Urban Health Extension Project

Urban FP/MCH Working Paper No. 11

A Survey of Slums in Dhaka Metropolitan Area - 1991

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Foreword

I am pleased to release these reports on urban health and family planning issues which are based on the activities of the Urban Health Extension Project (UHEP). UHEP is a follow-on activity of the former Urban Volunteer Program, a pilot project funded by the United States Agency for International Development (USAID).

The poor health status and the health needs of the urban poor continues to be an important emerging public health issue in the Developing World. Bangladesh is no exception. Despite the constraints of poverty and illiteracy, there are proven strategies to provide basic health and family planning services to the urban poor. In Dhaka alone, aside from the Government health care facilities, there are numerous NGOs and private sector providers giving needed services to the urban population. The Centre's own Urban Health Extension Project continues to focus on the urban poor, especially the slum populations, in providing basic family planning and health services through outreach activities (viz. health education, ORS distribution and referral services to service points).

However, enormous challenges remain in providing an optimum level of services to the urban poor. The UHEP, with the support of the USAID, will focus on health and family planning services delivery strategies in reaching the needed services to the urban poor. We certainly look forward to learning more about the health and family planning needs of the urban poor, testing sustainable strategies and applying these proven strategies in collaboration with other partners in government, NGOs and the private sector.

Demissie Habte, MD
Director

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This Working Paper is from the survey conducted in 1991 to identify and map all the slums in Dhaka metropolitan area. The survey was conducted by the Urban Health Extension Project (UHEP) in association with the Centre for Urban Studies (CUS), Dhaka. Numerous project staff were involved in the design, implementation and analysis of this survey. Sincere acknowledgement is extended for the hard work and dedication of UHEP field-based staff, data management staff, and project management staff. We also acknowledge the valuable and essential contribution by the staff of CUS who collaborated with us in this survey.

Urban Health Extension Project (Formerly, Urban Volunteer Program),
Community Health Division,
International Centre for Diarrhoeal Disease Research, Bangladesh
(ICDDR,B)

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SUMMARY

In 1991, a survey was conducted aimed at mapping the slums and squatter settlements within the Dhaka metropolitan area, and collecting some information on key characteristics of every slum settlement, particularly those with 10 or more household/family units. Slums were identified based on predominantly poor housing, very high housing density, and poor sewerage and drainage facility. Mapping of the slums was done by actual physical survey and observation. Information on key slum characteristics was collected from key informants by field investigators, using a structured and pre-coded questionnaire. The area and population of the slums were estimated.

A total of 2,156 slums were identified. About 75% of the slums were established on private land. The estimated slum population was 718,143 and the total area under slums was 789 acres resulting in a population density of 910 per acre (or 225,000/sq. km). Nearly one-fourth of the settlements were on government and semi-government land. Private slums were smaller (area and population) than the slums on government and semi-government land.

Most slums (81%) had been established since 1971, the year Bangladesh became independent. About 93% of the slum houses were constructed of poor materials (tin, wood, bamboo, or jhupri). Sixty-four percent of the slums had electricity and 33% had gas. Tubewells or taps were the primary source of drinking water, and most slum dwellers used shared latrines.

The survey emphasized the extremely poor environmental conditions of the slums, especially in terms of population density and poor housing.

SECTION 1

INTRODUCTION

1.1 The Background of the Study

The Dhaka metropolitan area consists of 14 *thana*[a]. According to the 1991 national census, the total area and population of the 14 *thana* is 303 sq.kms and 4.17 million respectively. The Urban Health Extension Project (UHEP) of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been providing family planning and health services through a network of volunteers to the slum residents of 5 of the 14 *thana* (Mohammadpur, Lalbagh, Kotwali, Sutrapur, and Demra). Since January 1991, UHEP has been maintaining a comprehensive health and demographic surveillance system, known as the Urban Surveillance System (USS), in a representative sample of the slums in these 5 *thana*. The sampling frame for the USS sample was based on a survey and mapping of the slums of Dhaka City conducted on behalf of UHEP by a private organization in 1989. The household registration and baseline surveys in the sampled slums was conducted in 1990. A review carried out in early 1991 revealed that the 1989 slum survey had undercounted the number of slums and in the identified slums, some specific information was erroneous, e.g. population and size characteristics, and new slums may have emerged since that survey. It was felt that an update of the USS sampling frame was necessary requiring updated information on Dhaka urban slum population and household sizes, and information on slum growth in terms of high/low growth areas, stable and unstable areas, floating population, and migration patterns. For this purpose, the UHEP decided to conduct a survey of all the

[a]*Thana*: police jurisdiction area

slums in the Dhaka metropolitan area (henceforth called the Dhaka Metropolitan Slum Survey - 1991 or briefly the DMSS-91). The Centre for Urban Studies (CUS) of Dhaka University was commissioned for undertaking the survey under UHEP's supervision. The present report is the outcome of the survey.

1.2 Scope and Objectives

The survey was aimed at mapping the slums and squatter settlements within the Dhaka metropolitan area, and collecting some information on key characteristics of every slum settlement, particularly those with 10 or more household/family units.

1.3 Definition of Slum

In previous surveys done by the CUS (1983 and 1988), it was observed that high population density and very small size make it extremely difficult to locate all slums and squatter settlements. For this reason, it was decided that in the present survey, slums with at least 10 households will be counted, so that they can be identified more easily. The following definition was used to identify slums and squatters.

Slums are settlements/areas of:

- poor housing, e.g.
  * shacks ("jhupris")
  * kutcha structures (flimsy structures)
  * semi-pucca flimsy structures (flimsy structure with brick or concrete floors)
  * dilapidated buildings (old building in bad condition)

- very high gross area density (over 300 persons/acre) and high room crowding (3 or more adults per room)
- poor sewerage and drainage
- inadequate water supply
- irregular or no clearance of garbage
- little or no paved streets
- insufficient or absence of street lighting
- little or no access to gas facility

The characteristics listed above are common to almost all slum settlements of the capital. However, for operational purposes, the following three physical characteristics, listed in the order of importance, were used to identify the slum settlements:

1. predominantly poor housing;
2. very high housing density; and
3. poor sewerage and drainage facility.

Slums were termed **squatters** when located on illegally occupied land belonging to government, semi-government, and autonomous and other organizations.

1.4 Definition of a Slum Household

It was known that not all the households in a slum area identified by the above definition could be characterized as a slum household. It was likely that slum areas would contain one or more pockets of non-slum housing especially in large slum areas, such as Islambagh, Shahidnagar, Jurain, Gandaria, and Mirpur. To determine whether or not to enumerate a household located within a slum area, the following definition was used:

A slum household is a household located in a slum settlement which fulfills either of the following criteria:

1. The household uses a shared latrine;
2. The household uses shared water sources.

1.5 Definition of a Slum Unit

Although few problems were encountered in defining the slums in terms of household or population criteria, the investigators often faced difficulty in delimiting the physical boundary of a slum cluster/unit on the ground. Previous studies or surveys in the slum areas have stressed this aspect very little. Therefore, a standard criteria for defining a unit of slum was lacking. The following definition of a slum unit was formulated for the purposes of this survey:

> A slum unit is a slum area containing contiguous slum 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, are connected by a 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.

The above criteria could not be strictly followed in the present study, but was particularly used to delimit the physical boundary of large slum units. A small slum cluster on a private plot was often identified as a single unit.

1.6 Specific Objectives/Tasks

The detailed objectives of the present study were as follows:

1. Enumeration of all the slums with 10 or more households;

2. Preparation of sketch maps with adequate addresses of each slum with an areal measurement of the size, estimated number of households and estimated total population;

3. Collection of information on the stability of each settlement;

4. Collection of information on the growth rate of each slum;

5. Collection of information about the land ownership of each slum;

6. Segmentation of the large slums into units of up to 200 households;

7. Preparation of maps of the slums (on a scale of 1:10,000) to be prepared by *thana* and by ward (city corporation administrative units);

8. Preparation of a large map of the Dhaka metropolitan area (on a scale of 1:30,000) showing all the slums;

9. Preparation of a report describing the definitions and methodology used in the preparation of the maps and the collection of the above mentioned information.

1.7 Methodology

The survey involved two major activities: (i) mapping of each slum cluster and (ii) collection of selected information on individual slums. Mapping of slums was done by actual physical survey and observation and recorded on *thana* maps (base map) on a scale of 1:10,000. In the field, the map work also involved detailed sketching of the slum settlements with identifiable landmarks.

Information on key slum characteristics was collected by field investigators using a structured and pre-coded questionnaire (Appendix A). The area of the slums was estimated from the length and breadth of the slum, measured by the field investigators by using walking steps. In small slums, the number of households was actually counted. In large slums, where this was not possible, the number of households in a small measured area was counted and then extrapolated to the whole slum. The slum population was estimated by multiplying the number of households by a number that was based on a preliminary assessment of the slum. Information on structural materials used in constructing houses in the slum was based on actual observations in the entire slum if small, or in part of the slum if large.

Information on other variables was primarily collected from key informants in each slum. On an average, about 3 key informants were interviewed for information on each settlement. Slum owners/managers, old residents, shopkeepers in the slum, etc. were usually selected as key informants. Information on some variables was backed up by questioning other residents and by actual observations. For example, information on water sources was verified by observing the presence or absence of that source, and information on electricity was verified by observing the distribution of electric lines. Any primary school reportedly present within the slum was checked.

The actual survey was carried out during April-May 1991. Over 20 field investigators and four supervisors were engaged for the survey. Two UHEP mappers were involved in the supervision of mapping of the large slums (slums with households of over 200). Prior to the field survey, the field investigators and supervisors were thoroughly trained by a team consisting of CUS and UHEP staff (Appendix B). The data were entered and processed by UHEP's Data Management Section. Quality checks, including consistency and range checks, were done and error feedback was generated. These were checked and corrected in the field by the CUS staff.

1.8 Organization of the Report

The next three sections present data collected in this study. The last section (Section 5) discusses issues of data validity and limitations of the study, focussing primarily on the post-survey rechecking, conducted to evaluate the accuracy and completeness of the information collected in the primary survey. Finally, the report presents summary conclusion.

SECTION 2

A GENERAL PROFILE OF THE SLUMS AND SLUM DWELLERS

2.1 Introduction

The Dhaka Metropolitan Slum Survey - 1991 identified 2,156 slum units. This section of the report focuses on some important general features of these slum settlements and their inhabitants. The following description is based on data collected from the primary survey of these slums. Some basic aggregate information about slum settlements has been summarized in Table 2.1. The attached map (opposite) of Dhaka metropolitan area presents the locations of the slums identified in the survey.

Table 2.19. Dhaka Metropolitan Area Slum Survey, 1991: Facts at a Glance

Facts	Statistics	
Total no.of slums	2,156	(100%)
Slums on public land	487	(23%)
Slums on private land	1,628	(75%)
Average no.of slums per *thana*	154	
Total area covered by slum settlements (acres)	789.04	
Average/median slum size (acres)	0.37/0.1	
Average size of public/private slums (acres)	0.64/0.27	
Percentage of clusters up to 0.33 acre (1 bigha)	84.90	
Percentage of cluster up to 1 acre (3 bighas)	96.10	

(continued next page...)

Table 2.1. Dhaka Metropolitan Area Slum Survey, 1991: Facts at a Glance (continued...)

Facts	Statistics
Estimated number of households (HH)	129,700
Average/median number of HH per slum	60/20
Estimated population (Popn.)	718,143
Average/median population per slum	333/110
Average density of slum population	
Per acre	910
Per square kilometer	224,923
Average annual growth of number of slum settlements	
Since 1960	21
Since 1970	73
Since 1980	107
Years when >100 slums were established/year	1971, 1975-76 1981, 1985-89
Slums completely flooded in 1988	1,455 (67%)
Slums without electricity	778 (36%)
Slums without gas facility	1,449 (67%)
Slums without access to primary schools	1,462 (68%)

2.2 Pattern of Land Ownership

On the basis of land ownership pattern, the slum settlements were classified into squatter settlements (developed on government/semi-government land, i.e. public land), slums on private land, or slums on land owned by non-government organizations or others. Table 2.2 shows that most slum clusters (75.5%) were established on privately owned land, nearly

one-fourth of the settlements (22.6%) were on government and semi-government land, primarily on land owned by the departments of Railways, Public Works and Building, Roads and Highway and city authorities, such as Dhaka City Corporation (DCC) and Rajdhani Unnayan Kartipakkha (RAJUK). A small number of slum clusters (1.6%) were built on land owned by various non-governmental organizations.

Table 2.2. Slum Land Ownership Patterns by *Thana*

	Ownership							
	Govt./ Semi-govt.		Private		Non-govt. & Others		All Slums*	
Thana	No.	%	No.	%	No.	%	No.	%
Mohammadpur	32	20.5	120	76.9	4	2.6	156	100.0
Mirpur	108	30.5	228	64.4	17	4.8	354 (1)	100.0
Lalbagh	14	7.3	176	91.2	3	1.6	193	100.0
Demra	25	9.0	251	90.6	1	0.4	277	100.0
Sutrapur	34	16.1	174	82.5	3	1.4	211	100.0
Shobujbagh	14	6.1	214	93.1	-	-	230 (2)	100.0
Tejgaon	78	51.7	72	47.7	1	0.7	151	100.0
Gulshan	49	35.5	87	63.1	2	1.5	138	100.0
Ramna	35	36.8	58	61.1	2	2.1	95	100.0
Dhanmondi	6	6.2	90	92.8	-	-	97 (1)	100.0
Cantonment	10	15.4	53	81.5	1	1.5	65 (1)	100.0
Motijheel	24	39.3	37	60.7	-	-	61	100.0
Kotwali	12	21.1	44	77.2	-	-	57 (1)	100.0
Uttara	46	64.8	24	33.8	-	-	71 (1)	100.0
Total	487	22.6	1628	75.5	34	1.6	2156 (7)	100.0

* Figures in parenthesis are unknown cases.

The above pattern of land ownership in slum areas conformed with the findings of previous studies (1,2). It has been generally observed that the proportion of slums on private land has been on the increase, primarily due to a rapid decline in the availability of public land. This was especially noticeable in several parts of the city, especially in the central zones where public lands were in high demand for building office blocks, staff housing, and construction of roads and market complexes. As a result, we observed a trend in the establishment of new slum settlements in the peripheral areas of the city, mainly on land owned by private individuals. We foresee a continued increase in the dependence of the city's poor communities on private land for housing needs.

2.3 Household and Population Size

The distribution of slums by household size and population size are presented in Tables 2.3 through 2.13. At the time of the survey during March-April 1991, the number of households and population in those settlements was estimated to be 129,700 and 718,143 respectively. Of them, 46.8% of the households (46.3% of the population) were, by definition, squatters, since they occupied government and semi-government land (Tables 2.5 & 2.6).

Among the households, 126,392 (97.4%) were family households and the remaining 3,308 (2.6%) were messes (male & female), i.e. individuals living in groups without their families (Table 2.3). Of the total slum population, 97.1% (697,130) lived with families, and 2.8% lived in messes located within the slum settlements (Table 2.4). The survey also estimated the size of the floating population residing within the slums, and found that a very small part (0.1%) of the total slum population was of this category (Table 2.4). However, no attempt was made in DMSS-91 to capture floating population outside established settlements.

Table 2.3. Distribution of Slums and Households by *Thana*

Thana	No. of Slums	Family Households*		Number of Messes†		Total Number of Households			
		.No.	%	No.	%	No.	%	Mean /Slum	Median /Slum
Mohammadpur	156	29911	23.67	324	9.79	30235	23.31	194	34
Mirpur	354	22747	18.00	183	5.53	22930	17.68	65	22
Lalbagh	193	14814	11.72	166	5.02	14980	11.55	78	25
Demra	277	9901	7.83	572	17.29	10473	8.07	38	20
Sutrapur	211	8174	6.47	368	11.12	8542	6.59	40	17
Shobujbagh	230	7455	5.90	345	10.43	7800	6.01	34	19
Tejgaon	151	6988	5.53	432	13.06	7420	5.72	49	25
Gulshan	138	6523	5.16	172	5.20	6695	5.16	49	16
Ramna	95	5689	4.50	346	10.46	6035	4.65	64	35
Dhanmondi	97	3674	2.91	143	4.32	3817	2.94	39	17
Cantonment	65	3145	2.49	34	1.03	3179	2.45	49	17
Motijheel	61	2974	2.35	136	4.11	3110	2.40	51	20
Kotwali	57	2608	2.06	76	2.30	2684	2.07	47	15
Uttara	71	1789	1.42	11	0.33	1800	1.39	25	20
	2156	126392	100.00	3308	100.00	129700	100.00	60	20

* **Family Households:** Households where families live.

† **Mess:** Households where group of males or females live together sharing a common kitchen, without their families.

More than 50% of the households and population were located in 3 *thana*, i.e. Mirpur, Mohammadpur, and Lalbagh (Tables 2.3 & 2.4). Mohammadpur *thana* alone accommodated nearly one-fourth of the total slum households and dwellers. This was closely followed by Mirpur *thana* which accounted for nearly 18.0% of the slum households and population. Lalbagh *thana*, located in the older part of the city, accounted for about 11% of the city's slum population and households. At the other end of the scale, in some centrally located *thana*, such as Kotwali, Motijheel, Ramna, and

Tejgaon *thana*, and upper class residential areas, such as Dhanmondi, Uttara, and Gulshan *thana*, the concentrations of slum households or population were found to be comparatively low (Tables 2.3 & 2.4).

Table 2.4. Distribution of Population by *Thana*

	Family Population		Mess Population		Floating Population		Total Population			
Thana	No.	%	No.	%	No.	%	No.	%	Mean /Slum	Median /Slum
Mohammadpur	168012	24.10	1822	8.98	48	6.71	169882	23.66	1089	187
Mirpur	125013	17.93	946	4.66	118	6.50	126077	17.56	356	121
Lalbagh	81162	11.64	1056	5.20	9	1.26	82227	11.45	426	137
Demra	52716	7.56	2542	12.52	0	0.00	55258	7.69	199	104
Sutrapur	49814	7.15	4550	22.42	27	3.78	54391	7.57	258	100
Shobujbagh	39861	5.72	1530	7.54	145	0.28	41536	5.78	181	100
Tejgaon	37728	5.41	1697	8.36	199	7.83	39624	5.52	262	125
Gulshan	35298	5.06	780	3.84	16	2.24	36094	5.03	262	86
Ramna	30967	4.44	2821	13.90	50	6.99	33838	4.71	356	189
Dhanmondi	20354	2.92	1066	5.25	83	1.61	21503	2.99	222	95
Cantonment	16907	2.43	88	0.43	5	0.70	17000	2.37	262	84
Motijheel	16251	2.33	434	2.14	15	2.10	16700	2.33	274	120
Kotwali	14545	2.09	925	4.56	0	0.00	15470	2.15	271	85
Uttara	8502	1.22	41	0.20	0	0.00	8543	1.19	120	95
	697130	100.00	20298	100.00	715	100.00	718143	100.00	333	110

Table 2.5. Distribution of Slums and Households by Land Ownership

Land Ownership	No. of Slums	Family Households		Number of Messes		Total Households			
		No.	%	No.	%	No.	%	Mean /Slum	Median /Slum
Govt/Semi-govt	487	60147	47.6	501	15.2	60648	46.8	125	34
Private	1628	62891	49.8	2696	81.5	65587	50.6	40	20
Non-govt & Others	34	3017	2.4	110	3.3	3127	2.4	92	35
Unknown	7	337	0.3	1	0.0	338	0.3	48	30
	2156	126392	100.0	3308	100.0	129700	100.0	60	20

Table 2.6. Distribution of Population by Land Ownership

Land Ownership	Family Population		Mess Population		Floating Population		Total Population			
	No.	%	No.	%	No.	%	No.	%	Mean /Slum	Median /Slum
Govt/Semi-govt	328933	47.2	3080	15.2	523	73.2	332536	46.3	683	165
Private	349801	50.2	16615	81.9	192	26.9	366608	51.1	225	104
Non-govt & Others	16524	2.4	601	3.0	0	0.0	17125	2.4	504	181
Unknown	1872	0.3	2	0.0	0	0.0	1874	0.3	268	160
	697130	100.0	20298	100.0	715	100.0	718143	100.0	333	110

It appears from Table 2.7 that about half of the slum clusters (51%) had 20 households or fewer and in about 75% of the slums, the number of households was 40 or fewer. On an average, a cluster had 60 families and 333 persons, and the median size of a cluster in terms of household and population size was estimated to be 20 and 110 respectively (Table 2.1).

Clusters with more than 200 households, or 1000 or more inhabitants, numbered 102 (4.7%) and 127 (5.9%) respectively (Tables 2.7 and 2.10). Nine (0.4%) slums were found to be extremely big with 5,000 or more inhabitants (roughly 1,000 families) (Table 2.10). The populations of the five largest slums were 41,250 (7,500 households), 30,288 (5,507 households), 19,250 (3,500 households), 11,000 (2,000 households) and 9,079 (1,651 households).

Table 2.7. Distribution of Slums by Number of Households and Land Ownership

Number of Households	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
1-9	3	0.6	11	0.7	0	0.0	14	0.6
10-20	185	38.0	893	54.9	8	23.5	1089 (3)	50.5
21-30	53	10.9	270	16.6	7	20.6	331 (1)	15.4
31-40	38	7.8	138	8.5	4	11.8	180	8.3
41-50	33	6.8	98	6.0	1	2.9	133 (1)	6.2
51-60	25	5.1	57	3.5	3	8.8	85	3.9
61-70	11	2.3	20	1.2	0	0.0	31	1.4
71-80	16	3.3	18	1.1	0	0.0	34	1.6
81-90	6	1.2	8	0.5	0	0.0	14	0.6
91-100	11	2.3	25	1.5	1	2.9	38 (1)	1.8
101-150	26	5.3	31	1.9	3	8.8	61 (1)	2.8
151-200	25	5.1	18	1.1	1	2.9	44	2.0
200 +	55	11.3	41	2.5	6	17.7	102	4.7
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0

*Figures in parentheses are cases for which the type of land ownership was not known.

Two things are obvious if we compare the mean and median number of households and population per slum. First, in all cases, the median is smaller than the mean, i.e. the distribution is skewed to the left. This implies that smaller slums (fewer households and people) are the predominant type. Second, the range of values of the mean is wider than that of the median, suggesting the presence of a similar distribution of slums with respect to size (households and people) across *thana* and ownership types. The mean is known to be very sensitive to outliers, both small or large. Since most slums are small, the wider range of values of the mean suggests the presence of a few very large slums in some *thana*, e.g. Mohammadpur and Lalbagh, or in some ownership categories, e.g. government/semi-government owned (Tables 2.3-2.6).

We have already noted that about three-quarters of the slums were located on private land. However, the total number of households and population was almost equally distributed between government/semi-government and private land, suggesting that the slums on government/semi-government land, though fewer, were larger in terms of number of households and population (Table 2.5 & 2.6). The survey also showed that most mess households and mess residents (82%) were on private land (Table 2.5 & 2.6).

The distribution of slums by number of households (Table 2.7) and by number of family households (Table 2.8) provides evidence in favour of our previous suggestion that the private slums were smaller than public and semi-public slums. In private slums, the proportions of clusters having 20 or fewer households and more than 100 households were 55.5% and 5.5% respectively, whereas in public slums these two proportions were 38.6% and 21.8% respectively (Table 2.7). On an average, a slum on public land was found to have 125 households and a population of 683, and that on private land to have 40 households and a population of 225 (Tables 2.5 & 2.6).

Table 2.9 presents the distribution of slums by number of messes showing that more than 80% of the slums did not have messes. Tables 2.10-2.11 indicate that slums with population less than 100 made up about half of the private slums.

Table 2.8. Distribution of Slums by Number of Family Households and Land Ownership

Number of Family Households	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
0	6	1.2	36	2.2	3	8.8	45	2.1
1-9	7	1.4	42	2.6	0	0.0	49	2.3
10-20	186	38.2	871	53.5	7	20.6	1067 (3)	49.5
21-30	47	9.7	259	15.9	6	17.7	313 (1)	14.5
31-40	38	7.8	135	8.3	4	11.8	177	8.2
41-50	31	6.4	88	5.4	1	2.9	121 (1)	5.6
51-60	23	4.7	42	2.6	2	5.9	67	3.1
61-70	11	2.3	18	1.1	0	0.0	29	1.3
71-80	16	3.3	17	1.0	0	0.0	33	1.5
81-90	6	1.2	8	0.5	0	0.0	14	0.6
91-100	11	2.3	27	1.7	1	2.9	40 (1)	1.9
101-150	28	5.8	31	1.9	3	8.8	63 (1)	2.9
151-200	22	4.5	18	1.1	1	2.9	41	1.9
200 +	55	11.3	36	2.2	6	17.7	97	4.5
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0

* Figures in parenthesis are cases for which the type of land ownership was not known.

Table 2.9. Distribution of Slums by Number of Messes and Land Ownership

Number of Messes	Land Ownership								
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*		
	No.	%	No.	%	No.	%	No.		%
0	422	87.0	1325	81.6	28	82.4	1781	(6)	82.8
1-9	47	9.7	202	12.4	2	5.9	252	(1)	11.7
10-20	11	2.3	66	4.1	2	5.9	79		3.7
21-30	1	0.2	18	1.1	1	2.9	20		0.9
31-40	3	0.6	4	0.3	0	0.0	7		0.3
41-50	0	0.0	2	0.1	0	0.0	2		0.1
51-60	0	0.0	4	0.3	1	2.9	5		0.2
61-70	1	0.2	2	0.1	0	0.0	3		0.1
71-80	0	0.0	1	0.1	0	0.0	1		0.0
	485	100.0	1624	100.0	34	100.0	2150	(7)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information: 6 cases.

Table 2.10. Distribution of Slums by Population and Land Ownership

Population Size	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
<100	158	32.4	760	46.7	7	20.6	926 (1)	42.9
100-249	129	26.5	602	37.0	13	38.2	747 (3)	34.6
250-499	80	16.4	149	9.2	3	8.8	233 (1)	10.8
500-999	52	10.7	64	3.9	5	14.7	123 (2)	5.7
1000-1499	24	4.9	20	1.2	2	5.9	46	2.1
1500-2499	18	3.7	16	1.0	4	11.8	38	1.8
2500-4999	20	4.1	14	0.9	0	0.0	34	1.6
5000 +	6	1.2	3	0.2	0	0.0	9	0.4
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0

*Figures in parentheses are cases for which the type of land ownership was not known.

Table 2.11. Distribution of Slums by Family Population and Land Ownership

Family Population Size	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
<100	168	34.5	805	49.5	9	26.5	983 (1)	45.6
100-249	123	25.3	576	35.4	11	32.4	713 (3)	33.1
250-499	77	15.8	134	8.2	3	8.8	215 (1)	10.0
500-999	51	10.5	63	3.9	5	14.7	121 (2)	5.6
1000-1499	24	4.9	19	1.2	2	5.9	45	2.1
1500-2499	19	3.9	15	0.9	4	11.8	38	1.8
2500-4999	19	3.9	13	0.8	0	0.0	32	1.5
5000 +	6	1.2	3	0.2	0	0.0	9	0.4
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.

2.4 Area Covered by Slums

The total area or land covered by 2,156 slums and squatter settlements was roughly estimated to be 789.04 acres or about 3.2 square kilometers. On an average, a slum cluster, thus, occupied 0.37 acre or a little over one bigha of land (Tables 2.13 & 2.14). However, the land areas of the majority of clusters were found to be very small as shown in Table 2.12. Nearly 40% of the slums occupied a land area of less than 5 kathas (0.08 acres) and 84.9% of the slums occupied an area of less than a bigha (20 kathas or 0.33 acres). The number of slums which occupied an acre (60 kathas) or more of land was only 97 or 4.5%. A few slums were observed to have a land possession of 10 acres or more (Table 2.12).

Table 2.12. Distribution of Slums by Size (Area) and Land Ownership

Area (in katha)	Land Ownership: Govt. & Semi-govt. No.	%	Private No.	%	Non-govt. & Others No.	%	All Slums No.*	%	Cumulative No.	%
<5	148	30.4	694	42.6	6	17.7	848	39.3	848	39.3
5-9	113	23.2	504	31.0	6	17.7	626 (3)	29.0	1474	68.4
10-19	101	20.7	244	15.0	9	26.5	356 (2)	16.5	1830	84.9
20-39	53	10.9	100	6.1	8	23.5	162 (1)	7.5	1992	92.4
40-59	31	6.4	35	2.2	0	0.0	67 (1)	3.1	2059	95.5
60-299	30	6.2	42	2.6	3	8.8	75	3.5	2134	99.0
300-599	8	1.6	5	0.3	1	2.9	14	0.6	2148	99.6
600 +	3	0.6	4	0.3	1	2.9	8	0.4	2156	100.0
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0		

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: 1 katha = 0.017 acres = 66.88 sq.metres

The study provided conclusive evidence that the private slums were smaller in size than slums on government/semi-government land (public) and slums on land owned by non-government organizations (semi-public). Forty-three percent of the private slums were found to have a land possession of less than 5 kathas (Table 2.12). The corresponding proportions for public and semi-public slums were 30% and 18% respectively. The average sizes of land occupied by public, semi-public and private slums were calculated to be 0.64, 0.98 and 0.27 acres respectively (Table 2.14).

Table 2.13 shows an analysis of slum area by *thana*. Within the 14 *thana* of the Dhaka metropolitan area, Mohammadpur appeared to have the

largest area of land occupied by slums. This particular *thana* alone had 234 acres of land under slum settlements. Mirpur *thana*, with 113 acres occupied by the slum dwellers, was next. The other important *thana* in terms of slum land concentration were Lalbagh, Sutrapur, and Demra. All these *thana* are located along the periphery of the city. At the other end of the scale, in some *thana*, which are located in the inner parts of the city (e.g. Kotwali, Motijheel, Ramna and Tejgaon), only a small land area was inhabited by slum dwellers (Table 2.13). The upper class residential areas of Dhanmondi, Gulshan, and Uttara *thana* had only small total slum areas.

Table 2.13. Slum Area by *Thana*

Thana	Mean Slum Size in Acres	Median Slum Size in Acres	Total Area Occupied by Slums in Acres	
			Sum	%
Mohammadpur	1.50	0.128	233.98	29.65
Mirpur	0.32	0.124	113.33	14.36
Lalbagh	0.41	0.116	78.97	10.01
Demra	0.22	0.074	61.10	7.74
Sutrapur	0.33	0.066	70.65	8.95
Shobujbagh	0.14	0.083	32.99	4.18
Tejgaon	0.23	0.107	35.14	4.45
Gulshan	0.21	0.124	29.18	3.70
Ramna	0.29	0.149	27.60	3.50
Dhanmondi	0.16	0.066	15.80	2.00
Cantonment	0.60	0.144	39.02	4.95
Motijheel	0.26	0.124	16.02	2.03
Kotwali	0.26	0.050	14.64	1.86
Uttara	0.29	0.124	20.62	2.61
Overall	0.37	0.099	789.04	100.00

Though the mean size of the private slums was much smaller than that of the government/semi-government slums, the total area of private slums (442 acres) was greater than the total slum area in government/ semi-government land (312 acres). The total area of non-government organizations land occupied by slums was small (Table 2.14).

Comparison of the mean area per slum to the median shows that, in all cases, the median is smaller than the mean, i.e. the distribution is skewed to the left. This implies that smaller slums are the predominant type across the board (Tables 2.13 & 2.14).

Table 2.14. Slum Area by Land Ownership

Land Ownership	Mean Slum Size in Acres	Median Slum Size in Acres	Total Area Occupied by Slums in Acres	
			SUM	%
Govt./Semi-govt.	0.64	0.141	312.24	39.57
Private	0.27	0.091	441.52	55.96
Non-govt. & Others	0.98	0.221	33.24	4.21
Unknown	0.29	0.186	2.05	0.26
Overall	0.37	0.099	789.04	100.00

2.5 Density of Population

Results of the survey showed that the density of slum populations in Dhaka city in 1991 was around 225,000 persons per square kilometer or 910 persons per acre (Table 2.15). Such density is extremely high by any

standard. When we consider that these slums are characterized by kutcha and semi-pucca structures of **a single storey** (3), the implications of the density estimate becomes apparent. Based on the 1991 National Census results, the overall population density of Dhaka City is estimated to be about 56 persons per acre. The population density in the slums was thus at least 16 times higher than the average density of the city.

Table 2.15. Population Density of Slums by *Thana*

Thana	Total Area in Acre	Total Population	Density: Persons per	
			Acre	Sq Km
Mohammadpur	233.98	169882	726	179428
Mirpur	113.33	126077	1112	274925
Lalbagh	78.97	82227	1041	257321
Demra	61.10	55258	904	223499
Sutrapur	70.65	54391	770	190256
Shobujbagh	32.99	41536	1259	311146
Tejgaon	35.14	39624	1127	278663
Gulshan	29.18	36094	1237	305684
Ramna	27.60	33838	1226	302983
Dhanmondi	15.80	21503	1361	336329
Cantonment	39.02	17000	436	107667
Motijheel	16.02	16700	1042	257618
Kotwali	14.64	15470	1057	261139
Uttara	20.62	8543	414	102387
	789.04	718143	910	224923

Although the density of slum dwellers was very high, considerable variation existed between public and private slums (Table 2.16) and from one city area to another (Table 2.15). The density ranged from as low as

414/acre in Uttara to as high as 1,361/acre in Dhanmondi. Generally, the density in the newer parts of Dhaka was lower than that of the older parts of the city. The density in public slums was also found to be higher than that of private slums and slums developed on non-government organizations land (Tables 2.17 & 2.16). Table 2.17 also shows that the number of low density slums was small. Only 278 (12.9%) slums had a density of less than 600 persons/acre, whereas every two of the three (64.2%) slums had a density of over 1,000 persons/acre and about one-third of the total slums (35.7%) contained 1,600 and more persons/acre.

Table 2.16. Population Density of Slums by Land Ownership

Land Ownership	Total Area in Acre	Total Population	Density: Persons per	
			Acre	Sq Km
Govt./Semi-govt.	312.24	332536	1065	263192
Private	441.52	366608	830	205198
Non-govt. & Others	33.24	17125	515	127319
Unknown	2.05	1874	914	225911
	789.04	718143	910	224923

Table 2.17. Distribution of Slums by Population Density and Land Ownership

Density (persons/acre)	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
<200	3	0.62	20	1.23	1	2.94	24	1.1
200-399	30	6.16	65	3.99	3	8.82	99 (1)	4.6
400-599	34	6.98	116	7.13	4	11.76	155 (1)	7.2
600-799	46	9.45	176	10.81	3	8.82	227 (2)	10.5
800-999	66	13.55	195	11.98	5	14.71	267 (1)	12.4
1000-1199	39	8.01	190	11.67	6	17.65	235	10.9
1200-1399	42	8.62	189	11.61	2	5.88	234 (1)	10.9
1400-1599	30	6.16	113	6.94	3	8.82	146	6.8
1600 +	197	40.47	664	34.64	7	20.59	769 (1)	35.7
	487	100.00	1628	100.00	34	100.00	2156 (7)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.

2.6 Topography and Flood Situations in Slums

General observations and anecdotal evidence indicate that slums and squatter settlements are usually developed on land which is in most cases, topographically unsuitable for housing. The city's low lying areas, such as on the sides of ditches, lakes, rivers, sewage canals, railway tracks and embankments, are the usual sites inhabited by the slum dwellers. Such areas are likely to be adversely affected by monsoon and flooding. To assess the magnitude of this problem, the present study inquired about the intensity of flooding in 1988 when the entire country experienced the most severe flood in recent history.

It is evident that, in 1988, about two-thirds of Dhaka's slum areas (67.5%) were completely inundated (Table 2.18). The most extensively flooded slums were located in *thana* like Shobujbagh, Uttara, and Mohammadpur. Over 90% of the slum areas in those *thana* were completely inundated (Table 2.18). Other severely affected slum settlements were in Cantonment, Gulshan, Sutrapur, and Lalbagh *thana*. The proportions of completely inundated slums in these *thana* range from 74.1% to 87.7% (Table 2.18).

Table 2.18. Intensity of Flooding in 1988 by *Thana*

	Intensity of flooding							
	Completely flooded		Partially flooded		Not flooded		All Slums*	
Thana	No.	%	No.	%	No.	%	No.	%
Mirpur	207	58.5	26	7.3	119	33.6	354 (2)	100.0
Mohammadpur	142	91.0	1	0.6	13	8.3	156	100.0
Motijheel	41	67.2	4	6.5	16	26.2	61	100.0
Lalbagh	143	74.1	8	4.1	42	21.8	193	100.0
Demra	128	46.2	2	0.7	147	53.1	277	100.0
Kotwali	17	29.8	0	0.0	40	70.2	57	100.0
Sutrapur	164	77.7	13	6.2	34	16.1	211	100.0
Tejgaon	66	43.7	21	13.9	64	42.4	151	100.0
Gulshan	111	80.4	20	14.5	7	5.1	138	100.0
Ramna	35	36.8	10	10.5	50	52.6	95	100.0
Cantonment	57	87.7	7	10.8	1	1.5	65	100.0
Uttara	65	91.5	2	2.8	4	5.6	71	100.0
Shobujbagh	215	93.5	3	1.3	12	5.2	230	100.0
Dhanmondi	64	66.0	0	0.0	33	34.0	97	100.0
	1455	67.5	117	5.4	582	27.0	2156 (2)	100.0

* Figures in parentheses are cases for which the intensity of flooding was not known.

A larger proportion of the private slums (72%) was completely inundated as compared to 53% of the government/semi-government slums and 59% of the slums on non-government land (Table 2.19). A little over one-fourth (27.0 %) of the slums were not flooded. Most of these settlements were located in *thana* such as Mirpur, Ramna, Kotwali, Tejgaon, Dhanmondi, and Demra (Table 2.18).

Table 2.19. Intensity of Flooding in 1988 by Land Ownership

Land Ownership	Intensity of flooding							
	Completely flooded		Partially flooded		Not flooded		All Slums	
	No.	%	No.	%	No.	%	No.	%
Govt./Semi-govt.	256	52.57	53	10.88	177	36.34	486	100.00
Private	1172	71.99	62	3.81	393	24.14	1627	100.00
Non-govt. & Others	20	58.82	2	5.88	12	35.29	34	100.00
Unknown	7	100.00	0	0.00	0	0.00	7	100.00
	1455	67.49	117	5.43	582	26.99	2154	100.00

Note: Missing information: 2 cases

2.7 Trends of In- and Out-Movements Among the Slum Dwellers

This sub-section focuses on the general pattern of mobility of slum dwellers, particularly in- and out-movement trends, and intra-city movement patterns of the slum people. This information was collected from key informants in each slum. The data should, therefore, be considered as indicative of trends rather than actual movement.

The question of movement was examined in several ways. In response to a specific question, it was found that, in 709 slums (33%), there was no out-movement during the one-year period preceding the survey (Table 2.20). The number of slums not experiencing in-movement was 610 (28%) (Table 2.21). The slums exhibited a net positive movement throughout the year, i.e. the slum areas gained more people through in-movement than they lost through out-movement (Tables 2.22 & 2.23).

Table 2.20. Distribution of Slums by Number of Persons who Moved Out in the Last Year and Land Ownership

	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
Number of Persons	No.	%	No.	%	No.	%	No.	%
None	260	53.39	433	26.63	13	38.24	709 (3)	32.92
1-9	20	4.11	87	5.35	3	8.82	110	5.11
10-19	61	12.53	297	18.27	6	17.65	364	16.90
20-49	76	15.61	489	30.07	4	11.76	570 (1)	26.46
50-99	43	8.83	216	13.28	5	14.71	267 (3)	12.40
100 +	27	5.54	104	6.40	3	8.82	134	6.22
	487	100.00	1626	100.00	34	100.00	2154 (7)	100.00

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 2 cases

The more detailed analysis showed that a greater proportion of the private slums had higher rates of in- and out-movement than government/ semi-government slums (Tables 2.20 & 2.21). The low mobility seen in government slums may be associated with the greater availability of rent free

accommodations on public land and/or may be the result of biased reporting by the key informants in the larger public slums, as they may be less aware of movements there.

Table 2.21. Distribution of Slums by Number of Persons who Moved In in the Last Year and Land Ownership

Number of Persons	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
None	212	43.53	385	23.68	12	35.29	610 (1)	28.32
1-9	33	6.78	84	5.17	2	5.88	119	5.52
10-19	65	13.35	308	18.94	8	23.53	381	17.69
20-49	80	16.43	498	30.63	4	11.76	583 (1)	27.07
50-99	53	10.88	239	14.70	4	11.76	301 (5)	13.97
100 +	44	9.03	112	6.89	4	11.76	160	7.43
	487	100.00	1626	100.00	34	100.00	2154 (7)	100.00

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 2 cases

In terms of number of persons moving-in and -out, the distribution by land ownership was similar when comparing migrants in the previous year to that of the previous month, i.e. most (74.8-83.5%) of the movement occurred in private slums (Tables 2.22 & 2.23). Tables 2.22 & 2.23 also present in- and out-movement as percentages of the total slum population in each ownership category. Private slums were experiencing a higher degree of movement than government slums. A similar analysis by *thana* is presented in Tables 2.24 & 2.25. Slums in Demra, Shobujbagh, Mirpur,

Lalbagh, and Mohammadpur were responsible for a large proportion of the total movement. However, in *thana* such as Mirpur and Mohammadpur, despite a large total contributon to movement, the degree of movement was low with respect to the resident population in those *thana*. The reverse was true in Motijheel, Tejgaon, Cantonment, Uttara, and Dhanmondi.

Table 2.22. Out-movement Patterns by Type of Land Ownership

Land Ownership	Last Year*			Last Month†		
	Sum	% of Total Out-movement	% of Total Population	Sum	% of Total Out-movement	% of Total Population
Govt./Semi-govt.	10713	16.8	3.22	1493	15.0	0.45
Private	52124	81.5	14.22	8298	83.5	2.26
Non-govt. & Others	843	1.3	4.92	84	0.8	0.49
Unknown	255	0.4	13.61	61	0.6	3.26
"	63935	100.0	8.90	9936	100.0	1.38

* **Last Year:** The year preceding the survey
† **Last Month:** The month preceding the survey

Table 2.23. In-movement Patterns by Type of Land Ownership

Land Ownership	Last Year			Last Month		
	Sum	% of Total In-movement	% of Total Population	Sum	% of Total In-movement	% of Total Population
Govt/Semi-govt	14609	21.2	4.39	2584	23.6	0.78
Private	52855	76.8	14.42	8208	74.8	2.24
Non-govt & Others	930	1.4	5.43	124	1.1	0.72
Unknown	403	0.6	21.51	56	0.5	2.99
	68797	100.0	9.58	10972	100.0	1.53

The study also inquired into the patterns of intra-city movement of slum dwellers, i.e. movement of occupants from one slum settlement to another within the city. For information on intra-city movement, key informants were asked to grade the rate of movement of the residents of that slum between different slums of Dhaka. In about one-sixth (16.4%) of the city's slums, movement within Dhaka was found to be very common. However, in about three-fifths (58.9%) of the settlements, the trends of movement were found to be low or infrequent and in one-fourth of the slum communities there was no intra-city movement among the inhabitants (Table 2.26).

Table 2.24. Out-movement Patterns by *Thana*

	Last Year			Last Month		
Thana	Sum	% of Total Out-movement	% of Total Population	Sum	% of Total Out-movement	% of Total Population
Mirpur	8184	12.8	6.49	1675	16.9	1.33
Mohammadpur	7882	12.3	4.64	703	7.1	0.41
Motijheel	2466	3.9	14.77	408	4.1	2.44
Lalbagh	6200	9.7	7.54	1144	11.5	1.39
Demra	11493	18.0	20.80	1661	16.7	3.01
Kotwali	686	1.1	4.43	46	0.5	0.30
Sutrapur	4648	7.3	8.55	565	5.7	1.04
Tejgaon	3525	5.5	8.90	491	4.9	1.24
Gulshan	2271	3.6	6.29	479	4.8	1.33
Ramna	2223	3.5	6.57	348	3.5	1.03
Cantonment	2057	3.2	12.10	316	3.2	1.86
Uttara	420	0.7	4.92	59	0.6	0.69
Shobujbagh	9623	15.1	23.17	1794	18.1	4.32
Dhanmondi	2257	3.5	10.50	247	2.5	1.15
	63935	100.0	8.90	9936	100.0	1.38

As with in- and out-movement, intra-city movement was more common among the dwellers in private slums than those in public slums (Table 2.26). This finding is quite expected, because slum dwellers on public land are less likely to pay any rent (data shown later), thus discouraging any movement from their usual settlements. On the other hand, to find cheaper accommodations, private slum dwellers are more likely to move from one place in the city to another.

Table 2.25. In-movement Patterns by *Thana*

	Last Year			Last Month		
Thana	Sum	% of Total In-movement	% of Total Population	Sum	% of Total In-movement	% of Total Population
Mirpur	10023	14.6	7.95	2118	19.3	1.68
Mohammadpur	6071	8.8	3.57	719	6.6	0.42
Motijheel	2499	3.6	14.96	346	3.2	2.07
Lalbagh	5701	8.3	6.93	897	8.2	1.09
Demra	12750	18.5	23.07	1679	15.3	3.04
Kotwali	703	1.0	4.54	60	0.6	0.39
Sutrapur	4673	6.8	8.59	537	4.9	0.99
Tejgaon	4618	6.7	11.66	683	6.2	1.72
Gulshan	3600	5.2	9.97	836	7.6	2.32
Ramna	2526	3.7	7.47	390	3.6	1.15
Cantonment	1716	2.5	10.09	322	2.9	1.89
Uttara	935	1.4	10.95	236	2.2	2.76
Shobujbagh	10531	15.3	25.35	1784	16.3	4.30
Dhanmondi	2451	3.6	11.40	365	3.3	1.70
	68797	100.0	9.58	10972	100.0	1.53

We did not observe any obvious patterns of intra-city movement by *thana*. More slums in Cantonment were likely to experience frequent intra-city movement of the residents, whereas the dwellers in only a very small proportion of the slums in Lalbagh, Kotwali, and Ramna moved frequently within the city (Table 2.27).

Table 2.26. Intra-city Movement Pattern by Land Ownership

Movement Pattern*	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums†	
	No.	%	No.	%	No.	%	No.	%
No Movement	187	38.4	336	20.7	7	20.6	532 (2)	24.7
Some Movement	242	49.7	997	61.3	27	79.4	1269 (3)	58.9
Frequent Movement	58	11.9	294	18.1	0	0.0	354 (2)	16.4
	487	100.0	1627	100.0	34	100.0	2155 (7)	100.0

* Based on respondent's perception of extent of movement

† Figures in parentheses are cases for which the type of land ownership was not known.

Note: Missing information = 1 case

Table 2.27. Intra-City Movement Pattern by *Thana*

	Movement Pattern							
	No Movement		Some Movement		Frequent Movement		Total	
Thana	No.	%	No.	%	No.	%	No.	%
Mirpur	128	36.26	169	47.88	56	15.86	353	100.00
Mohammadpur	22	14.10	115	73.72	19	12.18	156	100.00
Motijheel	15	24.59	39	63.93	7	11.48	61	100.00
Lalbagh	51	26.42	130	67.36	12	6.22	193	100.00
Demra	21	7.58	175	63.18	81	29.24	277	100.00
Kotwali	12	21.05	41	71.93	4	7.02	57	100.00
Sutrapur	47	22.27	131	62.09	33	15.64	211	100.00
Tejgaon	64	42.38	58	38.41	29	19.21	151	100.00
Gulshan	37	26.81	83	60.14	18	13.04	138	100.00
Ramna	25	26.32	65	68.42	5	5.26	95	100.00
Cantonment	13	20.00	31	47.69	21	32.31	65	100.00
Uttara	35	49.30	22	30.99	14	19.72	71	100.00
Shobujbagh	34	14.78	150	65.22	46	20.00	230	100.00
Dhanmondi	28	28.87	60	61.86	9	9.28	97	100.00
	532	24.69	1269	58.89	354	16.43	2155	100.00

Note: Missing information = 1 case

Table 2.28. Distribution of Slums by Rent Collectors and Land Ownership

Rent Collected By	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
None (i.e. Rent-free)	305	63.4	83	5.1	7	21.2	398 (3)	18.5
Govt./Semi-govt. Organizations	20	4.2	0	0.0	0	0.0	20	0.9
Private Organization	1	0.2	3	0.2	6	18.2	10	0.5
Private Land-owners	28	5.8	1483	91.3	4	12.1	1516 (1)	70.7
Govt./Non-govt. Employees	42	8.7	3	0.2	2	6.1	47	2.2
Mastaans/Middlemen	37	7.7	16	1.0	1	3.0	56 (2)	2.6
Others	48	10.0	37	2.3	13	39.4	98	4.6
	481	100.0	1625	100.0	33	100.0	2145 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 11 cases

2.8 To Whom Do the Slum Dwellers Pay Rent?

Results of the study showed that slum dwellers in most cases paid rent to those who own the land (Table 2.28). Residents in about one-fifth of the settlements (18.5%), mostly the squatters (government slum dwellers), lived without paying any rent. Private land owners were the most common (71%) and most efficient collecters of rent as residents in 91% of the slums on private land were paying rent to the land-owners. A considerable proportion of the rent collectors were those who do not own the land. This is especially common in government/semi-government and slums on non-government organizations land. The non-owner rent collectors include local mastaans[b], middlemen, and employees of different government and non-government

[b]Mastaan: Members of local gangs, local protection racketeers

organizations (Table 2.28). Mastaans/middlemen were the second (2.6%) most common rent collectors. The government and semi-government organizations owned 481 slums (22%), but the occupants of only 20 of these slums (3.9%) were reported to pay rent to the respective organizations (Table 2.28).

Table 2.29 shows the distribution pattern of rent payees in different *thana*. There was a wide variation in the proportion of slums where residents were not paying rent, ranging from 73% in Uttara to 4% in Dhanmondi. The influence of mastaans and middlemen was very strong in Tejgaon and Gulshan.

Table 2.29. Distribution of Slums by Rent Collectors and *Thana*

	Rent Collected By							
Thana	None %	Govt/ Semi-govt. %	Private Organizations %	Private Land-owners %	Govt./ Non-Govt. Employees %	Mastaans Middlemen %	Others %	Total (n=2145) %
Mirpur	20.23	0.00	0.00	56.98	0.57	3.42	18.80	100.00
Mohammadpur	25.81	0.00	0.00	61.29	1.29	0.65	10.97	100.00
Motijheel	31.15	0.00	0.00	60.66	6.56	1.64	0.00	100.00
Lalbagh	9.33	0.52	0.52	87.05	1.04	0.52	1.04	100.00
Demra	8.30	0.00	0.36	89.17	0.36	0.00	1.81	100.00
Kotwali	12.28	12.28	0.00	75.44	0.00	0.00	0.00	100.00
Sutrapur	11.96	2.87	1.44	79.90	1.44	1.91	0.48	100.00
Tejgaon	33.77	0.66	0.66	40.40	7.95	13.91	2.65	100.00
Gulshan	25.19	0.00	0.74	57.04	11.11	5.19	0.74	100.00
Ramna	27.37	2.11	3.16	61.05	3.16	3.16	0.00	100.00
Cantonment	21.87	0.00	0.00	73.44	1.56	3.12	0.00	100.00
Uttara	73.24	2.82	0.00	22.54	0.00	1.41	0.00	100.00
Shobujbagh	6.11	0.00	0.00	92.14	0.00	1.31	0.44	100.00
Dhanmondi	4.12	1.03	0.00	91.75	2.06	0.00	1.03	100.00

Note: Missing information = 11 cases

SECTION 3

PATTERNS AND GROWTH OF SLUM SETTLEMENTS

3.1 Introduction

This section of the report focuses mainly on the spatial distribution of slum settlements and their patterns of growth over time. The composition of the slum population has also been examined in this section to identify the districts that have contributed most to the growth of slums in Dhaka City.

A total of 15 maps were prepared showing the location and physical size of all slums with 10 or more households. Of these maps, 14 were individual *thana* maps which are not attached to this report but may be available upon request to UHEP[c]. These base maps were drawn on a scale of 6.34 inches = 1 mile. However, the enclosed map is the outcome of those 14 maps and is presented in a reduced form (see map facing page 8). The main purpose of this map is to show the relative size and location of all 2,156 slum settlements surveyed within the Dhaka metropolitan area in 1991. However, within this map, very small slum areas have been magnified and the identity number of each settlement has been dropped purposely for providing a clearer distribution pattern of the slums.

3.2 Spatial Distribution of Slum Settlements

The total number of slums and squatter settlements identified by the primary survey was 2,156. The distribution of these settlements is shown in

[c]Address: Urban Health Extension Project, ICDDR,B, GPO Box 128, Dhaka 1000, Bangladesh

the attached map (facing page 8). The map shows that the slums and squatter settlements are not distributed uniformly throughout the Dhaka metropolitan area, rather they are concentrated mostly in the fringe areas of the city. Due to an acute demand for land and high land price, especially in the central zones and in upper class residential areas, the slums and squatter communities have moved or are moving towards the periphery of the city to find cheap shelter both on private and public lands (4). Very often the slum settlements in these areas are prone to annual flooding, and they are environmentally unsuitable for housing, because they are usually located on low-lying areas and along the rivers, sewage canals, and railway tracts.

It is also observed that the slum settlements in these peripheral areas are comparatively compact, contiguous and large in size as shown on the map. Some important large clusters are: (i) Islambagh and Shahidnagar located on the bank of the Buriganga river near Chowk Bazar, (ii) Jatrabari and Jurain along the south-eastern fringe of the city, and (iii) Mirpur and Bhasantek located on the northern edge of the city.

The inner city slums are mostly small in size and scattered except in some areas where there are large slum areas, e.g. the series of slum clusters arranged linearly along the old and new railway tracts.

The slum settlements in Dhaka City are usually small in size (average size of a cluster is about 0.37 acres) and have a very scattered distribution. They are located mostly on private plots which are usually very small in size and spread all over the city. The highly fragmented distribution of the slums is apparent from the innumerable dots on the attached map.

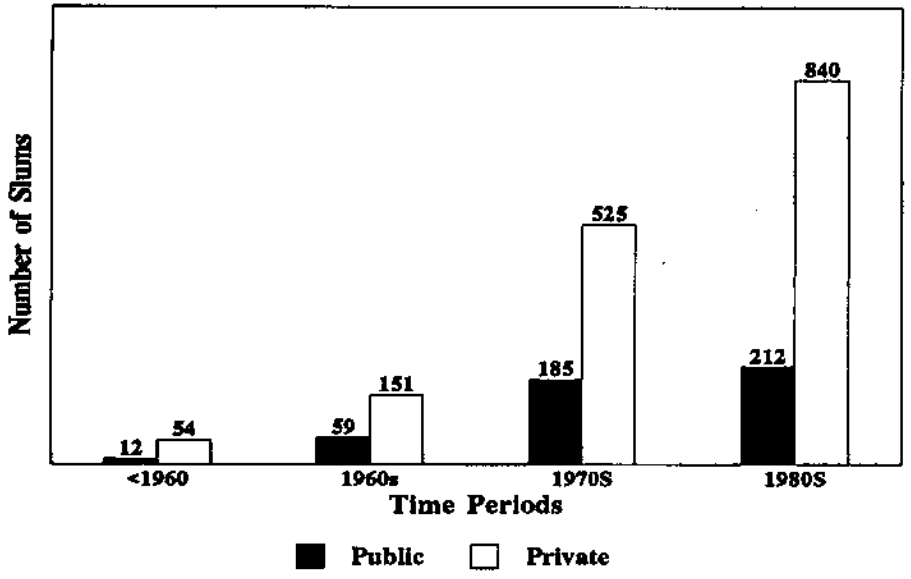

Figure 1: Number of Slums Established by Time Periods

3.3 Growth of Slum Settlements

The growth of the slums and squatter settlements within the Dhaka metropolitan area over time is shown in Figure 1 and Table 3.1. It is evident that Dhaka has experienced a prolific growth of slum settlements since independence in 1971. During the 20 years since then, a total of 1,734 slum clusters (80.4%) were established, an average of 87 settlements per year. Half of these (867) were established in the first 10 years (1972-1981) (Table 3.1). However, using slightly different categories we observe that the growth of slums in the 1980s was higher than that of the 1970s. During the later decade, the city accommodated 1068 (49.6%) new slums or about 107 bustees per year (Table 3.2). The differences seen by making such a small

change in the categories is probably due to peaks or lows in the establishment of new slums in 1971 and 1981.

Table 3.1. Distribution of Slums by Year of Establishment and *Thana*

	Year of Establishment							
	≤1971		1972-1981		1982-1991		Total	
Thana	No.	%	No.	%	No.	%	No.	%
Mirpur	32	9.07	139	39.38	182	51.56	353	100.00
Mohammadpur	17	10.90	68	43.59	71	45.51	156	100.00
Motijheel	25	40.98	20	32.79	16	26.23	61	100.00
Lalbagh	43	22.28	82	42.49	68	35.23	193	100.00
Demra	53	19.13	113	40.79	111	40.07	277	100.00
Kotwali	26	45.61	18	31.58	13	22.81	57	100.00
Sutrapur	80	37.91	88	41.71	43	20.38	211	100.00
Tejgaon	45	29.80	64	42.38	42	27.81	151	100.00
Gulshan	11	8.09	61	44.85	64	47.06	136	100.00
Ramna	25	26.32	38	40.00	32	33.68	95	100.00
Cantonment	10	15.38	22	33.85	33	50.77	65	100.00
Uttara	6	8.45	25	35.21	40	56.34	71	100.00
Shobujbagh	27	11.74	99	43.04	104	45.22	230	100.00
Dhanmondi	19	19.59	30	30.93	48	49.48	97	100.00
	219	19.46	867	40.27	867	40.27	2153	100.00

Note: Missing information = 3 cases

Further analysis of the data indicates that a large proportion of slum settlements established in the recent past were located in the peripheral areas/*thana* rather than the inner part of the city (Table 3.1). That is, the growth of slums in the peripheral zones was much higher than that of the

inner areas. It is also evident that most of the recent (1970s and 1980s) growth of slums has been on private land (Table 3.2 and Figure 1).

Table 3.2. Distribution of Slums by Year of Establishment and Land Ownership

Year of Establishment	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
<1960	12	2.47	54	3.32	2	5.88	68	3.16
1960s	59	12.16	151	9.28	1	2.94	212 (1)	9.85
1970s	185	38.14	525	32.27	16	47.06	730 (4)	33.91
1980s	212	43.71	840	51.63	14	41.18	1068 (2)	49.61
1990s	17	3.51	57	3.50	1	2.94	75	3.48
	485	100.00	1627	100.00	34	100.00	2153 (7)	100.00

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 3 cases

3.4 Source of Slum Population

Anecdotal evidence suggests that migrants from some parts of Bangladesh contribute more than others to the slum population of Dhaka City. We examined this issue through specific questions. Key informants from each slum were asked to list 3 districts from which most of the population of that slum originated. They were also asked to state the proportion of the total population contributed by people from those districts.

These proportions were then multiplied by the population and summed across all slums by districts.

The results are presented in Table 3.3. We could only explain the source of 84% (604,114) of the total slum population. People from 4 districts, i.e. Barisal, Faridpur, Dhaka, and Comilla, constitute more than three quarters of the slum population in Dhaka (Table 3.3). Because of the way these data were collected (for each slum, only 3 districts could be chosen), the overall contribution by districts at the lower extreme would have been underestimated and the districts at the upper extreme would have been overestimated. For this reason, we did not dis-aggregate this data by *thana* or land ownership, as this would have exaggerated the error. However, previous studies had also indicated that these districts were the major contributors of migrants to Dhaka City (5).

3.5 The Stability of Slums and Squatter Settlements

Most, if not all, of the slums and squatter settlements in Dhaka have developed outside the legal framework of the city management. We may, thus, question the stability of these settlements. In this section, the stability of these settlements is examined by looking into their duration of existence in this city and possible threats of eviction that they may face.

Table 3.4 presents data on the age or duration of existence of the slum settlements according to their land ownership pattern. It is evident that the age of Dhaka's slums varies from a few years to more than 30 years. The age of a slum, on an average, was found to be over 10 years. Over a third of them (39.7%) have been in existence in this city for 15 years or more.

It is also observed that the slums developed on government and semi-government land (i.e. squatters) are older than the slums on private land. In a more detail analysis about the establishment of slums by *thana* it appears that the inner city slums are older than the slums in the periphery of the city (Table 3.1).

Table 3.3. Distribution of Slum Population by District or Origin

Origin	Population Distribution	
	No.	%
Barisal	191685	31.7
Faridpur	126012	20.9
Dhaka	87132	14.4
Comilla	73044	12.1
Noakhali	27625	4.6
Mymensingh	27032	4.5
Pakistan*	26149	4.3
Rangpur	24155	4.0
Jamalpur	6867	1.1
Patuakhali	5569	0.9
Pabna	2137	0.4
Jessore	1685	0.3
Tangail	1439	0.2
Kushtia	1071	0.2
Chittagong	970	0.2
Sylhet	438	0.1
Khulna	377	0.1
Dinajpur	277	0.0
Rajshahi	238	0.0
Bogra	147	0.0
Chittagong Hill Tracts	65	0.0
	604114	100.0

* Stranded Pakistanis

Table 3.4. Distribution of Slums by Age of Slums and Land Ownership

Age (in years)	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
0-4	98	20.21	291	17.89	7	20.59	397 (1)	18.44
5-9	82	16.91	380	23.36	8	23.53	470	21.83
10-14	85	17.53	344	21.14	2	5.88	432 (1)	20.07
15-19	118	24.33	305	18.75	9	26.47	435 (3)	20.20
20-24	49	10.10	130	7.99	6	17.65	186 (1)	8.64
25-29	20	4.12	64	3.93	0	0.00	85 (1)	3.95
≥30	33	6.80	113	6.95	2	5.88	148	6.87
	485	100.00	1627	100.00	34	100.00	2153 (7)	100.00

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 3 cases

In addition to the duration of existence, the study also inquired about the possibility of eviction of slums and squatters by public or private land-owners. Of the 2,156 slums, only 174 (8.1%) reported that they had received an eviction notice from their landlords in the recent past (Table 3.5). However, the pressure of eviction varies significantly between public and private slums. In the private slums, only 3.9% of the settlements received eviction notices, whereas in the public slums or among squatters almost every fourth settlement (22.6%) received such notices. This shows that public slums have longer existence despite facing more threats of eviction than the private slum dwellers (Tables 3.4 & 3.5).

Table 3.5. Distribution of Slums by Receipt of Eviction Notice and by *Thana* and Land Ownership

Thana	Land Ownership								
	Govt/Semi-govt.			Private & NGO			Total No. of Slums		
	Total No. of Slums	Received Notice		Total No. of Slums	Received Notice		Total No. of Slums*	Received Notice	
		No.	%		No.	%		No.	%
Mohammadpur	32	10	31.3	124	14	11.3	156	24	15.4
Mirpur	107	14	13.1	244	15	6.1	353 (2)	29	8.2
Lalbagh	14	0	0.0	179	5	2.8	193	5	2.5
Demra	24	2	8.3	250	1	0.4	274	3	1.1
Sutrapur	34	5	14.7	177	2	1.1	211	7	3.3
Shobujbagh	14	2	14.3	214	8	3.7	230 (2)	10	4.3
Tejgaon	78	31	39.7	73	5	6.8	151	36	23.8
Gulshan	49	17	34.7	89	3	3.4	138	20	14.5
Ramna	35	13	37.1	60	6	10.0	95	19	20.0
Dhanmondi	6	3	50.0	91	5	5.5	97	8	9.2
Cantonment	10	0	0.0	54	1	1.8	64	1	1.6
Motijheel	24	9	37.5	37	0	0.0	61	9	14.8
Kotwali	12	1	8.3	44	0	0.0	57 (1)	1	1.8
Uttara	44	2	4.4	24	0	0.0	68	2	2.9
	483	109	22.6	1660	65	3.9	2148 (5)	174	8.1

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information: 8 cases

SECTION 4

HOUSING STRUCTURE AND ACCESS TO FACILITIES

4.1 Introduction

As with most of the data presented before, this section is based on actual observations and/or estimates provided by some informed members of the slum community instead of every household. In most cases, information provided by the key informants was subjected to some form of verification through observations. It was observed that most slum dwellers lived in houses constructed of poor materials. Limited access to community services and facilities was also observed and, when available, these services/facilities were usually of poor quality. Considerable variation of services was also found between public slums (slums on government and semi-government land) and private slums (slums on private land).

4.2 Housing Structure

The proportion of houses that were pucca[d], semi-pucca, etc. was estimated by actual observation of the whole slum if small, or part of the slum if large. These proportions were then multiplied by the number of slum households to give the approximate number of houses in each slum constructed of a particular material. Tables 4.1 and 4.2 present the percentages of all houses constructed of particular materials by *thana* and land ownership. About two-thirds of all houses were of bamboo, wood, or

[d]Pucca: Made of brick and mortar

tin. Jhupri* houses were the next most common type (28%). Slums in Kotwali were more likely to be pucca or semi-pucca. Semi-pucca houses were also relatively more common in Dhanmondi, Sutrapur and Motijheel *thana* (Table 4.1). Private slums were more likely to be pucca or semi-pucca than government/semi-government slums (Table 4.2).

Table 4.1. Distribution of Slum Households by Type of Housing Structure and *Thana*

	Percentage of Houses using the Structural Material					Total	
Thana	Pucca	Semi-Pucca	Tin/Wood/Bamboo	Jhupri	Other	%	No.
Mirpur	0.0	2.2	55.5	41.8	0.4	100.0	22818
Mohammadpur	0.8	4.4	61.3	33.2	0.3	100.0	30180
Motijheel	0.5	9.0	55.1	35.4	0.0	100.0	3102
Lalbagh	2.4	7.0	54.2	36.1	0.3	100.0	14807
Demra	1.3	5.2	83.9	9.6	0.0	100.0	10478
Kotwali	5.5	14.9	70.4	9.2	0.0	100.0	2678
Sutrapur	2.9	9.2	74.7	13.3	0.0	100.0	7861
Tejgaon	0.9	1.7	54.4	43.0	0.0	100.0	7413
Gulshan	0.0	6.1	75.5	18.2	0.2	100.0	6693
Ramna	0.1	9.3	74.1	16.5	0.0	100.0	6020
Cantonment	0.0	0.3	94.2	5.4	0.0	100.0	3180
Uttara	0.0	3.6	82.9	12.4	1.1	100.0	1802
Shobujbagh	0.0	2.2	85.0	12.6	0.2	100.0	7799
Dhanmondi	0.8	12.3	72.0	14.2	0.7	100.0	3823
	1.0	5.2	66.0	27.7	0.2	100.0	128654*

* Difference with the number reported in section 2 is due to rounding.

*Jhupri: Typically ∩ shaped, made of a mix of materials including bamboo, paper, plastic, tin, etc.

Table 4.2. Distribution of Slum Households by Type of Housing Structure and Land Ownership

Land Ownership	Structural Material Used for Housing					Total	
	Pucca	Semi-Pucca	Tin/Wood/ Bamboo	Jhupri	Other	%	No.
Govt/Semi-govt.	1.0	3.2	62.1	33.5	0.2	100.0	59926
Private	0.9	7.1	69.5	22.1	0.3	100.0	65235
Non-govt. & Others	0.0	2.8	66.3	30.9	0.0	100.0	3133
Unknown	0.0	0.0	72.6	26.8	0.6	100.0	340
	1.0	5.2	66.0	27.7	0.2	100.0	128654*

* Difference with the number reported in section 2 is due to rounding.

4.3 Access to Electricity and Gas

Although located within municipal limits, the slums and squatter families have limited access to these two important urban services. More than half the slums on public land and about one-third of the private slums did not have any electricity at all. Electricity was available in most houses of about half of the private slums and about one-third of the public slums (Table 4.4). Electricity was more common in slums in Kotwali, Lalbagh, and Demra (Table 4.3).

With regard to gas facilities, only 6.5% of the public slums and 41.0% of the private slums have access to gas in some form or other (Table 4.5). The remaining vast majority of the slums, obviously, using fuel other than gas. Gas was more common in slums of Demra, Lalbagh, Sutrapur, Shobujbagh and Kotwali (Table 4.3).

Table 4.3. Percentage of Slums having Access to Electricity, Gas, Safe Drinking Water, and Primary Schools by *Thana*

Thana	Percentage of Slums With:			
	Electricty*	Gas*	Safe Drinking Water†	Primary Schools‡
Mirpur	52.0	12.4	90.8	39.8
Mohammadpur	44.0	23.7	72.4	7.7
Motijheel	59.0	26.2	90.7	49.2
Lalbagh	83.9	53.9	93.3	23.3
Demra	83.4	57.4	97.7	53.1
Kotwali	84.2	42.1	100.0	40.4
Sutrapur	72.0	51.2	99.4	31.3
Tejgaon	41.7	17.2	97.6	14.6
Gulshan	54.3	2.9	93.4	20.3
Ramna	74.7	36.8	96.2	23.3
Cantonment	52.3	12.3	95.9	40.0
Uttara	25.4	0.0	67.6	14.1
Shobujbagh	73.0	43.5	96.5	38.3
Dhanmondi	67.0	39.2	92.3	19.6
	63.8	32.6	92.8	31.6
Missing Cases	2	4	509	13

* Available in at least some houses

† Safe drinking water = tap and/or tubewell

‡ Present within or very close to the slum

Note: For each facility, there are some missing cases.

Table 4.4. Distribution of Slums by Access to Electricity and Land Ownership

Availability	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
Available in most houses	147	30.2	838	51.5	12	35.3	999 (2)	46.3
Partially available	70	14.4	299	18.4	7	20.6	377 (1)	17.5
Absent	270	55.4	490	30.1	15	44.1	778 (3)	36.1
	487	100.0	1627	100.0	34	100.0	2154 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 2 cases

Table 4.5. Distribution of Slums by Access to Gas Facilities and Land Ownership

Availability	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
Available in most houses	8	1.6	381	23.4	1	2.9	390	18.1
Partially available	24	4.9	287	17.6	1	2.9	313 (1)	14.5
Absent	454	93.2	958	58.9	32	94.1	1449 (5)	67.2
	487	100.0	1628	100.0	34	100.0	2152 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 4 cases

4.4 Access to Water

The major sources of drinking water, both in public and private slums, were municipal taps and tubewells (Table 4.6). In case of bathing, however, a considerable proportion of slum dwellers used rivers, ponds, wells, etc. (Table 4.7). Except for Uttara and Mohammadpur, more than 90% of the slums in all *thana* used water from taps and/or tubewells for drinking purposes (Table 4.3).

Table 4.6. Distribution of Slums by Sources of Drinking Water and Land Ownership

	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
Source	No.	%	No.	%	No.	%	No.	%
Tubewell	54	20.0	371	27.6	5	19.2	431 (1)	26.2
Tap	166	61.5	870	64.7	16	61.5	1054 (2)	64.0
Tubewell+tap	9	3.3	32	2.4	2	7.7	43	2.6
Well	17	6.3	14	1.0	0	0.0	33 (2)	2.0
Pond/River	0	0.0	6	0.5	0	0.0	6	0.4
Other	13	4.8	37	2.8	2	7.7	53 (1)	3.2
Other-Mixed	11	4.1	14	1.0	0	0.0	25	1.5
Unknown	0	0.0	1	0.1	1	3.9	2	0.1
	270	100.0	1345	100.0	26	100.0	1647 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 509 cases

Table 4.7. Distribution of Slums by Sources of Bathing Water and Land Ownership

Source	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
	No.	%	No.	%	No.	%	No.	%
Tubewell	44	14.3	334	24.4	3	11.5	382 (1)	22.3
Tap	143	46.6	798	58.2	13	50.0	956 (2)	55.9
Tubewell+tap	8	2.6	29	2.1	2	7.7	39	2.3
Well	34	11.1	44	3.2	1	3.9	80 (1)	4.7
Pond/River	14	4.6	42	3.1	1	0.0	57	3.3
Other	27	8.8	43	3.1	2	7.7	73 (1)	4.3
Other-Mixed	37	12.1	80	5.8	3	11.5	121 (1)	7.1
Unknown	0	0.0	1	0.1	1	3.9	2	0.1
	307	100.0	1371	100.0	26	100.0	1710 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 446 cases

The present survey did not explore the various ways by which the slum dwellers collect their daily water. However, previous studies done by the Centre for Urban Studies, Dhaka in 1983 and 1988 revealed that a large proportion of the city's slum dwellers collect water from municipal taps located either along the public streets or in public places (1,2). Private slums often get their water from the landlord's house. Besides tap water, tubewells within the slum or neighbouring areas also play a vital role in supplying safe water to slum dwellers.

4.5 Access to Latrine

Inadequate number and poor maintenance of latrines are likely to be major contributors to the poor sanitary conditions of the slum population. The survey revealed that 5.1% of the slums did not have access to any latrine facility (Table 4.8). Shared latrines were the most common type of latrines. In 89% of the slums, more than three-quarters of the houses used shared latrines and in only 1.1% of the slums did all houses have private latrines (Table 4.8). Compared to private slums, government/semi-government slums were more likely to have private latrines (4.5%) or no latrines at all (15.8%), suggesting the presence of two extreme conditions in this category of slums.

Table 4.8. Distribution of Slums by Access to Latrine and Land Ownership

Percentage Using Shared Latrine*	Land Ownership								Percentage Using Private Latrine*
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums†		
	No.	%	No.	%	No.	%	No.	%	
No Latrine	71	15.8	33	2.0	1	2.9	111	5.1	No Latrine
0%	22	4.5	1	0.1	0	0.0	23	1.1	100%
1-25%	7	1.4	5	0.3	0	0.0	12	0.6	75-99%
26-50%	18	3.7	38	2.3	0	0.0	56	2.6	50-74%
51-75%	10	2.1	17	1.0	0	0.0	27	1.3	25-49%
76-100%	353	72.5	1534	94.2	33	97.1	1927 (7)	89.4	0-24%
	487	100.0	1628	100.0	34	100.0	2156 (7)	100.0	

* Except for the category "No Latrine" the other categories of Shared and Private Latrines are complementary, e.g. if 24% of slum population was using shared latrines, the remaining 76% was using private latrines.

† Figures in parentheses are cases for which the type of land ownership was not known.

4.6 Access to Primary Schools

When questioned, informants in 681 (31.7%) slums reported having access to a primary school, either within the slum (4.4%) or very close outside (27.3%) (Table 4.9). Though slums on government/ semi-government land were more likely to have primary schools inside the slums, private slums had greater overall access to primary schools (Table 4.9). With regard to distribution by *thana*, slums in Mohammadpur were least likely to have access to primary schools (7.7%) and slums in Demra most likely (53.1%) (Table 4.3).

Table 4.9. Distribution of Slums by Access to Primary Schools and Land Ownership

	Land Ownership							
	Govt. & Semi-govt.		Private		Non-govt. & Others		All Slums*	
Primary School	No.	%	No.	%	No.	%	No.	%
Present (inside)	45	9.2	50	3.1	1	2.9	96	4.4
Very Close (outside)	92	18.9	480	29.5	11	32.4	585 (2)	27.3
Absent	348	71.5	1088	66.8	22	64.7	1462 (4)	68.2
	485	100.0	1618	100.0	34	100.0	2143 (6)	100.0

* Figures in parentheses are cases for which the type of land ownership was not known.
Note: Missing information = 13 cases

SECTION 5

DATA VALIDITY AND LIMITATIONS

5.1 Data Validity and Post-survey Re-checking Method

The survey of over 2,000 slums within a very short period of time was an enormous and difficult task. Furthermore, the timing of the field survey coincided with the most difficult part of the year (i.e. the hottest months and nor'wester season) and Ramadan, the month of fasting. As a result, some under-enumeration of the slums may have happened. To estimate the magnitude of under-recording and the validity of information, UHEP re-surveyed 4 wards of the 5 target *thana* of UHEP (Mohammadpur, Lalbagh, Kotwali, Sutrapur, and Demra) and re-checked a sample of the slums identified by the CUS teams using the following methodology:

1. Four wards were re-surveyed to determine areal coverage and to estimate under-coverage (one each from Mohammadpur, Lalbagh, Kotwali, and Sutrapur *thana*):

   The wards chosen were of average size within the *thana*; the size was measured in terms of the number of slums surveyed in the DMSS-91[f]. They also were all above flood level, since, at the time of the resurvey, parts of Dhaka had been flooded. The ward boundaries were obtained, using the *thana* maps and by interviewing the local people. To estimate under-coverage, slums identified by the DMSS-91 were separated from the slums identified in the resurvey. A few slums which were established after April 1991, i.e. after DMSS-91, were excluded from the calculations.

[f]DMSS-91: Dhaka Metropolitan Slum Survey - 1991

2. A 10% sample of slums was drawn from the slum maps of the five *thana* and checked for the accuracy of address, boundary information, and estimated number of households and for correctness of plotting on the *thana* maps:

   The samples from each *thana* were 10% systematic samples ordered on the assigned numbers. The addresses were constructed with the identification and address information given on the questionnaire and any relevant information given on the individual maps. The household estimation was based on the given boundary information. If the boundary information was considered inadequate, we used the information on the area of the slum. In addition, the absence of other slums around some mapped areas helped in determination of boundary. The CUS household estimate was considered to be incorrect if it varied 20% or more from the UHEP's estimate.

3. The slums identified in 1989 were separated from those of the DMSS-91 and compared. Specifically, slums identified in the 1989 survey but not in the 1991 survey were located to provide an estimate of the proportion of slums in the original USS sampling frame that were missed in 1991.

5.2 Findings

1. **Under-coverage rate:** The average under-coverage checked from the four wards was 25% (Table 5.1). Comparing the slums identified in the 1989 and 1991 surveys, we observed that 25% of the slums of the 1989 sampling frame were not identified at all in the DMSS-91 and 10% of those slums were only partially mapped in the DMSS-91.

Table 5.1. Undercoverage found in UHEP Verification

Thana	Ward	Total Slums†	DMSS-91	Under-Coverage Rate
Mohammadpur	12	39	34	13
Lalbagh	16	18	16	12
Demra*	-	-	-	-
Kotwali	31	12	7	41
Sutrapur	38	27	18	33
		96	75	25

* Demra was not verified, † DMSS-91+UHEP coverage

2. **Address information:** Twenty-six percent of the slums had erroneous or inadequate addresses (Table 5.2). This included 6.2% with incorrect addresses which could not be located on the ground.

3. **Boundary information:** Thirty-three percent of the slums had missing or inadequate boundary information (Table 5.2). This included 4.1% with either incorrect information or no information on the boundaries.

4. **Household estimate:** Thirty-two percent of the slums had at least a 20% variation (both under- and over-count) in the household estimates from the actual counts (Table 5.2).

5. **Lack of consistent slum unit definition:** There was no consistent slum unit definition. Many slum units of the 1989 USS sampling frame were mapped as more than one unit. On the other hand, some discontiguous slum units of the 1989 sampling frame were mapped as single slum units in DMSS-91. Sometimes the interslum distance was less than the distance between segments within a slum.

Table 5.2. Address, Boundary and Household Estimate Verification

Thana	Number of Slums: Total	Number of Slums: Verified	Address inadequate/ incorrect	Boundary inadequate/ incorrect	Error in Household Estimate (≥20%)	Range of Variation of Household Estimate (if err≥20%)
Mohammadpur	156	13	15%	23%	23%	25-33%
Lalbagh	193	18	27%	22%	55%	20-29%
Demra	277	14*	28%	35%	42%	22-60%
Kotwali	56	6	33%	50%	<20%†	25%
Sutrapur	172	21	29%	45%	26%	20-53%
	854	72	26%	33%	32%	20-37%

* 27 slums were selected for Demra. 14 were verified.

† About 50% of the boundary information in the slum maps of Kotwali were inadequate, but on the ground they were more or less distinct with pavement, narrow roads and drains. In all the cases the area measurements, shape of the slums, and in some cases, absence of other slums around the area, were used to ascertain the boundary. Some of the slums in Sutrapur had a similar situation.

6. **Duplicate maps:** There were over 22% duplicates in the individual slum maps of Sutrapur. The duplicates were identified as different slums.

7. **Plotting on the *thana* maps:** More than 15% of the slums had been plotted in incorrect locations on the *thana* maps, most of them in Sutrapur (36%) and Lalbagh (29%) (Table 5.3).

8. **Ward boundary:** A number of ward boundaries were incorrect in Demra and Mohammadpur *thana*.

Table 5.3. Plotting check

Thana	Total Slums	Incorrect Plot	
		Number	%
Lalbagh	193	56	29.0
Mohammadpur	156	0	0.0
Sutrapur	172	66	38.3
Kotwali	56	10	17.8
Demra	277	-	-
	854	132	15.4

Note: The plotting check was performed for all DMSS-91 slums that had also been identified in 1989 (except Demra which was flooded). Plotting errors were detected in 132 slums, of which errors in 66 were obvious from the maps and addresses. The remaining 66 slum maps were checked and verified on the ground.

5.3 Limitations of the Study

Although the primary aim of the study was to record all slum settlements within the Dhaka metropolitan area, it was difficult to avoid under-enumeration due to some obvious reasons. Firstly, actual definition of a slum unit in the field on the basis of its physical, social and economic characteristics was not an easy task. The definition used required a certain degree of subjective assessment that may have resulted in the classification of some slums as non-slums. Secondly, some slums may have been missed by the actual process of locating slums on the ground given the dense housing, mixed land use with a wide variety of structures, the mushroom growth of small or mini-slums and the vastness of the area to be surveyed. It was also observed that many slum dwellers and slum land-owners did not want their settlements to be recorded as a slum.

Thirdly, the short-time period in which the survey was done and the actual timing of the field survey, as mentioned earlier, may have played an important role in the quality and completeness of the data collected.

Finally, the use of key informants to obtain information on slum and household characteristics may have been subject to various biases. However, we feel that this was the only data collection procedure that could be used, given the scope of the survey. This method has provided adequate and acceptable aggregate information on certain key slum characteristics, useful for overall planning and sampling (as in case of UHEP) purposes. Obtaining specific household and individual information was never the purpose of this survey.

CONCLUSION

The survey showed that it is feasible to survey, map and describe slum settlements in a large urban setting. However, the large under-coverage observed is to be expected, given the nature of the slums, many of which are very small entities, making actual location on the ground difficult. We also found that key informants from the slum communities are reasonable sources of aggregate information about the slums, especially information that is likely to be common knowledge.

The survey provided conclusive evidence of an explosion in the growth of slums in Dhaka City since independence. More than 80% of the slums identified in the survey were established after 1971. Migrants from a few specific areas of the country (greater districts of Barisal, Faridpur, Dhaka, and Comilla) have tended to contribute the most to this growth, suggesting the presence of some push factors and/or traditional migration behaviour in these districts.

We found that slums are much more likely to be set up on private land than on public land. However, public slums tend to be larger in terms of area and population. The survey results also suggest of the presence of a high degree of movement in the slum population, especially in the private slums. Slums on public land are more likely to be stable.

It is clear from the survey that the environmental condition of the slums is extremely poor, characterized by very high population density, poor housing and proneness to flooding. Population density in the slums was about 16 times higher than the average density in the 14 *thana* and more than 90% of the houses were constructed of poor materials. On the other hand, access to electricity and safe drinking water was quite high, especially in the private slums. However, primary schools were usually non-available, particularly in the private slums.

REFERENCES

Centre for Urban Studies. **Slums in Dhaka City**. Report of study conducted by CUS, sponsored by DMC, Dhaka: Centre for Urban Studies, 1983.

. Centre for Urban Studies. **Slums and Squatters in Dhaka City, 1988.** eport of study conducted by CUS, sponsored by DMC, Dhaka: Centre for Urban Studies, 1988.

3. Islam N. **The Poor's Access to Residential Space in an Unfairly Structured City, Dhaka.** *Orient Geogr* 1985-86;29 & 30.

4. Mahbub AQM, Islam N. The Growth of Slums in Dhaka City: A Spatio Temporal Analysis. In: Sharif Uddin Ahmed ed. *Dhaka Past Present Future*, Dhaka: The Asiatic Society of Bangladesh, 1990.

5. Mahbub AQM, Islam N. **Extent and Causes of Migration into Dhaka Metropolis, and the Impact on Urban Environment.** In: Mahbub AQM ed. *Proceedings of the Seminar on People and Environment in Bangladesh*, Dhaka: UNDP & UNFPA, 1990.

Appendix A

SAMPLE QUESTIONNAIRE

DMSS '91
SLUM CUS '91 No._____

Interviewer: _____ Supervisor: _____

Date of Interview: _____ Date of Inspection: _____

Signature: _____ Signature: _____

Dhaka Metropolitan Slum Survey, 1991

Center for Urban Studies,
Department of Geography, Dhaka University
on behalf of the
Urban Volunteer Program, ICDDR,B

(The information collected in this questionnaire is confidential and can only be used for research and development plan.)

Primary respondent(s):_____ Total number of primary respondents: _____

	Name	Designation	Address
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

PART A: IDENTIFICATION

1. Name of the slum: _____
   Address: _____
   _____
   Ward: _____ Thana: _____

Bustee # : _____
CUS '91 No.: _____
CUS '88 No.: _____
UVP '88 No.: _____

2. When was this slum established? (use probing with events)
   Year: _____
   Number of years in residence here: _____

3. Area of the slum
   Acre: _____ Bigha: _____ Katha: _____

4. Approximate size
   Length (yards): _____ Width (yards): _____

5. Sketch of slum: Make a sketch of the slum in the attached form and indicate the areas and roads around the slum and other essential information in the legend.

PART B: DEMOGRAPHIC INFORMATION

6. What is the estimated total population of the slum?
   Total number of persons: _____ (all ages)

   a) Number of living with family (spouse, child, relatives, friends, lodging guests, etc.):
   Households: _____
   Persons: _____

   b) Number of households/persons living in male-messes (groups)
   No. of messes: _____
   No. of persons: _____

   c) Number of households/persons in female-messes or with another family:
   No. of messes: _____
   No. of persons: _____

   d) Floating population in the slum (sleep in shops, varanda, factory or open space):
   _____

7. **Last year,** approximately how many households/persons left this slum? How many households/persons came to this slum? (use Bangla calender)
   Left
   Households: _____
   Single Persons: _____
   Came
   Households: _____
   Single Persons: _____

8. In the last month, how many households/persons left the slum and how many new households/ persons came to join the slum? (use Bangla calender)

Left
Households: _____
Single Persons: _____
Came
Households: _____
Single Persons: _____

9. How much is movement from this slum to other slums in Dhaka city?

No movement	0
Low rate of movement	1
Movement is common	2

10. Name 3 districts from which majority of the population came to this slum? (greater districts)

1. _____
2. _____
3. _____

PART C: <u>OWNERSHIP</u>

11. Type of ownership (land) of slum

a)	Govt/Semi Govt. (Name_____)	1
b)	Private (Single ownership)	2
c)	Private (Multiple ownership) Number of owners:_____	3
d)	Non-government organization (Name: _____)	4
e)	Non-government & private (both)	5
f)	Unknown	9

12. To whom do the slum people pay rent?

None	0
Govt./Semi Govt.	1
Private organization	2
Private Landlord	3
Govt./Non-Govt.worker	4
Mastan/Middleman	5
Other _____	7

13. If the slum is on govt./semi-govt. plot, did they ever get any notice to vacate? (11a)

No	0
Yes	1

If yes, when? (verbatim) _____

14. If the slum is on non-govt./private land, did the Landlord gave notice to vacate the slum? (11b-11e)

No	0
Yes	1

If yes, when? (verbatim) _____
Why, (vervatim) _____

PART D: HOUSING TYPE

15. Type of housing in the slum in percentages

a) Pucca building _____
b) Semi pucca building _____
c) Tin/wood/bamboo _____
d) Bamboo & Straw _____
e) Shacks (Jhupri) _____
f) Other, specify _____

PART E: FACILITIES WITHIN THE SLUM

16. Water source:

Drinking					
	Tubewell	No	0	Yes	1
	Tap	No	0	Yes	1
	Well	No	0	Yes	1
	River	No	0	Yes	1
	Pond	No	0	Yes	1
	Other _____	No	0	Yes	1
Bathing					
	Tubewell	No	0	Yes	1
	Tap	No	0	Yes	1
	Well	No	0	Yes	1
	River	No	0	Yes	1
	Pond	No	0	Yes	1
	Other _____	No	0	Yes	1

17.	Electricity	Absent	0
		Partially available	1
		Available in most houses	2
18.	Gas	Absent	0
		Partially present	1
		Available in most houses	2
19.	Primary school	No	0
		Yes	1
		Very close (outside)	2
20.	Distribution of Latrine users (in percentage)	No latrine	0
		Shared latrine	_____
		Private	_____
21.	Medical facilities (medical center)	Absent	0
		Government	1
		Non-government	2
		Other (specify)_____	7
22.	NGO Programme	Absent	0
		Present	1

If present, names of NGO _____

PART F: FLOOD

23.	Was this slum flooded in 1988?	Not flooded	0
		Completely flooded	1
		Partially flooded	2

(Thank the respondent for his/her time)

Appendix B

THE STUDY TEAM

Study Directors:	Professor Nazrul Islam Director, Centre for Urban Studies (CUS) & Professor of Geography, Dhaka University (DU)
	Dr. Abdullah Hel Baqui Research Head, Urban Health Extension Project, ICDDR,B
Research Associates and Field Supervisors:	1. Dr. A.Q.M. Mahbub CUS Faculty Associate & Associate Professor of Geography, DU
	2. Kazi Mizanur Rahman CUS Faculty Associate & Assistant Professor of Geography, DU
	3. Md. Iqbal CUS Faculty Associate & Assistant Professor of Geography, DU
	4. Dr. Salim Momtaz CUS Faculty Associate & Assistant Professor of Geography, DU
	5. Ms. Obaida Haque UHEP Mapper
Study Coordinators:	1. Dr. A.Q.M. Mahbub
	2. Dr. Syed Mizan Siddiqi UHEP Research Investigator
	3. Mr. N.M. Jahangir UHEP Analyst Programmer

Data Analysis and Entry:	1. Dr. A.Q.M. Mahbub
	2. Mr. N.M. Jahangir
	3. Mr. M. Mahbubur Rahman UHEP Data Management Assistant
	4. Dr. Shams El Arifeen UHEP Research Investigator
Map Preparation:	1. Dr. A.Q.M. Mahbub
	2. Ms. Obaida Haque
	3. Ms. Hosneara Begum UHEP Mapper
	4. Ms. Nusa Yamina Chowdhury UHEP Mapper
	5. Ms. Shahana Rahman UHEP Mapper
	6. Kazi Ahmedul Islam Draftsman, Dept.of Geography, DU
Field Investigators:	25 persons

Urban Health Extension Project (UHEP) Publications

Jamil K, Baqui AH, Paljor N. Knowledge and practice of contraception in Dhaka urban slums: a baseline survey. May 1993. (ICDDR,B working paper no. 31) (Urban FP/MCH working paper no. 3). *ISBN: 984-551-006-10.*

Baqui AH, Paljor N, Silimperi DR. The prevention and treatment of diarrhoea in Dhaka slums. May 1993. (ICDDR,B working paper no. 32) (Urban FP/MCH working paper no. 4). *ISBN: 984-551-007-8.*

Laston SL, Baqui AH, Paljor N, Silimperi DR. Immunization beliefs and coverage in Dhaka urban slums. May 1993. (ICDDR,B working paper no. 33) (Urban FP/MCH working paper no. 5). *ISBN: 984-551-008-6.*

Baqui AH, Paljor N, Nahar Q, Silimperi DR. Infant and child feeding practices in Dhaka slums. May 1993. (ICDDR,B working paper no. 34) (Urban FP/MCH working paper no. 6). *ISBN: 984-551-009-4.*
Chaudhury N, Mohiuddin QN, Momtaz S, Ghosh KR, Lili FB, Leena MM. Violence in the slums of Dhaka city. May 1993. (ICDDR,B working paper no. 35) (Urban FP/MCH working paper no. 7). *ISBN: 984-551-010-8.*

Baqui AH, Paljor N, Lerman C, Silimperi DR. Mothers' management of diarrhoea: Do urban volunteers of Dhaka have an impact? May 1993. (ICDDR,B working paper no. 36) (Urban FP/MCH working paper no. 8). *ISBN: 984-551-011-6.*

Salway S, Jamil K, Nahar Q, (editors). Issues for family planning in the urban slums of Dhaka, Bangladesh: opinions and perceptions of field-level workers. May 1993. (ICDDR,B working paper no. 37) (Urban FP/MCH working paper no. 9). *ISBN: 984-551-012-4.*

Urban Health Extension Project (UHEP) Publications (contd...)

Fronczak N, Amin S, Laston SL, Baqui AH. An evaluation of community-based nutrition rehabilitation centers. May 1993. (ICDDR,B working paper no. 38) (Urban FP/MCH working paper no. 10). *ISBN: 984-551-013-2.*

Arifeen SE, Mahbub AQM (Editors), Baqui AH, Islam N, Jahangir NM, Mahbub AQM, Paljor N, Siddiqi SM (Contributors). A Survey of Slums in Dhaka Metropolitan Area 1991. October 1993. (ICDDR,B working paper no. 39) (Urban FP/MCH working paper no. 11). *ISBN:984-551-014-25.*

Fronczak N, Amin S, Nahar Q. Health Facility Survey in Selected Dhaka Slums. October 1993. (ICDDR,B working paper no. 40) (Urban FP/MCH working paper no. 12). *ISBN: 984-551-015-7.*

Laston SL, Baqui AH, Paljor N. Urban Volunteer Service in the Slums of Dhaka: Community and Volunteer Perceptions. October 1993. (ICDDR,B working paper no. 41) (Urban FP/MCH working paper no. 13). *ISBN: 984-551-016-25.*

Baqui AH, Arifeen SE, Amin S, Black RE. Levels and Correlates of Maternal Nutritional Status and Consequences for Child Survival in Urban Bangladesh. October 1993. (ICDDR,B working paper no. 42) (Urban FP/MCH working paper no. 14). *ISBN: 984-551-017-43.*