WATER SUPPLY, SANITATION AND SOLID WASTE MANAGEMENT SITUATIONS OF SELECTED SLUMS IN DHAKA CITY

BY

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To

My Teacher

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ABSTRACT

Bangladesh has experienced an extremely rapid growth in urban population. This unplanned and unregulated growth is putting serious pressures on urban land and utility services. The problem is particularly acute in the capital city Dhaka. Many of the city's poorest population live in more than 3007 densely populated slum and squatter settlements in abject physical and environmental conditions. In the present research work, an attempt has been made to study the existing condition of water supply, sanitation, drainage and solid waste management systems of eight selected slums from residential, industrial and sub-urban areas in Dhaka City. Field survey and door to door interviews were conducted to collect data and information. This study has identified a number of factors, which have significant influence on slum improvement activities. It was found that legal possession of the slum, permanency of slum, local muscle power, political interferences, etc. play significant roles in the development of slum's overall situation. The impacts of various interventions for slum improvement were also investigated in this study. It was shown in this study that slum dwellers have better access to safe drinking water, although the supply is not sufficient. The main source of drinking water in the slum is WASA supply water. 'Water Point' is a newly introduced system for water supply which stores the WASA supplied water in a reservoir and then distributed it within the slum. It has been observed that slum dwellers have very limited access to sanitation facilities. The existing number of pit latrine is much less than the required for the huge population. In general it was found that the drainage systems of the slums are in poor condition and grossly neglected. It was found that solid waste disposal system in slums is getting better because of the introduction of barrel composting of wastes by different NGOs.

The present study also investigates the impact of location on slum's environmental condition. It was observed that the situation of slums located in sub-urban area is worse in all respects than those located in residential and industrial areas. It was evident from the study that slum dwellers are willing to pay for the services and are eager to improve their condition.

GLOSSARY

Bastee	Dense slum community territorially defined by influence of a leader, with poor environmental and living conditions
Slum	General term also used to designate urban poor renting private land
Squatter	Unauthorized inhabitant of public/ government land
Thana	Sub district Administrative Area
Khas	State owned land not specifically allocated to any government agency
Kucha	Temporary building material

ABBREVIATION

ADB	Asian Development Bank
BRAC	Bangladesh Rural Advancement Committee
CUP	Coalition for the Urban Poor
CUS	Center for Urban Studies
DCC	Dhaka City Corporation
DMA	Dhaka Metropolitan Area
DMDP	Dhaka Metropolitan Development Plan
DSK	Dustha Shathaya Kendra
DWASA	Dhaka Water and Sewerage Authority
GO	Government Organization
ICDDR, B	International Center for Diarrhoel Diseases Research, Bangladesh
LGED	Local Government Engineering Department
NGO	Non Government Organization
UPRP	Urban Poverty Reduction Project

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Chapter 1

INTRODUCTION

1.1: GENERAL

Bangladesh has experienced an extremely rapid growth in urban population. The urban population growth rate has been over 6 % over the last decades --- well above the national population growth rate of 2.5 % per annum (ADB, 1996). A large fraction of the population of Dhaka City lives in slums. These slums and slum people are the major concern of Dhaka city. Slums and slum population are placing serious pressures on urban land and utilities. A lot of factors influence the slum pockets to increase day by day. Besides the urbanization, there are rural pushes (landlessness, unemployment, natural disasters etc.) and urban pull (employment opportunities) encouraging the rural poor migration to the city areas. A field survey of UPRP and CUS (1996) shows that the total number of slums and squatter settlements within Dhaka City Corporation (DCC) is 3,007. The slum dwellers are deprived of the basic needs of living. Basic urban services include safe water supply and sanitation, drainage systems, garbage disposal facilities etc. Slum dwellers have very limited access to these services. Moreover, the quality of existing services is poor and supply is inadequate. The Asian Development Bank Urban Poverty Study shows that sanitation conditions in the slums are not at all satisfactory, with only 20% of households having access to sanitary latrine (ADB, 1996). Approximately 22% of households use municipal bins with 38% using ground pits for garbage disposal. About 42% of slum and squatter dwellers have no definite place to dispose of their solid waste. Any initiatives for the slum improvement project needs information on the existing situation of basic services in slum areas i.e. a baseline survey. This study is being undertaken with a view to

establish the baseline condition of the slums in Dhaka city with respect to water supply, sanitation, drainage and solid waste management systems.

1.2 OBJECTIVES OF THE STUDY

The main objectives of the study are:

i. Assessment of existing water supply, sanitation, drainage and solid waste management practices of selected slums in Dhaka City.
ii. To investigate the impacts of different slum improvement projects on slum population.
iii. To identify the major parameters influencing the improvements of the environmental condition of slums and to recommend some necessary measures to be undertaken for slum improvement.
iv. To compare the basic facilities available in slums of residential, industrial and sub-urban slums.
v. To prepare a map of showing the existing physical facilities of basic services like water supply, sanitation, drainage and garbage disposal practices in the selected slums.

1.3 SCOPE OF THE STUDY

To achieve the objectives, an extensive literature review was conducted for background information of slums in Dhaka city. A number of slums were randomly selected from residential, industrial areas and sub-urban slum to ensure that representative data are obtained. These three selected categories will present a clear picture of existing environmental condition of slums within Dhaka city. Field survey and door to door interview was conducted to assess and collect data on the existing condition of the stated topic. Analysis was carried out to study the effects of various factors on slum improvement programs for better living of the slum dwellers. Finally maps of the selected slums were prepared showing the availability of basic services.

1.4 ORGANIZATION OF THE REPORT

This study is presented in seven chapters. Chapter 1 sets out the scenario of urban poor's lifestyle, including the objective and scope of the study. Chapter 2 compiles a selection of relevant literature, which provides insight into the slum characteristics, existence of basic services in slum, and different GO and NGOs slum improvement activities. Chapter 3 describes the methodology of the study. Chapter 4 presents the outcome of the baseline survey. It also presents the base map of each study area. Chapter 5 provides a brief description of various technologies and approaches used in slum improvement programs. Chapter 6 concentrates on the detail analysis of the existing situation in slums. This is followed by discussion and conclusions of the study reported in Chapter 7. Appendix A presents a sample of questionnaire which is used as a part of field survey.

Chapter 2

REVIEW OF LITERATURE

2.1 INTRODUCTION

Cities, with their economics of scale are important centers for production, innovation and employment. Yet, most of the mega cities in developing countries experiences extreme poverty and Dhaka, the capital of Bangladesh, is no exception. Dhaka is one of the fastest growing mega cities in the world, here poverty coexists with prosperity. Every year, the poor, unemployed, landless villagers come to Dhaka for the hope of shelters and employment. Dhaka's population is growing at a rate of more than 6% annually (CUS, 1996) as rural migrants displaced either by natural disasters like flood, cyclone, river erosion, draught or economic necessity, and surge into the city. In Dhaka, urban infrastructure has not expanded commensurate with growth in population. These deficiencies in urban infrastructures and services impact particularly on the urban poor. Therefore, most of this population can not afford proper housing and as a result, a large percentage of urban population lives in slums. About five million people out of total 12 million population of Dhaka live in slums (ActionAid, 2002). A detail information on the characteristics of the urban poor i.e. slum growth, age of slums, slum population, access to basic services in the slums etc. are described in the following sections.

2.2 WHAT IS SLUM?

Slums are generally termed as densely constructed huts, usually arranged in rows and often containing multiple families of the urban poor. The huts usually have mud paved floor--- very few have pacca floors. The walls and roofs are frequently made of split bamboo. Plastic sheet of thatch on the roof provide limited protection against rain. Slum can be characterized by three main features:

- Predominantly poor housing
- Housing density and population density are very high and
- Poor water supply, sewerage, drainage and other basic services.

According to CUS (1991), slum can be defined as follows:

> "A slum or squatter cluster is an area containing contiguous slum/squatter settlements, and separated by non-slum objects or by distance. Common non-slum objects which separate slum units are vehicular roads, factories, multi-storied buildings, schools, non-slum residential areas, commercial places, open spaces, ditches and canals. A walking distance of a minute or so is also a separator. On the other hand, if more than one of such units, separated by ditch, canal or open space is connected by Bamboo Bridge or large water or sewerage pipeline with a maximum length of a minute of walking distance, they are considered to be in a single unit".

Various terms such as 'squatters', 'clusters', 'bastee' and etc. are frequently used to identify the same type of settlements like 'slum' although there are minute differences among them. Slums and squatters are different mainly from the point of their legal status. While slums are generally substandard settlements on privately owned land, squatter settlements are the ones developed on illegally occupied or invaded public or semi public land. The term squatter settlement is also synonymous with such term as 'irregular settlement', 'unauthorized settlement', 'informal settlement' etc. The term 'cluster' is defined as the household which have existence for sometime and are not counted as slums/ squatters as their size are too small (less than 10 household).

Considering the characteristics of infrastructure, basic services and environmental conditions, there is no difference between slums, squatter, cluster or whatever the name of the urban poor settlements is. People in slums or squatters, lead a very miserable life, without proper housing, water, sanitation, gas and electricity.

2.3 GROWTH OF SLUM

The majority of the people in Bangladesh usually live in rural areas, involving mainly agricultural activities. But the rural push (landlessness, unemployment and vulnerability to natural hazards) and urban pull (employment opportunities) factors continue to encourage the migration of the rural poor to urban areas despite of declining standards of urban infrastructure and services. Most urban population growth has taken place at slums or squatter areas in the large cities. As a result these areas become the main location of extensive poverty. Dhaka has experienced extremely rapid growth in population in recent years. This population growth has arisen mainly through the heavy influx of migrants from rural areas (Islam, 1996; Mahbub, 1998), the bulk of whom are poor and who usually take shelter in the city's slum and squatter settlements. The growing dimensions of urban poverty present a millennium challenge for the Government.

In 1970, there were 730 slums in Dhaka city (CUS, 1996). After the independence of Bangladesh in 1971, the rate of migration to Dhaka increased significantly, about 90% of the slums and squatters were established in that period. In eighties, the number of slums in Dhaka city were 1068 (CUS, 1996). In the decade of 1990, the number rose to 2147. According to a survey by CUS (1996), there are 3007 nos. of small to large slums in Dhaka. Thus the growth of slums and squatters during the recent years is remarkable. In Dhaka city area, about 19% people (878293) live in 1125 slums out of total 4.8 million people (CUP, 1998). But for greater Dhaka area, about 40% people (about 3 million) out of 7 million are slum dwellers. Roughly about 5 percent of slums and squatter settlements are more than 30 years old. On the other hand, age of nearly a quarter (25.4%) of all settlements is up to 5 years. *Table 2.1* shows the slum formation rate with respect to time. About 42% of all slums are formed within last 10 years, 85% are formed within last 20 years.

Table 2.1 Age of Slum in Dhaka City *(CUS, 1998)*.

Age of slum	Number of slum	Percentage
Less than 5 years	286	25.4
6 to 10 years	248	22.0
11 to 15 years	255	22.8
16 to 20 years	171	15.2
21 to 25 years	55	4.9
26 to 30 years	33	2.9
Greater than 30 years	64	5.6
Not available	13	1.2
Total	1125	

The current estimated population for 2002 of the slums in and on the fringes of the Dhaka would be somewhere between 2.5 million and 3.0 million of the greater Dhaka Metropolitan Development Plan (DMDP) (1995-2015). *Fig 2.1* shows the growth of population and slum people in DMDP. The current population of the same area under the above plan is around 10.0 million. According to the same plan by the year 2015, the total population of DMDP area would be in 17 million. The slum population unless corrective policies are adopted and implemented, would range between five and six million. In excess of thirty five percent of whole Dhaka would be living in unauthorized land and in miserable slum conditions. The living conditions of the city in general and that of the slums in particular while bad as they are today, it needs initiatives to be taken to decrease the miseries of the slum people.

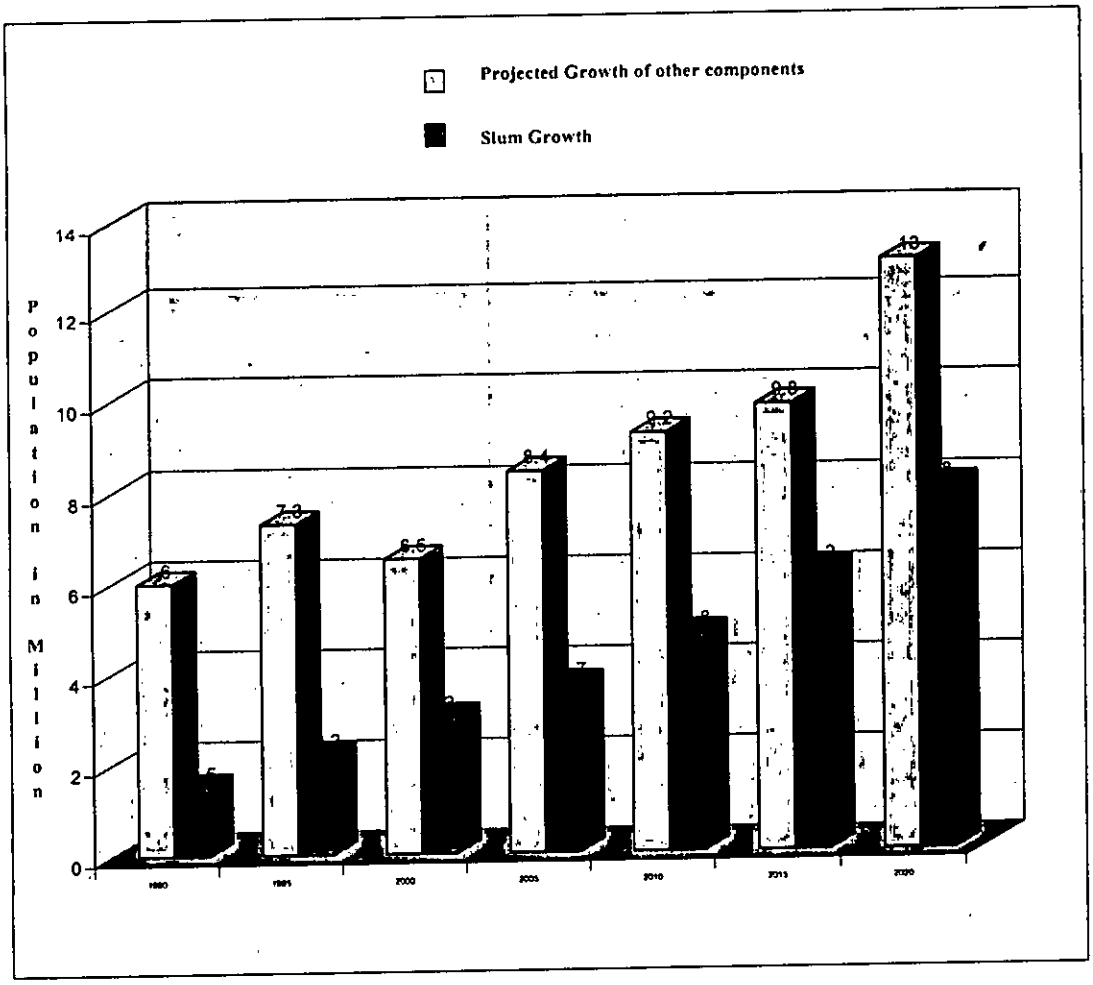


Fig 2.1 Growth Chart of city's Population and slum Population in DMDP Area (Nawaz, 1999).

2.4 SLUM CHARACTERISTICS

2.4.1 General

In 1996, Bangladesh Government undertook a project named 'Urban Poverty Reduction Project' (UPRP) for Dhaka City. Different organizations such as, LGED, CUS, ICDDRB, ADB were involved in that project. A survey was conducted by the co-ordination of CUS. The total number of slum and squatter settlements recorded by the CUS survey in 1996 is 3007 in the Dhaka Metropolitan Area (DMA) (*Table 2.2*). A large number of people in slum lead a very humiliating life. They are deprived of basic urban utilities like water supply, drainage and sanitation facilities, solid waste

disposal facilities, health services etc. The following sections present various features of slums in Dhaka City with respect to their numbers, population density, household distribution, access to basic services etc.

2.4.2 Location pattern and number of slums and squatter settlements in Dhaka City

All of the Dhaka's slums and squatter settlements (total of 3,007) were developed over the last 25 years (*Table 2.2*).

Table 2.2 Distribution of Slums and Squatter Settlements over the Last 25 years *(CUS, 1996).*

Period of Establishment	Number of Slums/ Squatters	Percent
Before 1971	315	10.5
1971-1980	782(avg. 78 pa*)	26.0
1981-1990	1369(avg. 137 pa)	45.5
Since 1991	541(avg. 108 pa)	18.0
Total	3007	100.0

***pa: per annum**

According to the CUS Survey conducted in 1991(*Fig 2.2*), the number of slums and squatter settlements within the survey (DMA) area totaled 2,156. The 1996 survey revealed that 507 nos. of clusters which was in the 1991 survey, vanished in 1996 survey. Thus, only 1,649 slums/squatters out of 2,156 recorded in 1991 have existence in 1996 survey. There appeared a surprising outcome within those five years (1991 to 1996), i.e. 507 nos. of slums had disappeared and 1,358 nos. of new slums were added in the 1996's map (*Fig 2.3*), thus totaling 3007 slums. *Fig 2.4(a)* and *(b)* shows the sites of slums and squatter settlements in Dhaka City according to CUS survey (1996). *Table 2.3* shows the detail variation of number of slums in 1991 and 1996 in Thana wise.

The reasons for the variation of the slum numbers within the period 1991-1996 can be explained as follows:

- Undercounting of slums
- Increased size of cluster leading to slum and
- For the dynamic characteristic of slum i.e. migratory nature of urban poor.

Although slums and squatters are commonly found in Dhaka city, there are some definite patterns in the location of these settlements. The peripheral zone of the city has a large concentration of slums compared with inner zones. Western fringe of the city (*Fig 2.3*) has the highest concentration of slums and squatters due to land availability and proximity to working places. Flood protection embankment accelerated the growth of slums along the western periphery. Kumrangir char, Islambag and Shahid Nagar (Lalbagh Thana) are most densely populated slums (*Table 2.3*). These are located very close to some of the city's major commercial areas (e.g. Chalk Bazar, Lalbagh, Islampur etc.). A large number of garments industries are located in Mirpur which is one of the causes of major concentration of slums and squatter settlements (*Table 2.3*) in that area. Distribution of slums in eastern periphery is scattered. The lowest concentration of slum is found in Uttara.

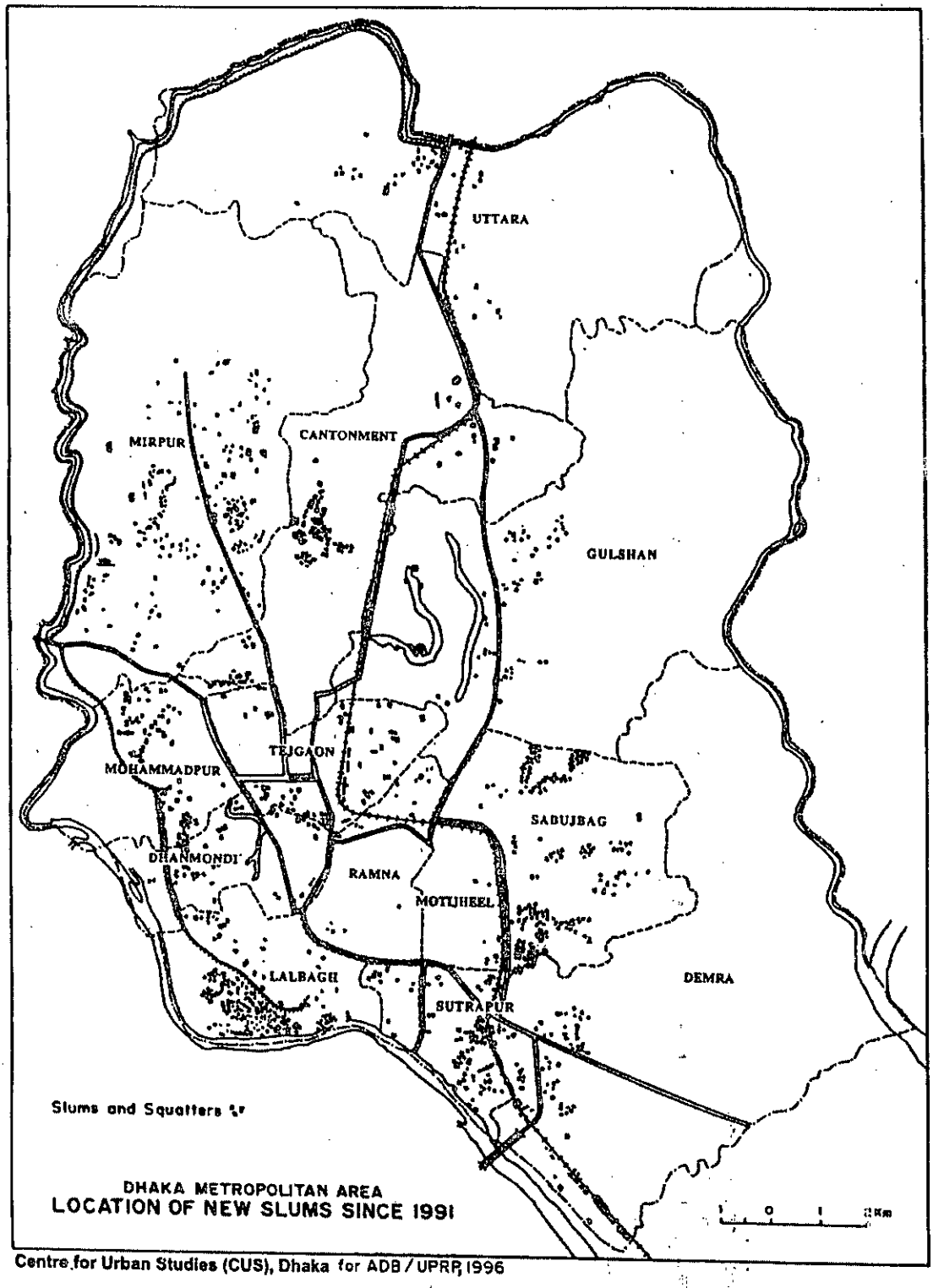


Fig 2.2 Location of new slums since 1991(CUS, 1996).

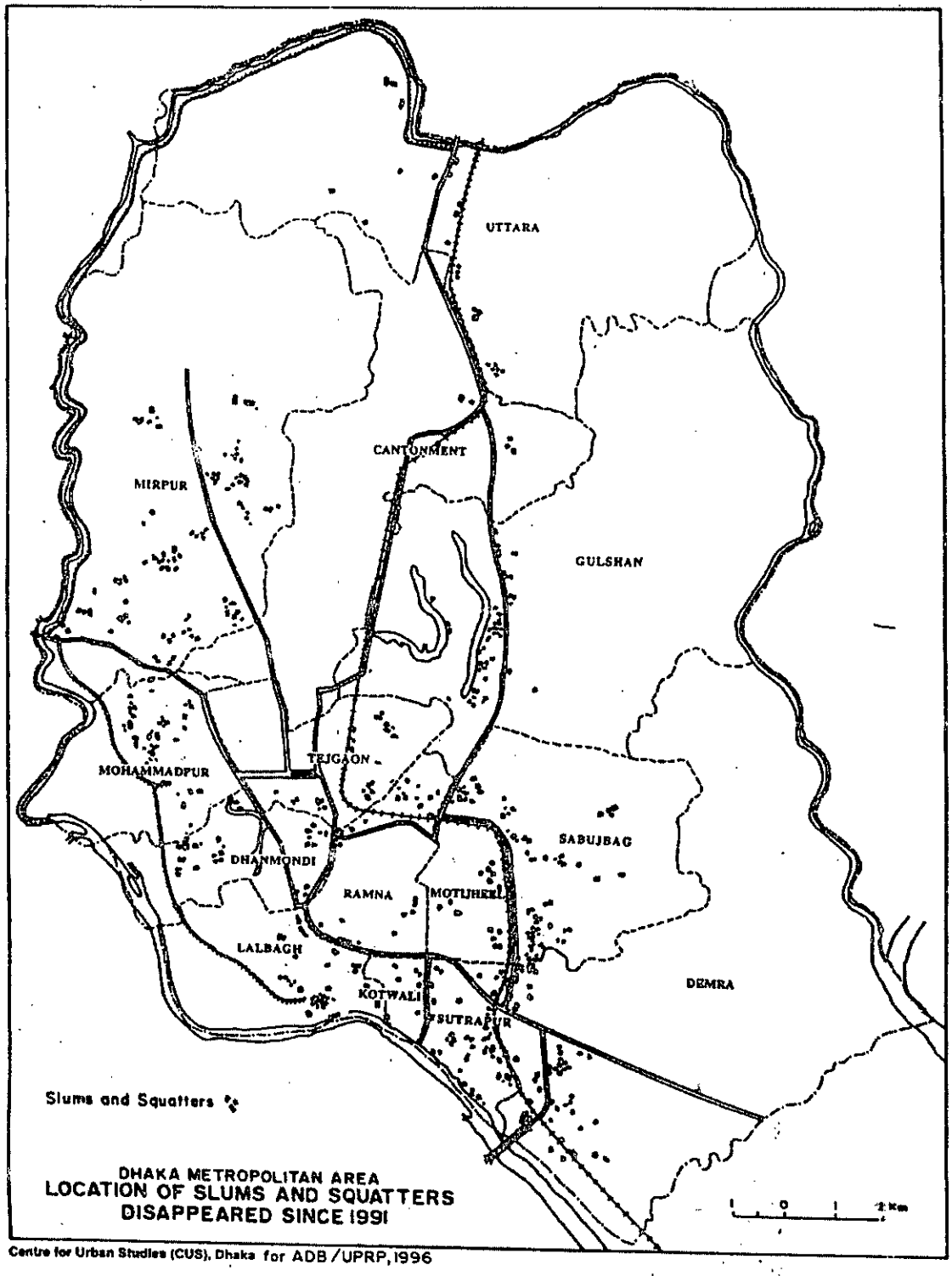


Fig 2.3 Location of Slums and Squatters Disappeared since 1991 (CUS, 1996).

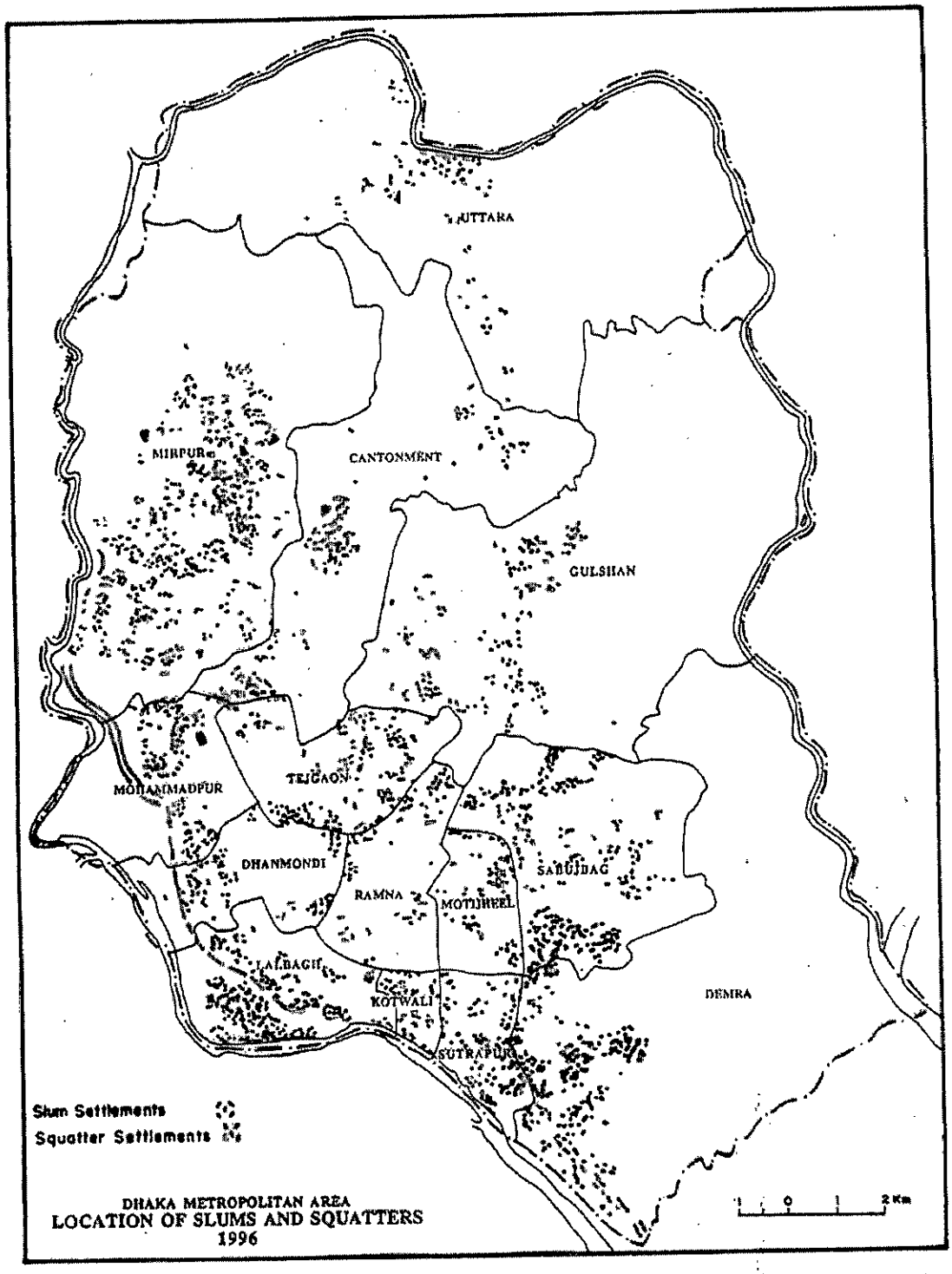


Fig 2.4(a) Location of Slums and Squatters, 1996(CUS, 1996).

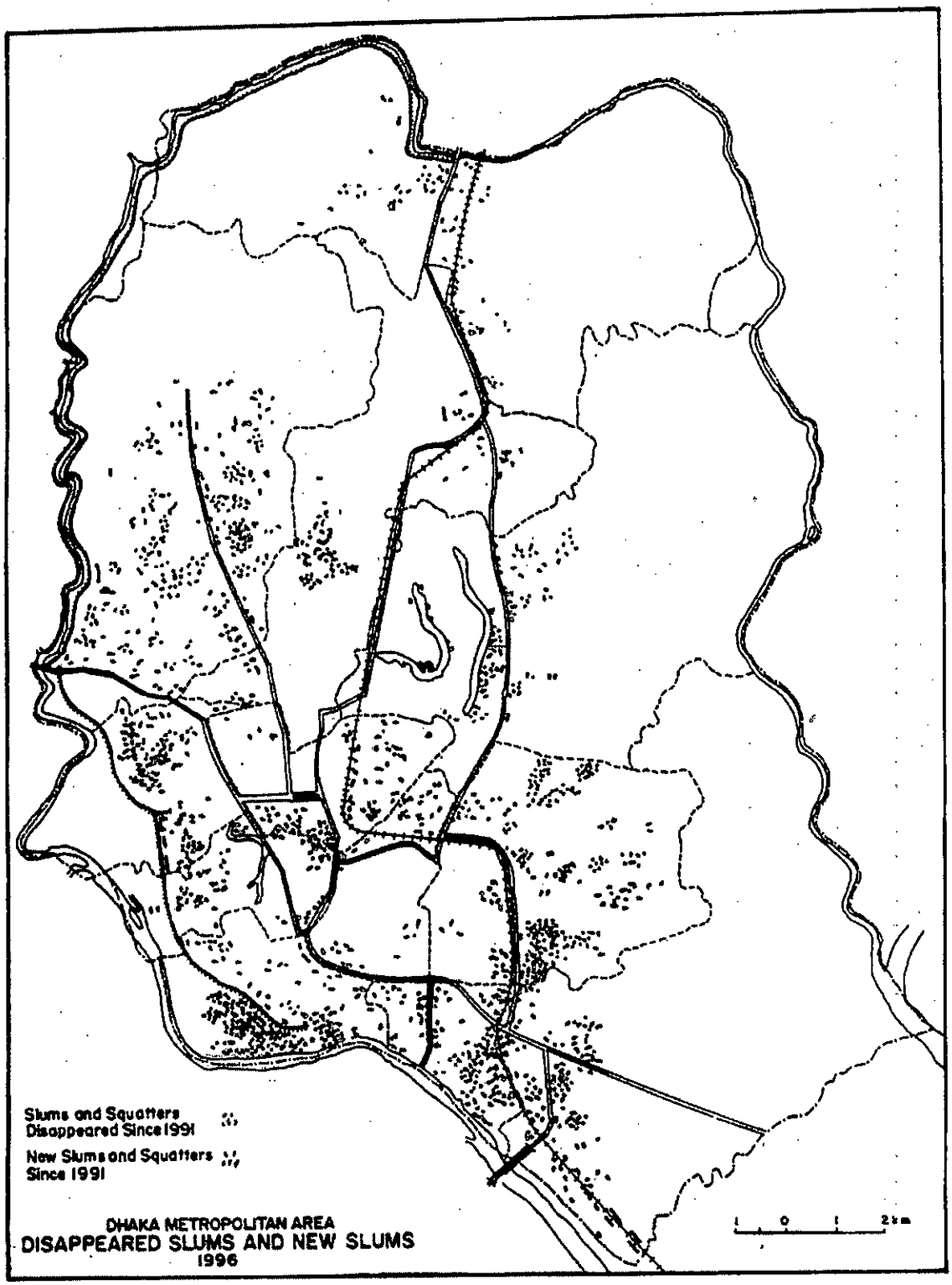


Fig 2.4 (b) Disappeared and new slums, 1996(CUS, 1996).

Table 2.3 Distribution of Slums and Squatter Settlements in 1991 and 1996 by Thana (ICDDR'B - CUS, 1991; CUS, 1996).

Name of Thana	No. of slums in 1991	1991 slums no longer existing in 1996	1991 slums that still exist in 1996	New slums identified in 1996	Total slums 1996 Column(4+5)
Cantonment	65	5	60	70	130
Demra	277	45	232	79	311
Dhanmondi	97	24	73	50	123
Gulshan	138	46	92	56	148
Kotwali	57	11	46	12	58
Lalbag	193	37	156	383	539
Mirpur	354	107	247	186	433
Mohammadpur	156	51	105	102	207
Motijheel	61	14	47	8	55
Ramna	95	24	71	17	88
Sabujbagh	230	66	164	228	392
Sutrapur	211	37	174	76	250
Tejgaon	151	19	132	51	183
Uttara	71	21	50	40	90
	2156	507	1649	1358	3007

2.4.3 Slum Population

According to the CUS Survey (1996) for the Dhaka Metropolitan Area, the number of people living in slum and squatter settlements was found to be 1.1 million (*Table 2.4*). About 50.7 % of them live in slums and rest 49.3 % people live in squatter settlements. According to the census of 1991, the total population of Dhaka Metropolitan area was 4.17 million (BBS, 1992). In 1996, assuming that the city population is growing at 6 percent annually, CUS estimates that the population of DMA is about 5.58 million with 19.8 percent living in slums and squatter settlements. *Table 2.5* shows Thana wise slums and squatter population of DMA in 1991 and 1996. The proportion of slum population varies quite substantially among the DMA's Thana. For example, Motijheel Thana has the lowest incidence of slum population where these residents account for 3.7 percent of the population, while in Mohammadpur Thana the proportion is relatively high, about 46 percent. But, in absolute terms, Mirpur Thana has the largest number of slum/squatter population, totaling 245,200 people.

Table 2.4 Area, population and density of population in the slum and squatter settlements in Dhaka Metropolitan Area (DMA) *(CUS, 1996).*

	Slums	**Squatter Settlements**	**All Settlements**
Number of settlements (Percentage)	2,328 (77.4)	679 (23.6)	3,007 (100)
Area(hectares) (Percentage)	222 (52.4)	202 (47.6)	424 (100)
Population (Percentage)	559,930 (50.7)	544,670 (49.3)	1,104,600 (100)
Population Density Persons / hectare	2,522	2,696	2,605

Table 2.5 Distribution of Slums / Squatter Population in the Dhaka Metropolitan Area by Thana *(CUS, 1996).*

Name of Thana	Census DMA Population 1991	Estimated DMA population 1996	Estimated Slum/squatter Population 1996	Slum/squatter Population as (%) of Total Population
Cantonment	190,472	254,894	61,000	23.9
Demra	521,160	697,428	92,100	13.2
Dhanmondi	201,529	269,690	37,400	13.9
Gulsha	281,337	376,491	61,700	16.4
Kotwali	210,504	281,701	14,600	5.2
Lalbag	401,387	537,145	98,600	18.3
Mirpur	641,630	858,645	245,200	28.6
Mohammadpur	316,203	423,152	194,400	45.9
Motijheel	223,676	299,328	11,100	3.7
Ramna	195,167	261,175	50,800	19.4
Sabujbagh	354,989	475,054	66,500	14.0
Sutrapur	307,483	411,481	70,200	17.1
Tejgaon	220,012	294,424	73,900	25.1
Uttara	108,077	144,632	27,100	18.7
Total	4,173,626	5,585,240	1,104,600	19.8

***Population estimated at 6 percent growth rate per annum – indicative forecast only**

2.4.4 Land ownership pattern in the slums and squatters

The most common places where slums have flourished in the city is on land owned by private individuals. The land ownership pattern of slums of the urban poor is shown in *Table 2.6.* Among 3,007 slums and squatter settlements identified by CUS (1996), an overwhelming majority of the poor settlements are located on land owned by private individuals (1270 clusters, or 42.2%), or under multiple private ownership (1047 clusters or 34.8%). Only 644 clusters (21.4%) are located on government and semi-government land while a few settlements (only 35 in number, 1.2%) are found on land belong to non- government organizations.

Table 2.6 Land ownership pattern of slums and squatter settlements (*CUS, 1996*)

Owners	No. of Settlements	Percent
Government / Semi Government	644	21.42
Non Government Organization	35	1.16
Private(Single Owner)	1270	42.23
Private(Multiple Owners)	1047	34.82
Others	11	0.36
Total	3007	100

2.4.5 Housing in slums

The physical condition of slums and squatter settlements is extremely poor. High land values and the shortage of buildable land have compelled the poor to settle on marginal land including land in low lying areas along canals, ditches, embankments and slopes. As a result, slum dwellers live in an environment that is generally not suitable for human habitation. Less than one-third of the slums are on flat land while over half of the slums are located on flat land but remain below flood level (*Table 2.7*). About 14% of slums are erected on bamboo poles. During floods, most of these settlements are inundated by water (*Table 2.7*).

Table 2.7 Location and physical characteristics of slums and squatter settlements *(CUS, 1996).*

Characteristics	No. of Households	Percent
Flat land above flood level	421	31.0
Flat land below flood level	696	51.3
Slopes, ditches, river, canal etc.	52	3.8
On bamboo poles	187	13.8
Others	2	0.1
Total	1358	100.0

Slum and squatter settlements in Dhaka mostly consist of densely constructed huts, usually arranged in rows and often containing multiple families. About 90% of Dhaka's urban poor households have only 1 main room (ADB, 1996), 65% have less than 100 square feet and approximately 40% live in kucha houses. Their huts usually have mud paved floor – very few have pacca floors. The walls and roofs are frequently made of split bamboo. They usually use plastic sheet or thatch for roofing which provides limited protection against rain. Only 5% of Dhaka's urban poor live in pacca (permanent) housing, compared to 50% of Dhaka's residents as a whole. The slum dwellers frequently pay rent for these crowded shelters, either to landlords and their intermediaries on private land. The CUS survey (1996) found that over half of households pay rent, some paying as much as Tk 900 per month in an inner city slum. The ADB poverty study found that 57% of the urban poor paying Tk 300 per month per household, with many of these (nearly 30%) paying more than Tk 500 per month (ADB, 1996).

Most of the slums are very small in size. It is observed from *Table 2.8,* that 80 percent of the slums and squatters have only 10 to 50 households. Another 9 percent of the clusters accommodated 51-100 households each. Thus the balance (11%) may categorize as large slums with more than 100 households. There are a few settlements with more than 3,000 households (ADB, 1996). A wide variation can be observed on

the basis of number of households. Squatter settlements (on public land) have an average of 159 households while the slums (on private land) have an average of 48 households each. Thus, the sizes of slums are much smaller than the squatter settlements, although the slums are more in number than squatter settlements (CUS, 1996).

Table 2.8 Distribution of slums and squatter areas by number of households *(CUS, 1996).*

Number of Households	Number of slum/squatter areas	Percent	Cumulative
10-50	2407	80.0	80.0
51-100	276	9.2	89.2
101-200	165	5.5	94.7
301-500	58	1.9	96.6
501-1000	50	1.7	98.3
1001 and above	38	1.3	99.6
	13	0.4	100.0
Total	3007	100.0	-

Inner city slums are particularly congested. Pathways inside the bustees are narrow (less than 1 meter in width). Paths are usually unpaved and without any lighting arrangements. In the absence of proper drainage facilities, the pathways serve the purpose of open drains, scattered with garbage. The absence of any open areas or space for cooking results in poor ventilation and air circulation within the slum shelters. This contributes to extremely unhealthy living conditions. The problem is exacerbated because, about 94% households cook with wood (CUS, 1996), with consequent health hazards from smoke. Not surprisingly, respiratory diseases are common among slum dwellers.

2.4.6 Access to Basic Services

Slums and squatter settlements are very congested in terms of both density of housing as well as population. The physical environmental condition of slum and squatter settlements can be explained by the exact utility services available to the slum and squatter people. The *Table 2.9* shows the percentage of slums by services such as electricity, gas, safe drinking water and access to sanitary latrine. According to CUS (1996), on average 73% of the households in all 3007 slums and squatter settlements have electric connections (legal/ illegal), 30.4 % have gas facilities, 85.8% have access to safe drinking water and about 58% have access to sanitary latrine.

Table 2.9 Physical facilities in slums (*Islam, 1990).*

Types of facility	No. Slums	% Out of 1125 Slums
Gas	341	30.5
Electricity	627	55.7
Solid Waste Collection	97	8.6
DWASA water supply	563	50.0
Tube well	164	14.6
Toilet	974	86.6
Bath place	575	51.1
Mosque	116	10.3
Primary school	64	5.7
Open place	115	10.2
Shops	296	26.3

2.4.6.1 Access to Water Supply

Most of the slum dwellers have access to safe drinking water. The main source of their drinking water is the WASA supply water. *Fig 2.5* shows that 22 percent of slum dwellers reported that they use tube-well water for drinking purpose. Similar figures are observed from the *Table 2.10,* that 79% of the surveyed households use supply water for cooking purpose and 79.7 % households use supply water for bathing.

Sometimes, unauthorized slums don't have water supply facilities within the slum and in that case, the inhabitants depend on public water supply points outside the slum. It is very common that bastee inhabitants depend on public water supply points outside the slum. It is very common that bastee inhabitants, mainly women, queing for water. Slum dwellers often use contaminated water for the cooking, cleaning and washing purposes from nearby water bodies.

It was reported by the respondents that the Landlords and Government provided 38.0 percent and 34.3 percent of the facilities respectively. It was also found that 22.2% of water facilities were provided by NGOs. Moreover it was observed that 2.7 percent of the water sources were illegally installed or connected (CUP, 1998).

Table 2.10 shows the money spent for drinking water by slum dwellers. It is evident from *Table 2.10* that half of the respondents were not spending any money for collecting drinking water. Only 12.2 percent and 36.1 percent of the households spending less than Tk.50 and more than Tk. 50 respectively per month.

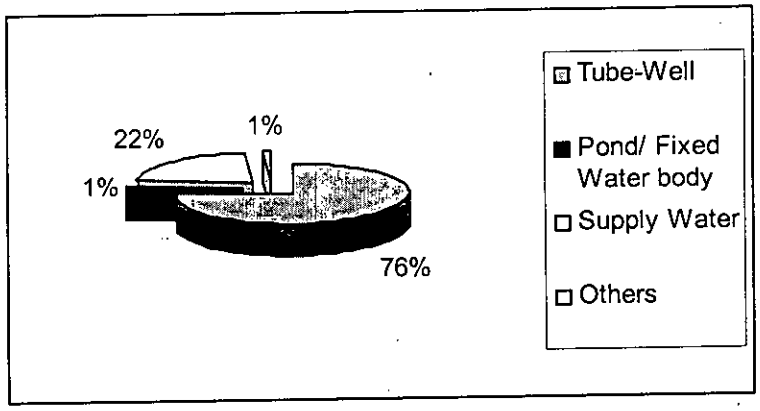


Fig 2.5 Sources of Drinking water in Slum Areas of Dhaka city.

(CUP, 1998)

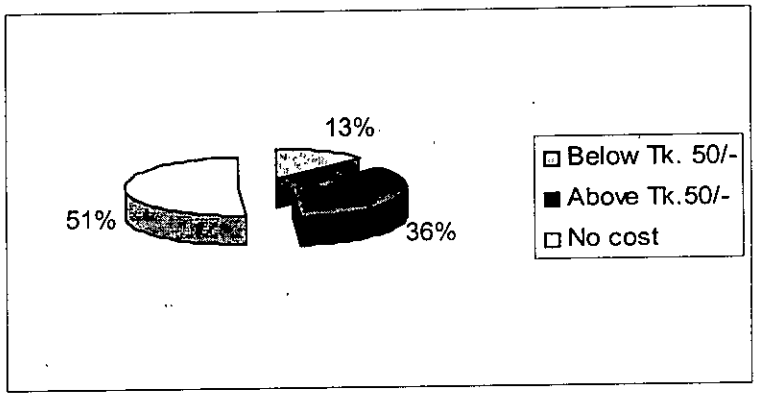


Fig 2.6 Money Spent for collecting water in Slum Areas of Dhaka city. *(CUP, 1998)*

Table 2.10 Water Source and Use Pattern *(CUP, 1998).*

Source of Drinking Water	**Percent**
Tube-well	22.1
Supply water	76.1
Pond/Fixed water body	1.2
Others	0.6
Sources of Cooking Water	
Tube-well	19.5
Supply water	79.0
Pond/Fixed water body	1.2
Others	0.3
Sources of Water for Bathing	
Tube-well	18.1
Supply water	79.7
Pond/Fixed water body	2.3
Others	-
Providers of the Drinking Water Sources	
Unauthorized water connection	2.7
Land lord the slum	38.0
Public facility	34.3
NGO	22.15
Own	0.5
Others	2.16
Money Spent (Per month) for drinking water	
Below Tk. 50/-	12.18
Above Tk.50/-	36.1
No cost	51.4
Distance of water source	
Within slum	88.6
Outside of slum	6.4
No response	5.0

2.4.6.2 Access to Sanitation

Slum dwellers have very limited access to sanitation facilities. Moreover, the quality of existing service is very poor and inadequate. Not only insufficient number of latrines but also the improper management of latrine is the main reason for poor and filthy environment within the urban slums. In authorized slums, there are some community latrines provided by the NGOs. In unauthorized slums, there are hardly any provisions for latrines. People usually erect a covered room directly over low-lying ditches, khals, canals and even over surface drains. The ADB Urban Poverty Study (1996) indicates that the sanitation conditions in the slums are not satisfactory, with only about 20% of households having access to sanitary latrine. But, only after two year's, it is observed that 56.3 percent of the households have access to any type of latrine (*Table 2.11*). Among them 30.0 percent of the households have hygienic sanitary or water seal latrine, 19.6 percent of the households have no fixed place for defecation, 13.0 percent of the households use jungle or open field or railway track as a place for defecation. 72.0 percent of the respondents reported that NGOs provided latrine facilities for them. 10.6 percent of the respondents reported that their landlords provided them latrine facilities. Only 19.65 percent of male, 19.5 percent of female and 7.2 percent children of the surveyed households used hygienic or sanitary latrine for defecation. Rest of the household's members used unhygienic latrines or had not at all used any fixed places for defecation. The overall environmental and sanitation situation in the slum and squatter settlements is particularly poor. The absence of night soil removal system means that wastes from communal pit latrines frequently contaminate the ground water with fecal matter. Conditions are especially worse in the monsoon season when many low-lying slums are inundated with contaminated water, including night soil and garbage.

Table 2.11 Sanitation Practices of Slum Dwellers *(CUP, 1998).*

Latrine Type	**Percentage**		
Hygienic sanitary/ water sealed	30.0		
No Fixed place	19.6		
Jungle/field/open space/railway line	13.0		
Hanging	26.3		
Fixed Place	6.6		
Beside canal/water body	5.5		
Providers of Safe Latrine Facilities			
NGOs	72.0		
Public Facilities	7.3		
Land lord of slum	10.6		
Own	1.0		
Others	1.8		
No response	7.3		
Reported Defecation Site	Male	Female	Children
Hygiene sanitary/	19.5	19.5	7.2
water sealed	35.6	38.4	36.0
No Fixed place	24.7	30.0	34.6
Jungle/field/open space/	17.0	9.6	0.4
railway line	0.5	2.1	0.3
Hanging	2.7	0.4	21.5

2.4.6.3 Access to Drainage

The rapid urbanization, unplanned and unregulated growths of the city are causing serious problems of drainage. The situation is particularly remarkable in Dhaka, where all areas, both in old and new city parts, have experiences of storm and rainwater stagnation. Unwise closure of natural and old artificial drainage and navigational canals have aggravated the situation. Many urban centers including Dhaka also suffer from annual as well as abnormal floods like the ones in 1987, 1988 and 1998. In major cities like Dhaka, the settlements of the poor are worst affected although other areas are not spared. Most of the slum and squatter settlements are flood prone. The conditions of the drainage systems varies from slum to slum, but are generally poor both in design and construction and practically no use in the long run (*Table 2.12).* Blockage of drainage is common in all slums. The lack of solid waste disposal facilities also contributes to poor drainage and water congestion and unhygienic condition in most slums. According to CUP (1998), only 35% slums have good drainage system and rest of the slums have bad drainage systems. Again 22% can be categorized in very bad condition, causing problems by overflowing and creating serious nuisance (*Table 2.12*).

Table 2.12 Drainage systems of slums in Dhaka city *(CUP, 1998)*

Drainage System	No. of slums	Percentage
Good	391	34.8
Bad	485	43.1
Very bad(Water stagnation after every rain fall)	249	22.1
Total	1125	100.0

2.4.6.4 Access to Solid Waste Management

According to Dhaka City Corporation (2002), it was found that waste generation rate was 4500 to 5000 tons per day in Dhaka City. Another study carried out by Waste Concern (2002) revealed that the generation of wastes is about 17,000 tons per day and DCC can collect only 42% of the total generated wastes. Some portions of solid waste generated in Dhaka city are never collected. Some of this waste is dumped in low lying areas, lakes or rivers. But, a large portion of uncollected solid waste is deposited at the roadside drainage ditches, storm sewers and city canal system. According to a study of CUS (1998), more than 90% of the slums do not receive municipal solid waste collection service. Although slum dwellers generate relatively small amount of waste per person, most of the wastes are disposed off in nearby khals, lakes, low – lying areas, drainage ditches or simply scattered in adjacent non-occupied areas. This results in adverse environmental impacts, also producing strong leachate which ultimately mix with surface wash. This practice of discarding solid waste in location other than community bins creates several problems, such as: (i) clogging of drainage system, (ii) degradation of river water quality and (iii) spread of disease by vector insects and rodents, (iv) soil pollution etc.

Although primary collection of solid wastes (door to door collection) have already been started in many residential areas in Dhaka City, this practice is yet to be introduced in slums. Waste Concern, a private organization has introduces barrel system for collecting solid wastes in few slums and is getting high responses from the slum people. This example may encourage others to keep their slum healthy, clean.

2.5 SOFT COMPONENTS FOR SLUM

2.5.1 Education and skills

Most of the urban poor in slum and squatter settlements do not have formal education and skills. Only 2 percent of the male and 0.22 percent of the female population of the study areas completed grade 10 (ADB, 1996) (*Fig 2.7*).

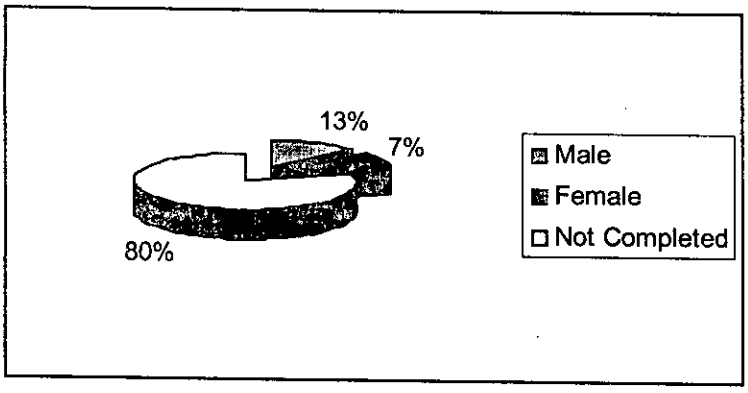


Fig 2.7 Persons completed grade 10 in the slum areas *(ADB, 1996).*

At present there are many NGOs involved to strengthen the slum dwellers literacy. They provide various services, such as primary school for school going children, night schools for the parents. There are also some schools provided according to slum people's need. As for example – Kallayanpur 4no. Pora Bastee has a GSS (Garments Sromic School) school (for the garments worker children).

2.5.2 Credit Programs

NGOs are working for the urban poor in Dhaka and providing small credit programs for them. A number of NGOs such as MSS (Manobik Shahaiya Sangstha), Shakti, BAPWPA (Bangladesh Agricultural Working Peoples Association), Proshika etc. are replicating the Grameen Bank approach to credit provision and has developed its own program. Loan recovery rates are almost 100% (ADB, 1996), thus confirming that the poor living in slums and squatter settlements are bankable, and can generate livelihood benefits for themselves and their poor communities. In May 2002 *Safe*Save has five branches serving the Dhaka slums with total active client accounts number over 6,400 (SafeSave, 2002).

2.5.3 Child to Child Program (CTC Program)

This is an awareness program, usually conducted on child. In this CTC program, a group of children has been formed to train them in preventive health care, personal hygiene, environment, child rights, gender equity, etc and after a certain months of training, the children were given the task of passing on their new knowledge to others such as their friends or relatives.

In 1996, UNICEF Bangladesh organized a workshop on CTC. After then Phulki an NGO took initiatives to develop packages of "issue-based" materials on this program. Traditionally the older children in a family, take care of their younger brothers and sisters as a duty. When people migrate to the cities, often the slum dwellers become a sort of substitute family and take care of each others' needs. This can be very useful to NGOs when working in the field. Phulki quickly recognized this potential and thus conceived of a virtually cost less way for imparting and disseminating information. Between the ages of 8 to 12, children living in slums are in danger of succumbing to conditions of poverty into which they were born. To build awareness among the slum community about their personal and environmental hygiene, nutrition, safe drinking water and sanitation, Phulki has developed a Child to Child activity program. The program establishes in the slums, with a group of 10 child-leaders. They teach them about health and nutrition. Each Child-leader is then responsible for teaching ten of his or her friends and siblings. Hundreds of children have been taught through this innovative method. Many of these children have an influence on their parents that has led to the installation of sanitary latrines, changes in dietary habits and in the preparation of pits for garbage disposal. This program has so far great success and has potential of improving the overall environmental condition within the slum.

2.5.4 Child Care Center for Poor Working Women

Some slums have childcare services for poor working women offered by NGOs. Without the provision of these centers, these poor women may not have been able to earn a living. These centers that are provided by Phulki are of mainly two types- one

who care the new born baby to 2 years old child and another who care the children above 2 years.

2.5.5 Slum Eviction

Along with the development activities in slums, NGOs are working in protection of slums. For an example, the Action Aid Bangladesh DA-2, an NGO is working with the slum dwellers of Mohammadpur in Dhaka.

2.6 GOVERNMENT ORGANIZATIONS INVOLVED IN SLUM IMPROVEMENT PROGRAMS

There are different government ministries and agencies involved in various degrees in slum improvement programs, such as in income generation and employment creation, education and skill development, water supply and sanitation, health care and shelter provision.

Income generation and employment creation: Ministry of Industries and Ministry of Manpower play the primary role in this sector. Urban credit programs have been implemented to a limited extent by the Ministry of Social Welfare (Department of Social Services). The Basic Bank and Agrani Bank under government ownership have also been involved in micro- credit programs for employment creation and income generation. For this purpose, the government has also established an NGO Bureau under the Prime Minister's Secretariat to facilitate NGO operations.

Education and skill development: The Ministry of Education, through its Primary and mass Education Program, has aimed to extend services to all the urban population including the urban poor. However, general education cannot sufficiently reach the poor. The Non-Formal Education Program of the Government has sought to provide services to the poor, with NGOs play a major role in implementation. However, the Government's involvement in skill development for the poor is limited, although some of the educated poor do have access to the government- run polytechnic institutes.

Health care: The Ministry of Health and Family Welfare is involved in providing health services to all, including the poor. The service is provided mainly by the government-run general and specialized hospitals (usually attached to various government medical colleges and other institutes). Although the services are generally free of charge, poor people seldom get proper treatment.

Shelter provision: The Ministry of Housing and Public Works is responsible for providing land and housing to the poor. In the 1993 National Housing Policy, the Government formalized its role as facilitator in providing housing for the poor. The Housing and Settlement's Directorate, Urban Development Directorate, Public Works Departments and Housing and Building Research Institute, all have various roles in the Housing and shelter sector.

In addition, Dhaka City Corporation initiated the Slum Improvement Department in 1990 in its organizational structure to improve the living standard of the poor city dwellers living in the slums and to improve the slum environment. Its major functions are-housing and shelters for the slum and squatter dwellers, increasing the potable water supply - sanitary conditions - drainage systems at slums, providing 3-meter run of footpath, improving street lighting - the garbage disposal system at slums, providing pre-primary, grade-1 and 2 non-formal education - adult literacy courses and also provision of micro-credit for self-employment and income generation activities, based on their existing skills.

During 1991 to 2002 DCC has conducted following slum development activities under different projects:

During the period of 1993-2001, DCC had undertaken following physical infrastructural development works in order to improve the environmental condition of the slums of Dhaka City from its own fund.

Table 2.13 Slum development activities by DCC during 1991-2002

(DCC, 2002)

Item	Numbers
Sanitary Toilet	230
Tube well	42
Footpath and Drain	53,085 meter
Installation of light post	4
Establishment of satellite school	4
Water Reserves	9
Biogas Plant	8

National/Special Day:

Following national and special days are celebrated in the Slum areas of the city:

1. National Immunization Day (NID)
2. National Nutrition Week.
3. Safe Motherhood Day.
4. Urban Slum and Sub-Urban Environmental Sanitation.
5. Breast Feeding Week.
6. Skill development Training (Tailoring, Embroidery, Block, Boutique, Tie-Dye, Doll Making etc.)
7. Child right and MINA Day.

Dhaka City Corporation (DCC) has conducted the Poverty Alleviation Program in three phases, the first phase (1991-1996), second phase (1996-2000) and the third phase (2001-2005) (*Table 2.14*). The first and second phase had done jointly by

LGED and DCC. For both of those phases the major components were primary health, motivation, awareness, infrastructure (footpath, drain, water and sanitation), non- formal education and group saving and micro credit. According to DCC, they are 100 percent successful in their two phases. The ongoing third phase (2001- 2005) consists of the major components similar to the first and second phases and only DCC is responsible for implementing these.

Table 2.14 Poverty Alleviation Programs and projects in slum areas of Dhaka City provided by DCC (2002).

Name of project	Major components	Duration	Coverage of slum	Planned		Achievement	
				Male	Female	Male	Female
Slum Improvement project in DCC	❑ Primary Health ❑ Motivation ❑ Awareness ❑ Infrastructure (Footpath, Drain, Water and Sanitation) ❑ Non-formal Education ❑ Group Saving and Micro Credit	1991-1996	Within Dhaka City Corporation Area (Jointly selected by LGED and DCC in 18 nos. Slum.)	16000	15000	16000	15000
Urban Basic Service Delivery Project	❑ Primary Health ❑ Motivation ❑ Awareness ❑ Infrastructure (Footpath, Drain, Water and Sanitation) ❑ Non-formal Education ❑ Group Saving and Micro Credit	1996 -2000	Within Dhaka City Corporation Area (Jointly selected by LGED and DCC in 74 nos. Slum.)	104550	95450	104550	95450
Support for Basic Service in Urban	❑ Primary Health ❑ Motivation❑ Awareness ❑ Infrastructure(Footpath, Drain, Water and Sanitation) Non-formal Education Group Saving and Micro Credit	2001-2005 (On going)	DCC, 74 Slums	550000	450000	105000	95000
Environmental Sanitation Hygiene and Water supply in Urban Slum and Fringes Project.	❑ Primary Health ❑ Motivation❑ Awareness ❑ Infrastructure(Footpath, Drain, Water and Sanitation)	1999 – 2001	Within Dhaka City Corporation Area (Jointly selected by LGED and DCC in 09 nos. of Wards)	12000	13000	12000	13000
Dhaka Integrated Flood Protection Project	Sanitary Latrine	1999 - 2000	45 Slums of DCC	52000	48000	52000	48000

2.7 SUMMARY

The key characteristics of Dhaka's slum and squatter settlements are as follows:

(1) There are 3,007 slums and squatter settlements in the DMA.

(2) The current estimated population of the slums and the squatters of the DMDP would be somewhere between 2.5 million and 3 million.

(3) 90% of Dhaka's urban poor live in one roomed house.

(4) The slum dwellers are often threatened by natural calamities, eviction, health hazards and malnutrition and social insecurity (violence by mastaans).

(5) They gain access to basic services mainly through informal channels, often at high cost, time and energy.

(6) Only 22% of the total slum dwellers have tube well water for drinking (CUP, 1998).

(7) Only 20% of the total slum households have access to sanitary latrines (ADB, 1996).

(8) Only 35%of the total slums of Dhaka contain good drainage system (may be pacca or even kucha with better stability).

(9) More than 90% of the slums do not receive municipal solid waste collection facility (CUS, 1998).

(10) Nearly three- fifths of the total slum populations aged between 6-10 years do not attend school.

(11) A most important feature of NGOs operating in the urban sectors is that they are principally concerned with organizing and mobilizing the poor so that they are empowered to meet the challenges they face.

Chapter 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

A number of slums were selected randomly from residential, industrial and far away from city areas to ensure that representative data are obtained. These three selected categories present a clear picture of existing environmental conditions of slums within Dhaka City. *Fig 3.1*, *Fig 3.2* and *Fig 3.3* present the location of the selected slums. Field survey and door to door interviews were conducted to collect data and information on the existing condition of basic services in the study areas. Based on the survey data, analysis of the existing situation in water supply, sanitation, solid waste disposal, drainage system of each slum was carried out. Comparisons were made among the slums with respect to the above stated services. An attempt was also made to study the effects of various interventions and factors that might have influence on slum improvement activities.

3.2 STUDY AREA

The total number of selected slums in this study is eight. *Table 3.1* presents the name, location and general information of the selected slums. These eight slums are grouped in three categories namely residential, industrial and far away from city according to the nature of the surrounding areas (*Table 3.2*).

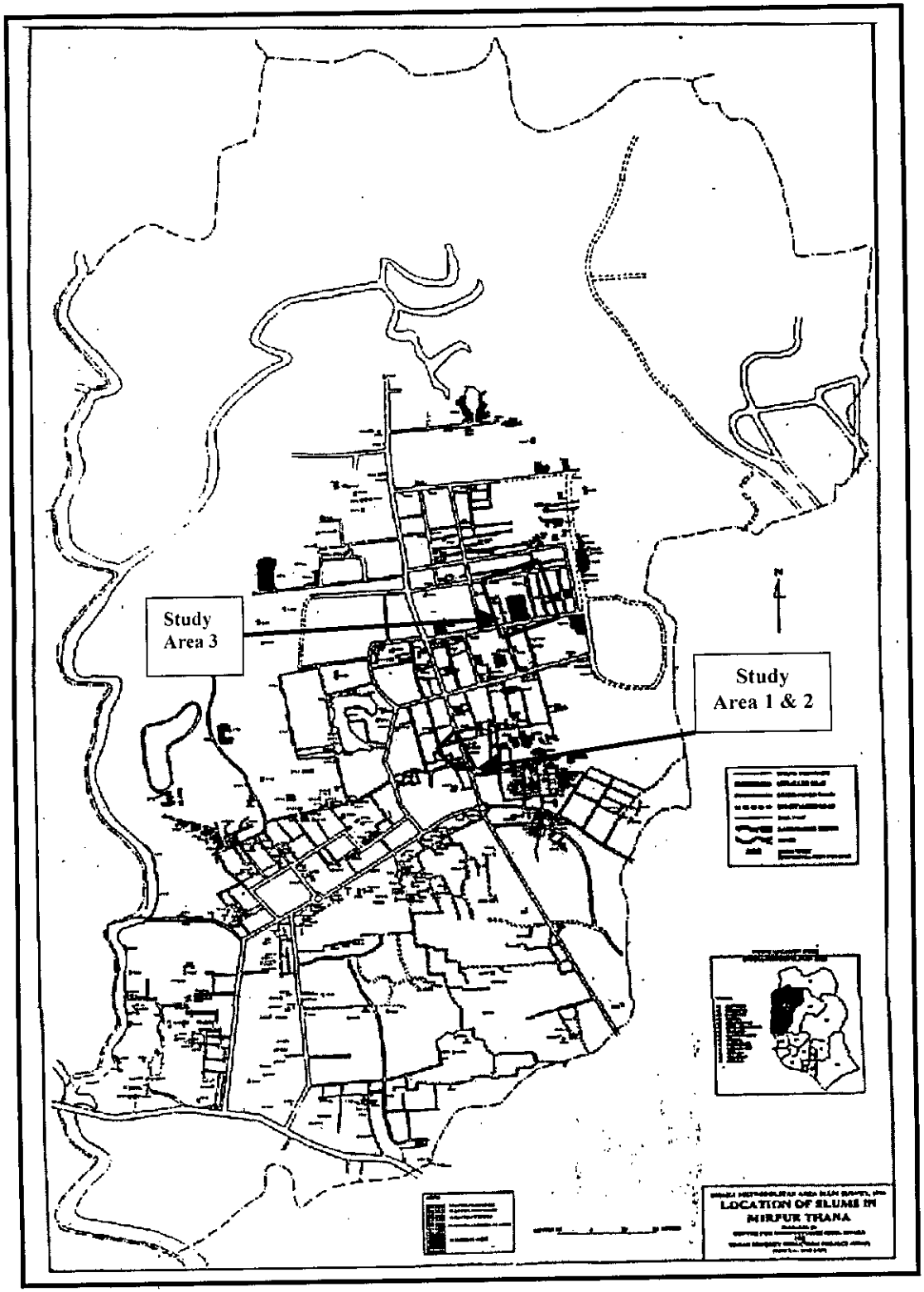


Fig 3.1 Study Areas in Mirpur Thana (CUS, 1996)

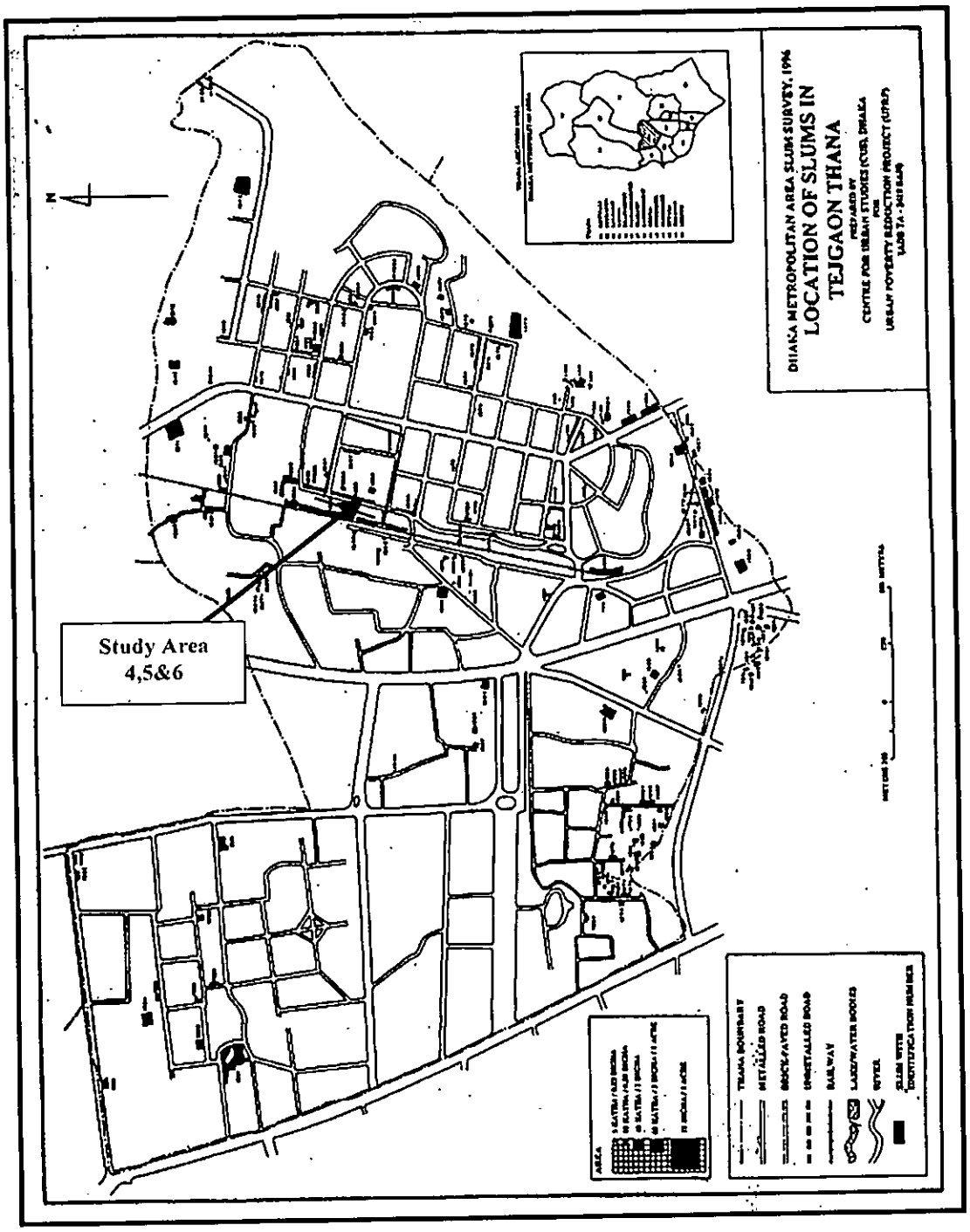


Fig 3.2 Study Areas at Tejgaon Thana (CUS, 1996)

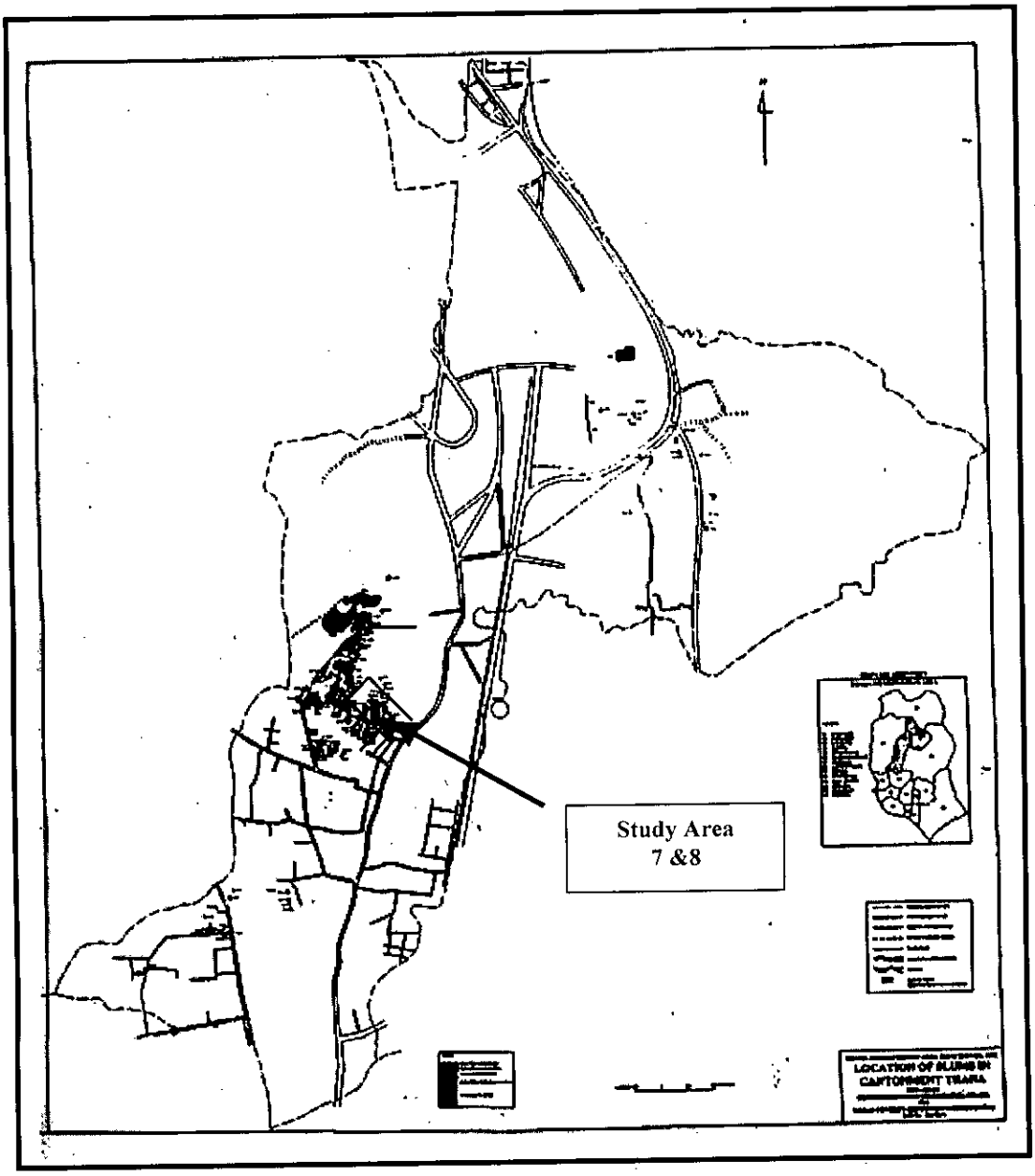


Fig 3.3 Study Areas at Cantonment Thana (CUS, 1996)

Table 3.1 Name and Location of Slums Selected in the Present Study

SL. No.	Slum Name	Slum Location	Slum Identification # by CUS (1996) ; CUS (1991)	General Information (CUS,1996)
1.	Kal-a-walaPara Bastee	Plot 7/819, Kalwala Para, Ward no.12, Mirpur-2	2941 ; 2592	Household: 50 Population:175 Area : 0.124(Acre)
2.	Nashimbag Bastee	Block F, Sec .2, Ward no.7. Mirpur Thana.	2799 -	Household: 25 Population:120 Area : 0.950(Acre)
3.	Kallyanpur 4no.Pora Bastee	Kallyanpur, Ward no.11. Mirpur Thana.	- -	- -
4.	BRI (Beg Rubber Industry) Slum	Tejgaon Thana.	- -	- -
5.	Omor Sons (Iron Materials Industry) Slum	Tejgaon Thana.	- -	-
6.	Tiger Industry (Wire Producer) Slum	Tejgaon Thana.	- -	- -
7.	West vasantek (Gudarghatt) Slum	Sec-14, Ward –4, Mirpur Thana	2696 -	Household: 320 Population:1600 Area : 2.020(Acre)
8.	West vasantake 1no. Bastee	Ward no.15 Contonment Thana	1456 1338	Household: 700 Population:3000 Area : 8.000(Acre)

Table 3.2 The studied slums are categorized into three types.

Types of slum	Name of slums
Slum adjacent to residential area:	• Kalwala Para Bastee • Nasimbag Bastee • Kallyanpur Pora Bastee
Slum adjacent to industrial area:	• BRI (Beg Rubber Industry) Slum • Omor Sons (Iron Materials Industry) Slum • Tiger Industry (Wire Producer)Slum
Sub- urban slums:	• West vasantek (Dhamalkot) Slum, Mirpur –14. • West vasantake 1no. Bastee (South – West Side) – Salam member's House adjacent area • West vasantake 1no. Bastee (North-East Side) – Joynal member's area

3.3 METHODOLOGY OF THE STUDY

Several field visits and surveys have been conducted to study the existing situation of water supply, solid waste management, excreta disposal, and sanitation and drainage systems in the selected slums. Extensive data collection was undertaken in this project.

Data has been collected from a range of sources including:

- Slums and squatter communities in Dhaka (Primary data)
- Institutions and agencies potentially or actually providing services to the urban poor (Secondary data).

Data collected from institutions and agencies has been tested, wherever possible against actual field situations and the perspective of slum dwellers. The study has identified the dimensions of poverty attempted to find out various perspectives of the key constraint for the improvement of slum situation. The data collection process based on integrated assessment of slums and squatter communities is summarized in *Table 3.3*.

Table 3.3 Data Collection and Analysis

Household Questionnaires x 10*	8 Slums: Data collection and analysis
Slum Survey and Mapping	8 Slums: Physical Survey and map
Physical Infrastructure checklist	8 Slums: Data Collection and analysis

* The surveyed data collected at least 10nos. of households of each slum.

3.3.1 Parameters Selected for the Study

The parameters of basic services selected for this research are as follows:

- Water supply
- Drainage
- Solid waste disposal
- Excreta disposal
- Sanitation and Hygiene practices

Other related parameters like literacy rate, micro-credit program, awareness are also considered.

3.3.2 Household Door to Door Survey in Selected Slums

A comprehensive household survey was carried out to assess the situation of selected slums with respect to basic services. The survey was done in two ways:

- By visual inspection
- By questionnaire

3.3.2.1 Observation by Visual Inspection

Visual inspections were carried out to assess the existing condition of the study areas. Visual inspection also helps to identify the impacts of various interventions to the existing situation. The survey was also aimed at understanding the impact of other environmental factors such as land type, lowering of water table etc., which may have significant impact on environmental conditions.

3.3.2.2 Observation by Questionnaire

A questionnaire containing 37 questions were distributed in the selected slums (Appendix- A). The questionnaire is based on five specific sections –

- general questions
- questions about water supply
- sanitation and drainage
- solid wastes management
- health, hygiene & environmental conditions; and
- questions about other related matter.

The arrangement of the questions has been prepared on consideration of the urban slum dwellers' life style. Therefore, it appears as the evidence of their thinking/ comments on the existing system of the slums.

After collecting the data, a standard format was prepared in tabular form to compare the data obtained from different study areas.

3.3.3 Mapping

On the basis of baseline survey, map was prepared for each selected slum. The map shows the layout of the households, pathways, water supply point, latrines, drains, garbage bins and community facilities etc.

3.4 SUMMARY

The key characteristics of the selected eight slums are as follows:

(1) The selected slums are mainly of three categories close to non-slum residential, industrial area and far away from city.

(2) The baseline map will be helpful for visualization of the existing slum condition.

Chapter 4

BASELINE SURVEY

4.1 INTRODUCTION

In this study, eight slums have been selected randomly. In order to make proper assessment of the existing situations, baseline survey was conducted for each case. The purpose of the baseline study is to know about the exact condition of water supply, sanitation and drainage, solid waste management system and health and hygiene situation of the slum. It implies a set of criteria that include information on location, area and population, socio economic status of the slum dwellers, possibilities of eviction, technical feasibilities, family wise monthly expenditure for water, activities of GO and NGOs etc. Initially the baseline survey starts with an individual interview of slum dwellers and also with the stakeholders who are already involved in the various slum improvement projects. These eventually lead to formation of a base map of selected slums.

4.2 Study Area 1: KAL-A-WALA PARA BASTEE

4.2.1 General Information

This slum is located at Mirpur Thana, ward no 12 (*Fig 4.1*). Total area is 0.124 acre. The slum is established in the open place of City Corporation, adjacent to Eye Hospital, Mirpur1. According to CUS (1996) study, the total population of the slum is 175 with 50 numbers of households. However Dustha Shasthya Kendra, DSK (1998) found that the household number is 200 with the population of 1000. The permanency of the slum is about twenty five years.

Most of the inhabitants are from Kishoregonj, Barisal, Chandpur, Mymensingh, Dhaka etc. They have pointed two major causes for migration, such as river erosion and unemployment. The monthly average income per family is about Tk.3000 to

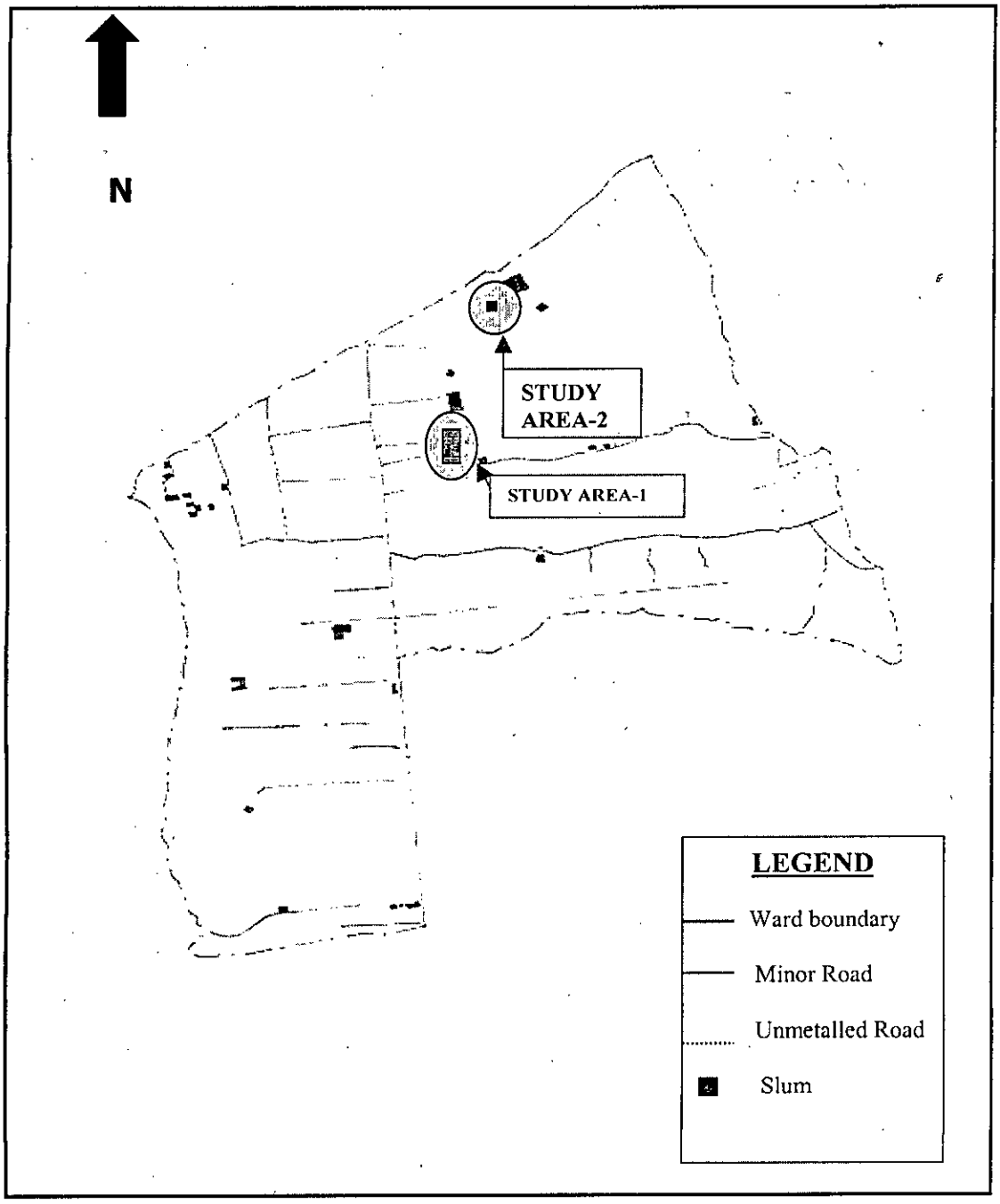


Fig 4.1 Kal-a-wala Para Bastee (Study Area 1) and Nasimbag Bastee (Study Area 2) in Mirpur, Ward no. 12 (DCC, 2002).

4000. There are some factories named as MS Anowar Steel, Jhangir Electric Manufacturing and Prodip Metal Industries and also five numbers of garment factories adjacent to the slum. These industries and garments offer employment opportunity to the slum dwellers. People of various professions such as business man, rickshaw puller, van driver, grocery shopkeepers etc. live in this slum.

Many GO and NGOs are working in different development programs in this slum. DSK with the help of Water Aid is working in Water Supply sector, Waste Concern provides Solid Waste Management service. Proshika, BRAC, MSS and ASHA work in Loan, Child and adult education programs. Shakti and Khodar Dan provide loans for the slum dwellers. The World Vision also work for Education and Water Supply in this slum.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.3*).

4.2.2 Water Supply System

While conducting the interviews among the slum dwellers, it was understood that they had serious water crisis in the past. During 1998, they had only one water tap which remained out of order most of the time. They used to collect water at a cost of Tk. 1.0 per kolshi. When they could not collect water from the nearest source, they had to collect water from the water source at the main road i.e. Mirpur - 1. Even sometimes they had to travel almost 2 km to collect water. There is a small river/ khal close to the slum. People used to collect water from there for bathing and washing purposes. The time spent for collecting water varied from 30 minutes to 2 hours. *Table 4.1* shows the different water sources and water use pattern of this slum people in the past.

Table 4.1: Water Source and Use Pattern of Kal-a-wala Para Bastee (DSK, 1998)

Water Source	Drinking	Bathing	Cooking	Dish Washing	Cloth Washing	Toilet use	Water use for prayer	Hand Washing
Beri bandh (adjacent to the river)		****		**	**	*		*
World Vision Supply (WASA supply)	****			*	*	*	*	
Tube well	*	**	**	*	*	*	*	*
House Supply (Piped supply)	*****	****	****	***	****	*** *	****	****
Sony hall Supply (Water stored in a reservoir)			*	*			*	
Dalas Garments (Water stored in a reservoir)			*	*				
Kua			**	*	**	***	***	***

Presently the main source of water in this slum is WASA. DSK with the assistance of Water Aid has provided two water points to store WASA's water. In order to create provision of water supply to slums, DSK had made a simple practical design for the water point. Water points were set up with an underground reservoir having connection with DWASA mains; on top of the reservoir, hand pump heads has been mounted so that water could be extracted via mechanical pressure (Sec 5.2). The Kal-a-wala para slum dwellers use this water to satisfy their demand. In addition to that, they have three hand pump tube wells to meet their needs.

4.2.3 Sanitation Practices

Presently the slum dwellers have seven nos. of pit latrines which is very small in numbers compared to their need. On average, one latrine serves each 6 households. Every household has to pay Tk. 40/month for using these latrines. Besides these pit latrines, the slum people also use hanging latrines, situated at the bank of a water body close to the slum. Therefore, unsanitary condition prevails within the slum. The situation becomes worse during rainy season, when the water level of this water body (Doba) rises with the wastes.

4.2.4 Drainage System

The drainage condition of the slum is very poor. Practically they do not have any surface drain. There is one semi-paca drain, which is clogged by polythene, debris etc. An open kucha narrow path just at the entrance of the slum, drains out the used water from the water point (*Plate 4.1*). As a result, even for a short time rainfall, the slum goes under dirty water.

4.2.5 Solid Waste Disposal System

In the past, the slum dwellers used to dump their solid wastes at the roadside or in the open places within the slum. As a result, the drain was blocked causing serious nuisance.

At present, the situation has been improved significantly because of using barrels for disposal of solid wastes. The inhabitants have a well-organized system for collecting their solid wastes provided by a NGO, named Waste Concern. The primary collection of the solid waste is done by using two different color of barrels such as green and yellow. Yellow barrels are used for storing organic wastes like vegetables, fruits etc. and green barrels are used for fish, chicken or any kind of meat wastes. There are 20 barrels in this slum – 15 yellow and 5 green (*Plate 4.2 and Plate 4.3*). The people are satisfied with this system, because now they can keep their slum much cleaner. Besides they can earn some money by selling the wastes to the Waste Concern who uses this waste for composting. The selling rate is Tk 2.00/kg of waste. However, it is

observed that the slum dwellers are reluctant to clean up or do proper maintenance of the barrels, specially the green ones.

4.2.6 Existing Health Problems

The slum dwellers suffer from several water borne diseases like jaundice, dysentery, diarrhea etc. throughout the year. *Fig 4.2* represents the severity of those diseases with respect to different seasons (DSK, 1998). It is evident from this figure, that during the dry season like Falgoon, Chaitra and Baisakh, the slum dwellers suffer from water borne diseases like jaundice, dysentery, diarrhea etc. and they also suffer from seasonal viral fever throughout the year. The main cause of these diseases is the unhygienic condition and practice of the slum people.

Plate 4.1 Jammed drain in Kal-a-wala Para Bastee

Plate 4.2 Barrel for Solid Waste Disposal in Kal-a-wala Para Bastee

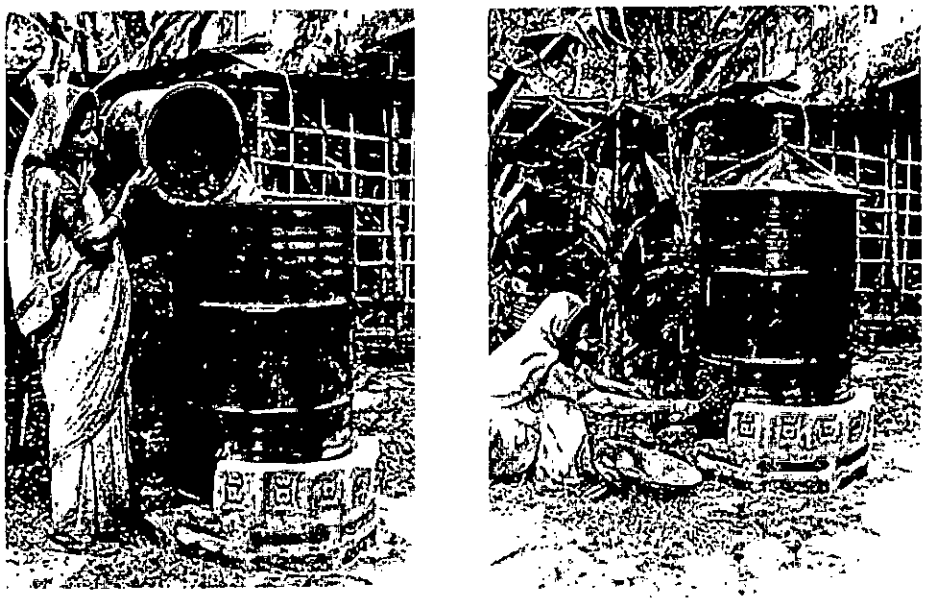


Plate 4.3 Barrel Practice in Kal-a-wala Para Bastee

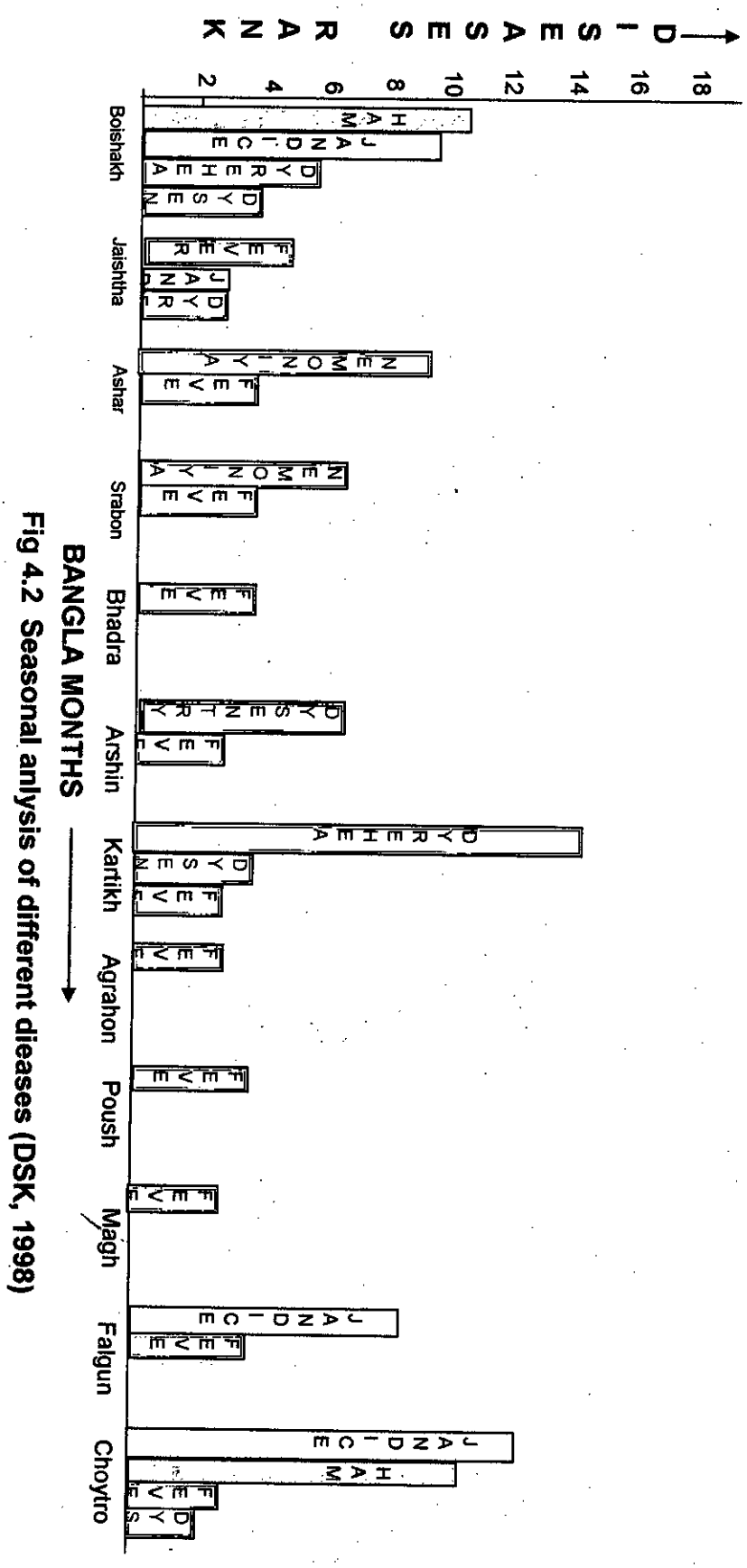


Fig 4.2 Seasonal anlysis of different dieases (DSK, 1998)

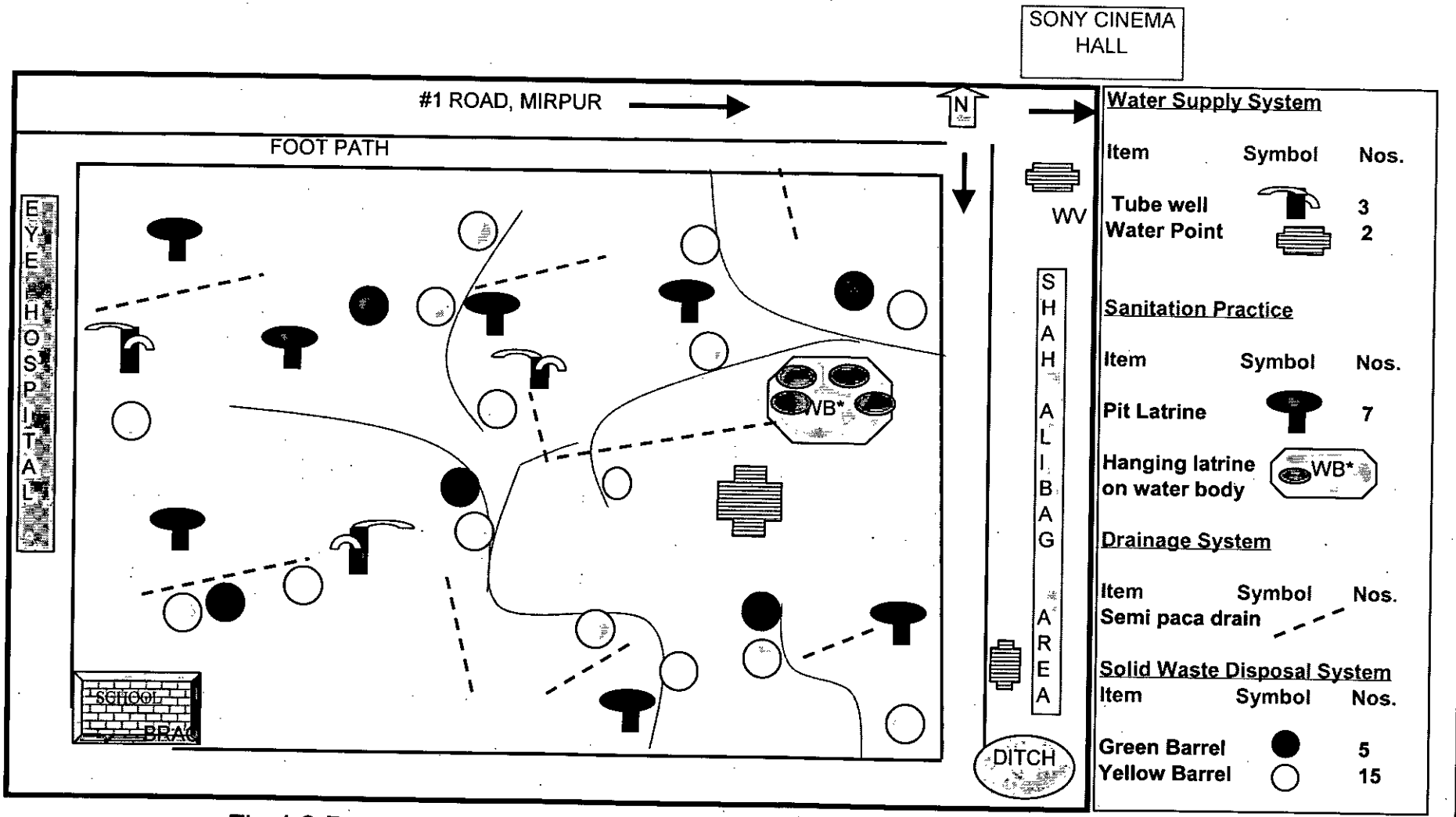


Fig 4.3 Base map of Kal-a-wala Para Bastee

4.3 Study Area 2: NASIMBAG BASTEE

4.3.1 General Information

This slum is located at Mirpur Thana, ward no12 (*Fig 4.1*). Total area is 0.950 acre (CUS, 1996). Compared to its area, the slum was not densely populated. According to CUS, (1996) there were twenty five households with total 120 people. But, at present it becomes densely populated with its total households about more than 150 nos. and population 600 (Waste Concern, 2001). There is a controversy with the ownership of this slum. The slum people claim that it is privately owned slum but the City Corporation claims the land as their own property.

The slum people often get services of water supply, sanitation and solid waste management from WATSAN projects, World Vision, Waste Concern. Also BRAC, Proshika, ASHA work in child and adult education program, micro credit program etc.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.4*).

4.3.2 Water Supply System

The main source of water is the supply of WASA. There are four tubewells within the slum, all of them are storing Dhaka WASA supply water at adjacent little water reservoir.

4.3.3 Sanitation Practices

In this slum, there are 7 nos. of common toilets provided by different NGOs. Each toilet is designed for use of 6 nos. of households. They have to pay for using the toilets. The slum dwellers are willing to get WASA sewerage line connected to their toilets.

4.3.4 Drainage System

There is a surface drain in the slum. That surface drain connects the toilets within the slum. However since it does not have any connection with the main WASA roadside drain, it remains blocked with garbage and human feces.

4.3.5 Solid Waste Disposal Service

There are 35 barrels for storing solid wastes, of which 30 nos. are yellow and 5 nos. are green. *Plate 4.4, 4.5* and *4.6* represent the barrel practice for disposal of solid waste.

4.3.6 Existing Health problems

The existing health care facility is insufficient for the slum dwellers. In the past, World Vision used to work in health education and hygiene programs, they also provided medicines free of charge. But at present, the people have to go to the nearby clinic for their medical needs.

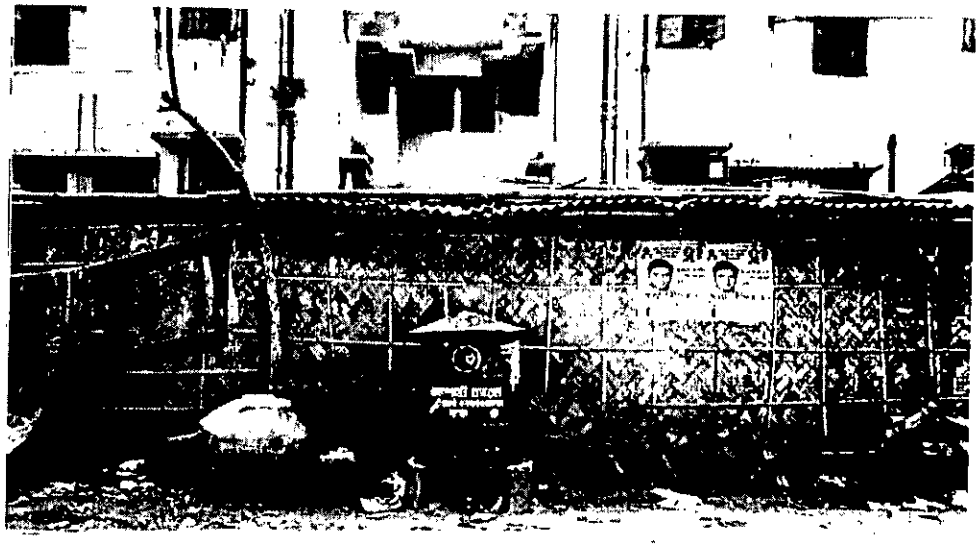
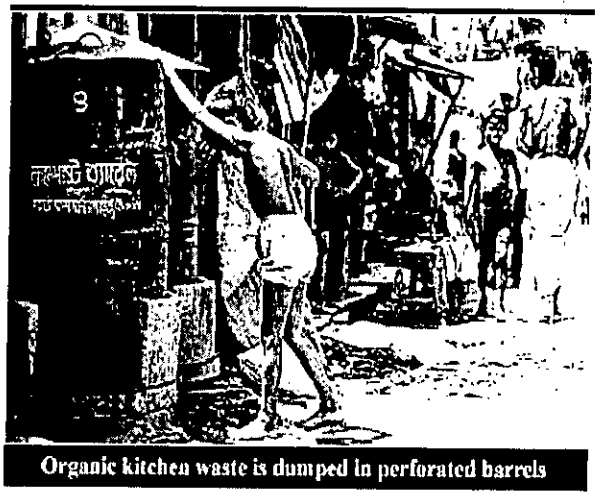


Plate 4.4 Barrel at Nasimbag



Organic kitchen waste is dumped in perforated barrels

Plate 4.5 Compost Barrel Practice

Plate 4.6 The Barrel composting practice offer a marvelous lifestyle for the slum dwellers both for Kal-a-wala Para Bastee and Nasimbag Bastee

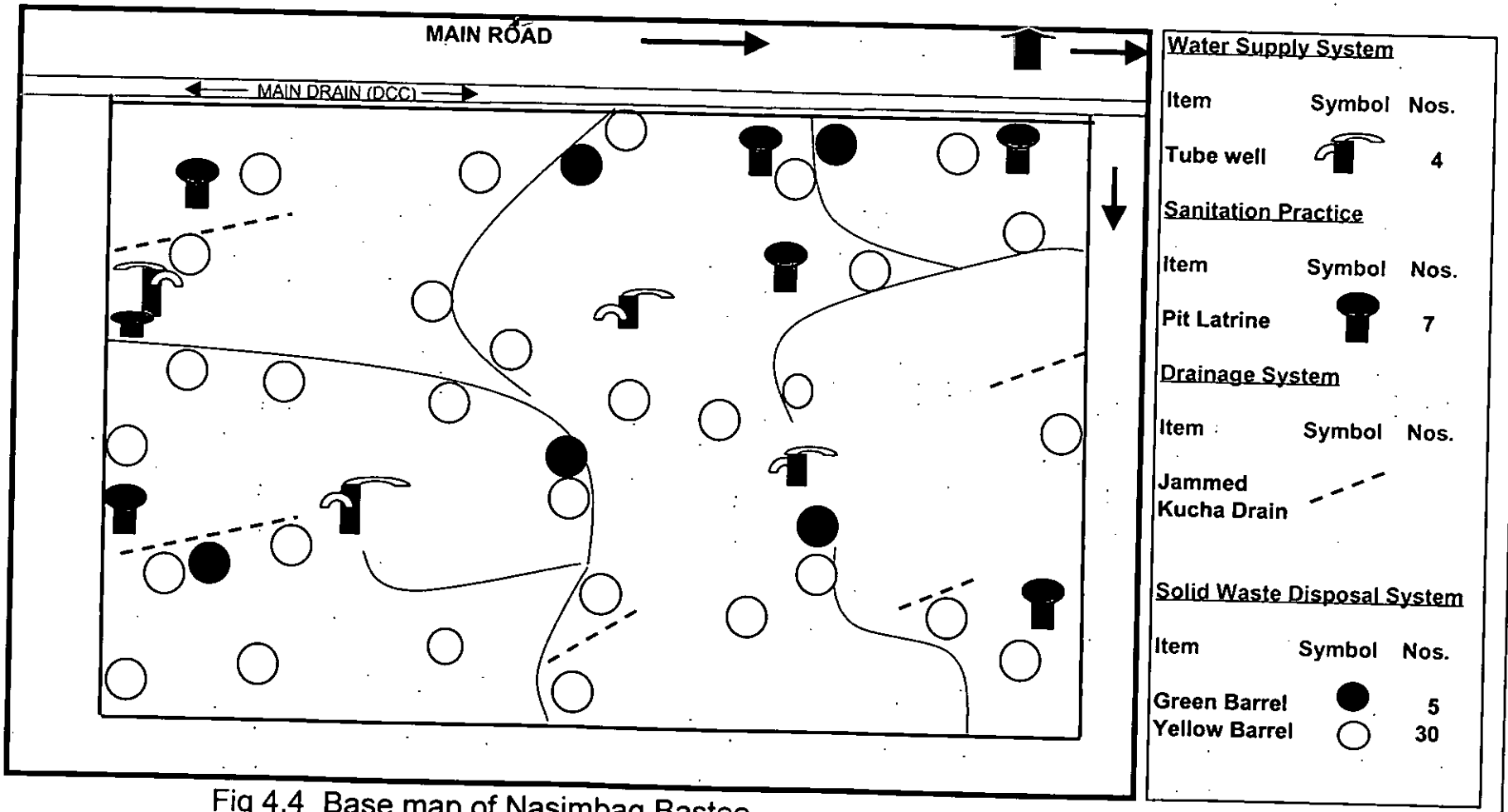


Fig 4.4 Base map of Nasimbag Bastee

4.4 Study Area 3: Kallyanpur 4 no. Pora Bastee

4.4.1 General Information

This slum is located at Mirpur Thana, ward no. 11 (*Fig 4.5*). The slum (*Fig 4.6*) is situated at east side of Bangla College and southern side of the Kallayanpur Housing Estate. The land is partly owned by the Govt. and partly owned by Kallyanpur Housing Estate. The area of the slum is 60 acre, total population is about 16000 and the total households are 9000 (DSK, 2001). Most of the houses are kucha with tin shed and bamboo partition. There are few households of paca floor. It is a large slum consisting of eight nos. of sub slums. For this study only the 4no. slum has been chosen.

The whole slum "Kallayanpur Pora Bastee" is situated on both sides of a lane, which is connected to the Kallayanpur main road. This is comparatively a developed slum. There is a mosque and two schools. They have some improved facilities for all of the eight sub slums such as CTC (child to child) program, a school for garment worker's child named GSS and a day care center. The day care center has become more popular day by day as it costs only Tk.15 to 30 /month as a token money and it helps the working mother. Recently, they have access to electricity with meter. There is a Satellite School provided by "Bastee Unnayan Bivag" of DCC in 1996. Most of the inhabitants are rickshaw puller, van driver, bus driver, day labours, garment's workers etc. Few are engaged themselves in begging and small business. DSK provides water supply, health care facilities and vacutag facilities. Vacutag also regulate the sanitation program (Sec 4.4.5, *Plate 4.7*). Phukli works for water supply, solid waste management, baby care center (Sec. 4.4.6.1, *Plate 4.8*) and CTC (Sec. 4.4.6.2, *Plate 4.9*). *Plate 4.10* represents the community meeting arranged by Phulki. Safe save and GSS act for the loan. There are also Marie Stops Clinic and Radda for the medical facilities. BRAC provides the education program.

The study area – Kallayanpur 4 no. slum consists of 200 nos. of households with population of 1000 (DSK, 2002). The slum dwellers are comparatively in better condition than other slums.

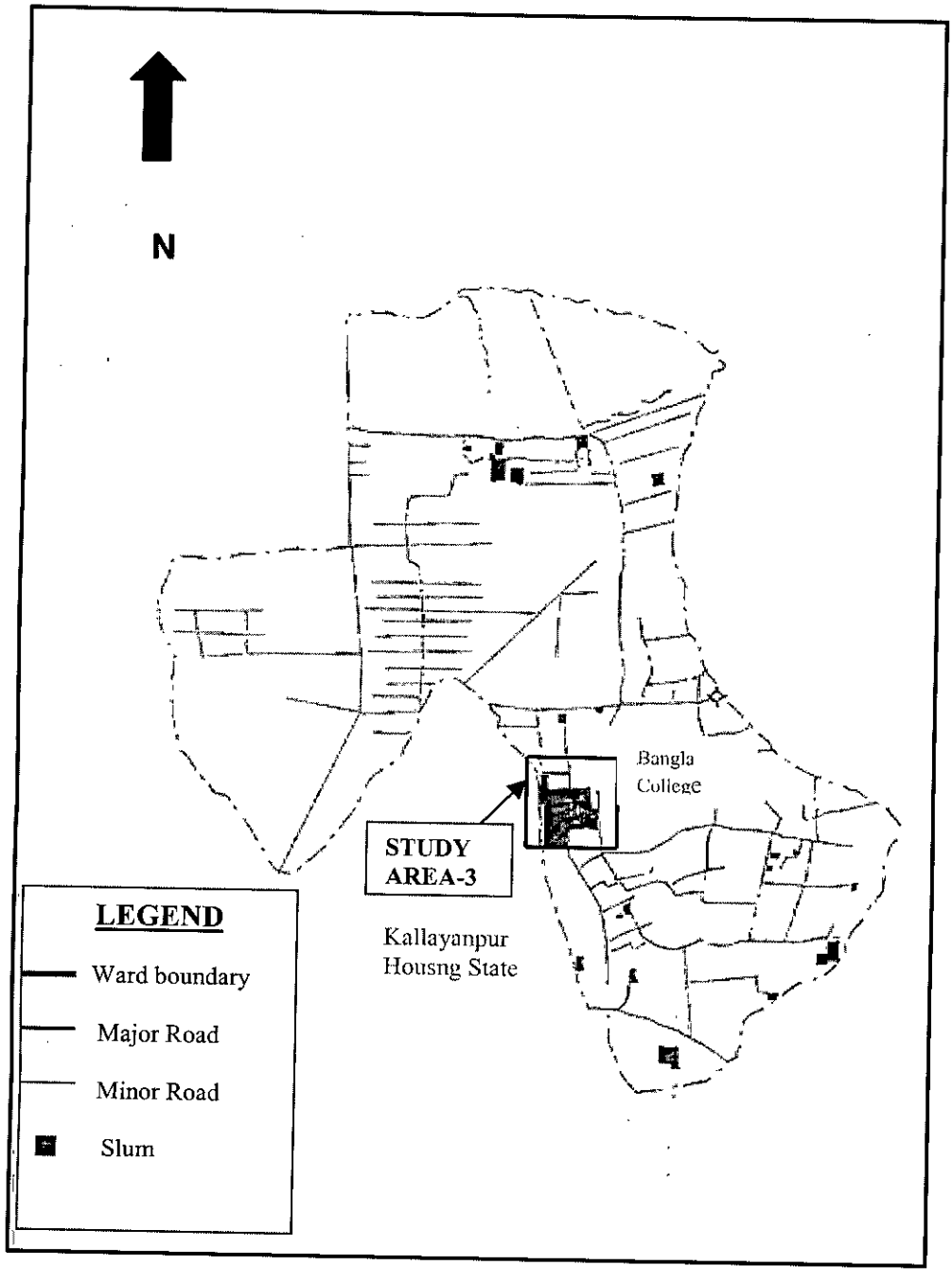


Fig 4.5 Kallayanpur Pora 4 no. Bastee (Study Area -3) at Mirpur, Ward no.11 (DCC, 2002).

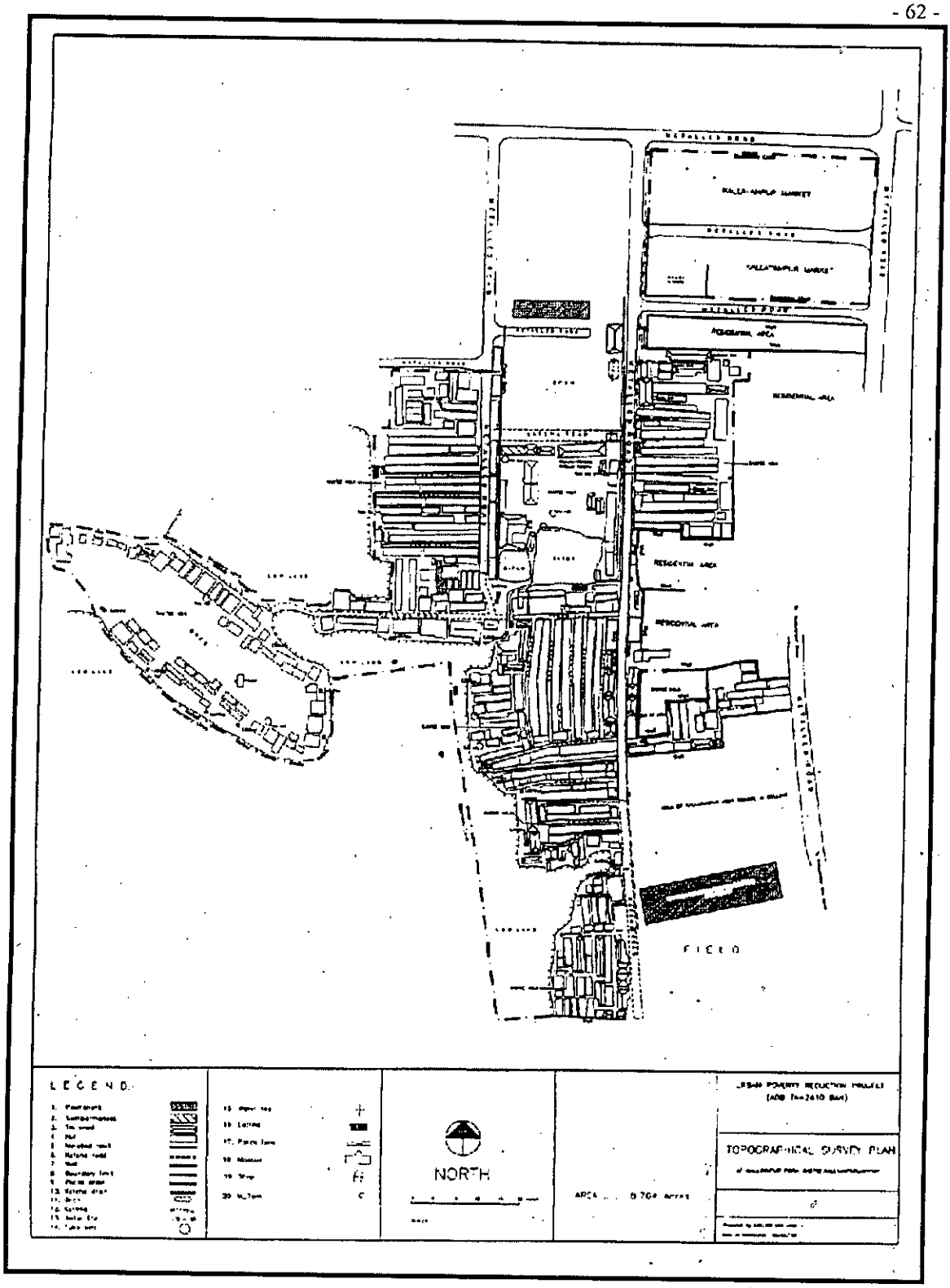


Fig 4.6 Topographical survey map of Kallayanpur Pora Bastee (CUS, 1996).

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.8*).

4.4.2 Water Supply system

In the past, the people of this slum had severe water crisis. They had some tube wells provided by WATSAN projects. As those tube wells were not user friendly they could not use them. Moreover due to lowering of water table in dry season, those tube wells remained unused most of the time. WASA line is also far away (about 6000 ft) from the slum. Therefore, the inhabitants had to collect water at a high cost i.e. Tk.1.00 per kolshi or they were forced to use dug well water when there were no alternatives. *Fig 4.7* presents the water use pattern of this slum in past years (DSK, 2001).

At present they are in better position considering the water supply services. Now they have 9 nos. of hand pump tube wells and one water point provided by DSK. Although the designed capacity of this water point is to serve 200 households, now it is serving 50-100 households. These tube wells and water point services are provided on a 'Cost Recovery Schemes' with the support of Water Aid, Bangladesh.

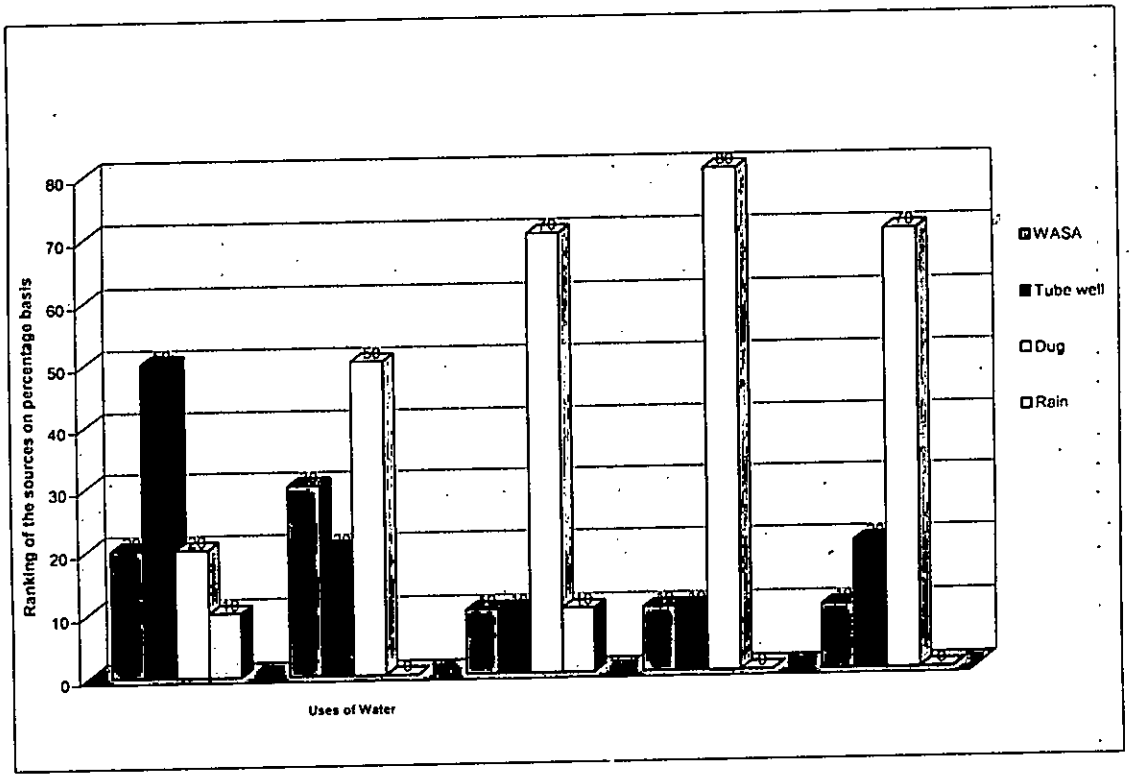


Fig 4.7 Uses of water on the basis of sources (DSK, 2001)

4.4.3 Sanitation practices

At past there were very few number of latrines with respect to the population in this slum. About 50 households used one latrine. Due to lack of sufficient water, the existing toilets are found dirty. Presently the slum dwellers have six nos. of communal latrines. Those are provided by Phulki. Each of them consist 6 to 8 nos. of latrines. Those who intend to use the latrines are required to pay 25% of the cost of construction payable in installments. Phulki signed an agreement with the management committee and users for smooth operation, collection of installments and for keeping the toilets clean and hygienic as part of their on-going process. There is another facility of desludging the pits by "vacutag" provided by DSK. *Plate 4.7* represents the vacutag practice.

4.4.4 Drainage System

The drainage condition is very bad in this slum. The City Corporation constructs the existing drains adjacent to main road. The maintenance is conducted by the children of the slum under child to child program. There is also some kucha drains in the slum with a poor drainage system. In rainy season the drains become full and cause serious nuisances. Dirty water of adjacent slum no.2 enters this slum easily and passes through it. In rainy season the drain's water flow over the houses.

4.4.5 Solid Waste Disposal system

The inhabitants have the facility for primary disposal of solid waste. There is door to door collection system. This existing situation keeps the area neat and clean. Since 2001, Phulki has taken up a garbage collection drive. A driver collects the garbage from each lane of the slum and deposits it in a nearby Dhaka City Corporation (DCC) dustbin. The community pays the salary of the driver. The children of the Kallyanpur slum manage the solid waste project. However, due to lack of proper awareness, they sometimes dispose their solid and liquid wastes into the nearby water body.

4.4.6 Exiting Other Facilities

4.4.6.1 Baby Care Center

There is a baby care center for working mothers of kallayanpur pora bastee provided by Phulki. *Plate 4.8* represents the baby care center provided for this slum's dwellers.

4.4.6.2 Child to Child Program

Within three years Phulki has successfully incorporated the child to child program at kallayanpur pora bastee. The participants are of eight to twelve years old. After completion their three months training they engaged themselves for different fields by knowledge sharing with others. They adopt the knowledge on water supply, sanitary latrines, drainage system, proper solid waste management and also personal hygiene and they become responsible for improving the existing system. *Plate 4.9* represents the practice of child to child program.

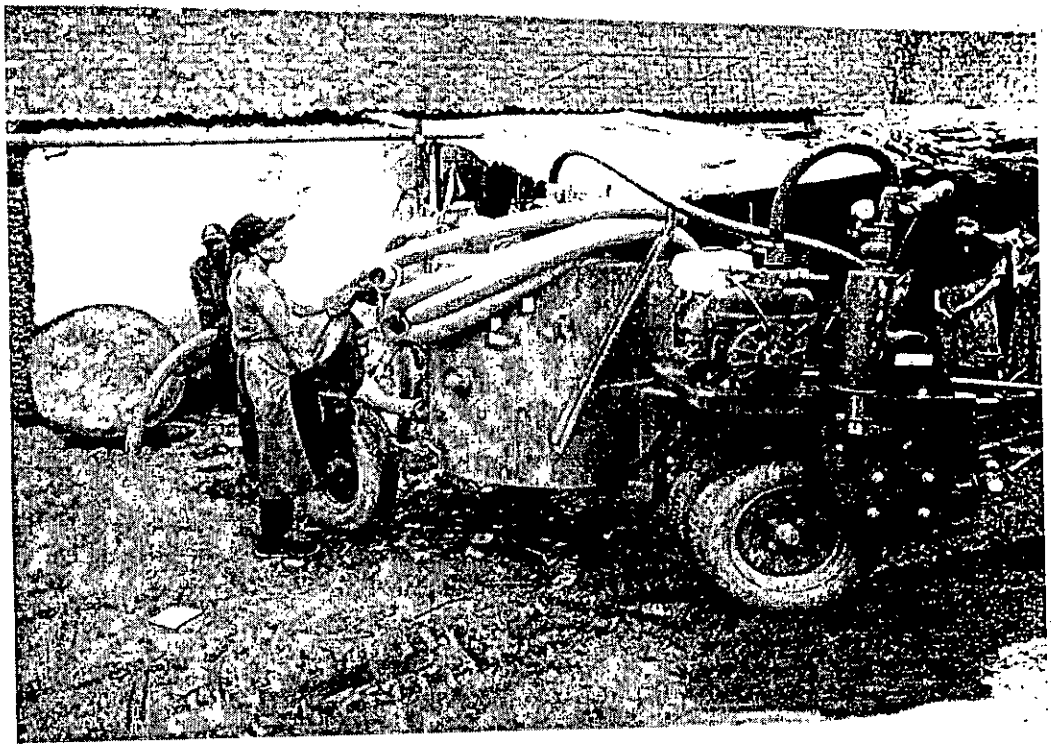


Plate 4.7 Vacutag Practice

Plate 4.8 Baby care center provided by Phulki

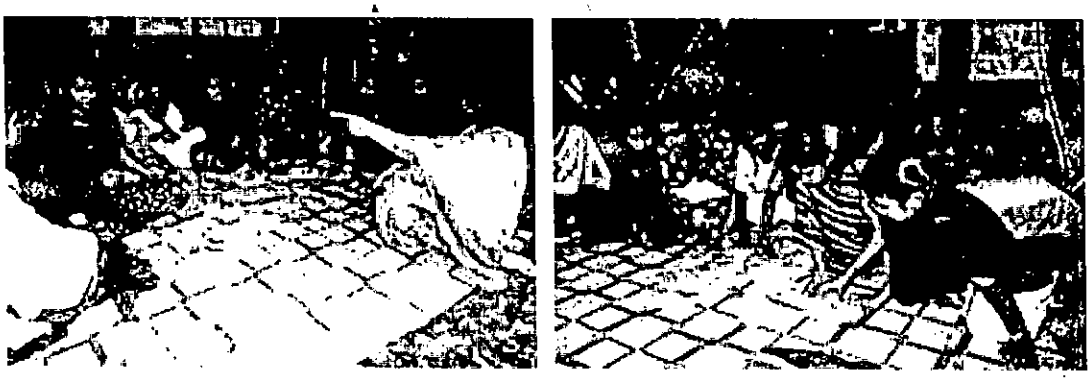


Plate 4.9 Child to Child program arranged by Phulki

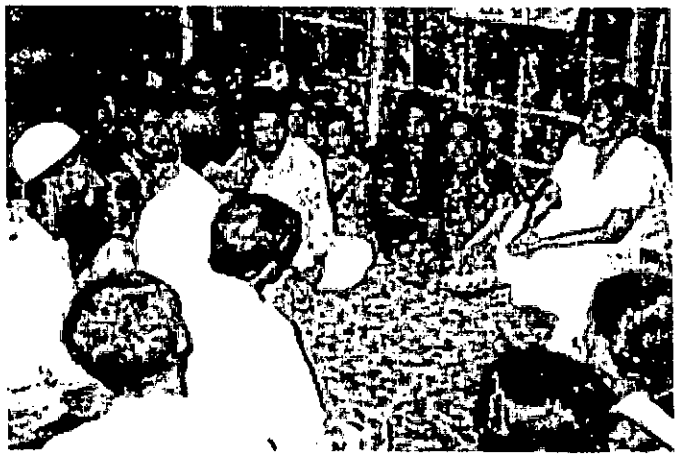


Plate 4.10 Community meeting arranged by Phulki

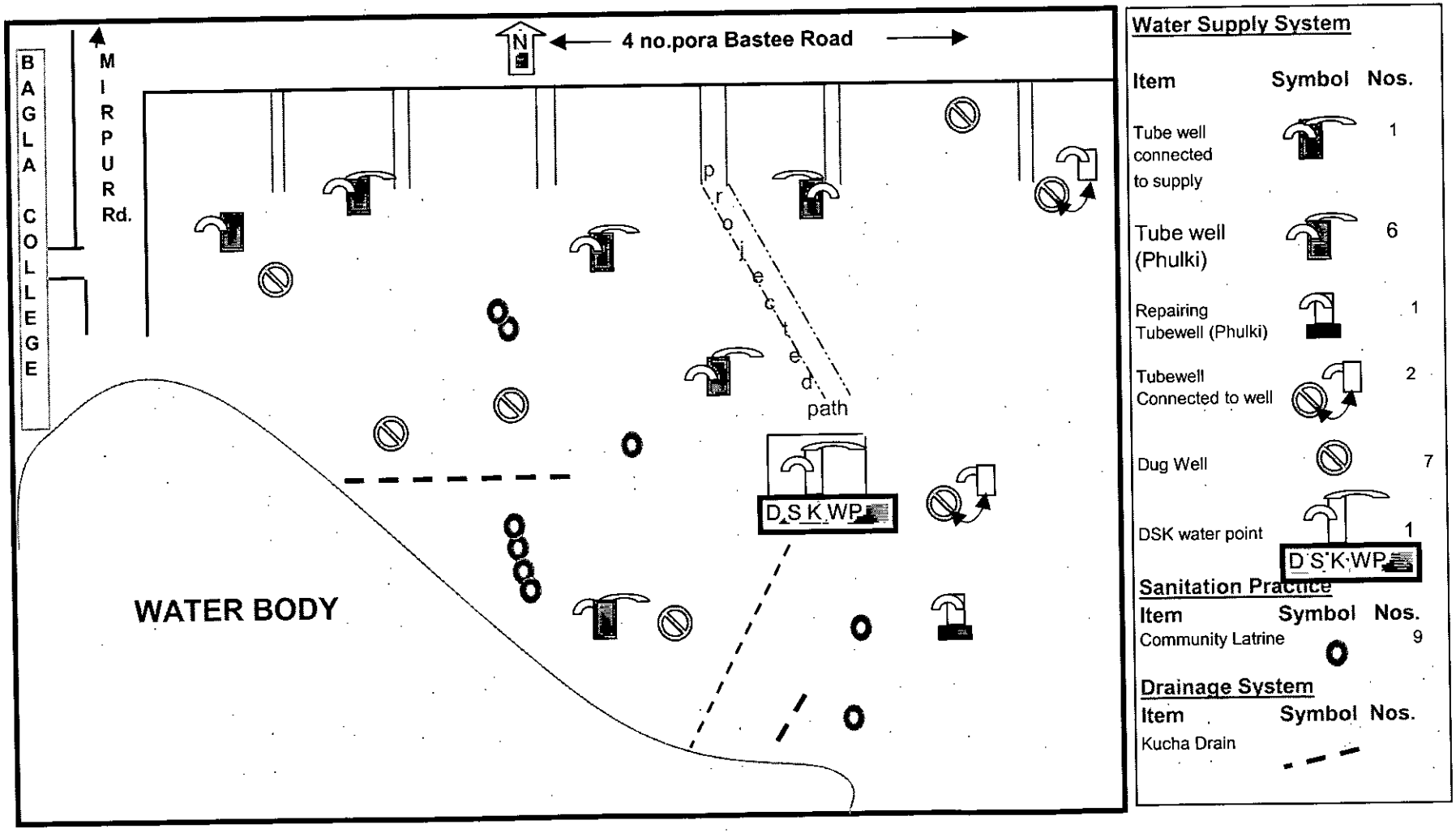


Fig 4.8 Base map of Kallayanpur #4 Pora Bastee

4.5 Study Area 4: BRI (Beg Rubber Industry) Slum

4.5.1 General Information

This slum is located at Tejgaon Thana, ward no. 37 (*Fig 4.9*). According to field survey and also from DSK's information, there are 150 nos of households, although the registered households are 65. The total population is about 600.

The slum dwellers got water supply and sanitation facilities from DSK, BRAC, MSS, ASHA acts for the loan, child and adult education. *Plate 4.11* represents the community meeting arranged by DSK.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.11*).

4.5.2 Water Supply System

The main source of water for drinking and other domestic purposes is tube well. There is a sanitation block (Sec. 5.3) provided by DSK within the slum. The Sanitation Block has two parts one for male and another for female. Each part consists of 3 nos. of pit latrines and a tube well (*Fig 4.10*). Thus there are only two tube wells within the slum. However, they have separate system for male and female for using these tube wells. The slum dwellers pay Tk.1.0/bucket for the water. They have also the bathing facility there and it costs Tk. 1.0 per person.

4.5.3 Sanitation Practices

The Sanitation Block (*Fig 4.10*) serves 100 households with the provision of 3 pit latrines of each part. The users pay Tk. 0.50 per use of these toilets. A caretaker selected within the slum, takes care of the management and maintenance of these latrines and also the tube wells. There is separate entrance for male and female for the sanitation block. DSK provided Vacutag for collecting the human waste after fill up of the toilets. This was a low-cost effective technique for disposal and management of human waste in the slum. But due to the lack of responsibility of slum dwellers for

proper maintenance and interaction with the service provider (DSK), the program faces problems.

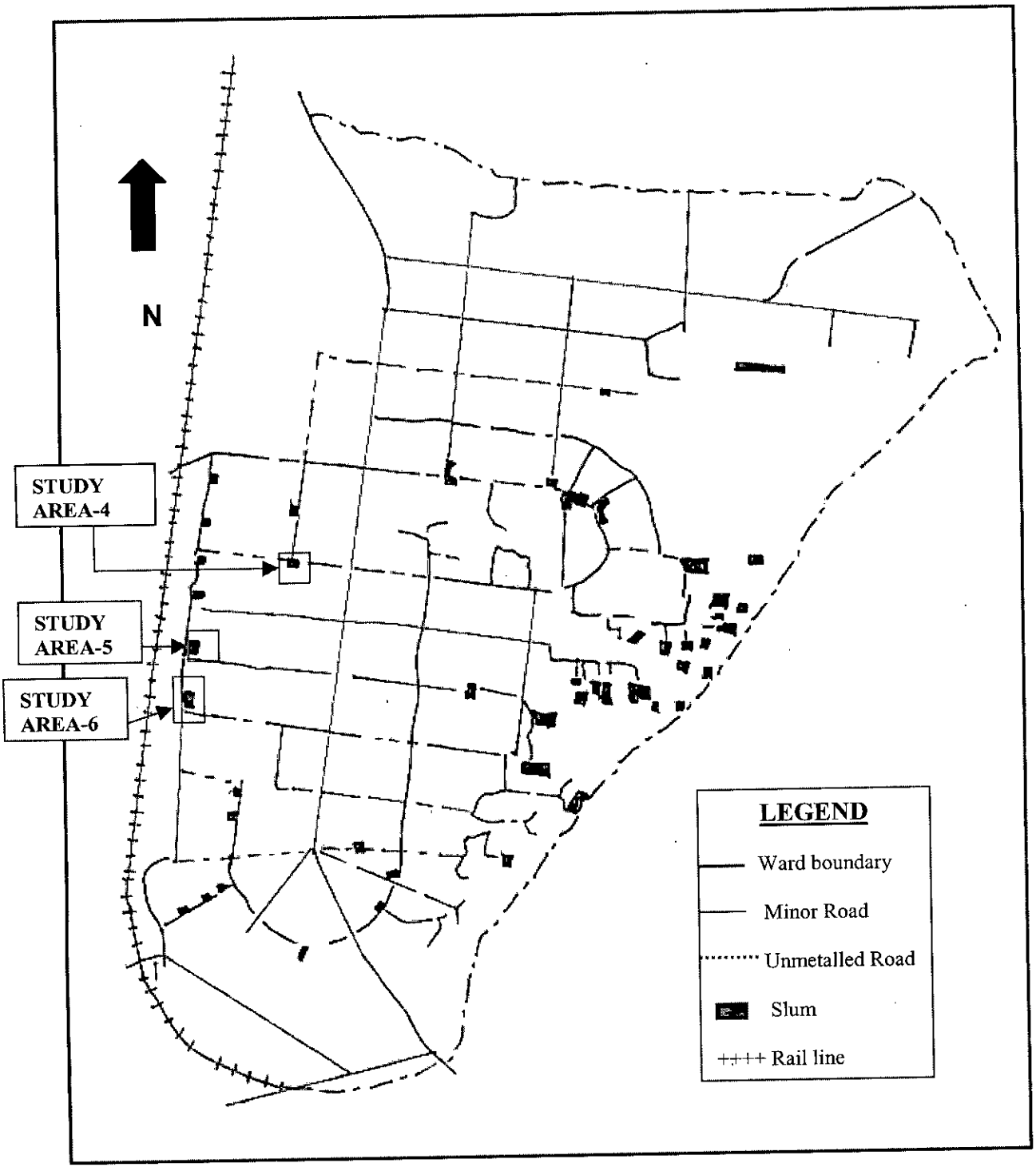


Fig 4.9 BRI Slum (Study Area 4), Omor Sons Slum (Study Area 5) and Tiger Slum (Study Area 6) at Tejgaon, Ward no. 37 (DCC, 2002).

4.5.4 Drainage System

There is one discontinuous drain within the slum. It drains out water from the sanitation block to the main road side drain. Other than this drain, no drainage facility exists in the slum.

4.5.5 Solid Waste Disposal System

There is no systematic arrangement for solid waste disposal of the slum. The people usually dump their everyday wastes in the roadside DCC (Dhaka City Corporation) bin. They dispose off their wastes within the slum also, which creates nuisance and unhygienic environment in the slum (*Plate 4.12*).

Plate 4.11 Uncollected wastes at the entrance of the BRI slum

Plate 4.12 Community meeting provided by DSK

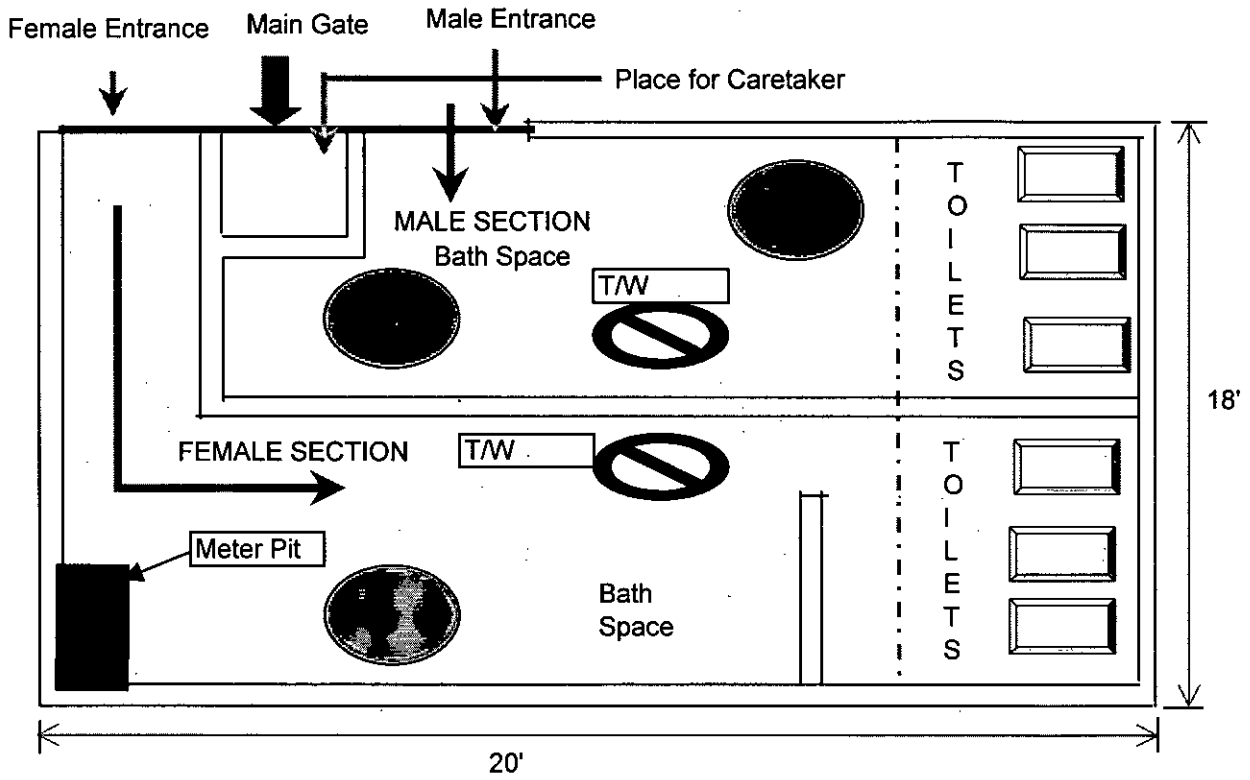


Fig 4.10 Sanitation Block (B.R.I Slum)

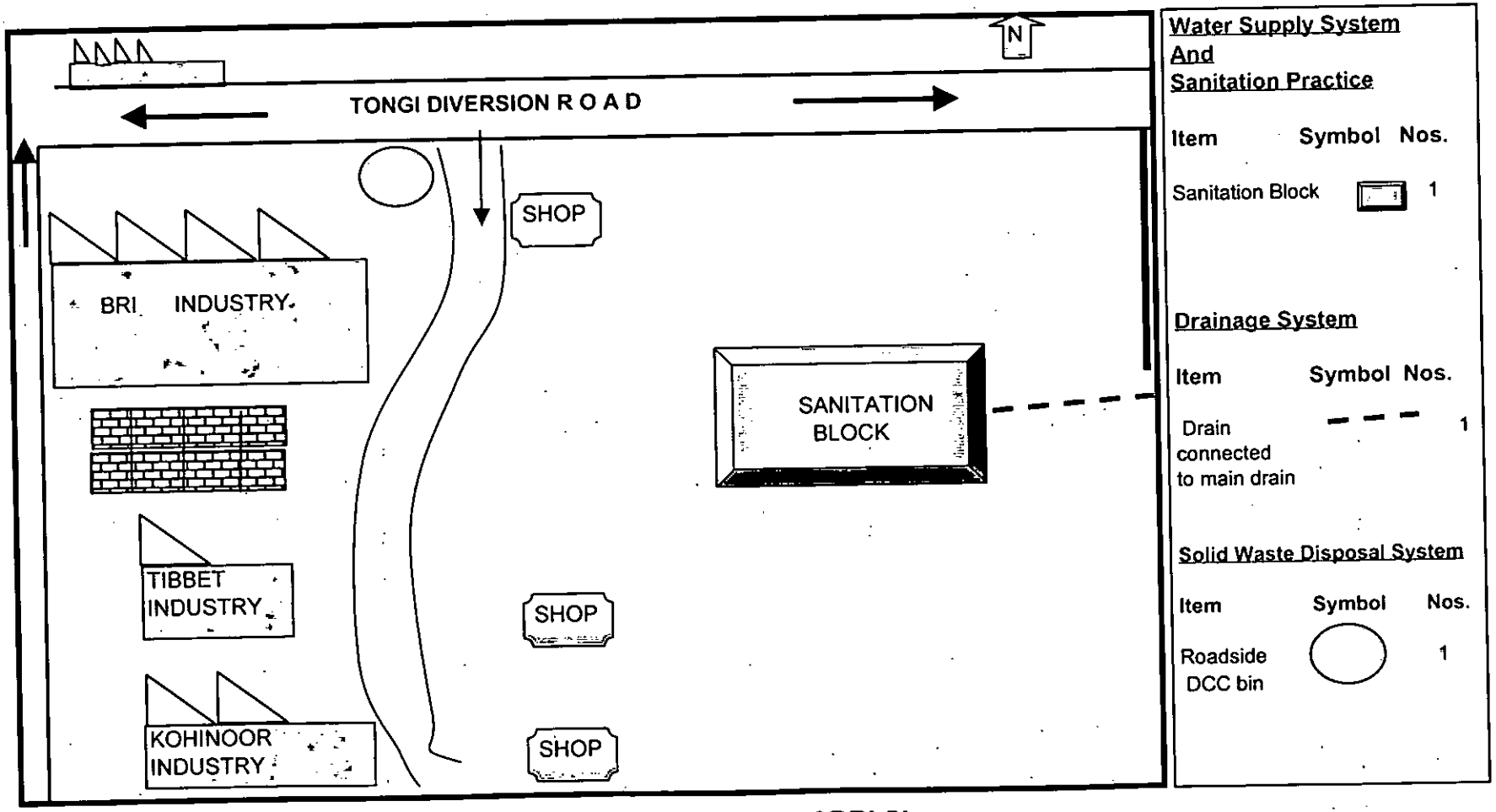


Fig 4.11 Base Survey map of BRI Slum

4.6 Study Area 5: Omor Sons (Iron Materials Industry) Slum

4.6.1 General Information

This slum is located at Tejgaon Thana, ward no. 37 (*Fig 4.9*).The number of household is about 100 and population is about 600 in this slum (DSK, 2000). A divergent road from the 'Polytechnic Senior Staff Quarter Road' passes through the slum and meets with the Tiger slum (*Study Area 6*) connecting road.

Various NGOs such as DSK, BRAC, MSS work in water supply and sanitation sectors within the slum and ASHA works in child and adult education, credit programs etc.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.12*).

4.6.2 Water Supply system

At present there is a water point provided by DSK. The water point consisting of two tube wells, is a kind of underground reservoir having connection with DWASA mains; on top of the reservoir hand pump heads has been mounted so that water could be extracted via mechanical pressure (Sec. 5.2). The designed capacity of this water point is to serve 100 households and it is sufficient to meet the slum dwellers' need. This water point service is provided on a 'Cost Recovery Schemes' with the support of Water Aid, Bangladesh.

4.6.3 Sanitation practices

In this slum, there are 8 nos. of common toilets (slab) provided by different NGOs, each toilet for the use of 10 households. They have to pay for using the toilets. They want to have the WASA sewerage line connected to the toilets.

4.6.4 Drainage System

There is one discontinuous drain within the slum. It drains out water from the water point to the main road side drain. Other than this drain, no drainage facility exists in the slum.

4.6.5 Solid Waste Disposal System

There is no systematic arrangement for solid waste disposal of the slum. The people usually dump their everyday wastes in the roadside DCC (Dhaka City Corporation) bin. They dispose off their wastes within the slum also, which creates nuisance and unhygienic environment in the slum (*Plate 4.13*).

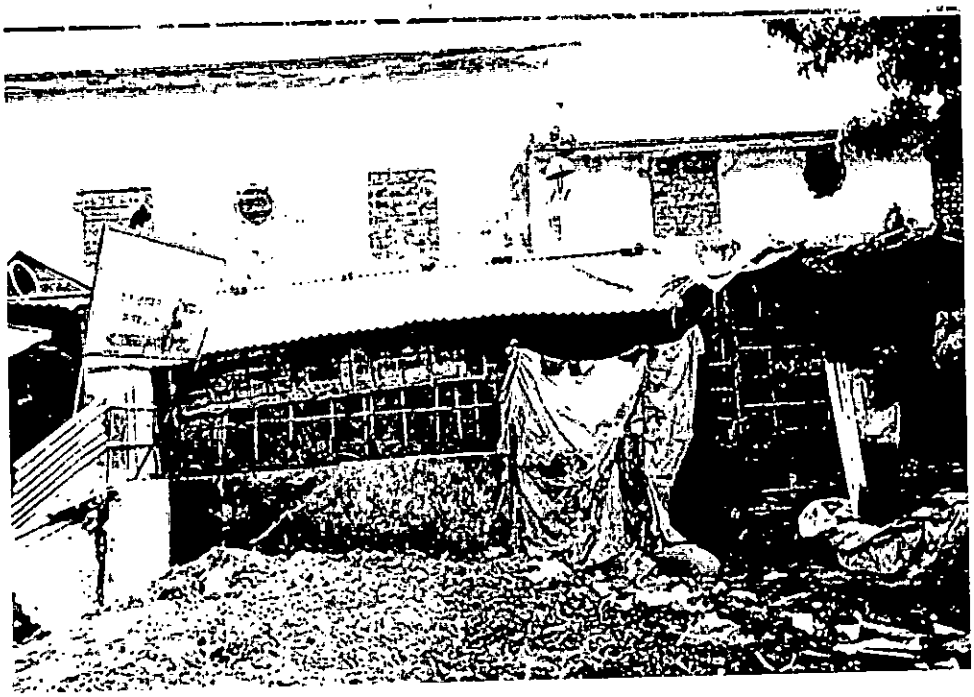


Plate 4.13 Uncollected wastes at Omor Sons slum

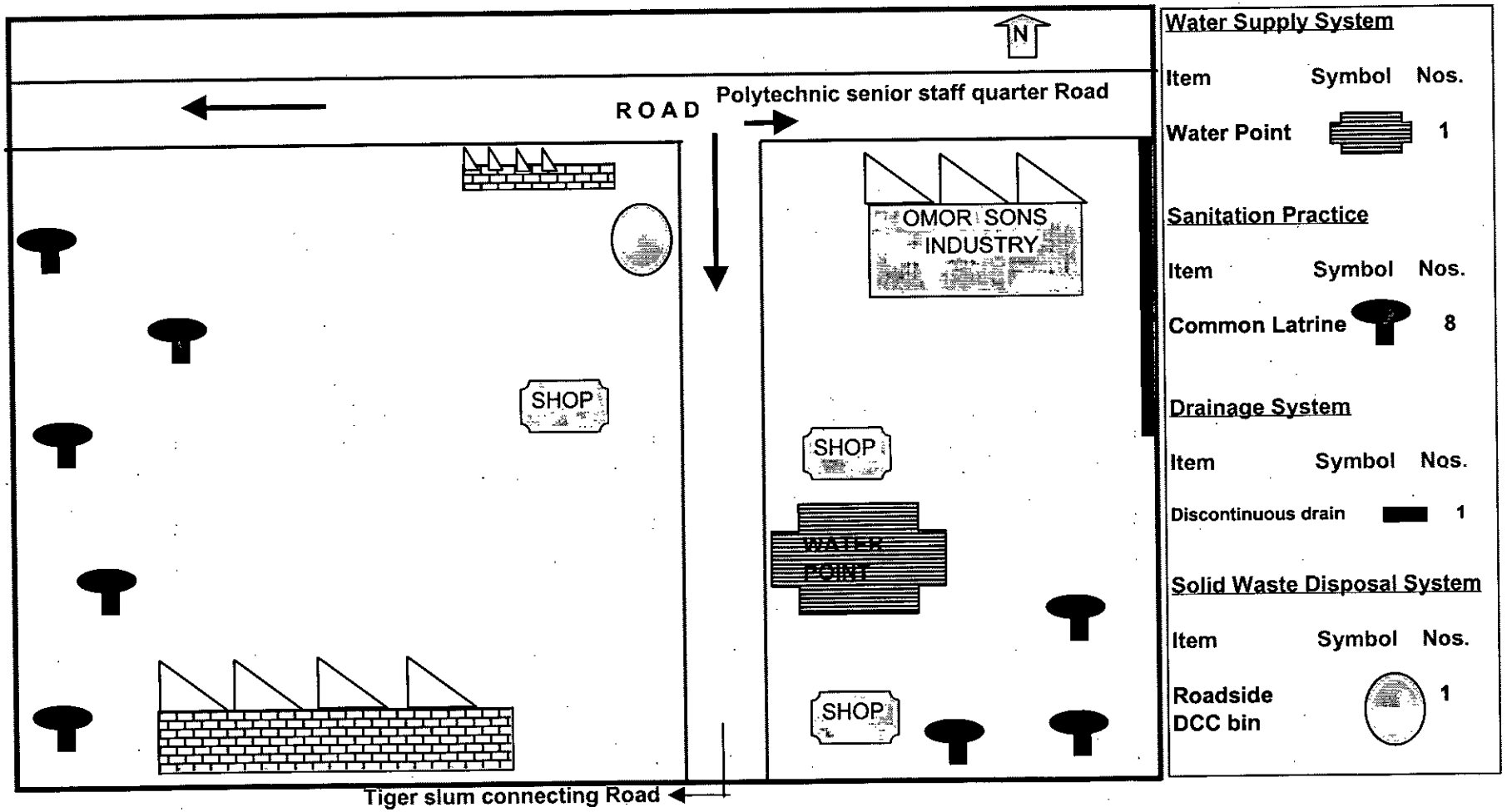


Fig 4.12 Base map of Omor Sons Slum

4.7 Study Area 6: Tiger Industry (Wire Producer) Slum

4.7.1 General Information

This slum is located at Tejgaon Thana ward no. 37 (*Fig 4.9*).The permanency of the slum is about 23 years. According to CUS (1996), the registered households are 72, whereas DSK (1998) report shows households are 140 and population is 600. Most of the people in this slum, both male and female, work at the nearby industries. Their monthly income ranges from Tk. 3000/- to Tk. 5000/-. Since this slum is located in the industrial area, there are many primary schools and community hospitals like 'Shurjer Hashi Clinic', 'DSK Clinic' in the neighbourhood. The parents usually send their children to nearby schools but they cannot complete their primary education because of the availability of jobs in the nearby industries and parents prefer earning to schooling.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.13*).

4.7.2 Water Supply system

There is one water point provided by DSK to supply water within the slum. The water point (Sec. 5.2) has connection with the DWASA main line and two tube wells have been installed to get the stored water from the water point. . The designed capacity of this water point is to serve 100 households and it is sufficient to meet the slum dwellers' need. This water point services are provided on a 'Cost Recovery Schemes'.

4.7.3 Sanitation Practices

There are twenty eight slab latrines at present. Most of these latrines are mainly situated in a row at the north side of the slum. The rest are located by the side of the road in the south. There exists some hanging latrines along with these slab latrines. There are some designated space for bathing of the slum people. Since there is no proper drainage in this slum, unsanitary condition prevails. Moreover, lack of

awareness, personal cleanliness and indiscriminately disposal of solid wastes create unhygienic environment in the slum. As a result, the inhabitants suffer from various diseases throughout the year.

4.7.4 Drainage System

There are two discontinuous kucha drains connecting the latrines and bathing places within the slum. It drains out water to the main road side drain. Other than this drain, no drainage facility exists in the slum.

4.7.5 Solid Waste Disposal System

There is no arrangement for solid waste disposal of the slum. The people usually dump their everyday wastes in the roadside. There is no bin. They dispose off their wastes within the slum also, which creates nuisance and unhygienic environment in the slum.

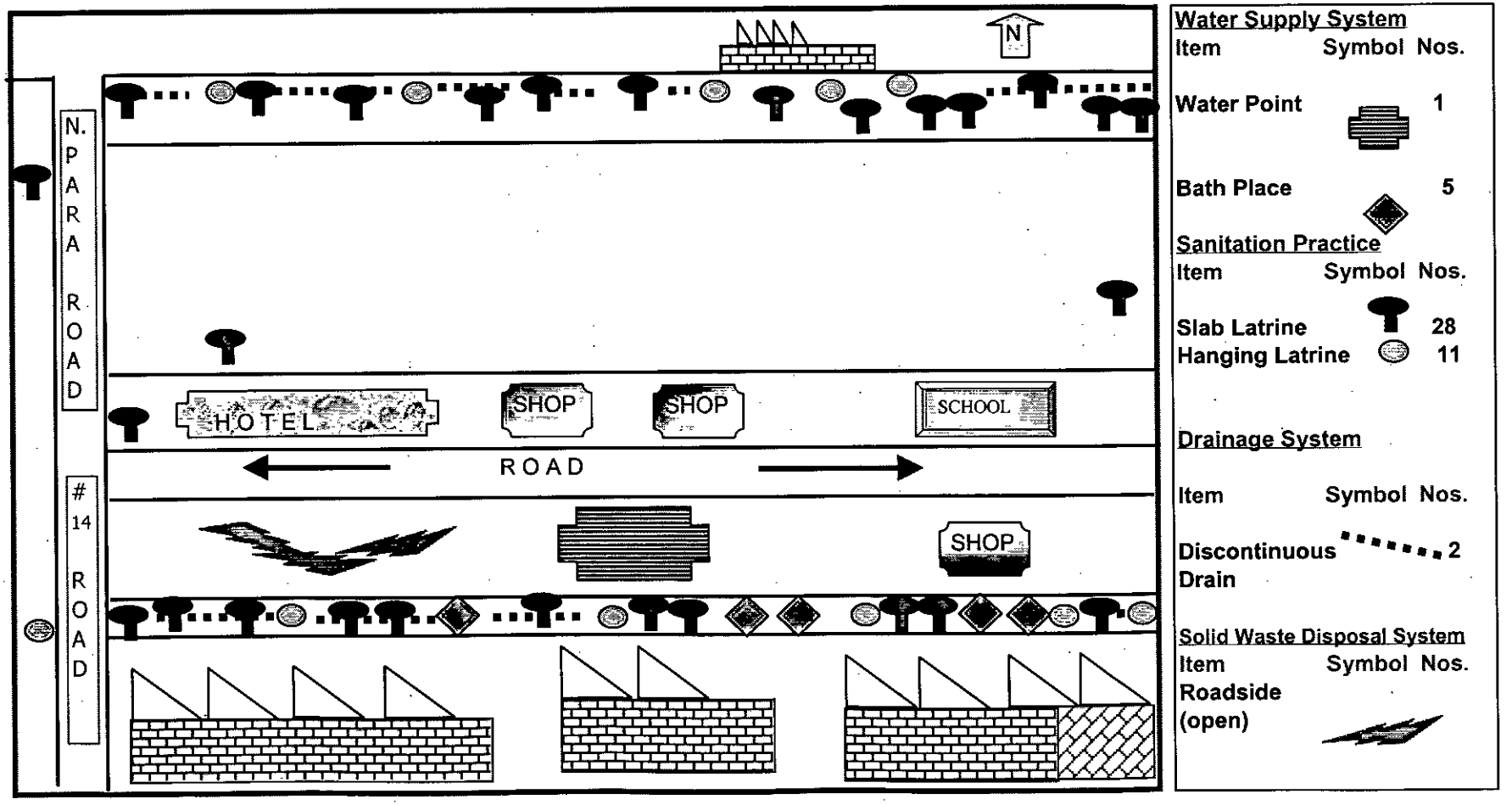


Fig 4.13 Base map of Tiger Slum

4.8 Study Area 7: West Vasantek Slum, Mirpur – 14

4.8.1 General Information

This slum is located at Mirpur Thana, ward no.4 (*Fig 4.14* and *Fig 4.15)*. It has a local name "Godarghat Bastee". This slum is situated on a high land (Tek) surrounded by low lying areas and water body. The owner of the land is Government and the age of the slum is about seven years. The total area is more than one acre and population is approximately 750. There are about 140 households in the slum. As the slum owned by the Government, the people are always concern of the eviction of the slum. They have already applied for the lease and trying to purchase the land by installments. There is a mosque, one madrasha and one primary school within this slum. Most of the houses are made of bamboo, tin, polythene sheets etc. There is a road, which divides the slum into two parts. The road provides also some lanes for easy access to houses of the slum. These lanes become unacessible for a short duration of rain .There is a "Bastee Unnayan Committee" within the slum. The committee decided to construct a katcha path on the bank of the Jheel. They have constructed this path by taking donations from each household of the slum in the March'2002. Now, they can easily go out of the slum without using a boat. Now they are trying to make this path as pacca pavement.

There are some NGOs engaged for slum improvement programs, such as --- Dushtha Shasthya Kendra (DSK) provides the water and sanitation facilities and micro credit program. PROSHIKA works for education and micro credit.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.16*).

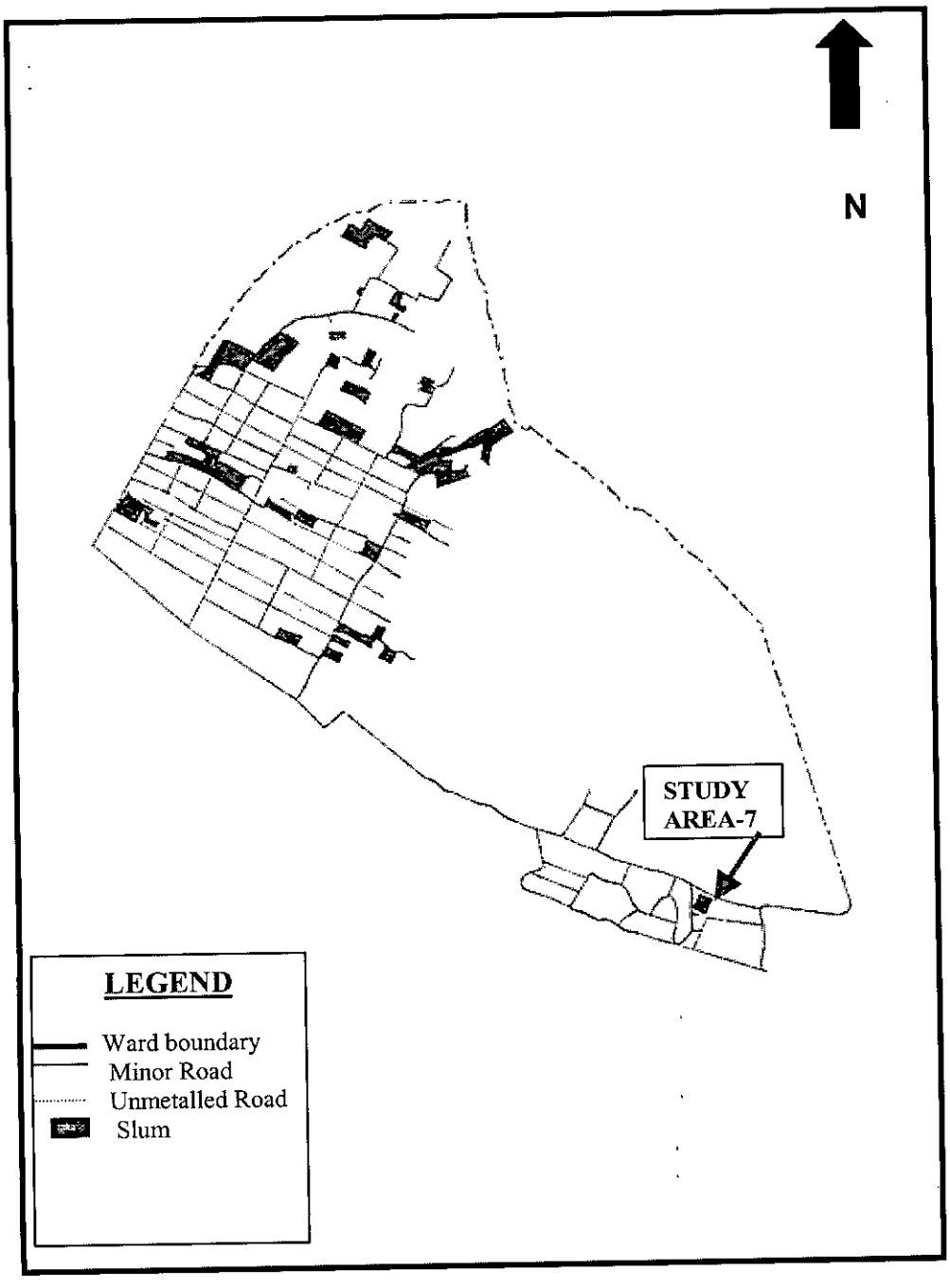


Fig 4.14 West Vasantek Slum (Study Area 7) at Mirpur, Ward no.4 (DCC, 2002)

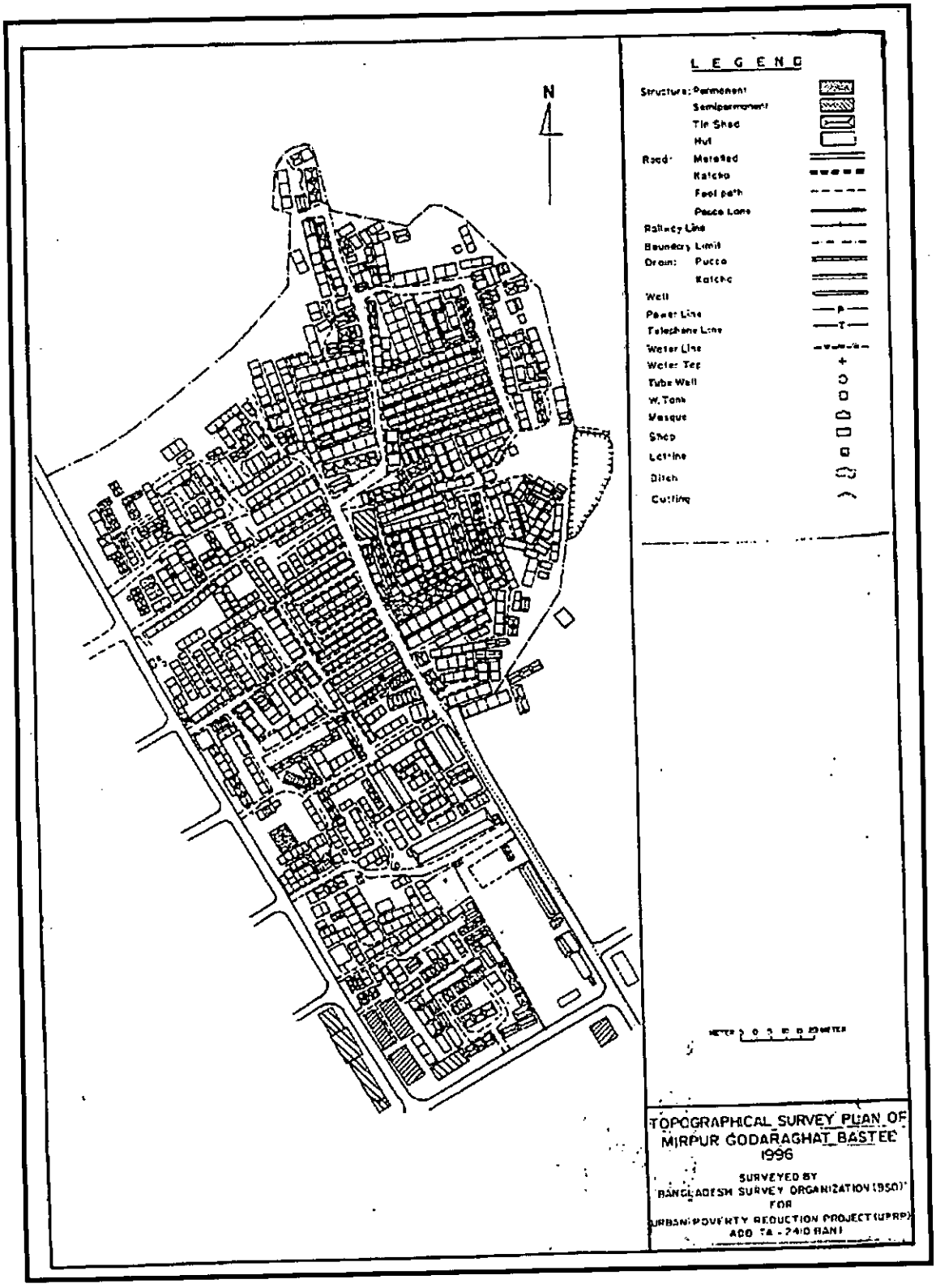


Fig 4.15 Topographical Survey map of West Vasantek (Study Area -7) (CUS, 1996).

4.8.2 Water Supply System

In the past, the people of this slum had severe water problem. They had three tube-wells provided by ward commissioners. At present, two tubewells are working which need frequent servicing. In 2002, DSK provided four water points which are connected to the WASA main line. Therefore, now the slum dwellers have sufficient water to meet their demand (*Plate 4.14 a* and *b*).

4.8.3 Sanitation Practices

There are altogether forty latrines at present. Most of these latrines are mainly situated in a row at the north side of the slum. There are 36 nos. of hygienic latrines out of total 40 latrines provided by DSK (*Plate 15 a* and *b* represents the present situation of sanitation after getting the toilets from DSK). At present 6 to 7 nos. of persons use one latrine. The children generally try to use the hanging / slab latrine. But those who are not able to go, their feces are disposed off into the nearest Jheel.

4.8.4 Drainage System

There is no drain to dispose of the waste water in the slum. It is difficult for the slum dwellers in the rainy season with the wastewater. Although all of the salubrious toilets that are recently provided by DSK are water sealed, the habit of dumping wastes haphazardly makes the drainage system even worse.

4.8.5 Solid Waste Disposal System

There is no specific disposal point of solid wastes. The inhabitants usually discard their daily kitchen wastes and other solid wastes to the Jheel (water body). The open wastes cause odor problem and also increase the scope of breeding of mosquito and therefore, increase the risk of diseases. They are also polluting the Jheel's water. It seems that the community is completely unaware of these problems and they have no objection about the existing situation.

4.8.6 Existing Health Problems

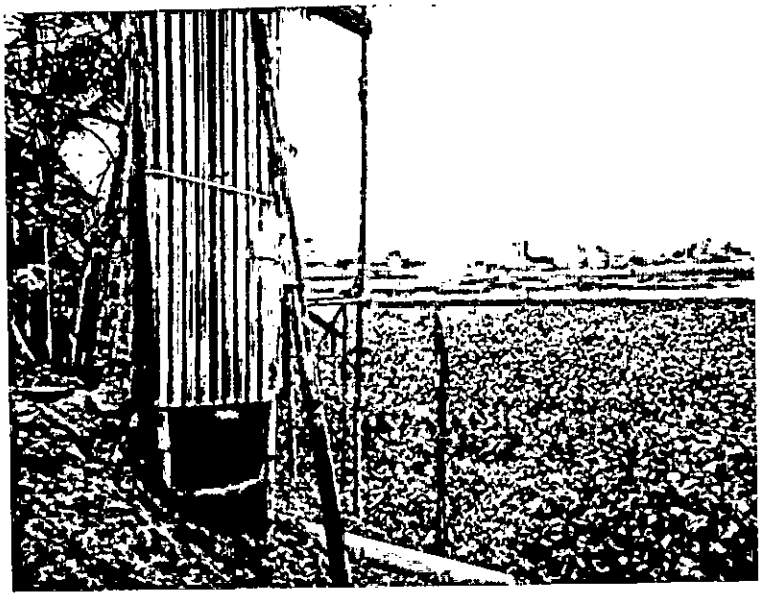
A large nos. of the inhabitant suffers from diareahoea, dysentery, itch, pox, fever, malaria, scarf and so on. Most of the diseases are caused due to lack of their alertness and cleanliness. They use to go to the Kobiraj or Quack for the treatment. All of the inhabitants do not have necessary knowledge about the vaccine for pregnant mothers and infants. Some of them know about the health and hygiene but they are not willing to practice those not only for their neighbors but also in their own family.

(a)

(b)

Plate 14 (a)(b) Water point provided by DSK

(a)



(b)

Plate 4.15 (a) (b) Sanitation facilities provided by DSK

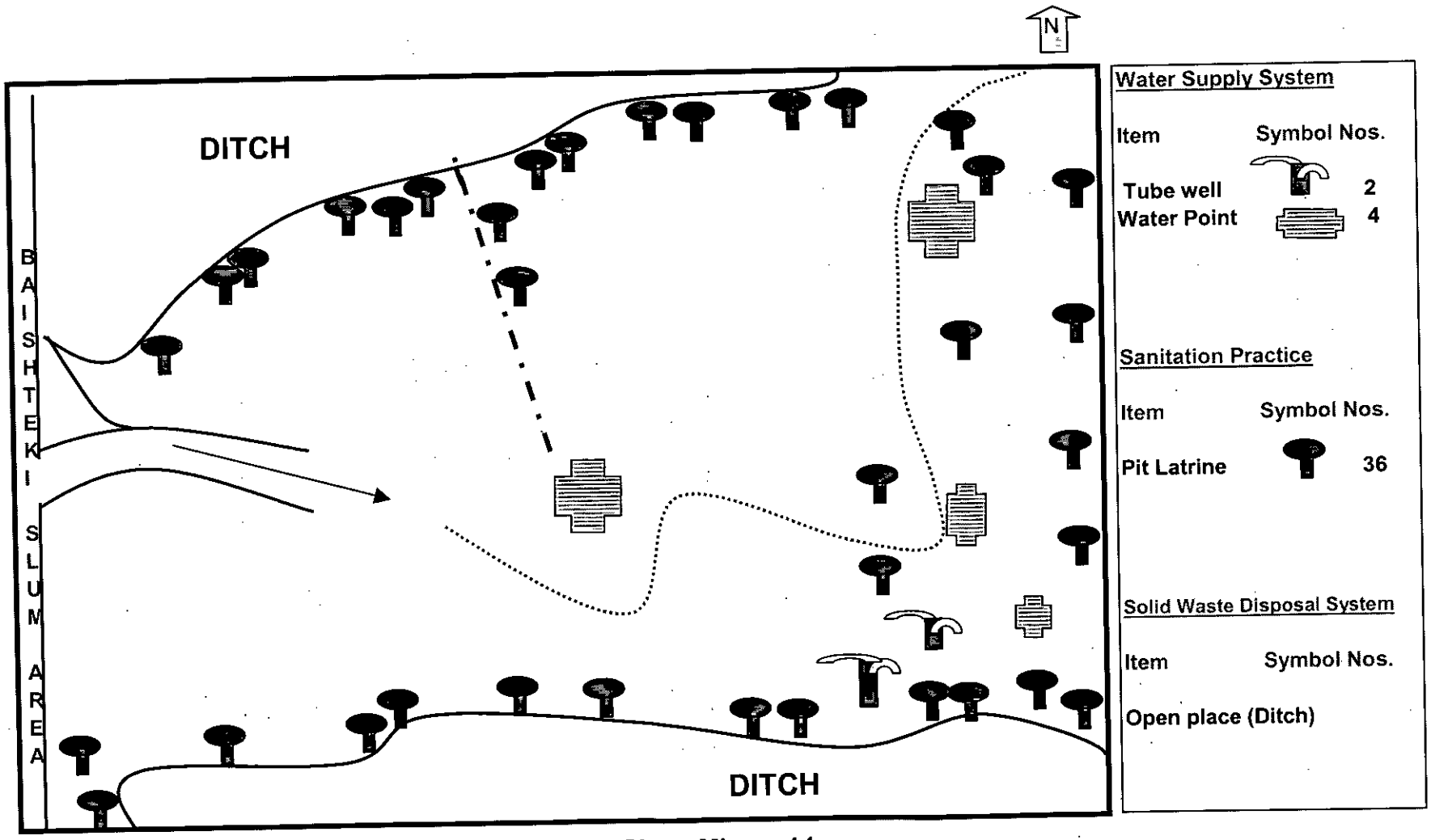


Fig 4.16 Base map of West Vasantake Slum, Mirpur-14

4.9 Study Area 8: West Vasantake no. 1 Bastee

4.9.1 General Information

The slum is located at ward no.15 (*Fig 4.17*) of the Cantonment Thana of Dhaka City Corporation. It is situated at north – east part of the West Vasantake slum. The slum is situated on the private land. The actual proprietor is Benarasi. The permanency of the slum is about thirty years. The total area is about 48 acre. The total population is about 12,000. There are 2,500 nos. of households. The slum dwellers always face the problems of high rent and threat of eviction. Kucha road inside the slum causes serious problems in rainy season. There is a police fari, a non-Govt. primary school and a high school in the neighbourhood. There are also some schools and clinics provided by different organizations. The slum dwellers are engaged in different types of services such as rickshaw pulling, driving auto rickshaw, selling vegetable, business of 'Bhangari', grocery shop keeper, servant, working at Garments, selling rice cake, sewing, making jute bags etc. Sometimes the employment becomes a problem due to sudden shut down of garment factories.

Dushtha Shasthya Kendra (DSK) provides the water and sanitation facilities and micro credit program. PROSHIKA works for education, micro credit program. BRAC also works for education. There are also Phulki, SAKTI and Progati Samaj Kallayan Sanasta work in various programs.

The following sections present the details of the facilities in the study area and at the end of this descriptions, a map is also shown with locations of the facilities (*Fig 4.19*).

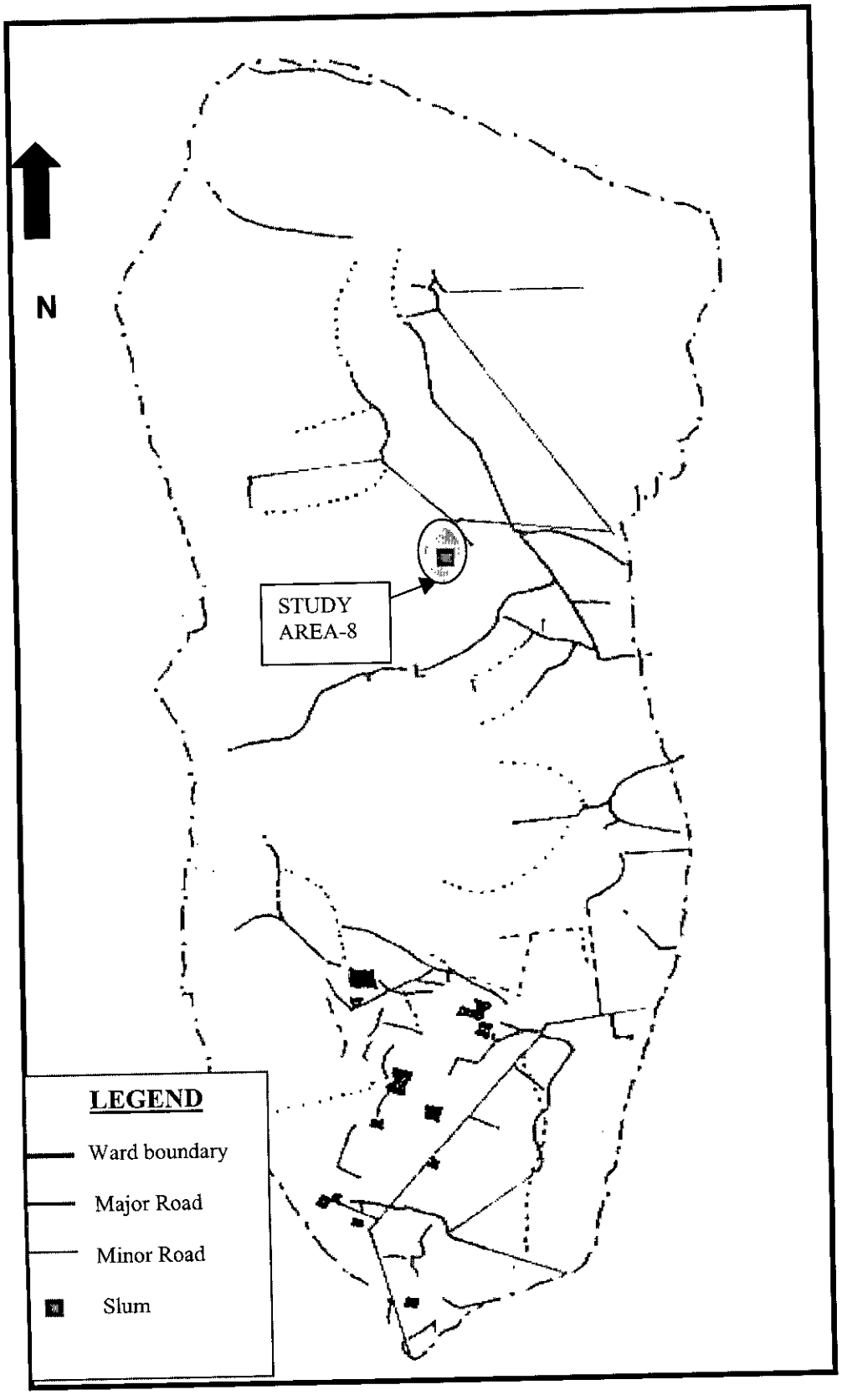


Fig 4.17 West Vasantake no. 1 Bastee (Study Area 8) at Cantonment, Ward no 15 (DCC, 2002).

4.9.2 Water Supply system

The slum people usually get water from WASA supply main, pond, tube well and rainwater. Tube-wells are provided by City Corporation, different NGOs and private interest. They have 13 tubewells. Supply water is provided by PROSHIKA and City Corporation. Rest of the water systems is provided by private interests that are illegal. They do not have pay for tube well water as there is no involvement of 'cost recovery system'. Moreover, the tube-wells remain out of order most of the time. In that case, the inhabitants have to purchase water from the nearby local market. At present they are collecting water from illegal lines connected to the WASA main line. The present situation is not satisfactory. There is four water points in the slum. People have to pay Tk. 40.00/ month for using water point. They also use pond water which is not safe, rather highly contaminated. During rainy season, the inhabitants use rain water but since there is no hygienic system/ structure to collect and store rain water, they can not use it for a long time. The different water sources and water use pattern for different purposes in shown in Fig 4.18.

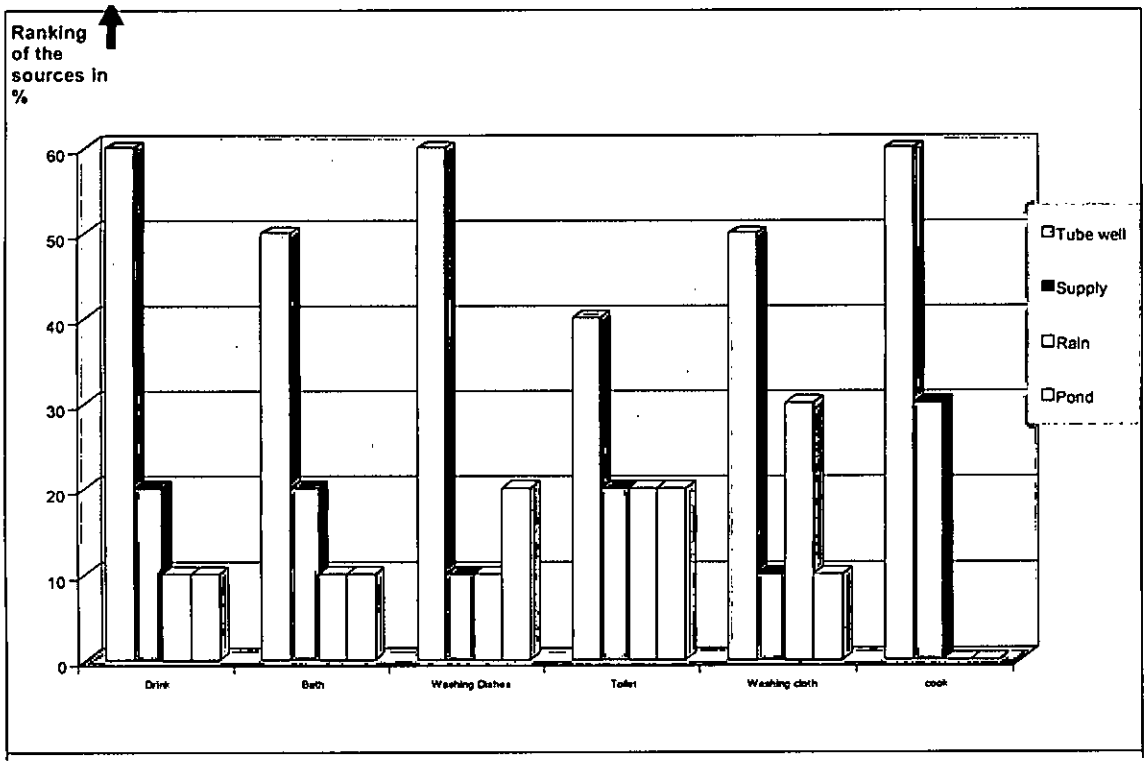


Fig 4.18 Uses of water on the basis of sources

4.9.3 Sanitation Practices

There are 35 latrines in this slum. These are not sufficient. Most of the latrines are kucha and hanging. There are some hygienic toilets, but due to lack of proper management they are causing environmental pollution. Most of the children defecate at the open spaces within the slum or at the nearby nala (thin water body).

In this slum, most of the people do not use shoes, sandals in the latrines. They also do not use soaps or ash after defection. However, some of them use water for washing hands after toilets. These unhygienic practices cause different diseases such as diarrhea, jaundice, cholera etc. among the slum people.

4.9.4 Drainage System

There is no drain to dispose of the waste water in the slum. It is difficult for the slum dwellers in the rainy season with the wastewater. Although all of the salubrious toilets that are recently provided by DSK are water sealed, the habit of dumping wastes makes the drainage system ever worse.

4.9.5 Solid Waste Disposal System

There is no specific disposal point of solid wastes. The inhabitants usually discard their daily kitchen wastes and other solid wastes to nearby open places. The open wastes cause odor problem and also increase the scope of breeding of mosquito and therefore, increase the risk of diseases. They are also polluting the water bodies, pond by throwing wastes. It seems that the community is completely unaware of these problems and they have no objection about the existing situation.

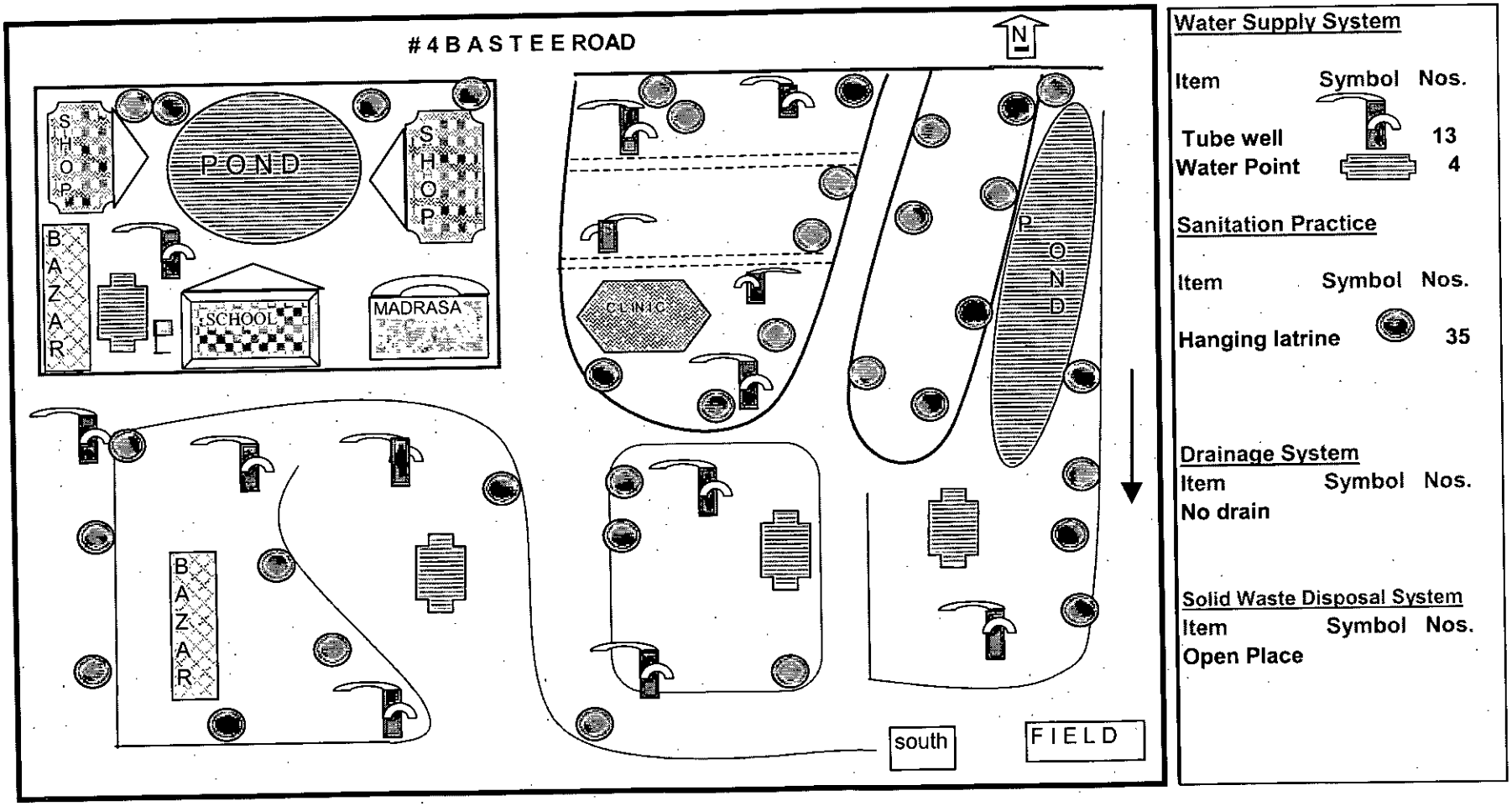


Fig 4.19 Base map of West Vasantake no.1 Bastee

Chapter 5

PRESENT PRACTICES IN WATER SUPPLY, SANITATION AND SOLID WASTE MANAGEMENT SYSTEM

5.1 INTRODUCTION

While conducting the baseline survey of the selected slums, it is observed that various NGOs and GOs are involved in slum development projects, particularly in water supply and sanitation sectors. They are introducing some improved low cost technologies and approaches specially suitable for slums. This chapter presents the description and technical details of these projects and approaches.

5.2 WATER SUPPLY (WATER POINT)

Water point is one of the newly introduced water source in the slum. It is nothing but an underground water reservoir connected with WASA main line. Tube wells are often connected with this water point, through which people get water for their different purposes. An NGO, 'DSK' is providing these water points and they are also performing the official formalities for getting the legal connection from WASA. Among the studied slums it has been observed that Kal-a-wala para (study area no.1), Omor Sons (study area no.5), Tiger slum (study area no.6), West Vasantek slum (study area no.7) and West Vasantek 1 no. slum (study area no.8) have water points. DSK is providing these water points 'on revolving credit basis'. The flow chart as shown in *Fig 5.1* presents the whole process of implementation of water points--- starting from the primary data collection to the overall management system. Before

installing the water points, DSK has considered some key factors such as possibilities of eviction of slum, demand for improved services and willingness to pay, existence of enough spaces to set-up water point in the slum area, distance of WASA mains from the slum etc. They emphasize on the strength of community based organization (CBO), women participation and leadership, financial and social sustainability of the project.

5.2.1 Design Details

The water point comprises of an underground reservoir combined with a piped connection, two suction pumps and a bathing space (*Fig 5.2* and *5.3*). Water points are usually located next to communal latrines. In order to prevent seepage of contaminated water into water reservoir, a plastic sheet is being inserted in the inner wall of the reservoir. The design capacity of the water point is to serve 100 families (approximately 500 individuals). Sometimes a small reservoir is necessary to store water due to the irregularity of flow from the main water supply. The volume of the underground water storage reservoirs are 3000 liters and is designed to supply water for 24 hour period. The reservoir is covered by a concrete slab on which one or two simple suction hand pumps are mounted to raise the water. The water points are connected to the WASA supply network by a 1" diameter GI pipe. One hand pump is connected to the reservoir while the other is connected directly to the supply line. In the later designs, valves were also added in order to prevent back- siphonage during time of low pressure in the supply system. The design of water point is simple and maintenance and repairing cost is less.

Construction of the water point and the piping is carried out using locally employed, skilled masons with the assistance of water point committees and DSK technical staff. All procurement of construction materials is also done by DSK. However, DSK staff does the connection to the piped water system.

FLOW CHART

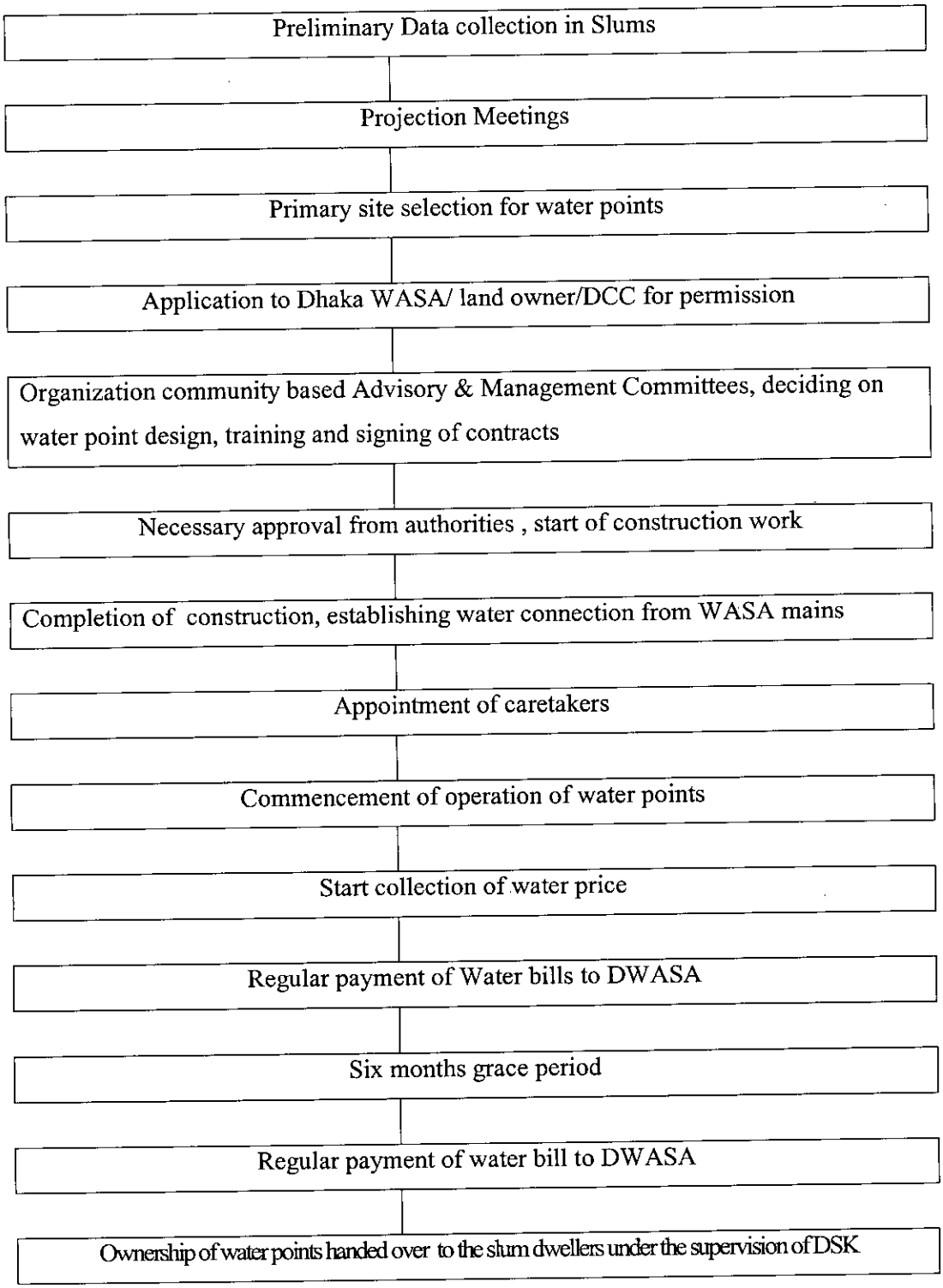


Fig 5.1 Process of Implementation of Water Point (DSK)

5.2.2 Management and Operation

On completion of the construction of water point, the operating committee and advisory committee formed within the slum and DSK, meet jointly to discuss the detail expenditure statement and the terms and condition of water use and management. A contract between DSK and the community formalizes the terms and conditions of operation of the water points. The community manages and operates the water point, repays the capital cost to DSK and pays for the water bills as well. The committee hires two part-time caretakers within the slum to collect water rates and to maintain the water point. Each site has an appointed caretaker who performs the following tasks:

- Collecting money from the users
- Guarding the water point
- Operating the gate valve to control water flow into the reservoir and
- Ensuring that the facilities are not being abused and water is not being wasted.

A caretaker, who lives on the site and collects revenue from users, supervises the water point. There is a revolving rotation of caretakers and the caretaker is usually changed in every 2 months. In necessity, the other members of the committee also help the caretakers. The role of the water point's caretaker is the successful operation of the system which leads finally a sustainable project. Generally one or two women are appointed as caretakers.

Loan repayments are accumulated by DSK and form the basis of a revolving fund. Capital costs account for 50 percent of total project costs and are recovered over a 30 months period (6 months grace and 24 months of equal loan installations).

For collection of water rate, the operating committee in consultation with the users and DSK, decide on the water rates. The rates are collected either daily on a pay-and-use basis or on a monthly basis. Some water points use a combination of the two systems. Caretakers of the water points hold the token money collected in a wooden box under lock and key. At night or early in the morning the box is unlocked in the

presence of the President and Secretary and the money handed over to the Treasurer. The treasurer enters the transaction into a tally book and hands over the money to the field workers of DSK the following day. The field worker takes it to the accounts section who in turn deposits it into the bank.

Facilitator => Caretaker => Treasurer => Field worker => Accountant => Bank

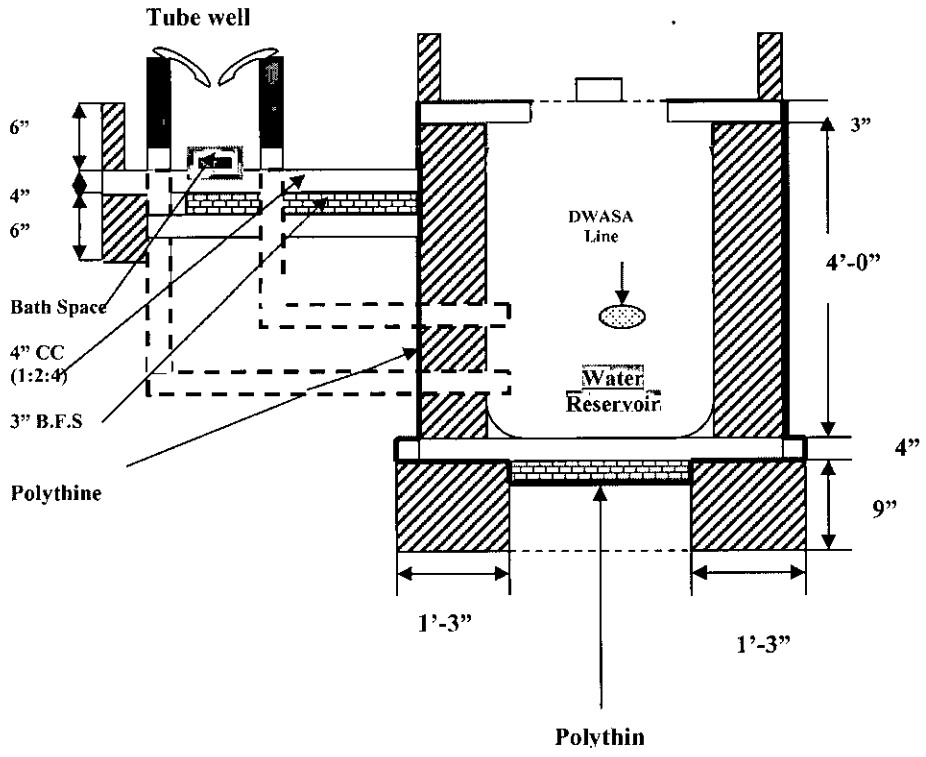


Fig 5.2 Water point (DSK)

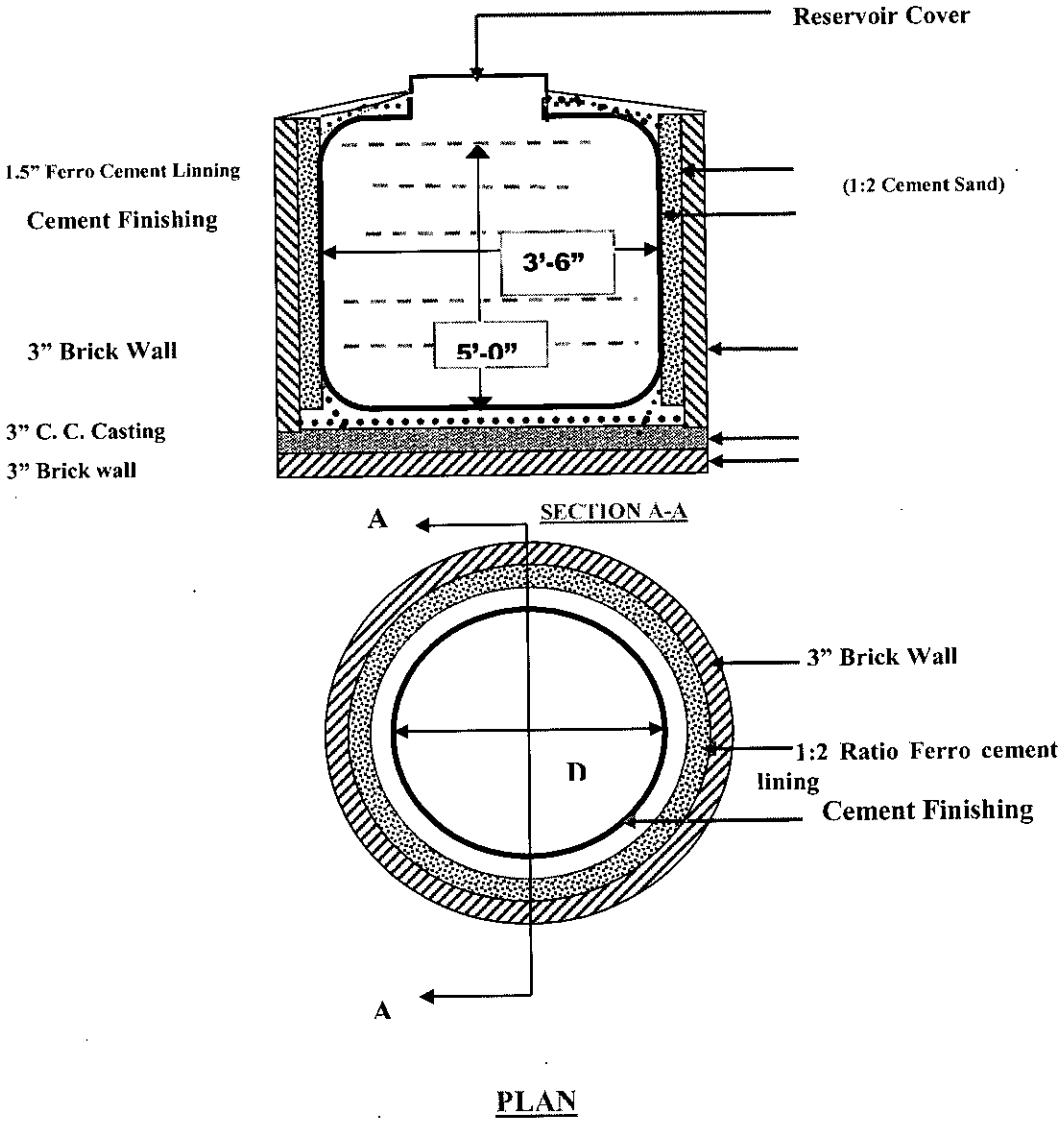


Fig 5.3 Plan and Section of Underground Water Reservoir (Water Point).

5.3 SANITATION PRACTICE

5.3.1 Community sanitation block

Community sanitation block is another new technology, which provides water and sanitation facility to the slum dwellers. Each Sanitation Block has been designed for 100 Households. Normally a sanitation block consists of 3 nos. of pit toilets and 1 tube well for male and 3 nos. of pit toilets and 1 tube well for female (*Fig 5.4* and *Fig 5.5*). These tube wells cover the drinking purpose and other purposes. The beneficiaries pay Tk.1.00/ kolshi and Tk. 0.50 /use of toilet. The community selected caretaker is responsible for maintaining the sanitation block and also collecting the money for refunding the construction cost invested by DSK.

Among the studied slums, BRI slum (study area no. 4) and Omor slum (study area no.5) have the sanitation block.

In comparison with individual latrine, the following points can be noted for the sanitation block:

- In case of lack of lands, it is vary suitable as it takes less amount of land.
- The tube well near the latrine is also a plus point for cleanliness of the latrines.
- Where the availability of land is not a problem, it is not suitable for its high cost.

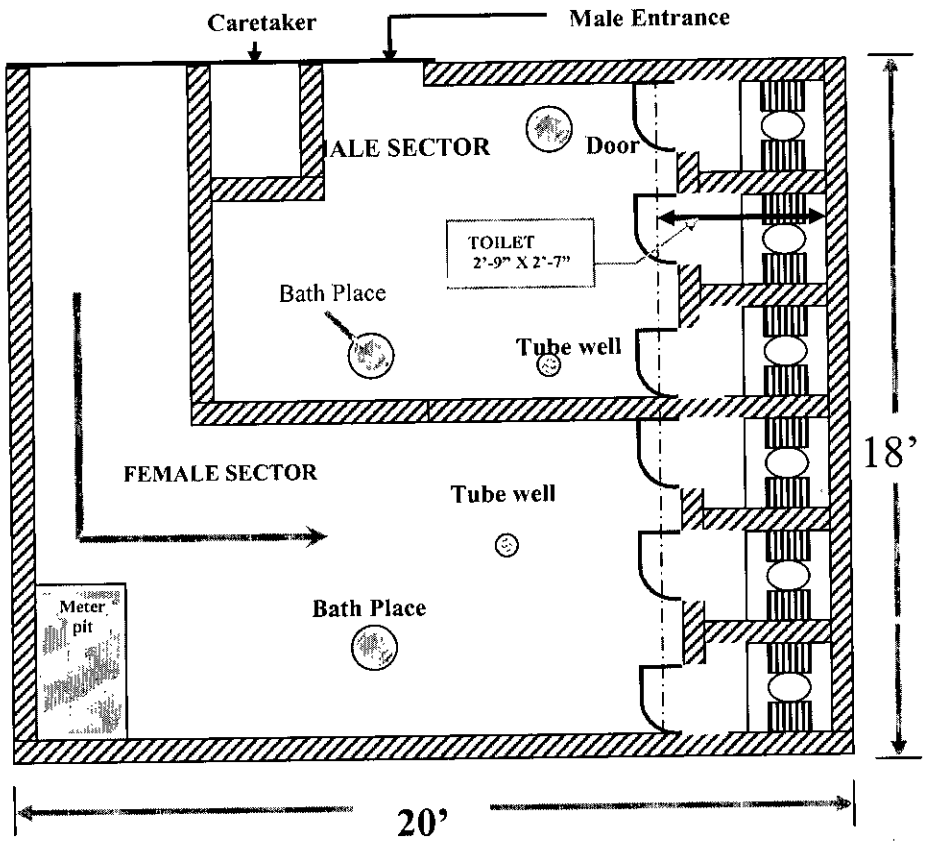


Fig 5.4 Sanitation Block (DSK)

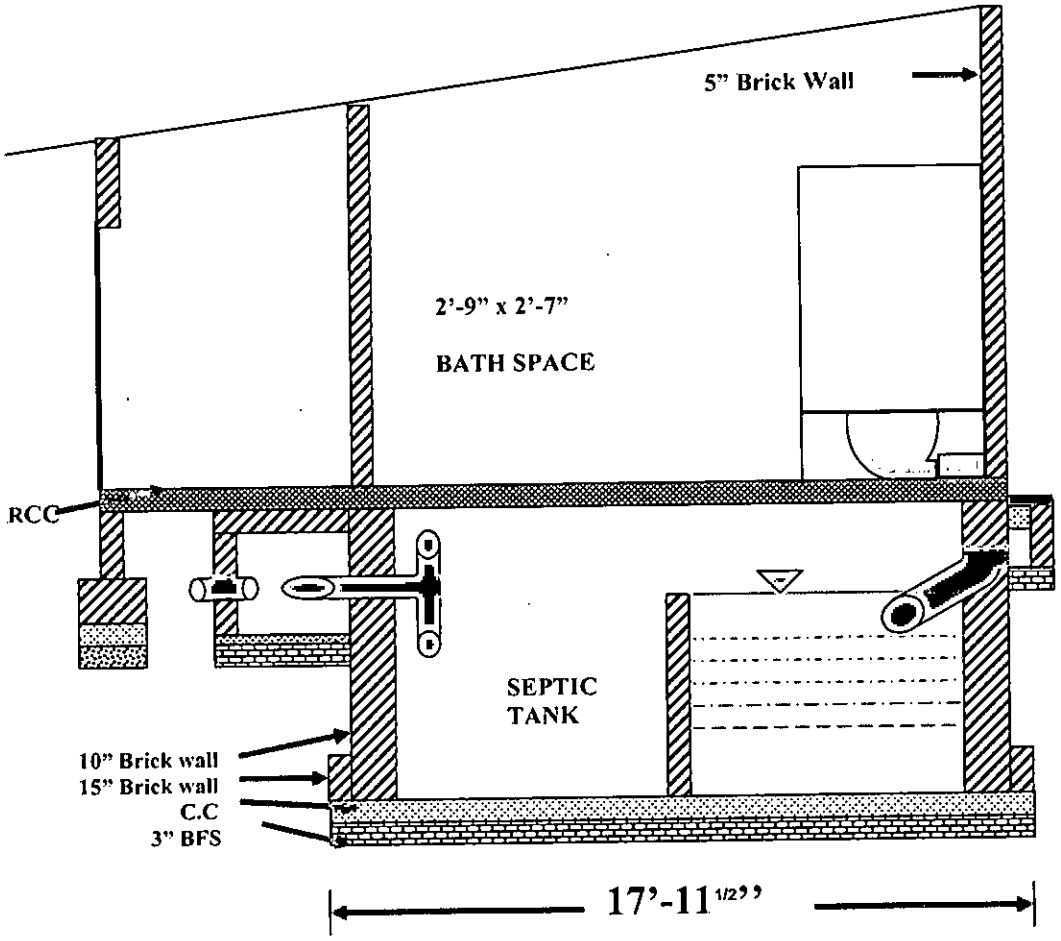


Fig 5.5 Section of Sanitation block (DSK)

5.3.2 Vacutag

The urban poor of the slums and squatter settlements generally use open places, pit latrines and or hanging latrines for defecation purposes. When the latrines are become full, they need to be emptied or abandoned and a new pit is dug. For densely populated slums and insufficient spaces within the surrounding houses, the slum dwellers face problems for digging new pits. So, the easy solution of this problem is to empty the existing pits. The most common and traditional method of emptying pit latrines are done manually and wastes have to dump into the nearest drain or lakes. This method is very unhygienic and hazardous for the concerned sweepers and does not promote a sanitary environment. To ensure the safer system, the "Vacutag" was developed by Manus Coffey Associates LTD on behalf of UNCHS/ HABITAT. The Vacutag is a mechanized latrine pit emptying device. Water Aid Bangladesh (WAB) imported a Vacutag MARK-I of 500 liter capacity pit latrine emptying machine in January 2001. As a leading urban developer partner, DSK has taken the responsibility to manage and use the machine on pilot basis for the informal urban areas. The machine is used to empty the human wastes into its tank and transported to an appropriate disposal or transfer site. The Mark I Vacutag machine is a motorized one. Due to its low speed about 5 km/hour, this machine is only feasible to use in the following cases:

- Have proximity to sewerage lines
- Permission to discharge to DWASA sewerage lines
- Latrines and septic tanks are reasonably accessible (less than 10m from the main lane or the sub lane) and
- Strong community demand for latrine/ septic tank emptying exists.

After analyzing the performance of the Mark I machine, DSK and WAB brought another Mark II machine of 1900 liter capacity in September, 2001. The "Vacutag" machine has been used on cost recovery basis. The Mark II (*Plate 5.1*) machine is suitable for following cases:

- To get the better facilities it requires clients such as septic tank of the office, hostel and residential buildings and
- The 100 feet long hosepipe of the machine reduces the labor for disposing activities.

Kallayanpur pora Bastee (study area no.3) and BRI (study area no.4) have "Vacutag" facility provided by DSK.

Table 5.1 The status of the Vacutag (Mark I with 500 liters' capacity) provided by DSK up to June 2002 *(DSK, 2002).*

SL	Activities	April- June,2002 Vacutag Mark1
1	Latrine cleared	102
2	Septic tank cleared	03
3	Sludge Cleared (in liters)	110750
4	Households covered	435
5	Income earned to date (in Taka)	41430
6	Total working days	65

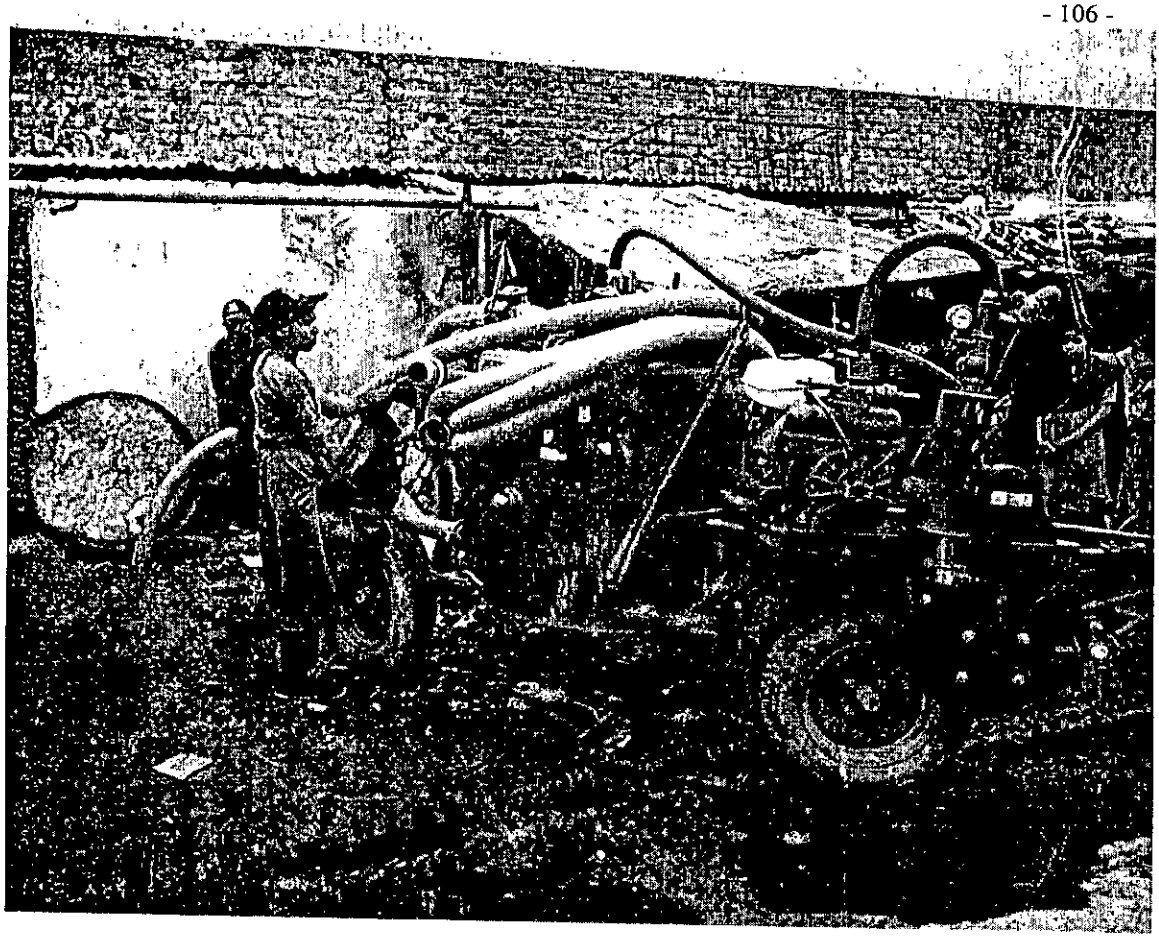


Plate 5.1 Vacutag at field (DSK)

5.4 SOLID WASTE MANAGEMENT (BARREL COMPOSTING)

The inorganic (non-biodegradable) portions of the waste in the residential as well as commercial areas of Dhaka city are recycled by waste pickers popularly known as "tokais". The readily available matters are extracted by the "tokais" from the waste stream, there appears to be considerable value in what they leave behind. This value lies in the organic (bio-degradable) portion of the waste, which can be converted into compost--- an organic fertilizer, which improves the ability of soil to retain water and resists soil erosion. Compost is also valuable as a pesticide substitute. When compost is added in- conjunction with nutrient, it makes the phosphorous more readily available and prolongs the nitrogen availability of the plant. Processing of solid waste into compost on a large scale with the help of informal sector is an unexplored sector in Bangladesh. Waste Concern brings an initiative approach of solid waste

management in slum areas named "Barrel Composting" (*Fig 5.6*). At the study areas Kal-a-wala para Bastee (study area no.1) and Nasimbag Bastee (study area no.2) have barrels for disposal of solid wastes by Waste Concern. In its composting technology, aerobic composting is followed. The following steps are followed by waste concern-in managing solid waste.

Solid waste collection:

Using secondary collection method, they collect wastes from both the yellow and green coloured barrels of the households after filled up the barrels. The Waste Concern pays for the wastes to the inhabitants of the slum. The participant household dwellers are getting Tk. 2.00/kg. of wastes.

Piling of the sorted organic waste for composting:

Compostable organic waste is heaped into piles which allow the beneficial microorganisms to decompose the organic material. Pile temperature of 55-65 degree is optimum for aerobic composting. To enable the micro organisms to obtain sufficient oxygen, the pile is aerated using bamboo aerators. In tropical countries, it is relatively easy for the piles to reach excessively high temperature.

Turning of pile & Watering of pile:

Turning along with the use of bamboo aerators is the method used to maintain pile temperatures within the optimum range. Turning associated with watering maintains the conditions for rapid decomposition. Turning also moves the non- decomposable materials from exterior of the pile into the interior, thus providing new food sources for bacteria. The critical indicator of when to turn the compost is the temperature of the pile. The temperature of the pile is monitored with a thermometer and records are kept of the temperature trends. Carbon nitrogen ratio of 35 to 50 is optimum for aerobic composting. The carbon nitrogen ratio of solid waste is slightly higher (carbon 22.6% and nitrogen 0.41%) in Dhaka. At higher carbon nitrogen ratios, nitrogen can be limiting nutrient. Waste Concern use chicken and cattle manure to optimize the nitrogen content and overcome the deficiency in this project.

Maturing of Compost & Screening of compost:

The process of composting is odorless. The composting requires 40 days for decomposition and 15 days for maturing. Recently Waste Concern is trying to reduce the decomposition time of 40 days by using inoculums (compost digester) to accelerate the decomposition.

Packaging and marketing of compost:

After maturing the compost is screened for different grades of compost and packed for marketing.

FLOW CHART

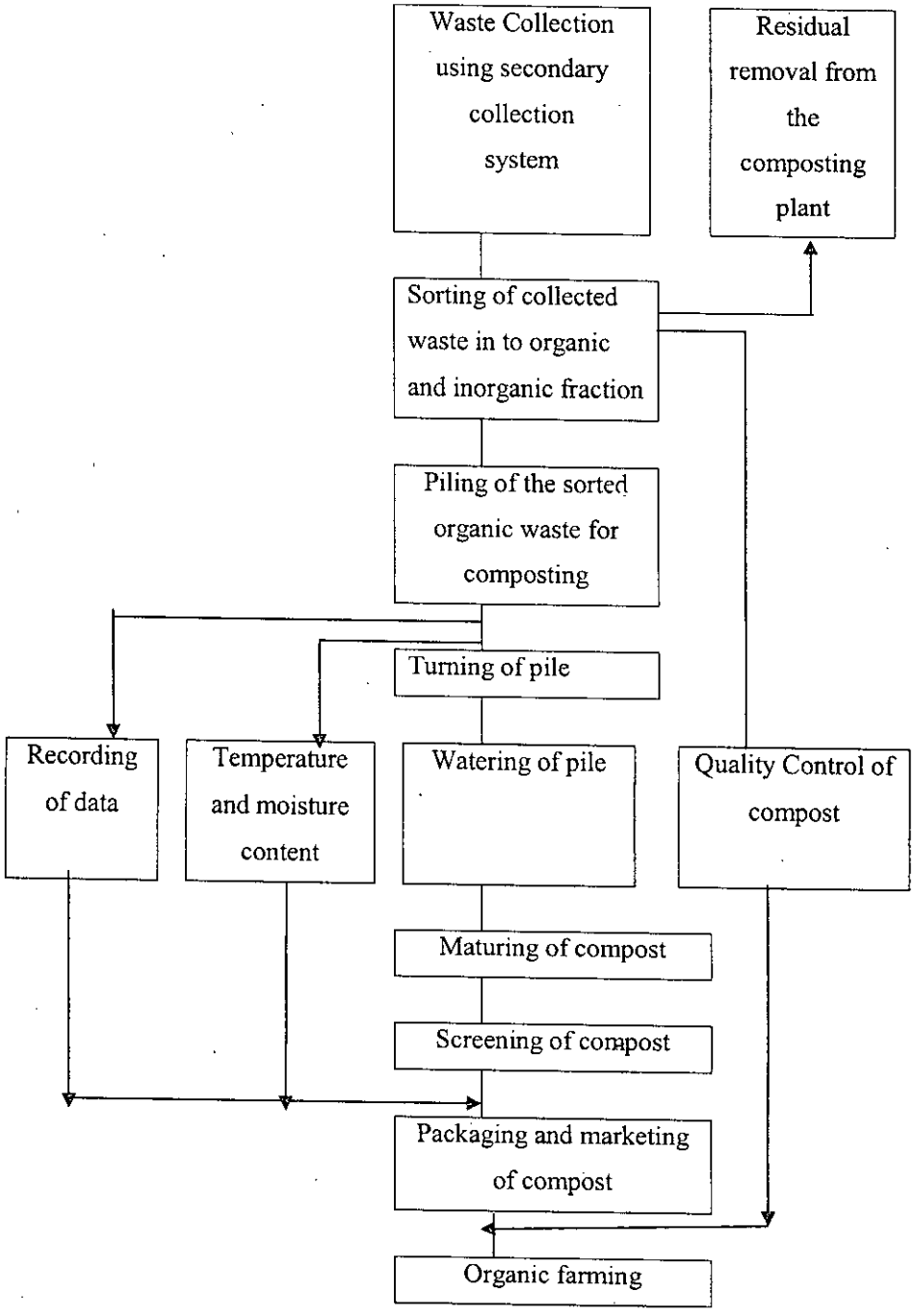


Fig 5.6 Barrel Composting

5.5 OTHER SERVICES

Apart from the water supply, sanitation and solid waste disposal system, various development projects are undergoing in the slums such as awareness, motivation, health education, adult education, micro-credit program etc. Different approaches are adopted to make these programs successful. Some of these approaches are described in the following sections.

5.5.1 Child to Child Training (CTC) Program

This approach is applied in health care, personal hygiene, safe environment, food sanitation etc. 'Phulki' an NGO is giving this training among the children of Kallayanpur pora bastee (study area no. 3). Each group consists of ten children with one child leader. One trainer gives knowledge and information on the above said topics to the leader and instructs him to pass his knowledge to ten of their group members. These children again pass their knowledge to their family members, relatives etc. and thus knowledge and information exchange is occurred from person to person. Not only these, they are also instructed to implement these lessons learnt in their everyday life. This technique has proved great success in health care, hygiene, sanitation practices and cleanliness of the drains and open spaces within the slum area. Within the short period of three years, it had proved its effectiveness as a means of instrument for behavioral changes of the people. Phulki intends to use this experience and knowledge in future and in consultation with other national and regional organizations, plans to develop a training module that can be shared by other organizations working in the relevant field (*Fig 5.7*).

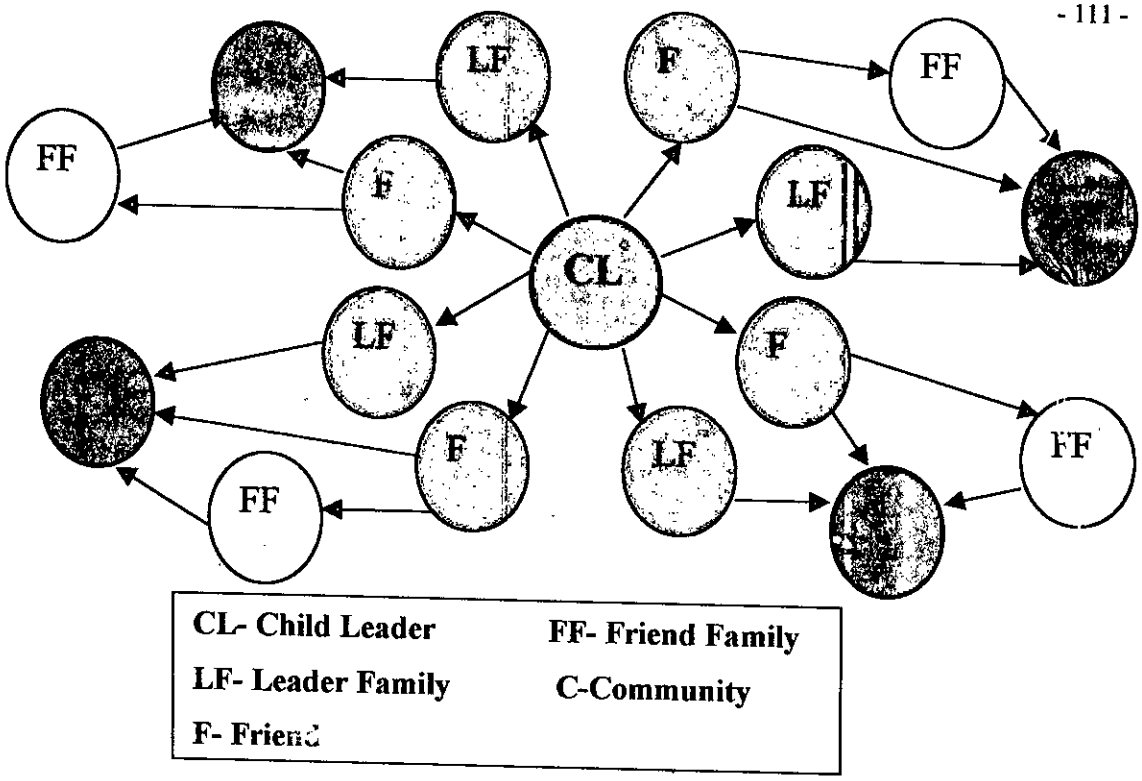


Fig 5.7 Child to Child Project

5.6 ASSESSMENT OF SITUATION

5.6.1 Matrix Ranking

This method is used to identify the various problems within the slum and makes an attempt to find out the possible solutions suggested by the community. A team with the participation of the community people including male, female and children would carry out the activity. Facilitator would encourage the participants to identify the common problems prevailing in using the current infrastructure related to water and sanitation options. The participants shall draw a graphics and finally would list down problems through the scoring and numbering process. The objectives of using the tool are to determine the problems related to use of water and sanitation options in target locations. It can also assess whether the options are women and children friendly or not. After identifying all the problems of the community through the PRA (Participatory Rapid Appraisal) exercises, this session is devoted to illustrate communities understanding about how they can develop their own future, they identifies their own problem and provides necessary inputs for its mitigation (*Table 5.2*).

not. After identifying all the problems of the community through the PRA (Participatory Rapid Appraisal) exercises, this session is devoted to illustrate communities understanding about how they can develop their own future, they identifies their own problem and provides necessary inputs for its mitigation (*Table 5.2*).

Table 5.2 Planning matrix practiced by DSK

Sl. No.	Problems	Solutions
1.	Water and latrine	- Establishment of water point via community initiative; - Establishment of standard safe latrines through community initiatives.
2.	Housing Problem	Government rehabilitation initiatives
3.	Financial Problem	Create employment opportunities. Increase wage rates.
4.	Electricity Problem	Community should jointly proceed for establishment of electricity connection
5.	Bathing Problem	Introduce Bathing services along with water services provision.
6.	Communication Problem	To construct a bamboo bridge in order to alleviate communication problem.
7.	Unemployment	Initiative for self-help and for self employment.
8.	Health Care Problem	Introduction of weekly mobile health clinics in the community.

5.6.2 Venn diagram

Through this technique the interventions of various GO and NGOs involved in slum improvement program can be assessed. By preparation of such a venn diagram, the contribution of different slum improvement providers can be identified by considering their sizes.

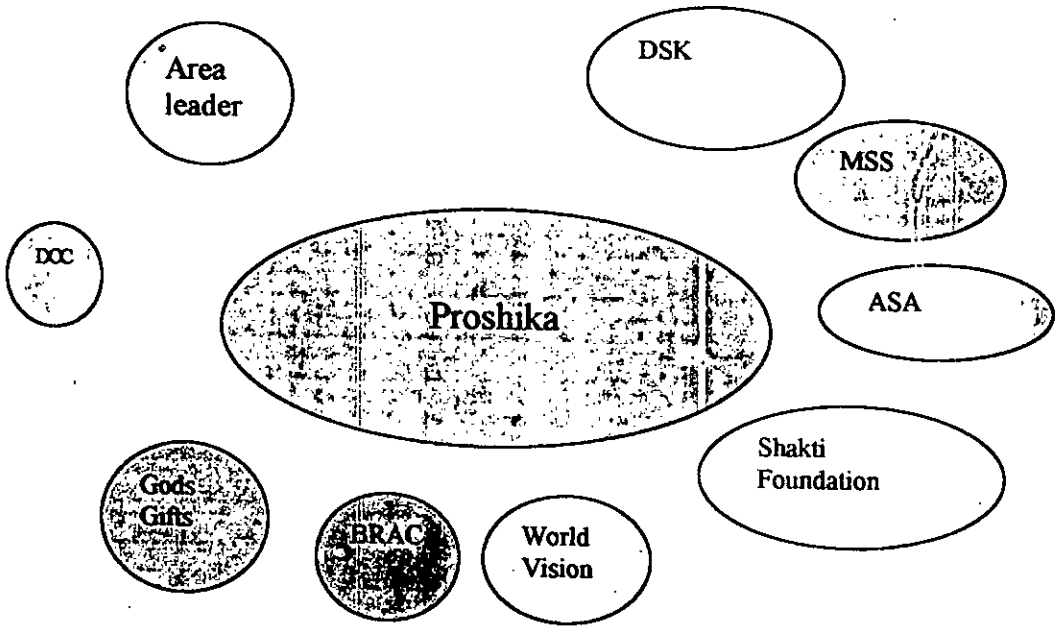


Fig 5.8 Venn Diagram (DSK)

As for example, in Kal-a-wala Para Bastee, DSK, MSS, Proshika, ASA, DCC, BRAC, World Vision, Shakti, Gods Gifts etc. are working in various sectors. Their contribution on the respective sectors are shown in the closed oval shaped figure (*Fig 5.8*). The greater the size of the circle, the greater the contribution or influence of the organization.

5.6.3 Problem Tree

To identify various problems and their solutions from the community itself, NGOs apply various approaches. One of them is 'Problem Tree'. In this approaches, they provide leaf sized paper on different topics such as hygiene, sanitation, water supply etc. to the community. After getting the feedback from them, they arrange those in a shape of a tree (*Fig 5.9*). By analyzing the problem tree and discussion with the community, the service provider finds out the problem area, their possible solution and can also identify the parameters which may have influence in changing their behaviour, past concept and awareness etc. (*Fig 5.10, Table 5.3*).

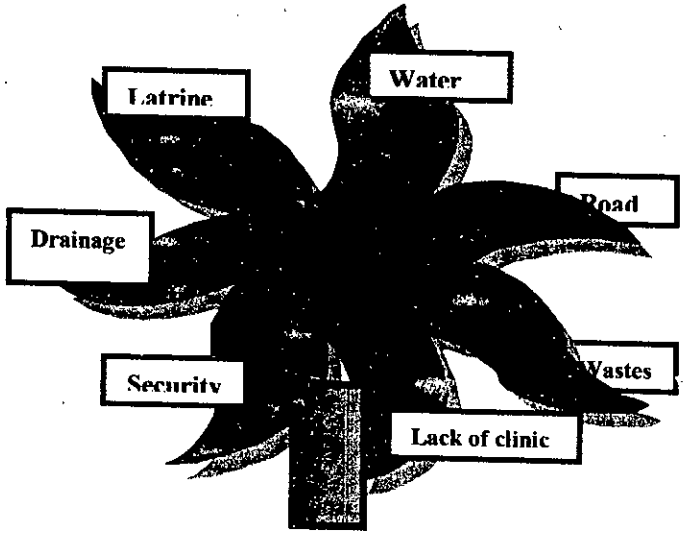


Fig 5.9 Problem Tree

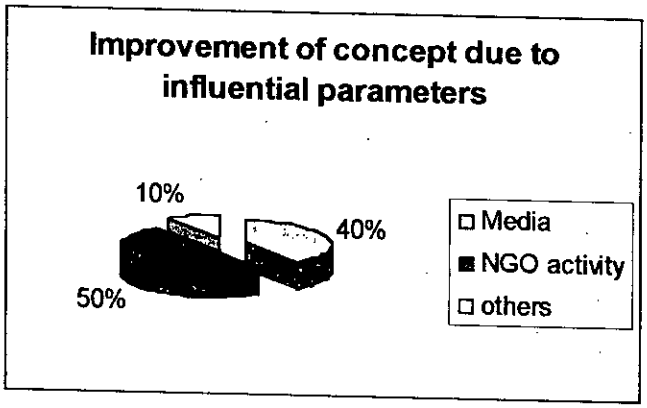


Fig 5.10 Influential parameters (Field Study)

Table 5.3: Improvement of past concept by influential parameters (DSK).

Past Concept	Present Concept	Influential parameters
1. Defection at open place isn't harmful	o Open place not hygienic o Pollute environment o Problems arises for female	o Media- Radio, TV.
2.A common latrine is sufficient for all	o Time consuming o Dirty o Many Health hazards arise	o Different NGO activities o Lessons from health workers of NGO
3. Washing hands after coming from latrine with soap or ash	o Most of them wash with soap/ash	o Getting Hygiene training from NGO's
4. Don't use sandal for going to latrine	o Most of them use latrine	
5. Dirty latrine doesn't create any problem	o To be healthy, clean latrine are necessary	
6. Any type of water has accepted for drinking	o To avoided water-born diseases	
7. Pure water isn't necessary for cooking	o Necessary	
8. Any type of water can be used for vegetable washing	o Pure water is necessary	o Increased Consciousness
9.Wastes can be throw at any places	o A fixed place has needed for avoiding odor and germs.	o Increased educational percentage
10. The surroundings of the houses aren't necessary	o To ensure healthy environment, it is necessary	o Knowledge sharing
11. They aren't conscious about their nails	o Consciousness increased and they have practiced cutting their nail after each 15 days.	

5.7 SUMMARY

- Water point is an appropriate technique for supplying and storing water for the slum people. The slum dwellers are satisfied with the service and are operating the project successfully.

- The Vacutag is a mechanized pit latrine emptying device. The main purpose of vacutug is the improvement of sanitation system through introducing the environmental friendly latrine emptying machine on sustainable basis.

- Barrel composting can be a suitable option for the slum dwellers in managing the solid wastes. It helps to reduce the volume of total wastes generated in slum by aerobic decomposition and at the same time it will be a source of earning for the slum people by selling waste to Waste Concern.

Chapter 6
SITUATION ANALYSIS

6.1 INTRODUCTION

To assess the physical environmental condition and existing facilities of basic services such as water supply, sanitation, waste management etc., base line surveys were conducted among the selected slums in Dhaka city (Chapter 4). The information and data obtained from the survey is analysed and presented in this chapter. An attempt was also made to study the impacts of various development programs in slums by both GO and NGOs.

6.2 SITUATION ANALYSIS

As a part of field survey, a questionnaire (Appendix-A) survey was conducted. The questions were selected in such a way that the information of the whole environmental condition of slums could come out. The household's responses at the various environmental parameters are excerpted and presented in *Table 6.1*. The values in *Table 6.1* represent the overall responses of the eight studied slums.

On the basis of baseline survey (Chapter 4) maps, fact sheets are prepared for each slum (Slide 6.1 to 6.8). Each slide shows the present environmental picture of the slum at a glance. The fact sheet contains the data and information of water supply, sanitation, drainage and solid waste disposal services in each slum.

Table 6.1 The Questions and responses in the Field Survey

Questions/ Variables	Values	Values %
1. Sources of water for drinking	o Tube well o Well o River o Pond o WASA supply o Others	0 0 0 0 100 0
2. Sources of water for other purposes	o Tube well o Well o River o Pond o WASA supply o Others	0 20 0 30 50 0
3. Any problems in fetching water from the source	o Water source is far away o Timing of the supply water o Crowded o Surrounding environment is unsuitable for fetching water for women	20 10 60 10
4. Does the quantity of water satisfy the demand?	o Yes o No	75 25
5. Mode of defecation	o Open place /drain o Pit latrine o Bucket latrine o Hanging latrine o Water seal latrine	30 50 0 20 0
6. Existing latrine facilities	o Common o Single	100 0
7. Do you have to pay for using latrines?	o Yes o No	90 10
8. Are you satisfied with the existing solid waste disposing system?	o Yes o No	38 62
9. Are you satisfied with the existing drainage system?	o Yes o No	0 100
10. Water borne diseases	o Cholera o Diarrhea o Dysentery o Any other	10 40 30 20
11. Occupational health issues	(a) Working area : Spacious / Congested / Suffocating (b) Living area : Spacious / Congested / Suffocating	50 50
12.Sanitation practice /hygiene (a) Washing hand before taking meal (b) Washing hand after defecation If yes , use : soap / ash / only water	(a) Yes o No (b) Yes o No	100 0 100 0
13. Wear slippers /shoes in toilet?	o Yes o No	95 5
14. Use lids to cover food?	o Yes o No	100 0
15. Is there any participation of community in the project work?	o Yes o No	100 0

SLIDE-1

Kal-a-Wala Para Bastee

(Study Area no. 1)

Location: Mirpur Sec-2, Ward 12; Near the residential area.

Permanency: 25 years

Area: 0.124 acre (CUS, 1996)

Nos. of Households: 200 (DSK, 1998)

Population: 1000 (DSK, 1998)

Water Facility: 2 water points and 3 tube wells

Sanitation Facility: 7 pit latrines, hanging latrine on water body.

Drainage Facility: Discontinuous Semi paca drain

Solid waste Facility: 20 nos. of waste collecting barrel

SLIDE-2

Nashimbag Bastee (Study Area no.2)

Location: Mirpur Sec-2, Ward 12; Near the residential area.

Area: 0.95 acre (CUS,1996)

Nos. of Households: 150 (DSK, 1998)

Population: 600 (DSK,1998)

Water Facility: 4 tube wells

Sanitation Facility: 7 common toilets

Drainage Facility Jammed drain

Solid waste Facility: 35 nos. of waste collecting barrel

SLIDE-3

Kallyanpur 4 no. Pora Bastee (Study Area no.3)

Location: Kallayanpur, Ward 11; Near the residential area.

Nos. of Households: 200 (DSK, 2002)

Population: 1000 (DSK,2002)

Water Facility: 9 tube wells, 1 water point and 7 dug wells

Sanitation Facility: 6 communal latrine (it is basically pit latrine in nature)

Drainage Facility: Kucha drain

Solid waste Facility: Door to door collection system from slum and ultimate disposal to DCC bin.

SLIDE-4

BRI (Beg Rubber Industry) Slum (Study Area no.4)

Location: Tejgaon, Ward 37; Near the industrial area.

Nos. of Households: 150 (DSK, 1998)

Population: 600 (DSK, 1998)

Water Facility: 1 sanitation block. There are two individual sections – one for male and another for the female inhabitants of the slum. Each section consist three nos. of pit latrines and a tubewell. In total there are 6 nos. of latrine and 2 nos. of tubewells.

Drainage Facility: 1drain connected to WASA drain.

Solid waste Facility: Roadside DCC bin.

SLIDE-5

Omor Sons Slum (Study Area no.5)

Location: Tejgaon, Ward 37; Near the industrial area.

Nos. of Households: 100 (DSK, 2000)

Population: 600 (DSK,2000)

Water Facility: 1 water point

Sanitation Facility: 8 common latrines

Drainage Facility: 1 discontinuous drain

Solid waste Facility: Roadside DCC bin

SLIDE-6

Tiger Slum (Study Area no.6)

Location: Tejgaon, Ward 37; Near the industrial area.

Permanency: 15 to 23 years

Nos. of Households: 140 (DSK, 1998)

Population: 600 (DSK,1998)

Water Facility: 1 water point

Sanitation Facility: 28 slab latrines, 11 hanging latrine.

Drainage Facility: 2 discontinuous drains

Solid waste Facility: Roadside

SLIDE-7

West Vasantek (Study Area no.7)

Location: Mirpur Sec-14, Ward. 4; Far away from city.

Area: 1.65 acre

Permanency: 7 years

Nos. of Households: 140 (DSK, 2002)

Population: 750 (DSK,2002)

Water Facility: 2 tube wells and 4 water points

Sanitation Facility: 36 latrines

Drainage Facility: no drains

Solid waste Facility: open place

SLIDE-8

West Vasantek 1 no.

(Study Area no.8)

Location: Cantonment, Ward-15; Away from city.

Permanency: 30 years

Area: 48 acre

Nos. of Households: 2500 (DSK, 2002)

Population: 12,000 (DSK,2002)

Water Facility: 13 Tube well and 4 water point

Sanitation Facility: 35 hanging latrines

Drainage Facility: no drain

Solid waste Facility: open place

6.3 ANALYSIS OF WATER SUPPLY SITUATION

From the questionnaire survey (*Table 6.1*), it was observed that mainly women collect water from the sources (*Fig 6.1*). The children also take part in water collection (9%) whereas, the contribution of male is negligible in this job (1%). Among the eight studied slums, people spend less time in water collection in seven slums except one ---- Kallayanpur 4no. pora Bastee. The reason is that they have to stand in a long queue for indefinite time due to inadequate quantity of water supply. It has been found that slum dwellers have to pay for the water (*Table 6.2*) and the cost is Tk 1.00/kolshi for most of the slums and two slums --- Tiger and West Vasantek pay daily and monthly basis respectively. Considering the cost, it is observed that the slum dwellers pay high price for water use compared to the other established city dwellers, as the WASA rate is Tk. 200/month.

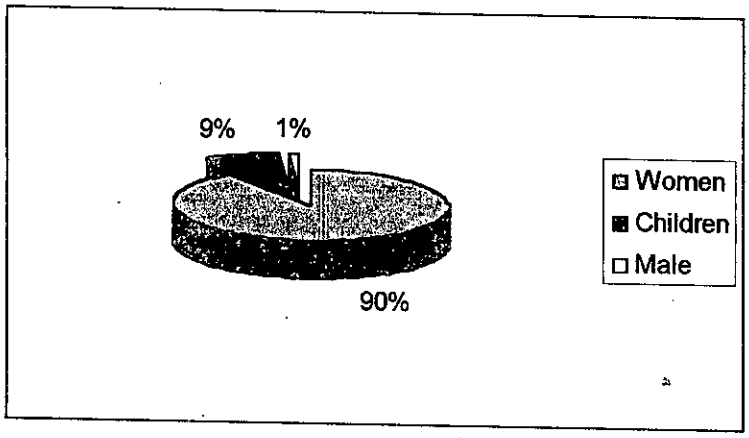


Fig 6.1 Rate of Water Collection (Household member wise distribution) [Field Study]

Table 6.2 Cost of Water in the Studied Slums

Slum Location	Name of the Slum	Water sources	Water cost
Area-1 (Slums located in Residential Area)	Kal-a-wala para bastee	Water Point (WASA)	Tk. 1.00/Kolshi
	Nasimbag	Tube Well (WASA)	-
	Kallyanpur 4 no. Pora Bastee	Tube Well (WASA) Dug Well	Tk. 1.00/Kolshi
Area-2 (Slums located in Industrial Area)	BRI (Beg Rubber Industry)	WASA (Sanitation Block)	Tk. 1.00/Kolshi
	Omor Sons	Water Point (WASA)	Tk. 1.00/Kolshi
	Tiger	Water Point (WASA)	Tk. 15-20/Day
Area-3 (Sub- urban Slums)	West Vasantek	Water Point (WASA)	Tk. 1.00/Kolshi
	West Vasantek 1 no.	Water Point (WASA)	Tk.40 /Month

From the baseline survey (Chapter 4), it is observed that in the studied slums, the main source for the drinking water is WASA, which agrees with the findings of CUP (1998) where they observed that 76.1% slum people used WASA water for drinking purpose. The slum people also use other water sources such as pond (duba), dug well etc. for different domestic purposes. It was learnt from the previous studies that many slums got illegal water connection (ADB, 1996), in this study illegal connection was found in only one slum—West Vasantek no.1 slum.

Among the study areas, it has been found that there are some common facilities exist such as water point (mainly provided by DSK), community tube well (they are provided by various NGOs) and public stand post. In case of absence of the above facilities, they use the water sources of neighbouring slums. From field survey, it was found that there are some slums those have ponds or dugwells within the slum and also some water bodies adjacent to the slum area. They also use these water sources in

need. Therefore, it can be said that the slum people have mainly three options of water sources. *Table 6.3* shows the percentage wise use of these sources in three categories of slums.

Table 6.3 Use of water sources (percentage) in the three areas

Indicator	Area-1 (Residential) (%)	Area-2 (Industrial) (%)	Area-3 (Sub-urban) (%)
Water point	70	72	65
Community Tube well/ Public Stand	12	20	12
Water source of neighboring slums / pond/ other water bodies	18	8	20

It is evident that the new technology 'Water Point' appears as a useful option of water sources for the slum people (*Table 6.3*). The well facilitated slums (Group- A) are dependent on this facility. On the other hand, the Group-B (Kallyanpur 4 no. Pora Bastee and West Vasantek#1) only get 20% facility from water point (*Table 6.4*). Although Kallayanpur 4 no. Pora Bastee has waterpoint connected with deep tubewell, but the water stored in those waterpoint cannot meet their demand because of lowering of water table. In West Vasantek #1 slum, there is no water point.

On the basis of the data and information related to water services in the eight studied slums, two groups are formed - well facilitated and less facilitated slums. Six slums- Kal-a-wala para, Nasimbag, BRI, Omor, Tiger and West Vasantek are grouped as well facilitated (Group-A) whereas Kallayanpur 4 no. pora Bastee and West Vasantek#1 slums are grouped as less facilitated slums (Group-B). The graphical presentation of this grouping (*Fig 6.2*) shows that Group-A has 6 points while Group-B two remaining slums has 2 points out of total 8 points.

Table 6.4 Use of water sources (%) in two grouped slums.

Indicator	Group-A (Well Facilitate) (%)	Group-B (Less Facilitate) (%)
DSK water point	100	20
Community Tube well/ Public stand post	0	30
Neighboring residence / pond/ river	0	50

From *Table 6.3*, it is evident that the slums located far away from the city (Area-3) are neglected in water supply sector compared to the other slums. The main reason is that the slum improvement providers (NGOs) are somewhat reluctant to work in those areas. Moreover the contact and relationship between the service providers and slum leaders (local mastaan) play an important role in development activities in the slum.

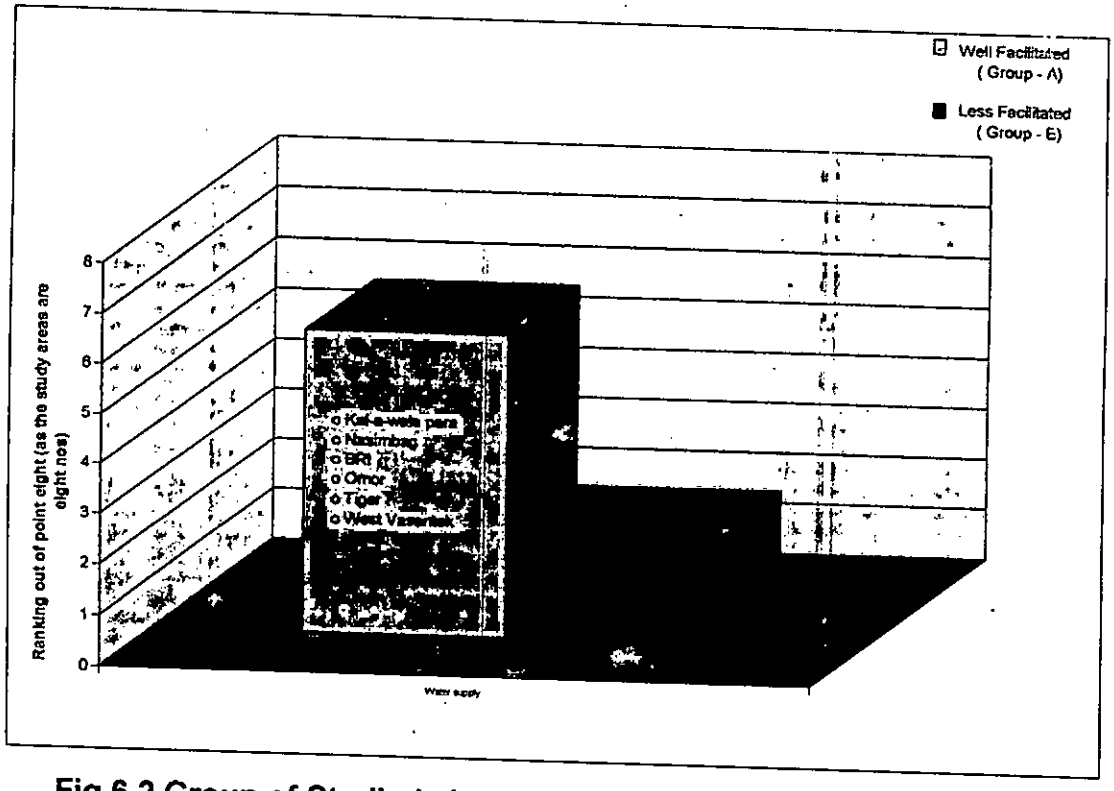


Fig 6.2 Group of Studied slum on the basis of their existing Water Supply Facilities.

6.4 ANALYSIS OF SANITATION SITUATION

From the field survey, it is revealed that the sanitation situation is worse than water supply situation in slums. Among the sanitary facilities, pit latrine is the main mode of sanitation options for the slum people (*Table 6.5*). They frequently use open place or drain (30%) (*Table 6.1*) for defecation purpose, and hanging latrine is another commonly used practice in slums, specially where slums are located at the side of water bodies. It has been observed from the study that, no proper hygienic latrines such as water seal latrine exist (*Table 6.5*) in any of the studied slums. Considering the water use facility at or near the latrines and overall hygienic condition of latrines, the situation is very disappointing. In most cases, the latrines are not far off from the houses. But still, the percentage of latrine use by children is only 12% (*Fig 6.3*). The present study shows that the slums those have pit latrines or sanitation blocks given by NGOs, have to pay for using the latrines (*Table 6.5*). It has been found from field survey that BRI slum has sanitation blocks with separate systems for male and female which is really a better option for the slum dwellers. Comparing the latrines of the studied slums, West Vasantek no 1. slum is in the worst condition and hence falls in the less facilitated group (Group-B). The rest of the seven slums are considered as the well facilitated slums although their facilities are much less than required.

Table 6.5 Sanitation Related Information

Name of the Slum		Population	Type and Number of latrine	Nos. of HH Latrine is designed for use	Cost
Area-1 (Residential Area)	Kal-a-wala Para Bastee	1000	Pit latrine: 7	6	Tk. 40 /month/HH
	Nasimbag	600	Pit latrine: 7	6	Tk. 40 /month/HH
	Kallyanpur 4 no. Pora Bastee	1000	Communal Pit: 6	4	-
Area-2 (Industrial Area)	BRI (Beg Rubber Industry)	600	Sanitation Block:1	100	Tk. 0.5 /use of toilet
	Omor Sons	600	Slab latrine:8	10	-
	Tiger	600	Slab latrine:28	5	-
Area-3 (Sub-urban slum)	West Vasantek	750	Pit latrine: 36nos.	6 to 7	-
	West Vasantek 1 no.	12000	Kucha and Hanging: 35	-	-

From the field survey it was understood that the sanitary condition and water use facility at the latrine is not satisfactory and according to the slum people's opinion, Kallayanpur 4 no.Pora Bastee is in worst condition.

From field survey it was found that in most cases the latrines are located very close to the houses. Considering the children defecation practices, three options have been found --- only latrine, both latrine and open places and only open places (*Fig 6.3*).

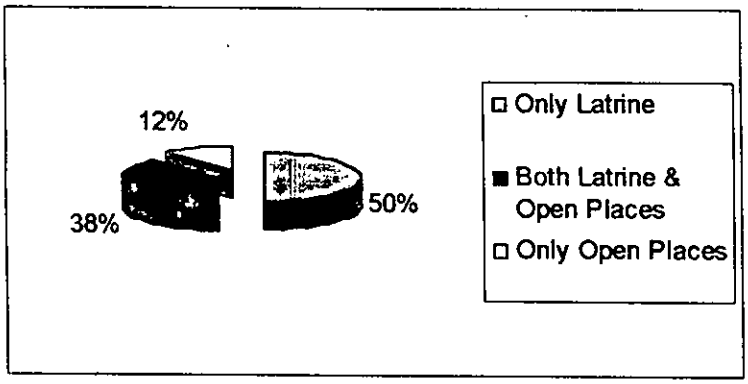


Fig 6.3 Slum children's existing defecation practice (Field Survey)

On the basis of the above information and observation from *Table 6.5*, the studied eight slums can be grouped under two headings- well facilitated (Group A) and less facilitate. *Fig 6.4* presents this grouping graphically.

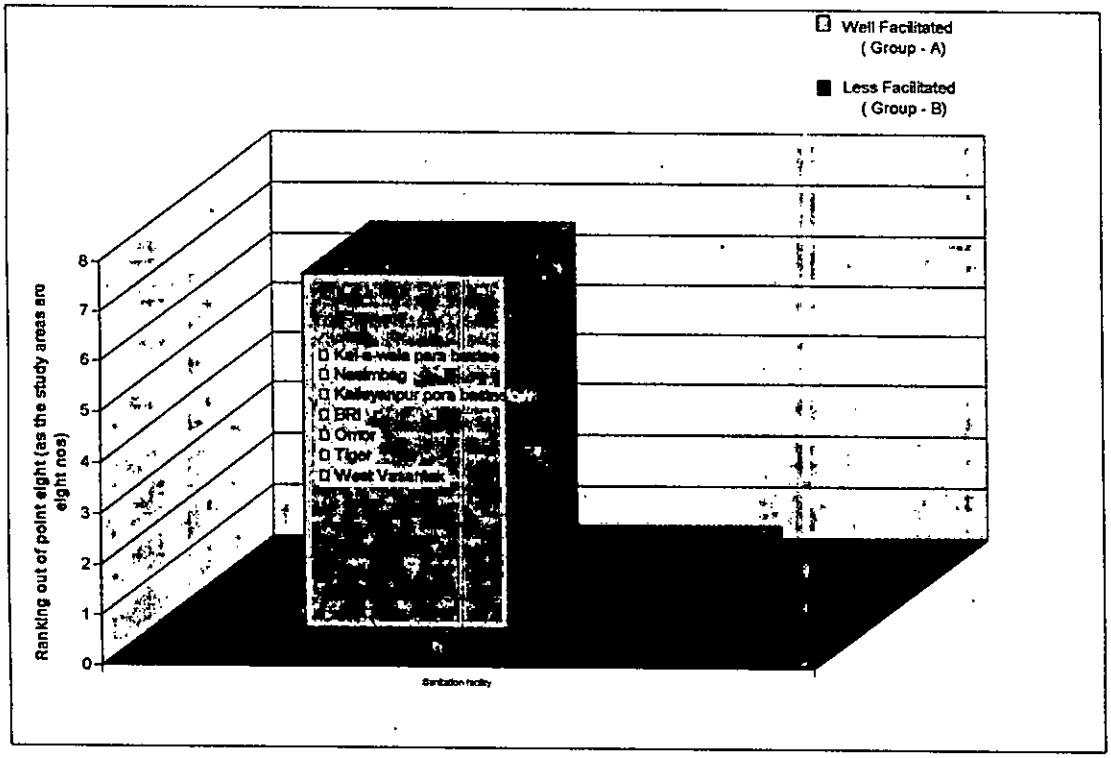


Fig 6.4 Group of Studied slum on the basis of their existing Sanitation Facilities.

From the field study, it is noticed that there are some common facilities exist in each slum. The two types of facilitated groups (*Fig 6.4*) will be further analyzed by narrow down the focused two indicators --- any type of fixed latrines and places for open defecation (*Table 6.6* and *6.7*).

Table 6.6 Variation in quality and availability of latrine facilities in the three areas.

Indicator	Area-1 (Residential)	Area-2 (Industrial)	Area-3 (Sub-urban)
Latrine available (simple pit latrine)	50	20 and 1*	42
Kucha and hanging	-	-	45
Open latrine	-	-	21

* Sanitation Block

Table 6.7 Access of different type of latrines (%) in two grouped slums.

Indicators	Group-A (Well Facilitate) (%)	Group-B (Less Facilitate) (%)
Simple pit latrine, Sanitation block	100	0
Kucha and hanging , Open latrine	0	100

Table 6.7 shows that Group B slums (West Vasantek1 no.) has only options for open defecation (100%) which identifies itself in worst condition with respect to sanitation facility.

From field survey, it was found that the female slum dwellers are the marginalized in every basic service achievement. They believe that latrines or any closed place is safe for their security, paying negligible importance on the hygienic concept. It will be an important issue to increase awareness in the community in context of their latrine use

practice. A comparison can be made on the latrine use pattern between male and female (*Table 6.8*).

Table 6.8 Latrine use by sex distribution (Surveyed among 50 persons in each area of the age above 10 years).

Area	Male (%)	Female (%)
Area-1 (Residential)	98	100
Area-2 (Industrial)	98	100
Area-3 (Sub-urban)	90	100

6.5 ANALYSIS OF DRAINAGE SITUATION

The overall drainage conditions of the studied slums are presented in *Table 6.9*. Although *Table 6.9* shows the existence of some sort of drainage system in the slums, but practically they are in no use condition. Most of the slums have kutcha drains or nala which are located at the site of water sources such as tubewell or water point to drain out only the used or excess water. Since, these drains are discontinuous, short in length and has no connection with the main drainage line, the water cannot get out of the slum. Most of the existing drains remain blocked with garbage, solid wastes. There is no maintenance of drains at all. In wet season, the situation becomes worse. The slum becomes water logged with wastewater for days.

Table 6.9: Drainage Related Information

Name of the Slum		Nature of Existing Drain
Area-1 (Residential Area)	Kal-a-wala Para Bastee	Semi –Paca
	Nasimbag	Jammed
	Kallyanpur 4 no. Pora Bastee	-Paca -Kucha
Area-2 (Industrial Area)	BRI (Beg Rubber Industry)	-
	Omor Sons	Semi –Paca
	Tiger	Semi –Paca
Area-3 (Sub- urban Area)	West Vasantek	No Drain
	West Vasantek 1 no.	No Drain

It has been found that the overall drainage condition is totally poor in the study areas. There is not a single slum of pacca drainage system. On the basis of above discussion and also from observation from *Table 6.9*, the studied eight slums can be grouped under two headings- well facilitated and less facilitated. *Fig 6.5* shows this outcome visually.

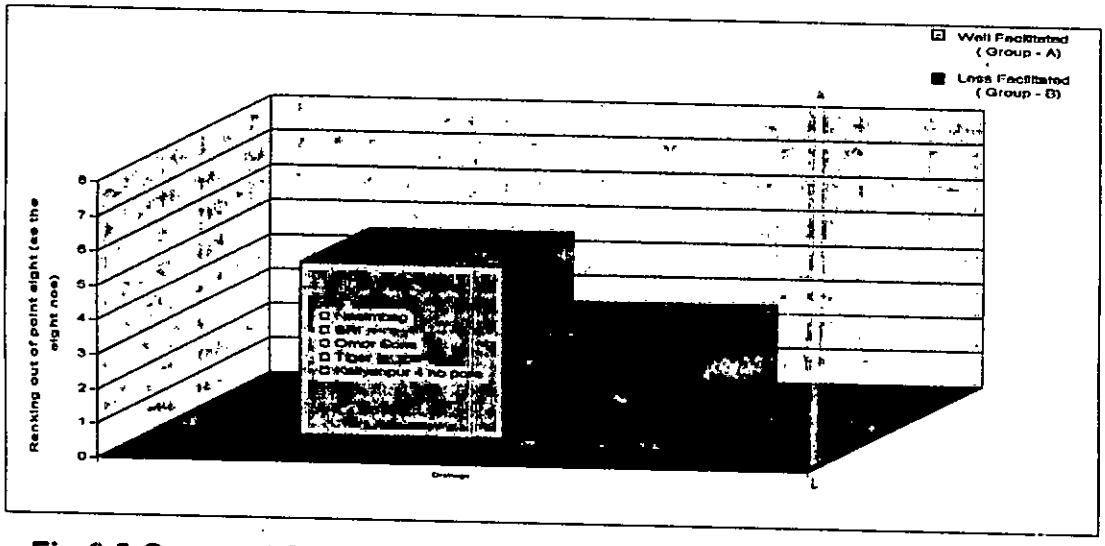


Fig 6.5 Group of Studied slum on the basis of their existing Drainage Facilities.

From the field study, it is observed that there are variations of the existing wastewater disposing practices in the three classified areas (*Table 6.10*).

Table 6.10 Drainage practices in the three classified areas (qualitative measure).

Indicator	Area-1 (Residential)	Area-2 (Industrial)	Area-3 (Sub-urban)
Disposal in open area	10%	6%	20%
Disposal in water bodies	0	0	80%
Disposal in drain	90%	94%	0

In Area-1 and Area-2, the wastewater is mainly drained out by drains connected to roadside drains whereas in Area-2, wastewater is disposed off in open places and adjacent water bodies (*Table 6.10*).

6.6 Analysis of Solid Waste Disposal Situation

The survey result carried out in eight slums shows that only two slums have solid waste disposal facility provided by Waste Concern, a private organization. The overall scenario of solid waste disposal system is shown in *Table 6.11*. However, Kallayanpur 4no. pora Bastee looks much cleaner because of the existence of Child to Child program introduced by an NGO, 'Phulki' (*Sec. 5.6.1*). This programs encouraged and guided the children to keep their slum clean. In West Vasantek and West Vasantek no.1 slum, no facilities for solid waste disposal system exist.

Table 6.11 Solid Waste Related Information

Name of the Slum		No. of Existing bins	Provider
Area-1 (Residential Area)	Kal-a-wala Para Bastee	20	Waste Concern
	Nasimbag	35	Waste Concern
	Kallyanpur 4 no. Pora Bastee	Door to Door	Phulki, DCC
Area-2 (Industrial Area)	BRI (Beg Rubber Industry)	1	DCC
	Omor Sons	1	DCC
	Tiger	1	DCC
Area-3 (Sub-urban Area)	West Vasantek	Nil	-
	West Vasantek 1 no.	Nil	-

It has been observed that there are two facilities (door to door and fixed place) exist for collecting wastes. A comparison table can be established under three indicators to get the picture (*Table 6.12* and *6.13*).

Table 6.12 Availability of Solid Waste Collecting Bins in the two groups.

Indicator	Group-A (Well Facilitate) (%)	Group-B (Less Facilitate) (%)
Open bin	10	5
Closed bin	90	0
No specific place	0	95

Table 6.13 Availability of Solid Waste Collecting Bins in the three areas.

Indicator	Area-1 (Residential)	Area-2 (Industrial)	Area-3 (Sub-urban)
DCC communal bin	5%	6%	0
Closed bin	95%	0	0
Open place	0	94%	100%

From *Table 6.12* and *6.13*, it can be said that the situational condition has a significant positive impact on the study areas. The slums in residential area posses waste collecting bins/ barrels and are grouped as well facilitated. There are only 5% open bins (DCC bin)exist which stores waste collected by van from household of the slum Kallyanpur 4 no. pora Bastee (study area 3). It is also a very good practice as the wastes collected in open van by door to door collection practices. On the other hand, slums at industrial areas, practically no collection system exist. People simply dump wastes at the roadside DCC communal bin and open places. The slums in Area-3 have no facility for disposal of solid wastes. The wastes remain scattered all over the slums and adjacent open places.

On the basis of above discussion and also from observation, studied eight slums can be grouped under two heading- well facilitate and less facilitate. *Fig 6.6* shows this outcome visually.

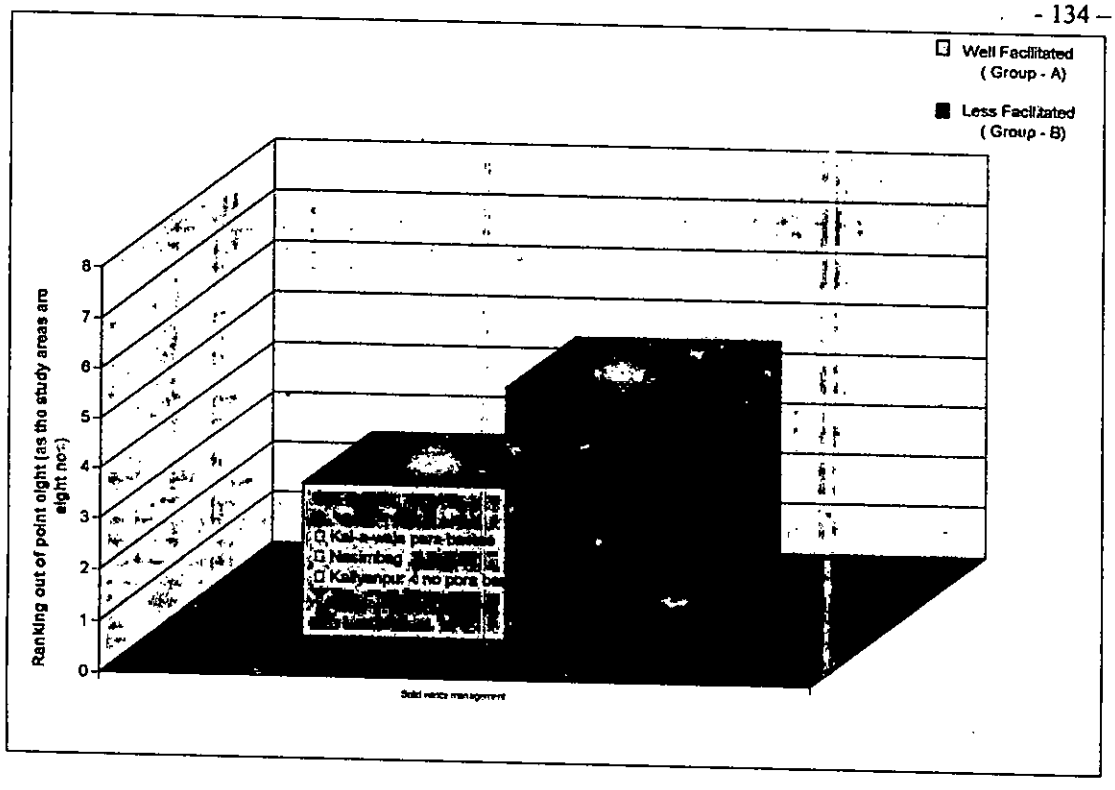


Fig 6.6 Group of Studied slum on the basis of their existing Solid Waste Management.

6.7 OVERALL ANALYSIS OF EXISTING FACILITIES

On the basis of above discussion (Sec 6.2 to Sec 6.6), it is observed that there is no slum that can be said perfect on the basis of the existence of four basic services. Although their existing facility can be identified better than others. *Table 6.14* and *Fig 6.7* present comparisons of the slums in four different areas (water supply, sanitation, solid waste disposal and drainage facilities).

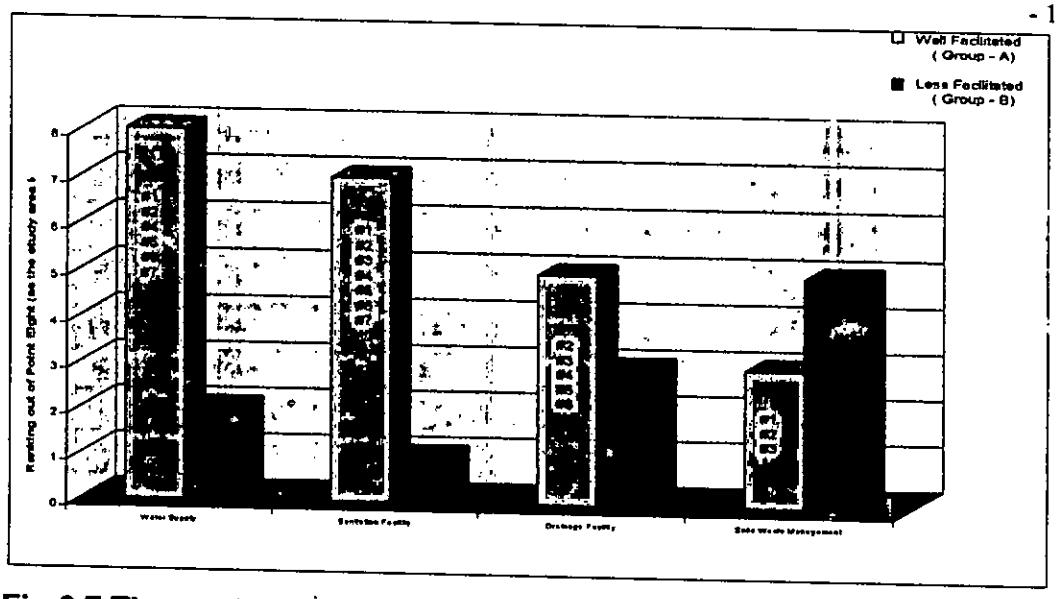


Fig 6.7 The study slums on the basis of their existing facilities

Table 6.14 Comparison of the slums in four sectors

Sectors	Group – A (Well Facilitated)	Group –B (Less Facilitated)
Water supply	▪ Kal-a-wala Para ▪ Nasimbag ▪ BRI ▪ Omor Sons ▪ Tiger ▪ West Vasantek	▪ Kallyanpur 4 no. Pora bastee ▪ West Vasantek 1 no.
Sanitation	▪ Kal-a-wala Para ▪ Nasimbag ▪ Kallyanpur 4 no. Pora bastee ▪ BRI ▪ Omor Sons ▪ Tiger ▪ West Vasantek	▪ West Vasantek 1 no.
Drainage (N.B. from the field survey it has been found that practically there is no significant drainage system at any slum.)	▪ Nasimbag ▪ BRI ▪ Omor Sons ▪ Tiger ▪ Kallyanpur 4 no. Pora bastee	▪ Kal-a-wala para bastee ▪ West Vasantek ▪ West Vasantek 1 no.
Solid waste Disposal	▪ Kal-a-wala Para bastee ▪ Nasimbag ▪ Kallyanpur Pora bastee	▪ BRI ▪ Omor Sons ▪ Tiger ▪ West Vasantek ▪ West Vasantek 1 no.

It is observed that West Vasantek 1 no. slum (study area no.8) always falls in Group-B (less facilitate) (*Table 6.14* and *Fig 6.7*). *Fig 6.6* shows that in solid waste management sector, five slums (BRI, Omor Sons, Tiger, West Vasantek, West Vasantek 1 no.) fall in Group-B (less facilitated). More clear view will be found by making a situational classification which is stated in Sec 6.8.

6.8 ANALYSIS OF FACILITIES BASED ON SITUATION

A comparison was made to study the effects of slum's location on its existing facilities. To facilitate this, a rating system is applied in three categorical areas such as Area-1, 2 and 3. This rating system is a qualitative measure to indicate which slums are having better services and which are in worst condition.

Table 6.15 Rating allocated to different facilities in the selected three slum areas.

Parameters	Area-1 (Residential Area) [- Kal-a-wala para - Nasimbag – Kallayanpur 4 no. pora]	Area-2 (Industrial Area) [- BRI - Omor sons - Tiger]	Area-3 (Sub-urban Area) [- West Vasantek - West Vasantek 1 no.]	Comment
Water supply	4	4	3	5-Very good 4-Good 3-Reasonable 2-Bad 1-Very bad
Latrine waste exposure	4	5	3	
Waste water disposal	2	3	1	
Solid waste exposure	5	3	1	
Health care provision	3	3	3	
Total	18	18	11	
Percentage (Relative)	39	39	22	

From *Table 6.15*, it is observed that slums in both residential area and industrial area have 18 points, whereas slums located away from the city have 11 points. This indicates that the situation or location of slum does not have significant role in getting better services in the slums. There are other factors which mainly influence the scope of getting better services and are discussed in Chapter 7.

A comparison can be made between the previous years facilities and the present study findings. It would be a good measure to get chronological improvement of the facilities. (*Table 6.16*). The drainage system is not included in this table because, no previous data on drainage facilities were available in the studied slums. Moreover, in the present study it is observed that no development activities on slum's drainage system is being carried out.

Table 6.16 Comparison of various facilities in three different years.

Parameters		Availability			Remarks
		1998 (DSK)	2000 (DSK)	2002 (Field Survey)	
Number of legal water point	Area-1	-	3	8	Area-3 getting improved facilities.
	Area-2	-	4	4	
	Area-3	-	-	3	
Number of sanitary latrine	Area-1	35	42	50	Area-3 getting improved facilities.
	Area-2	10	21	21	
	Area-3	-	50	108	
Number of solid waste colleting point	Area-1	-	-	55	Area-1 has excellent management practices.
	Area-2	-	-	4	
	Area-3	-	-	-	

From the above observation, it has been found that the progress on water supply and sanitation sector is good. Although the existing facility is not sufficient for the huge slum population, still it is a good sign that the progress is increasing day by day. In solid waste sector, Area-1 is getting the maximum facility during the period of 2000 to 2002, because they are located in a residential area.

6.9 WILLINGNESS TO PAY FOR THE SERVICES

From the field observations it appeared that the slum dwellers are quite responsive to pay for the services. A survey conducted out of 50 persons in each area shows that their willingness to pay for the better services is 100% (*Table 6.17*). If anybody faces the financial problem to pay in time, they believe their committee will help them.

Table 6.17 Assessment of willingness to pay for the services Interviewed out of 50 persons in each community).

	Area-1 (Residential) (%)	Area-2 (Industrial) (%)	Area-3 (Sub-urban) (%)
Willingness to pay for the services	100	100	100

Chapter 7

DISCUSSION AND CONCLUSION

7.1 DISCUSSION

The main objective of this study was to investigate the existing condition of water supply, sanitation, drainage and solid waste disposal system in some selected slums of Dhaka City. Many of the city's poorest live in more than 3007 densely populated slums and squatter settlements in 'abject' physical and social condition. Water supply, sanitation, hygiene and health of the slum people have been grossly neglected. Slum people have minimum access to basic services. Where safe drinking water is not adequate, slum dwellers often resort to contaminated water from surface water bodies. The first priority of these poor, homeless people is to get any sort of shelter under the sky, whether it is legal or illegal. While carrying out this study, it is observed that various initiatives are being undertaken from both GO and NGO level to improve their environmental conditions. However it is understood from the study that many factors are responsible for the poor physical and environmental condition of the slums as well as the improvement of the slum's situation. Security is precarious, with threats of eviction from landowners and violence is endemic. Women, specially single mothers are particularly disadvantaged by their vulnerable position in the society and threats of violence.

There are some common problems which must need to overcome in order to ensure safe water supply, sanitation, health and solid waste management system in slums. These are:

i) The legal right/ position of the residents with respect to land ownership
ii) The political influence/ interference among the slum people
iii) The geographical location of the settlements including distance and accessibility from the main roads
iv) The affordability for the services
v) The permanency of the slum
vi) Interferences of local leaders/ mastaans in slum improvement projects and
vii) Threat of slum eviction.

Slum communities have their own social systems, factions and groupings. There are mainly three types of community based organizations (CBOs) in slums. CBOs may be formed by slum leaders or mastans who may reside inside or outside the slum. Second CBOs can be formed by political parties. Thirdly there are CBOs formed as a result of NGO activity, which are generally charged with a development activities as well as slum protection.

Limited access to basic services adversely affects women. Time and energy spent on activities such as water collection accelerates existing health problems and uses valuable time that could be spent more productively elsewhere. Slum children deserve special attention. They often support themselves and contribute to the support of their families. They can become an efficient work force if they are properly educated, trained and guided (Sec. 5.6.2).

Among the eight studied slums, it is observed that slum people do not have adequate access to all four basic services in any of the slums. Although most of the slums have water supply facilities, the other sectors such as sanitation, drainage and solid waste disposal services are grossly neglected. It has been shown in chapter 6, that some slums are grouped as well facilitated and some are less facilitated in each sector (*Fig 6.8*), the grouping is only done to make a comparison of the existing facilities among the slums. It does not indicate that the slums in well facilitated group have really sufficient access to those services. The slums in Group-A (well facilitated) still have shortage in the respective sectors, compared to their huge population. The grouping only compares that how worse is the condition of one slum than that of other.

From the present study, it is understood that the location of slum (whether it is in the residential, industrial or away from the main city) does not have much effect on its overall condition. In this study, the slums in residential area (Kal-a-wala para, Nasimbag and Kallayanpur 4no. Pora Bastee) and slums in industrial area (BRI, Omor Sons and Tiger) are getting more or less same facilities (Table 6.14). Only the sub – urban slums, are not getting much attention from the slum development providers (GOs and NGOs). While carrying out this study, the researcher got the impression that the reason of this negligence is lack of co-ordination between the service provider and the slum leaders. If local leader do not cooperate, the people from outside (GO and NGOs) cannot implement development activities successfully.

Regarding the sanitation situation, most of the slums have pit latrines which are not fully hygienic. These may cause groundwater contamination depending on the soil characteristics and distance between the water sources and latrines. Although the use of 'Vaccutag' (Sec 4.4.3 and 4.5.3) was observed in two slums – (Kallayanpur 4 no Pora Bastee, BRI) for a limited time period, it appears as a very useful, low-cost method for disposal of human feces of slum community. Another low-cost, useful technique in water supply sector is water point. The slum dwellers are satisfied with this service even though they have to pay for this. The drainage system is the most neglected sector in slums. Both GO and NGOs should provide attention to this sector.

The success rate of various development activities (water point, sanitation block, barrel system, CTC program etc) by both GO and NGOs prove that if the slum community is properly awared, convinced, motivated and guided, their situation will positively change.

7.2 CONCLUSION

The principal conclusions drawn from the present study are as follows:

(i) The slum people depend on mainly WASA supply water for their drinking purposes. Legal accesses to safe drinking water have been increased in the studied slums (*Table 6.16*) but still not sufficient.

(ii) The new system of water source such as 'Water Pont' appears very useful to the slum dwellers.

(iii) The use of pit latrines is increasing instead of open hanging latrines- a positive sign of intervention of different slum improvement activities (*Table 6.16*).

(iv) Although the various GO and NGOs are providing sanitary pit latrines in the slums, the number is very inadequate compared to the huge population (*Table 6.5*). Moreover, the distance between the water sources and latrines are very short, which may lead the contamination of water sources.

(v) The waste water disposal system is in very dismal state and neglected (*Table 6.9*).

(vi) Solid waste disposal practice is getting importance in the slums. Two slums (Kal-a-wala para and Nasimbag) among the eight studied slums have barrel system for solid waste disposal and the slum dwellers are satisfied with the effectiveness of the system (*Table 6.11*).

(vii) The location of the slum i.e. slums located near residential areas, industrial areas or sub-urban slums, does not have significant effect on getting basic facilities such as water supply, sanitation and solid waste services. It is evident from the study that only the slum (*Table 6.14*) which is located far away from city, is in the worst condition with respect to these basic services compared to the other slums.

(viii) The willingness to pay for the services of the slum dwellers is sufficiently responsive (*Table 6.17*).

(ix) The well facilitated slums compared to the less facilitated slums (*Table 6.14*) are the examples of result of various interventions by both GO and NGOs for the improvement of slums.

(x) Many factors such as legal position of slums, permanency of slums, local masculine power influences the development activities in the slum.

7.3 LIMITATION OF THE STUDY

This study was conducted on eight selected slums of Dhaka City, it does not represent the exact situation of all the slums (3007) in Dhaka City. In the field survey, most of the respondents were female (98%) which might not reflect the total (male, female) view of the slum dwellers. Moreover, sometimes respondents were unwilling to express their views for social insecurity.

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APPENDIX A

Slum Survey proforma

Serial No:

Date of Interview :

Time :

Place :

1. Name of the Slum :
2. Type of the Slum:
3. Name of the respondent (a) Male ☐ (b) Female ☐
4. Name of the inhabitants: (a) Male ☐ (b) Female ☐
5. Area covered:
6. Total nos. of households:
7. Educational qualifications :

(a)Literate ☐ (b)Illiterate ☐ (c)Class I-V ☐

(d) S.S.C ☐ (e) H.S.C ☐

8. Age:.....
9. Source of income of the family : .....
10. Nos. of member in the family :.....

QUESTIONS ABOUT WATER SUPPLY:

1. Sources of water for drinking :

(a) Tube well ☐ (b) Well ☐ (c) River ☐

(d) Pond ☐ (e) WASA supplied water ☐ (f) Others ☐

2. Sources of water for other purposes :

(a) Tube well ☐ (b) Well ☐ (c) River ☐

(d) Pond ☐ (e) WASA supplied water ☐ (f) Others ☐

3. Distance of the water sources from the households :

(a) Drinking water ☐

(b) For other purposes ☐

4. Any problems in fetching water from the source :

(a) Water source is far away ☐

(b) Timing of the supply water ☐

(c) Crowded ☐

(d) Surrounding environment is unsuitable for fetching water for women ☐

5. Does the quantity of water satisfy the demand ? yes /no.

6.Any comment on the existing water supply conditions ?

QUESTIONS ABOUT SANITATION AND DRAINAGE:

1. Mode of defecation :

(a) Open place /drain ☐

(b) Pit latrine ☐

(c) Bucket latrine ☐

(d) Hanging latrine ☐

(e) Water seal latrine ☐

2. Existing latrine facilities :

(a) Common ☐

(b) Single ☐

3. If common ,
   (a) Users number per latrine .....

   (b) Do you have to pay for using latrines ? yes / no.

4. Any comment on the existing sanitation conditions ?

5. Liquid waste generated Approx. quantity (volume & weight) :.....

6. Waste disposal system and location of disposal sites ;

   (a) Their distances from settlement : .....

   (c) Cross (x) the appropriate box for the present waste water disposal system :

i	Slum	——	Drain	——		River
ii	Slum	——	Drain	Treatment		River

   (d) Involvement of any govt. / private organization (name it) :

7. Any comment on the existing drainage conditions ?

QUESTIONS ABOUT SOLID WASTES:

1. Amount solid waste generated Approx. quantity (volume & weight) :
2. Waste disposal system and location of disposal sites ;

   (a) Their distances from settlement : .....

   (b)Involvement of any govt. / private organization (name it) :
3. Any comment on the existing solid waste disposal practice ?

QUESTIONS ABOUT HEALTH , HYGENE AND ENVIRONMENTALCONDITIONS :

1. Water borne diseases :

(a) Cholera ☐

(b) Diarrhea ☐

(c) Typhoid ☐

(d) Any other ☐

2. Occupational health issues :

   (a) Working area : Spacious / Congested / Suffocating

   (b) Living area : Spacious / Congested / Suffocating

3. Sanitation practice /hygiene :

(a) Washing hand before taking meal : ☐ yes ☐ no.

(b) Washing hand after defecation: ☐ yes ☐ no.

If yes , use : soap / ash / only water .

4.Wearing slippers /shoes while in toilet? yes no.

5. Using cover whether keep food ? yes no.

6. Existing health caring facilities ;

(a) Their distances from settlement : .....

(b)Involvement of any govt. / private organization (name it)

7.Any comment on the existing health care practice ?

8. Visible / Perceived impacts on the environment

(a) Surface water :
(impairment of domestic use , fishes farming , aquatic weeds , recreation etc.)

(b) Ground water :
(effect on TW water)

(c) Air :
(smoke , flume , inhalation by the neighbors)

(d) Land :
(wastes of land , conversion into marshy land)

(e) Ecological :
(any imbalance on ecology)

(f) Cultural :
(any religions , cultural or ethnic problem)

(g) Social

QUESTIONS ABOUT OTHERS:

1. Slum improvement Project Provider

   (a) Name of the organization:

   (b) Type of work:

   (i) Water supply
   (ii) Sanitation
   (iii) Hygiene
   (iv) Solid waste management

   (c) Completed Project work :

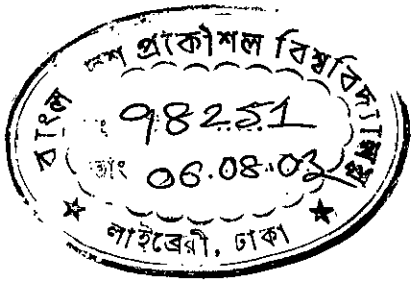
   (d) On going program :

   (e) Project monitoring : yes /no

   (i) by project provider
   (ii) by the community

2. Is there any participation of community in the project work ? yes/ no.

3. Overall comment on the water supply , sanitation and solid waste management of the slum .
   (Note any suggestions of the community to overcome the different problems , if any .)



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