variables in GO managed areas, waiting time (-0.56) has shown the highest value of negative index and other negative variables according to least index are performance of cleanliness (-0.46), acceptance for women (-0.42), drainage condition (-0.41), maintenance system (-0.23), management system (-0.21), etc. In total in GO managed areas, the satisfaction index has shown the negative value (-0.19) (Table: 5.20). On the other hand, total in NGO managed areas, only one variable i.e. location of the latrine (0.03) has shown the positive value of satisfaction index. Among all the negative variables, acceptance for women (-0.94) has shown the highest value of negative index. The other negative variables according to least index are performance of cleanliness (-0.88), drainage condition of the latrines (-0.80), structural condition (-0.78), platform condition (-0.70), sitting arrangement (-0.70), privacy condition (-0.70), etc. In total in NGO managed areas, satisfaction index has shown the negative value (-0.67) (Table 5.21).

5.6 Problems related to Sanitation Facilities

A wide range of problems related to sanitation facilities have been identified. These are distant location of the latrines, inaccessibility, long waiting time, cracked platform, unsatisfactory sitting arrangement, unclean platform surface, poor drainage, unskilled management system, irregular maintenance, inferior quality of latrine materials, visible stool, using problems in wet seasons, and pollute of environment due to stench from latrine (Table: 5.22). In Ganaktuli, it has been found that top most problem is waiting time (167) and according to rank other priority problems are unclean platform (203), poor drainage (230), spread of stench (242), visibility of stool (260), unsatisfactory sitting arrangement (265), using problems in wet season (266), etc. In Dhalpur, two problems rank the top position with the same value (218) and these are long waiting time and poor drainage condition. The other priority problems are unclean platform (273), spreading of stench (284), using problems in wet season (313), maintenance problems (344), visibility of stool (354), unsatisfactory sitting arrangement (375), etc. In Agargaon, rank one problem is spreading of stench and pollution of environment (282) and other priority problems according to rank are visibility of stool (278), long waiting time (289), unclean platform (320), poor drainage (362), unsatisfactory siting arrangement (399), using

problems in wet season (413), cracked platform (448), etc. In Kallayanpur, number one problems related to sanitation facilities is spreading of stench and pollution of environment (202). The other priority problems according to rank are using problem in wet season (248), unclean platform (282), visibility of stool (292), poor drainage (296), long waiting time (310), inferior quality latrine materials (314), unsatisfactory sitting arrangement (334), cracked platform (377), unskilled management system (427), etc

Table: 5.22 Problems related to Sanitation Facilities (according to rank) for Selected Urban Poor Areas in Dhaka City

Problems	GO Managed Areas				Total		NGO Managed Areas				Total	
	Ganaktuli		Dhalpur				Agargaon		Kallayanpur			
	RV	R	RV	R	RV	R	RV	R	RV	R	RV	R
1. Distant Location	307	10	445	12	752	12	577	13	515	13	1092	13
2. Inaccessibility	276	8	376	8	652	8	475	10	445	11	920	10
3. Long waiting Time	167	1	218	1	385	1	289	3	310	6	799	8
4. Cracked Platform	299	9	378	9	677	9	448	8	377	9	825	9
5. Unsatisfactory Sitting Arrangement	265	6	371	7	636	7	399	6	334	8	733	5
6. Unclean Platform	203	2	273	2	476	3	320	4	282	3	602	3
7. Poor Drainage	230	3	218	1	448	2	362	5	296	5	658	4
8. Unskilled Management System	356	13	379	10	745	11	545	12	427	10	972	11
9. Irregular Maintenance	336	11	344	5	680	10	511	11	478	12	989	12
10. Inferior Quality Latrine Material	345	12	442	11	787	13	471	9	314	7	785	7
11. Visibility of Stool	260	5	354	6	614	6	287	2	292	4	579	2
12. Using Problems	266	7	313	4	579	5	413	7	248	2	661	6
13. Spreading of Stench and Pollution of Environment	242	4	284	3	526	4	282	1	202	1	484	1

Source: Field Survey, 2000 **Note:** RV = Relative Value, R = Rank

Total in GO managed areas, long waiting time to use the latrine (385) rank the top most problem and other priority problems are poor drainage (448), unclean platform (476), spreading of stench and pollution of environment (526), using problem in wet season (614), etc. Total in NGO managed areas, spreading of stench and pollution of environment (484) rank the top most problem and other priority problems are visibility of stool (579), unclean platform (602), poor drainage (658), unsatisfactory sitting arrangement (733), etc.

Chapter: 06 Summary Findings and Recommendations

6.1 Summary Findings

6.1.1 Respondents Characteristics

In all GO managed and NGO managed areas single-family type has been found in most cases. A mixture of residential statuses have been identified in GO managed areas, where as in NGO managed areas two types (owned and tenant) have been found. Cost of the owned houses is higher in NGO managed areas than in GO managed areas. Generally, cost of the owned houses varies from 5001-15000 taka in general, but in some cases the cost reaches up to TK. 25000 or above. In case of rental houses, rent varies from 300 taka to 900 taka. In NGO managed areas (Agargaon and Kallaynpur) musclemen are the house owners and they collect rent by the selected persons who are also the dwellers of these slums. In GO managed areas (Ganaktuli and Dhalpur) dwellers who are basically employees of DCC pay their house rent to DCC. In the age structure of the dwellers, children (30.7 %) and young people (44.2 %) between the ages of 11-30 years, comprises the majority of the population in all four study areas. More than half of the dwellers in these slums are illiterate followed by primary (33.5 %), secondary (8.9 %) and S.S.C (1.4 %) levels of education. However, literacy rate is somewhat better in GO managed areas than in NGO managed areas. Most of the dwellers of these urban poor areas are engaged in such kinds of occupations as rickshaw pulling, petty business, day laboring, govt. and pvt. services (4^{th} Class Employment), transport service, household work, garments job, etc. However, a substantial proportion (20.6 %) of unemployment has also been identified in all four urban poor areas. Most of the dwellers maintain their family with poor household income (monthly 1000-3000 taka) and in maximum cases their monthly income and monthly expenditure are equal.

6.1.2 Water Supply Facilities

In GO managed areas, dwellers of Ganaktuli use DWASA's piped water (not house connection) through public water point where as in Dhalpur dwellers use DWASA's water by tubewell. In general, the dwellers of Ganaktuli and Dhalpur use DWASA's piped water (whatever the systems) for all purposes. In addition, water reservoir system

has been found in Ganaktuli, which is an exceptional facility not found in other three areas. However, in NGO managed areas (Agargaon and Kallayanpur), dwellers use shallow hand tubewell for all purposes. Dwellers of Kallayanpur use water of hand made ring well by digging soil in front of their houses, which is also an exceptional water source that is not found in other three areas. The dwellers of Kallayanpur slum store rainwater and underground water in dug-well and use that water for cleaning utensils and bathing even for cooking when water crisis is happened.

In the context of getting sufficient water supply, between GO managed areas, dwellers of Ganaktuli are happier than Dhalpur, where as between NGO managed areas, dwellers of Agargaon are slightly happier than Kallayanpur. Among the GO managed and NGO managed areas, dwellers of Agargaon are more satisfied with the sufficiency of water supply. In case of insufficient water supply, dwellers of Kallayanpur and Agargaon have to buy water to meet their additional requirements and on the other hand, dwellers of GO managed areas meet their additional requirements by other means. However, the cost of additional water may vary from area to area. There is a seasonal variation of getting sufficient water supply in all four urban poor areas. In this respect, NGO managed areas are better than GO managed areas. Actually, in reality, only about 30 percent users get sufficient water supply at all seasons in total. Various alternative water sources have been identified in these urban poor areas; these are illegal WASA's connections (30.5 %), neighbor houses (23.4 %), others' houses (12.8 %), pond/river/canal (5 %) and others (17.7 %) and some people also depend on fate when water crisis is happened. At present, ratio of families per water source/point is much higher than that of the standard fixed at the establishment period in all four urban poor areas, due to huge population increase later on.

Maximum water sources (79 % in total) provided by GOs and NGOs in different urban poor areas have been identified as running well. Where as only 18 percent water sources have been found to be choked up partially. In this respect, Agargaon (90 % water sources running well) has shown the better performance and Dhalpur (62 % water sources running well) has shown the worst condition. Platform conditions of the water sources

have also been found better in Agargaon (68.3 %) followed by Ganaktuli (60 %), Dhalpur (48 %) and Kallayanpur (44 %). 6 percent water sources have been identified which do not have any platform. Drainage conditions of the water sources have been found better in Ganaktuli (55 %) followed by Agargaon (41.7 %). Where as worst drainage conditions of the water sources prevails in Dhalpur and Kallayanpur. Due to huge population pressure on limited water sources, maximum users have to wait in line to collect water in all four poor areas. In this context, GO managed areas have shown the worse condition than NGO managed areas. 92 percent and 90 percent users have to wait in line to collect water in Dhalpur and Ganaktuli respectively. The number and duration of waiting time vary from area to area. The normal waiting number has been identified 1-3 times and duration 10-40 minutes a day in all surveyed areas. In most cases, community people/member (68 %) take the responsibilities for caretaking the water sources and other type of caretakers are land/house owner (11.5 %), musclemen (5.5 %), concerned GO/NGO officials (5.5 %), Ward Commissioner (3 %) and others (6.5 %). After breaking down of any water source, community people repair the source by their own effort and the rented repairman also do the repair work. However, sometimes the dwellers did not take any initiative in case of major repairing. In this respect, irregular maintenance system has been observed in most of the cases. In this context, 44 percent users have been identified who do not want to participate any maintenance activities related to cost involvement.

Dwellers' satisfactions about water supply facilities have been investigated through level of satisfaction and by a satisfaction index with eleven variables. The variables are availability of water supply, accessibility of water sources, waiting time, management and maintenance of the water sources, cost recovery system, seasonal variation, and storage provision. According to level of satisfaction, the aggregate results for all variables, percentage of satisfied users (36.4 %) are somewhat equal to unsatisfied users (37.5 %) in Ganaktuli, where as unsatisfied users (64.7 %) are three times more than satisfied users (21 %) in Dhalpur in GO managed areas. On the other band, in NGO managed areas, unsatisfied users (43.8 %) in Agargaon are slighty more than satisfied users (33.5 %), where as in Kallayanpur, unsatisfied users (57.1 %) are three times more

than satisfied users. In total, 51 percent users were unsatisfied, 27.7 percent respondents were satisfied and 21 percent just accepted the overall conditions of water supply facilities. Highest level of dissatisfaction was observed in Dhalpur (64.7 %) followed by Kallayanpur (57.1 %), Agargaon (43.8 %) and Ganaktuli (37.5 %). According to satisfaction index, NGO managed areas have shown somewhat better results than GO managed areas. In NGO managed areas, among eleven variables three variables (availability, accessibility, and location of the water sources) have shown the positive index and on the other hand only one variable has shown positive value in GO managed areas. Nevertheless, in respect of aggregate index for all variables of water supply facilities, NGO managed areas (-0.18) have shown slightly better results than GO managed areas (-0.24).

A wide range of problems related to water supply facilities has been identified. By using a priority ranking technique all the problems have been ranked. The various problems related to water supply facilities, are insufficient water supply, inaccessibility of water sources, cracked down platform condition, poor drainage and distant location of water sources, long waiting time, poor management, irregular maintenance, complex cost recovery system, insufficient supply of water in dry season, poor storage system and turbid water. Among the various problems long waiting time and insufficient supply of water ranked the 1st and 2nd position in GO managed areas. Where as in NGO managed areas, cracked down platform condition and poor storage system ranked 1st and 2nd positions respectively in Agargaon. In Kallaynpur, poor drainage system of water sources and turbid water rank 1st and 2nd positions among the various problems.

6.1.3 Sanitation Facilities

Very bad type of sanitation conditions prevails in all the four urban poor areas, and in this respect, NGO managed areas are worse than GO managed areas. On an average, 40 percent users felt 'bad' and about 47 percent users felt 'very bad' in regard to their sanitation facilities. The determinant causes for bad or very bad conditions of sanitation facilities are, one latrine for many people (84.9 %), harmful to health (20.3 %), lack of maintenance (14.5 %), etc. In most of the cases, there is no separate latrine for woman except in Ganaktuli, where 65 percent users have said that they have separate latrine for

woman. In Kallayanpur, such kind of separate latrines are not found. In maximum cases, the separate latrines for woman in Ganaktuli, Agargaon and Dhalpur are located out side the main house and stand beside the man's latrines. Only a few users (24 %) have been found who pay for using the sanitary latrines. Among the payee users in GO managed areas are the employee of the DCC who have to pay the bill along with their house rent. In NGO managed areas, the payee users pay their sanitation bill to the house owner or caretaker of the community latrine

The numbers of families per sanitary latrine are very high at present due to huge population pressure, but at the time of establishment of latrines the pressure was not so high. Most of the dwellers did not know the actual number of families fixed for one latrine at the establishment period but at present average number is 50-100 or above in all the four study areas. Actually, the provided facilities are not sufficient for the total number of dwellers and for this reason, many of the dwellers have made unsanitary *kutcha* latrines.

Only one-third number of latrines have been found running well in total and other two-third latrines have been found to be overloaded by stool or not fit for using. In GO managed areas, Ganaktuli (40 %) and in NGO managed areas, Agargaon (36.7 %) have shown somewhat better performance in respect of running conditions of the sanitation facilities. The platform conditions of the sanitary latrines of those two areas are also found better in comparison to Dhalpur and Kallayanpur. About 77 percent users in all four urban poor areas have said that the drainage conditions of the latrines are in bad shape except in Ganaktuli (32.5 %). Most of the users (85 %) have to wait in line to use the sanitary latrines, except some of the house/land owner and musclemen. The waiting number and duration may vary from area to area as well as person to person because age-old and children do not get the chance to use the latrines. So, the children and age-old people are used to defecate in open place or in the drain. Community people take the responsibilities in caretaking the sanitation facilities and others are land/house owner, ward commissioner, concerned GO/NGO officials, and others. However, periodic cleaning of the latrines are better performed by community people in GO managed areas than in NGO managed areas. In NGO managed areas, in many cases, community people

do not take any initiative to clean up the latrines. The various systems for cleaning the latrines are found such as sweeper engaged by responsible caretaker, or rented sweeper, GO/NGO appointed sweeper, anybody of the community and others. The sweepers appointed by the concerned GO/NGO are not always available and their performance of cleaning is very irregular. In this respect, Ganaktuli has shown the better performance than other areas. The cause behind irregular maintenance is that fifty percent of the dwellers do not want to pay any *taka* to clean up or repair the sanitary latrines. Only 42 percent users are identified who have paid TK. 1-30 in last three months for maintenance.

Dwellers' satisfactions about sanitation facilities have also been investigated through level of satisfaction and by the satisfaction index with thirteen variables. The variables are location of the sanitary latrines, accessibility, waiting time, structural conditions, platform conditions, sitting condition, performance of cleanliness, drainage conditions, maintenance and management system, cost recovery system, privacy condition, and acceptance for woman. According to level of satisfaction, in total, NGO managed areas have shown the worst conditions for all variables. It has been found that about 73 percent users in Agargaon are unsatisfied with the quality of sanitation facilities. On the other hand, in GO managed areas, about 53 percent users in Dhalpur and 44 percent users in Ganaktuli, are unsatisfied with the quality of sanitation facilities. According to satisfaction index, GO managed areas have shown somewhat better condition than NGO managed areas. Out of thirteen variables, eight variables in Dhalpur, and ten variables in Ganaktuli have shown the negative value of satisfaction index. Where as in NGO managed areas, except one variable in Agargaon, all variables have shown the negative value of satisfaction index. The only positive variable in Agargaon is location of sanitary latrine (0.17). The positive variables in Ganaktuli according to rank are location of sanitary latrine (0.34), platform condition (0.16), accessibility of the latrines (0.06), sitting condition (0.06), and structural condition (0.02). Highest negative index has been shown for the variable of acceptance for woman of the latrine facilities (-0.96) in Kallayanpur.

A list of thirteen problems related to sanitation facilities has been identified through users perception. The problems are distant location, inaccessibility of sanitary latrines, long waiting time, cracked down platform condition, unsatisfactory sitting arrangement, unclean platform, poor drainage and poor management and maintenance system, inferior latrine materials, visibility of stool, using problems at wet season, and spreading of stench which pollute the environment. In GO managed areas, long waiting time to use the latrine rank the top most problem and other priority problems are poor drainage, unclean platform, spreading of stench from the latrine, using problem in wet season, etc. In NGO managed areas, stench pollute the environment rank the top most problem and the other priority problems are visibility of stool, using problem in wet season, long waiting time, unclean platform etc.

6.2 Recommendations

Recommendations in this study are divided into two parts. The two parts are *Recommendations for Water Supply Facilities and Recommendations for Sanitation Facilities* and these are described below.

6.2.1 Recommendations for Water Supply Facilities

After studying, GO managed and NGO managed water supply facilities it can be said that neither of the systems have been found to be suitable for recommendation for all aspects such as types of facilities, provision standard, performance standard, maintenance and management systems, and cost recovery system for urban poor areas in Dhaka City However, individually Ganaktuli in GO managed areas and Agargaon in NGO managed areas can be taken as examples of better performance of water supply facilities for urban poor in Dhaka City. Some specific recommendations are described below which will be needed both for GO managed and NGO managed urban poor areas in this city.

Total number of water supply points should be increased both in GO managed and in NGO managed areas by the concerned authorities. Improvement should be needed for existing water sources, especially which are not working properly.

Illegal water sources have been found in NGO managed areas, so, if it is possible the water sources used illegally by the dwellers should be legalized. It can be done through NGO or any private organization or DCC itself, so that WASA can earn some revenue from urban poor and by this way, so-called system-loss in water supply will be decreased gradually.

Platform conditions of the water sources need to be improved especially in NGO managed (Kallayanpur) areas. Drainage condition of the water sources need to be improved in both GO managed and NGO managed areas.

Due to huge population pressure, every dweller has to wait in line several times in a day for long duration; for this reason, increase in number of water points as well as improvement of existing water sources should be the priority action for the concerned authorities; because of these problems are basic for all urban poor areas in Dhaka City.

Maintenance and management systems need to be improved, efficient, and regular. Community people or concerned officials who are engaged with management and maintenance systems should be more responsive

Urban poor live with very limited monthly income and they expend the whole income for their living purposes. For this reason, GO/NGO/CBO should come forward to provide the water supply facilities at affordable cost.

In respect of water storage, Ganaktuli would be an example to other urban poor areas in Dhaka City. Due to heavy seasonal variations dwellers of these poor areas do not get sufficient water in all the seasons. So, authorities should think about water storage provision.

Rainwater harvesting needs to be made popular to the dwellers of urban poor areas with easy techniques. It has been observed through the survey that many house owners have tin made roof, which can be used for rainwater harvesting. However, low-cost rainwater harvesting system should be innovated and introduced by the NGOs and GOs in these urban poor areas.

Locational analysis needs to be taken before providing the water supply facilities so that the facilities whether water points or tubewells, may serve maximum households with easy access to the facility.

6.2.2 Recommendations for Sanitation Facilities

Poor sanitation facilities have been found in all the four urban poor areas, in most of the aspects such as types of facilities, provision standard, performance standard, maintenance and management systems, and cost recovery system. However, GO managed sanitation is somewhat better than NGO managed.

Very bad conditions of sanitation facilities prevail in all the four study areas, and the main reason behind this condition is one latrine for many people. So, the concerned authorities should increase the number of latrines and improve the sanitation facilities by proper maintenance.

Separate latrines should be provided for women with appropriate privacy and these must be segregated from men's latrines. Structural improvements are needed for better performance of the existing latrines that would be helpful for solving wet season problems.

Water sources should be nearer to these sanitary latrines and by this way water can be used after using the latrines. Cost recovery system should be easier for the poor dwellers and should be affordable by them.

Number of users per sanitary latrine need to be checked regularly for maintaining the standard of provision as provided for actual number of families at the establishment period.

Management and maintenance systems need to be more efficient and regular so that the unfit or partially unfit latrines become fit for use, and also they remain clean and germs free for healthy sanitation.

Community people should take care of cleaning the latrines especially who use the particular latrine. By this way, participatory process will be added and everybody can take part in the cleanliness of the sanitation facilities. Such type of latrine does not spread the stench and environment will remain hygienically safe for the dwellers.

Due to poor structural condition of the latrines privacy from the out side is a serious problem, especially for the women. So, there is need to improve the structural conditions of existing sanitation facilities and by this way, the latrine will be more acceptable for women.

6.3 Conclusions

By the rapid urbanization, urban poor areas (slums and squatters) have proliferated in every urban center of Bangladesh. The proliferation of slums and squatters in urban areas especially in major metropolitan cities in this country is one of the degraded environmental problems. These urban settlements are most deprived areas in respect of getting urban facilities. Though the GOs and NGOs have taken some efforts recently but due to huge population pressure in these poor areas, the projects and programs under taken by the different organizations, are going to be unsuccessful. The causes behind this unsuccessfulness are, limited facilities, poor maintenance and management systems, complex cost recovery system, etc. In this context, water supply and sanitation facilities for urban poor in Dhaka City not beyond those limitations. Nevertheless, other various problems are associated with water supply and sanitation facilities provided by GOs and NGOs for urban poor have also been investigated in this city. So, there is an acute need to address the various problems associated with water supply and sanitation facilities provided by different organizations for urban poor in Dhaka City. In this respect, citizens, community people, CBOs, GOs, NGOs with collaboration from the donor agencies, and private organizations should take a cooperative approach to improve the water supply and sanitation conditions specifically, and overall environmental conditions totally as well as the quality of life of urban poor. For this reason, systematic and comprehensive researches are necessary for evaluating and monitoring as well as improving the provided facilities by different organizations.

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SITE IDENTIFICATION

01. General Information About Slum/Squatter Settlement

Name:_____

Address:_____

Ward No:_____

Total Area (in acre):_____

No of Household:_____

Infrastructure Condition of the Houses:_____

Total Population:_____

Land Level Characteristics (High/Low Land):_____
_____
_____

Nature of the Settlement (Public/Private Land):_____
_____

02. Water Supply Related Information

Name of the Supplier(GO/NGO/CBO/Owner):_____

Supply System (Free/Rental):_____

Type of Water Sources Mainly Use (Tap/Stand Point/Tube Well):_____
_____

Duration of Supply:_____

Management Body:_____

Number of Tube Wells Functioning in the Area:_____

Number of Stand Points Functioning in the Area:_____

03. Information About Sanitation Condition

Name of the Supplier(GO/NGO/CBO/Owner):_____

Supply System (Free/Rental):_____

Type of Toilet Facility Mainly Use (Public/Community/Own/Other):_____
_____

Infrastructure Condition of Toilets:_____
_____

Duration of Supply:_____

Management Body:_____

04. Information About GOs, NGOs, CBOs and any other Organizations related to Water Supply and Sanitation Facilities in the Slum/Squatter Settlement

Name of NGOs:_____
_____

Total Number of NGOs:_____ Duration of their Involvement:_____

Name of GOs:_____

Total Number of GOs:_____ Duration of their Involvement:_____

Name of CBOs:_____
_____

Total Number of CBOs:_____ Duration of their Involvement:_____

Other Organizations:_____
_____
_____

* Other Interesting Information about Water and Sanitation Condition (If any):_____
_____
_____

Date:----------

Bangladesh University of Engineering and Technology (BUET), Dhaka
Department of Urban and Regional Planning
Questionnaire for
"A Comparative Study of GO Managed and NGO Managed Water Supply and Sanitation Facilities For Urban Poor in Dhaka City"
(Questionnaire for Household Survey)

(For Research Purpose Only) Identification Number: ( )

1. HOUSEHOLD/FAMILY INFORMATION

1.1 Name of the Slum:_____

1.2 Name of the Area:_____

1.3 Name of the Household Head:_____

1.4 Type of Family: i. Single ii. Combined iii. Others iv. No Response

1.5 Religion: i Muslim ii. Hindu iii. Christian iv. Buddhist v. No Response

1.6 Resident's Status: i. Owned ii. Tenant iii. Freehold iv. Leasehold v. No Response

1.7 Settled in this Slum: i. Since Grand Father's Time ii. Since Father's Time iii. Since Own Time (How Long:_____ Years) iv. No Response

1.8 Detail Information about each of the Member of the House Hold

Members		Head	2	3	4	5	6	7	8	9	10	11	12
Age													
Sex													
Education													
Occupation	**Primary**												
	Secondary												

Code: **Sex:** 1. Male 2 Female

Education: 1. Illiterate 2. Primary 3. Secondary 4. SSC 5. HSC 6. Graduate 7. Master's 8. Others

Occupation: 1. Day Labour/Porter/Construction Worker 2. Rickshaw/Van puller 3. Push Cart Driver 4. House Hold Worker 5. Garments Worker 6. Mason 7. Service (Govt./Private) Holder 8. Transport Worker (Bus/Truck/Tempo) 9. Factory Worker 10. Petty Businessman 11. Salesman 12. Tailor 13. Mechanic 14. Gardener 15. Student 16. Beggar 17. Unemployment 18. House Wife 19. Others

1.9 House Hold Income (Per Month)

Own:_____(Taka/Month)
Children/Wife:_____(Taka/Month)
Family (Total):_____(Taka/Month)

1.10 House Hold Expenditure (Per Month) [Please include all expenses like food, housing, clothing, utility service charge, medical, education etc.]

Family (Total)_____ (Taka/Month)

1.11 Do you live in owned house or rented house? i. Owned..... ii. Rented .....

a. If owned, what is the cost of the house? Cost: _____ Tk.

b. If rented, how much is the monthly rent? Monthly Rent: _____ Tk.
c. To whom you pay the rent? Specify: _____

2. INFORMATION ABOUT WATER SUPPLY

2.1 We would like to know are you using different sources of water for different purposes? (Please use tick only)

Source of Water Supply	For Drinking & Cooking Purpose	For Cleaning, Bathing & Washing Purpose	For All Purposes
Piped Water (DWASA): Own House Connection			
Piped Water: Connected through Neighbors			
Piped Water. Public Water Point (Road Side)			
Tubewell (Public/Private/NGO)			
Others (Specify): Pond/River/Canal/Well etc.			

2.2 If you mainly use piped water what is the source you get piped water from?

i. From DWASA pipe connection .....

ii. From a water point (installed by a NGO) .....

2.3 If the supply of water is not free of cost, what is the monthly cost you have to pay? [In case of daily payment and or charges based on use quantity of water please calculate on a month basis.]

i. I have to pay (monthly)_____ Taka ii. I don't pay separately as it is included in the house rent iii. Others (Specify)_____

2.4 Do you get sufficient supply of water? i. Yes ..... ii. No .....

In case of no, do you have to buy/pay to meet your water requirement?

i. Yes ..... ii. No .....

If yes, what are the extra amount you spend for your additional water requirement per month? Cost of Additional Requirement _____Taka.

2.5 What is the number of users (family/person) per water source?

i. Number at the year of establishment: _____

ii. Number at present: _____ iii. Don't Know .....

2.6 Do you get sufficient water supply from this water sources both at dry season and wet season?

i. Get sufficient water supply at all the seasons .....

ii. Get sufficient water supply at wet season but do not get at dry season .....

iii. Get do not get sufficient water supply at all the seasons .....

If you get sufficient water at wet season or do not get sufficient water supply at all the seasons, what are the alternative sources of water supply on that periods?

i. From neighbor's house ..... ii. From another house..... iii. From pond/river/canal ..... iv. From illegal WASA's connection ..... v. Depend on fate ..... vi. Others (Specify)_____

2.7 What is the present conditions of the water sources (tubewell/stand point)?

i. Running ..... ii. Choked up partially..... iii. Choked up completely..... iv. Temporarily out of order .....

2.8 What is the platform condition of water sources?

i. Good..... ii. Cracked..... iii. Tilted damaged..... iv. Not exists.....

2.9 What is the drainage condition of the platform of water sources?

i. Good..... ii. Moderate..... iii. Bad.....

2.10 Do you have to wait in line to collect water? i. Yes..... ii. No.....

If yes what times you have to wait in line in a day and what is the duration of each waiting time?

I have to wait _____ time(s) in a day and duration of each waiting time (approximately) is_____ minutes.

2.11 Who is the caretaker of water supply?

i. Ward Commissioner..... ii. Community Member..... iii. Land/House Owner..... iv. Muscleman of the Slum..... v. Concern NGO/GO Official..... vi. Others (Specify)_____

2.12 After breaking down any tubewell/stand point, who repair these facilities?

i. Caretaker..... ii. Rented repairman..... iii. NGO/GO's repairman..... iv. Anybody of the community..... v. Don't take any initiative for repairing the facilities .....

2.13 What is the frequency of maintenance?

i. Frequently..... ii. Moderate frequently..... iii. Not frequently.....

2.14 What is the cost of maintenance you have to pay in last three months for water supply purpose?

i. Amount of TK. _____ ii. Don't Know.....

2.15 Respondent's perception of satisfaction of provided water supply facilities (Please use tick mark on each item/variable relevant to the level of satisfaction).

Items/Variables	Satisfactory	Acceptable	Unsatisfactory
i. Availability of water supply			
ii. Accessibility of water supply			
iii. Platform condition of tubewell/standpoint			
iv. Drainage condition of platform			
v. Location of water source			
vi Waiting time to collect water			
vii Management of water collection			
viii. Maintenance system			
ix. Cost recovery system			
x. Seasonal variation			
Xi Storage provision			

2.16 Respondent's perception of problems related to water supply facilities (Use priority ranking as describe by the respondent).

No.	Problems Related to Water Supply Facilities	Rank
1.	Insufficient water supply	
2.	Inaccessibility of water	
3.	Platform condition is cracked down or nonexistent	
4.	Drainage condition of platform is very poor	
5.	Location of water source is not satisfactory	
6.	Have to stay long time to collect water	
7.	Unskilled management system	
8	Maintenance system is not frequently	
9.	Have to pay more cost than that of actual	
10.	Could not get water in dry season	
11.	There is no storage provision	
12.	Turbid water which could not use as drinking water	

2.17 Others Comments Related to Water Supply:_____

_____

_____

_____

_____

_____

3. INFORMATION ABOUT SANITATION FACILITIES

3.1 How do you rate your sanitation facility?

i. Good..... ii. Fair..... iii. Bad..... iv. Very Bad..... v. No Comment.....

If bad or very bad why do you think it is so?

i. One latrine for many people..... ii. Nobody takes care of maintenance..... iii. Lack of privacy..... iv. Harmful to health..... iv. No reply..... v. Others (Specify)_____

3.2 Do you have separate latrine for men and women? i. Yes..... ii. No.....

If yes, where is the latrine located for women?

i. Inside the inner house..... ii. Outside the house..... iii. Beside/Behind the men's latrine..... iv. Neighbors house..... v. Others.....
(Specify_____)

3.3 Do you have to pay any cost to use the sanitary latrine? i. Yes..... ii. No.....

If yes how much you have to pay per month? [In case of daily basis, calculate it for monthly]

i. I have to pay (monthly)_____Taka ii. The cost is included in my house rent ..... iii. Others (Specify)_____

iv. Don't Know .....

3.4 What is the number of users (family/person) per latrine?

i. Number at the year of establishment: _____

ii. Number at present: _____ iii. Don't Know .....

3.5 What is the present conditions of the latrines?

i. Running..... ii. Fill up by stool partially..... iii. Fill up by stool completely..... iv. Do not fit for use.....

If the latrine is not fit for use, what are the relevant causes: _____

_____

3.6 What is the platform conditions of latrine?

i. Good..... ii. Cracked..... iii. Tilted damaged..... iv. Not exists.....

3.7 What is the drainage condition of the latrine?

i. Good..... ii. Moderate..... iii. Bad.....

3.8 Do you have to wait in line to use the latrine? i. Yes..... ii. No.....

If yes what times you have to wait in line in a day and what is the duration of each waiting time?

I have to wait _____ time(s) in a day and duration of each waiting time (approximately) is_____ minutes.

3.9 Who is the caretaker of sanitation facilities?

i. Ward Commissioner..... ii. Community Member ..... iii. Land/House Owner..... iv. Muscleman of the Slum..... v. Concern NGO/GO Official..... vi. Others (Specify)_____

3.10 After fill up with excreta of any latrine, who engage sweepers for cleaning?

i. Responsible caretaker clean up the latrine by the sweepers..... ii. Rented sweepers clean up the latrine regularly..... iii. NGO/GO's appointed sweepers clean up the latrine..... iv. Anybody of the community clean up the latrine..... v. Don't take any initiative for cleaning up the latrine.....

3.11 If sweepers are appointed by NGO/GO, what is the availability of sweepers?

i. Available..... ii. Not available.....

3.12 What is the frequency of maintenance of these latrine?

i. Frequently..... ii. Moderate frequently..... iii. Not frequently.....

3.13 What is the cost of maintenance you have to pay in last three months for latrine facilities purpose?

i. Amount of TK. _____

ii. Don't Know .....

3.14 Respondent's perception of satisfaction of provided sanitation facilities (Please use tick mark on each item/variable relevant to the level of satisfaction).

Items/Variables	Satisfactory	Acceptable	Unsatisfactory
i. Location of latrine			
ii. Accessibility			
iii. Waiting time			
iv Condition of the structure			
v Platform condition			
vi. Siting condition			
vii. Performance of cleanliness			
viii. Drainage condition			
ix. Maintenance system			
x. Management body			
xi. Cost recovery			
xii. Visible (from outside) condition			
xiii Acceptance for women			

3.15 Respondent's perception of problems related to sanitation facilities (Use priority ranking as describe by the respondent).

No.	Problems Related to Sanitation Facilities	Rank
1.	Long distance location of the latrine	
2.	Inaccessible	
3.	Have to stay long time to use the latrine	
4.	Cracked down platform condition	
5.	Unsatisfactory sitting arrangement	
6.	Unclean platform surface	
7.	Drainage condition is very poor	
8.	Unskilled management system	
9.	Maintenance system is not frequently	
10.	Inferior quality latrine materials	
11.	Stool is visible	
12	Problems in using latrine in wet season	
13.	Stench spreads out and pollute the air	

3.16 Other Comments Related to Sanitation Facilities:_____

_____

_____

_____

_____

_____

_____Thanking You for Your Kind Cooperation_____

Name of the Interviewer :_____Date:_____

Bangladesh University of Engineering and Technology (BUET), Dhaka
Department of Urban and Regional Planning
Questionnaire for
"A Comparative Study of GO Managed and NGO Managed Water Supply and Sanitation Facilities For Urban Poor in Dhaka City"
(Questionnaire for Community Survey)

(For Research Purpose Only) Identification Number: ( )

1. Name of the Slum:_____
2. Name of the Area:_____
3. Ward No.:_____
4. Ownership of the Slum (Public/Private):_____
5. Total Households in the Slum:_____
6. Total Population in the Slum:_____
7. Who are working for water supply and sanitation facilities in your slum?
   i. Governmental Organizations (GOs). ..... ii. Non-governmental Organizations (NGOs)..... iii. Both GOs and NGOs..... iv. Nobody.....
   v. Others (Specify):_____
8. Do you know the name of concern GOs/NGOs working for water and sanitation facilities in your slum?

Name of Concern GOs	Name of Concern NGOs

9. When they started their program? (Year of establishment/starting)
   Water Supply:_____ Sanitation Facilities:_____
10. What types of water sources you mainly use?
    i. Shallow Tubewell..... ii. Deep Tubewell..... iii. Stand Point.....
    iv. Piped water connected through WASA..... v. Hand Tubewell on WASA's Connection ..... vi. Ring Well..... vii. Pond Sand Filter..... viii. River/Pond/Cannel .....ix. Rainwater Harvesting at Wet Season..... x. Others (Specify):_____
11. Do you know the total number of existing water sources (Tubewell/stand point)?
    i. Yes..... ii. No.....
    If yes, what is the total number? Total Number:_____
12. Among the total water sources how many working at present?

Working Total:_____ Non-working Total:_____

13. Who is the management body of the water supply facilities?

i. Concern GO/NGO..... ii. Community people..... iii. Ward Commissioner..... iv. Muscle man..... v. There is no management body..... vi. Others (Specify) _____

14. If the management body is concerned GO/NGO, what is cost recovery system?

i. The facilities are free of cost..... ii. Concern GO/NGO has collected the cost at a time..... iii. Concern GO/NGO has collected the cost installment..... iv. Others (Specify)_____

If the concerned GO/NGO has collected cost at a time, what is the amount you have to pay? Amount of TK. _____

If the concerned GO/NGO has collected cost installment, what is the amount you have to pay in each installment? Amount Per Installment TK._____

15. If the management body is community people, what is cost recovery system?

i. Head of the community pays the money..... ii. Head of the community collects the money at a time..... iii. Head of the community collects the money installment..... iv. Others (Specify)_____

If head of the community collects the money at a time, what is the amount you have to pay? Amount of TK. _____

If head of the community collects the money installment, what is the amount you have to pay? Amount of TK._____

16. What types of sanitatiou Facilities you mainly use?

i. Water Seal/Slab Latrine..... ii. Pit Latrine..... iii. Septic Tank Latrine..... iv. Open Latrine..... v. Hanging latrine..... vi. Public Toilet..... vii. Others (Specify):_____

17. Do you know the total number of existing sanitary latrines?

i. Yes..... ii. No.....

If yes, what is the total number? Total Number._____

18. Among the total sanitary latrines bow many working at present?

Working Total:_____ Non-working Total:_____

19. Who is the management body of the sanitation facilities?

i. Concern GO/NGO..... ii. Community people..... iii. Ward Commissioner..... iv. Muscle man..... v. There is no management body..... vi. Others (Specify) _____

20. If the management body is concerned GO/NGO, what is cost recovery system?

i. The facilities are free of cost..... ii. Concern GO/NGO has collected the cost at a time..... iii. Concern GO/NGO has collected the cost installment..... iv. Others (Specify)_____

If the concerned GO/NGO has collected cost at a time, what is the amount you have to pay? Amount of TK. _____

If the concerned GO/NGO has collected cost installment, what is the amount you have to pay in each installment? Amount Per Installment TK._____

21. If the management body is community people, what is cost recovery system?

i. Head of the community pays the money..... ii. Head of the community collects the money at a time..... iii. Head of the community collects the money installment..... iv. Others (Specify)_____

If head of the community collects the money at a time, what is the amount you have to pay? Amount of TK. _____

If head of the community collects the money installment, what is the amount you have to pay? Amount of TK._____

22. Who are responsible for maintenance of these Facilities (water and sanitation)?

i. Community People..... ii. Concern GO/NGO..... ii. Others (Specify):_____

23. Who are the bearer of maintenance cost (water and sanitation)?

i. Community People..... ii. Concern GO/NGO..... iii. Community Leader..... iv. Others (Specify):_____

24. What kinds of problems you mainly face to get/use these (water and sanitation) facilities?

Problems Related to Water Supply	Problems Related to Sanitation Facilities
i.	i.
ii.	ii.
iii.	iii.
iv.	iv.
v.	v.
vi.	vi.
vii.	vii.
viii.	viii.
ix.	ix.
x.	x.

Extra Comments:_____

_____

_____Thanking You for Your Kind Cooperation_____

Name of the Investigator:_____ Date:_____

Appendix: 04 Priority Ranking Matrix

Table: 01 Priority (Technique) Matrix for the Ranking of Problems by getting *mini score* for Water Supply Facilities in Ganaktuli (N = 40)

SP	Respondents Scoring for the Ranking of Problems																		RV
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	1	1	1	1	1	6	7	5	8	9	5	10	12	2	10	10	7	2	1	CONTINUE
2	2	3	2	2	2	7	8	11	12	10	8	8	5	12	11	9	8	6	1	
3	9	8	6	11	7	8	9	12	11	11	12	11	4	3	12	4	4	3	4	
4	10	4	7	12	6	9	10	10	10	8	7	9	7	7	3	5	11	7	7	
5	7	9	10	5	8	10	1	2	3	1	6	7	6	6	4	1	5	11	6	
6	5	2	5	3	5	2	3	3	2	3	4	4	1	1	1	2	1	4	5	
7	11	10	8	10	12	5	6	8	6	5	11	5	8	10	9	6	10	8	8	
8	8	5	9	7	11	4	5	9	5	6	10	6	3	11	8	7	9	9	9	
9	12	12	12	9	10	11	11	7	4	4	9	12	11	8	5	8	6	10	10	
10	6	6	4	8	9	12	12	4	9	7	2	3	9	9	6	11	12	11	12	
11	4	11	11	6	4	3	4	6	7	12	3	2	2	4	2	3	3	12	2	
12	3	7	3	4	3	1	2	1	1	2	1	1	10	5	7	12	2	1	3	

Sources: Field Survey, 2000

Note: SP = Serial of Problems based on Questionnaire
RV = Relative Value

Cont. Table: 01 Priority Matrix

SP	Respondents Scoring for the Ranking of Problems																				RV	RK
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
1	4	4	8	3	6	1	2	6	9	5	4	4	5	4	5	1	3	1	1	4	1	170	2
2	1	3	5	5	2	12	1	1	2	1	2	1	2	3	4	12	1	2	2	5	2	196	3
3	8	10	7	4	4	8	6	8	6	7	5	7	7	6	10	4	10	12	6	10	12	306	10
4	3	2	6	2	5	10	5	7	5	6	7	8	10	8	3	2	11	11	8	11	4	283	8
5	9	6	1	6	3	9	12	10	10	9	9	5	9	10	11	8	12	5	4	12	11	279	7
6	2	1	2	1	1	1	11	3	2	3	2	3	6	3	5	1	11	6	4	10	8	146	1
7	11	12	3	12	12	7	11	3	7	4	10	9	8	9	9	9	5	6	11	6	6	326	11
8	10	11	9	10	7	6	9	4	8	4	6	10	11	5	2	10	9	7	9	3	7	297	9
9	6	5	12	11	10	2	10	9	11	8	8	11	6	7	12	7	8	9	12	9	10	354	12
10	5	7	4	7	9	3	4	5	4	10	3	3	4	1	8	6	4	8	7	2	8	262	5
11	7	8	11	9	8	4	7	11	12	12	12	12	7	3	7	3	5	7	9	11	12	278	6
12	12	9	10	8	11	5	8	12	1	12	11	2	1	2	6	5	2	10	3	1	3	204	4

Sources: Field Survey, 2000

Note: SP = Serial of Problems based on Questionnaire
RV = Relative Value RK = Rank

Plate: 01 A typical shallow hand tubewell provided by Plan International in Agargaon.

Plate: 02 A woman is collecting water from shallow hand tubewell in Kallayanpur provided by DSK.

Plate: 03 Dwellers are collecting water from stand points in Ganaktuli provided by DCC.

Plate: 04 Water supply system in Dhalpur where tubewells are used for collecting water from DWASA's pipelines.

Plate: 05 Dwellers are waiting to collect water from a stand point in Ganaktuli along with a lot of jars where girls are the water collectors in most cases.

Plate: 06 An Bogal DWASA's water connection in Agargaon.

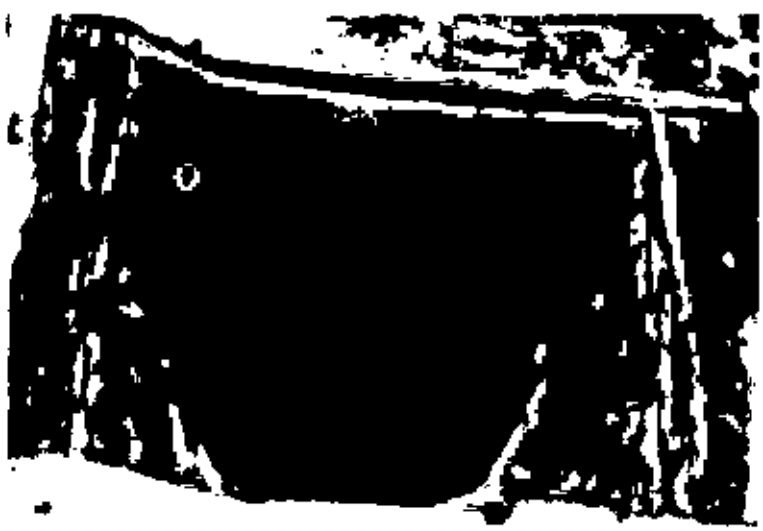

Plate: 07 A typical water reservoir system (hand made ring well) in Kallayanpur. Dwellers use such kind of turbid water for bathing, washing utensils and even for cooking.

Plate: 08 Poor platform and drainage conditions of the water sources are a common scene in Dhalpur.

Plate: 09 A non-working tubewell in Agargaon, however, the platform condition is found satisfactory.

Plate: 10 Dwellers (both male and female) are bathing by using the reservoir water in Ganaktuli.

Plate: 11 Dwellers do not get water from the tubewells provided by DCC when DWASA's pipeline remains empty.

Plate: 12 Co-existent of water points, latrines and bathing place in Agargaon.

Plate: 13 Due to poor maintenance and management, community latrines in Ganaktuli provided by DCC going to be disordered.

Plate: 14 Unsatisfactory structural and visual conditions of community latrines provided by Plan International in Agargaon usually fill up by excreta. Acceptance for women is a question to use these latrines.

Plate: 15 Well structured community latrines in Dhalpur but maintenance and management systems are very poor.

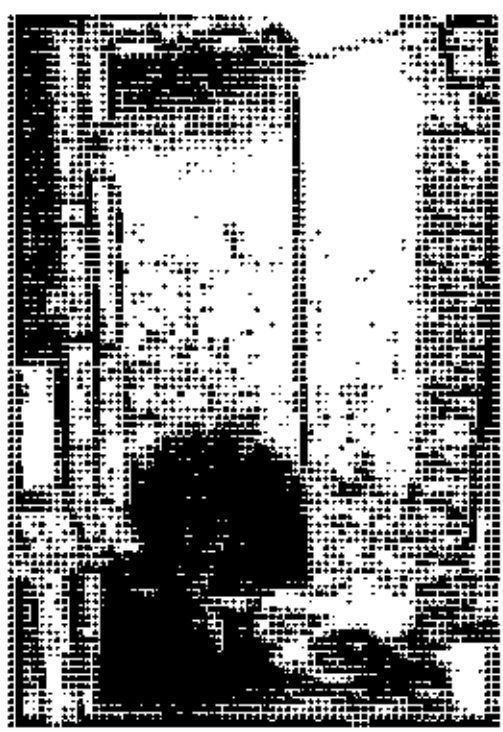

Plate: 16 A non-working community latrine in Kallayanpur.

Plate: 17 A house wife is cooking by using biogas, however, the biogas plant did not get the wide acceptibility of the dwellers in Agargaon.

Plate: 18 Children usually deficate on the open drains, which is a common scene in all urban poor areas in Dhaka City.

Plate: 19 Kutcha hanging latrines on the low laying area in Kallayanpur, dwellers usually make such kind of latrines due to heavy pressure on communlty latrines provided by different organizations. This kind of open latrine is very harmful to the citizens health as well as overall environment of the city.

Plate: 20 Co-existent of community latrines and garbage disposal spot is not a sign of proper location.