

Providing the urban poor with water and sanitation: an introduction

by

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Introduction

According to the UNDP-World Bank pollution of the urban environment is now seen as one of the major obstacles to sustained economic growth. (A.Wright)

The unhealthy conditions of those lacking sanitation cannot be ignored because sanitation related diseases and polluting water sources often have devastating social, economic and environmental effects on all urban residents.

Both the number and percentage of people without access to sanitation services continues to increase. According to an UNDP-World Bank report, in 1991, 33% of the urban population in developing countries had no sanitation services (453 million urban people). By 1994 the number of unserved people had risen to 589 million or 37 percent of the urban population.

With no facilities for disposing of garbage and excreta and limited access to water for basic hygiene, the urban poor are particularly susceptible to epidemics of water related and vector borne diseases. Death rates in urban slums are substantially higher than in wealthier city suburbs or even among the rural poor e.g. statistics from Bangladesh suggest twice as many infant deaths per 1,000 live births than in urban areas as a whole (BBS, 1991).

The need for decent water and sanitation for the urban poor is therefore imperative. The aim of this report is to look at water and sanitation projects present in the slums of Dhaka. Four NGOs that we looked at (DSK, Proshika, Plan International and Concern) have undertaken water and sanitation projects throughout the Dhaka Slums.

This report serves as an introduction into the area of urban water and sanitation projects in Dhaka City. Issues that will be highlighted include community management and some of the technical challenges regarding the implementation of the projects.

Background to Dhaka City

Dhaka is one of the fastest growing cities of the world. In 1981 its population stood at 3.5 million, 1991 it was 6.95 million and is predicted to reach 9 million by the year 2000. (Water supply and sanitation problems in the slums of Mohammedpur, Dhaka. June 1997)

The increasing urban population results from the migration of people from different parts of the country. The primary reason for migration to the cities is rural poverty. Other reasons may include loss of land in river erosion, rural unemployment and natural hazards.

The overall state of the swelling urban population is far from satisfactory. In 1988-89 it was estimated that 44% of the urban population lived on an income which was only enough to provide for the minimal daily requirement (2122 calories/day/capita), while 20% can not even afford this, and could only provide themselves with 1805 calories/day/capita.

Another study found that more recently in 1990, 50% of the urban population fell below the minimal daily requirement (2122 calories/day/capita) and 30% under the 1805 calories/day/capita. These raising percentages are very alarming.

The planning commission estimates that 30% of the Dhaka City's population are slum dwellers. (this represents some 2.25 million people). According to the Dhaka Municipal Corporation there are approximately 1125 slums.

The most common problem facing the urban poor is the lack of adequate housing. Slum areas are highly crowded, the water supply is inadequate, sewage and drainage facilities are poor, the streets are narrow, cramped and littered with garbage.

The health and education facilities of the slum areas are poor or non-existent. The unhealthy and unsanitary residential environment combined with inadequate nutrition and poor food intake result in malnutrition and lower disease resistance levels. Unhygienic individual health practices due to lack of education and information also contribute to the general poor health of the urban poor.

Most families in the slums are male-headed households. In a study by the Center for Urban Studies (CUS), it was found that of a sample of 1230 poor urban households, two thirds were of the nuclear type with an average household size of 5.9. Young people (aged 15-29) were found to dominate the floating populations of the cities.

Unsafe drinking **water** and inadequate **sanitation** are two of the most urgent problems facing the urban poor and contribute significantly to their poor health. Slum dwellers are often required to pay for better water and sanitation facilities. NGOs endeavor to provide the urban poor with these facilities for it seems that the Municipal Corporation is unwilling and/or unable to extend its services to these areas.

It was stated in the Critical issues and 1995 survey findings that, less than 40% of the urban poor population get sufficient quantity of safe drinking water. The major sources of water in such settlements are private hand tubewells or miscellaneous sources rather than municipal piped water. (Report of task force, 1991, vol. 111) In the same book it stated that in 1991, hygienic sanitation systems were made available for about 60% of all urban households in the country. The remaining 40% consisted mainly of the poor and did not have any organized system of sanitation.

In Dhaka, 55% of the population use water supplied by WASA. Many have to purchase water from informal private sources and intermediary brokers. (Critical issues and 1995 survey findings).

The present position of urban water supply and sanitation is far from satisfactory and the situation is particularly alarming for the urban poor population.

Hussain (1980) states that in some locations slum dwellers buy water for drinking purposes from local taps spending Taka 0.50 per jar. Only 37% of slum dwellers get sufficient quantities of safe drinking water (CUS, 1983) whilst 10% of the slum households get their drinking water from wells, ponds etc. In small towns around Dhaka most of the poor households use water from public tubewells and other's tubewells on municipal pipelines. (Ahsan and Ahmed: Water and sanitation).

Approximately half the households in Dhaka have access to a sanitary toilet. (Critical issues and 1995 survey findings). The sanitation systems found in Bangladesh are- sewer system, septic tanks, pit latrines, bucket latrines and others that include latrines hanging over ponds, ditches or rivers etc. Few studies by CUS, various institutions and individual researchers provide information regarding sanitary conditions of urban poor. In the slums we have described, almost 90% of the families share latrines with others, while about 26% release themselves on the side of the railway lines and drains. (Ahsan and Ahmed: Water and sanitation).

Project I

Plan International

A: Sanitation

Plan International is an international NGO, which focuses on children's welfare. In 1996 Plan International began a pilot sanitation project in the slums. The residents were provided with a variety of sanitation options with the aim to discover which one would be most likely to succeed. Technical support was provided by ICCDRB and the latrine options piloted were:

- biogas
- septic tank
- connected ring slab latrines
- single ring slab latrines

As a result of this pilot phase the septic tank and biogas plant were considered to be the best options for further implementation. Septic tanks were found to be high cost whereas biogas was of low cost and gave greater coverage.

Based on this the first biogas plant was completed in 1996. Currently Plan International has 17 biogas plants. The latrine blocks have been modified with the latest blocks consisting of 15 cubicles: five for women, five for men and five for children. At the time of writing the cost of building the latrines was 10,000 Taka and the cost of building the biogas plant was 55,000 Taka.

The community contributes 10% of the cost and recruits a caretaker who is paid 10 Taka per month for his/her services. The community also covers the cost of maintenance and materials. Each family pays 10 Taka a month for the use of the facilities and up to 100 families will use one biogas/latrine plant.

The gas produced is used for cooking by six families who are selected by the community. The families tend to be more vulnerable and/or residing near the plant. The community is left to decide the criteria for families eligible to use the gas produced.

B: Water

Plan International provides water to the urban poor by shallow tube wells, which go to a depth of 180-200 feet. Plan has sunk 279 tubewells since 1996.

Again, the community contributes 10% towards the cost of the tubewell at a cost of 16, 000-17,000 Taka.

Project II

DSK- Dushtha Shasthya Kendra

DSK is a local NGO that started working with slum communities in 1988.

A: Sanitation

DSK has one community latrine, which consists of only two latrines within a waterpoint site. The latrines are connected to the main sewer, at the time of our visit, the pipe was broken and human waste was visible in the gutters. They had originally built a septic tank but it was found to be too small and hence disposal was connected to the main sewers.

DSK is currently in the process of building a second community latrine in TTC slum, which is to be connected to the sewers of DWASA pending their permission.

The new sanitation block design was developed after Participatory Rural Appraisal (PRA) exercises with the community to assess their needs. A report was written that covered the process whereby the design of the sanitation block was achieved and is called 'A design for a communal sanitation/bathing block using stakeholder analysis in TTC'. The stakeholder analysis gave rise to several issues regarding the use of latrines especially for women where lack of privacy and places to go were found to be major issues. The new design incorporates all these concerns in the plan. The block is still under construction, so it is too early to tell if the block is being successfully utilized by all the social groups the project aimed to cater for.

DSK also carried out a survey of one of their waterpoints (see appendix). It was shown that women bathe far less at the water points than men, this suggests that they lack sufficient privacy and hence future designs could incorporate a feature for female bathers. The survey gave a breakdown of when the facilities were utilized, by who (adult male, adult female, child) and for what activities. We propose that this information be taken into account when planning future water and sanitation blocks.

B: Water

The most interesting of DSK's projects are their community owned and managed waterpoints, a model that was developed in 1996-97. Currently DSK water projects benefit some 15,000 slum dwellers.

Communities willing to form groups are provided with training on management and maintenance of waterpoints, health, hygiene habits and behavioral change.

The community is loaned money to construct a waterpoint at 60,000 Taka. This has to be repaid to the NGO in 24 monthly installments following a six-month grace period. The NGO (DSK) obtains permission for the work from Dhaka Water and Sewage Authority (DWASA) and Dhaka City Corporation (DCC). DSK acquires the necessary land permission and applies to DWASA for a connection. A major disadvantage of working with DCC and DWASA is the amount of time it takes to get approval (upto 60 days). This can have repercussions on donor money. Involvement of the government in provision of services is however important and this example of community managed water points shows that is possible.

Once the water point is up and running the community charges for the use of the water so as to cover the cost of the water bill and repay the loan. DSK has currently successfully established 46 waterpoints.

C: Water point management

At the DSK water points, the community selects two committees:

- a water management committee, which consists of eight female members,
- a advisory committee, which consists of five male members.

The water management committee shoulders the day to day management of the site and self select one member to act as the caretaker, who has responsibility for collecting revenue from the users. Revenue is generated from the sale of the water to cover all costs.

Not all of the water points are successful, some make substantial profits and have paid back the loans whereas other have not. Suggested reasons as to why some water points are more successful than others need to be investigated further but each situation is unique and needs assessment for each community would probably need to be carried out if the most successful project for that area is to be realized.

Project III

Proshika

Proshika is a local NGO and has been active in the field of rural development since 1976.

Proshika members join primary organizations consisting of single sex members only. Proshika implement their urban programmes in urban centers through these primary groups. Representatives from these groups are then sent to make up

federation groups. The federation groups access the government services on behalf of their members.

Social, health and economic committees have been built up which actively participate in their own welfare. At the time of researching we were encouraged to hear the deputy director of the Urban Programme speak of an occasion where the slum dwellers had written directly to a minister through their federation group.

A: Sanitation

Currently Proshika is working to improve sanitation in Chanpara (Demara) slum by providing community latrines. The community latrines have 20 stalls, 10 for men and 10 for women and serve upto 200 families. Proshika loans the community the money to build the latrine and each family pays 30 Taka per month for 5/6 years in order to realize the costs. The community latrines are connected to a deep pit that needs to be emptied regularly. The slum dwellers are known to complain of the stench every time the pit was emptied and cleaned.

Proshika is currently constructing three new community latrines with pits that have a capacity of 68,000 liters. These new latrines should only need emptying after several years. Proshika had also tried to build a biogas latrine. They were unsuccessful because the tank was too small. Its use as a biogas plant was subsequently abandoned.

In Kerala slum Proshika provides sanitation by ring slab latrines. Only members of Proshika's slum communities are eligible for loans for the ring slab latrines.

Project IV

Concern

A: Sanitation

Concern provides sanitation to the dwellers of Kerail slum by community latrines. Upon inspection of Concern's community latrines, the state of disposal of waste from the pit was poor with waste everywhere.

In this instance, upto 200 families use one community block latrine and a committee consisting of five people manages the latrine. The committee collects 6 Taka per family to pay the caretaker and cover costs of maintenance and repair. The state of the latrines, especially regarding the removal of waste indicated that either the committee was not carrying out its functions correctly or the latrines were unable to cope with the amount of waste produced.

Concern is currently seeking to move away from latrine construction and placing greater importance on increasing awareness through education and lobbying.

Technical challenges

1. Biogas latrines

The main advantage of biogas latrines is that they do not require much emptying and an extra source of fuel is generated from the waste. The waste produced is also less contaminated than that from pit or ring slab latrines. According to Plan International the chamber only needs to be cleaned/emptied every three years.

In one of the older Biogas units visited, waste was unable to pass through into the chamber. It was not clear whether this was due to broken pipes or a blockage. If the latter is the case then a potential solution could be to increase the capacity of the drainage.

Furthermore a biogas plant needs to have a water source nearby, as the chamber needs large amounts of water in order to work properly.

The lack of space in most slums should always be taken into account. When building biogas latrines space is necessary not only for the cubicles but also for the biogas chamber. Communities chose suitable locations themselves and Plan International then send an engineer to check its suitability. The lifespan of a biogas plant is not really known, as the oldest one is just three years old.

2. Tubewells

The use of tubewells in Bangladesh is extensive, maintenance and repair is relatively easy, as most people are familiar with the related technology. The water table in Dhaka IS FALLING, making sinking of tubewells significantly more expensive and rendering existing tubewells that are redundant. This issue should be kept in mind when considering sinking tubewells in Dhaka. For example, 10-15 years ago Plan International only needed to sink tubewells 40-50 feet, Now tubewells need to be sunk upto 200 feet or more to hit the water table. One possible explanation for this dramatic change is the increasing pressure mans activities exert on these natural underground water resources.

3. Water points

In 'A guide to the establishment of community owned and managed water points' DSK outlines the construction criteria required to build a water point. This design has been given DCC approval and DSK recommend that it is adhered to prevent any complications with DCC.

The main technical problem associated with the water points is lack of adequate water from the WASA pipes. One of the solutions has been to move the connections from one pipe to another, which then adds an extra financial burden

to the community. There are many branch lines, which may be full of water. Connections are changed depending on the availability of water.

Conclusion

As the population is so dense in the slums, pit latrine, septic tanks and ring slab latrines all fill up very rapidly and need regular removal of sludge. This requires efficient co-ordination and reliable technologies if the waste is to be removed in a hygienic manner. Although innovative ways of removing sludge are being explored (e.g. Water Aid intend to introduce a machine called the Vaculug which will allow sludge to be removed in a more hygienic manner than it is at present), options that lessen the need for removal would be more favorable. If space is a major issue then individual latrines maybe the only viable solution. If there is enough space for community latrines then these would be the next best option as these can either utilize the public sewer or the biogas plant.

Community management

1. Biogas latrines

Communities have to contribute 10% towards the cost of the biogas plant and manage general maintenance and repair as well as hire a caretaker. At one of the biogas plants visited, a conflict had arisen whereby one member of the community did not want to pay for the latrines to be cleaned and insisted on cleaning her own toilet. Committee members were against this as they felt that she would not clean consistently. At an older biogas plant the latrines were not being kept clean regularly enough. This raises doubts as to whether the community is able to cope with management of its utilities. One of the critical questions is where does the role of the NGO end and the responsibility of the community begin?

2. Water points

DSK believes that in order to achieve empowerment, sustainability of the water supply, sanitation provision and maintain autonomy, the water points should be fully managed by the community. DSK feels that ultimately these are highly desirable goals both for the implementing NGO and the local community. In practice, the transfer of the water point to the community is problematic, especially when there is lack of state support. In essence, the NGOs are required to play the role that the state shoulders in other countries regarding the provision of water and sanitation. It is probably unrealistic to expect communities to totally manage their own water points given that this does not happen elsewhere.

It is, however, encouraging to see communities willing to cover the total cost of the water points. Few of the other projects researched were able to achieve this aspect of ownership within the local community. Over a series of committee meetings at one water point the community was faced with the problem of inadequate water supply from the WASA line. The committee not only decided to change the connection to a better line but also raised 3,500 Taka towards the cost of the work. The committee then asked DSK to cover the rest of the costs. If DSK wishes to achieve total sustainability then the money could be loaned to the community. This is a good example of the community managing their utility. However the presence of the NGO's expertise was necessary to facilitate the decisions the committee subsequently made.

At another waterpoint, a conflict between the management committee and the advisory committee was occurred. One male was complaining that his wife was on a committee and he was not. Generally, however, there is harmony between the advisory and management committee. This is probably due to the fact that the management committee chooses the advisory committee.

Conclusion

✓ The urban context is different from rural situations and hence different ways of finding solutions need to be implemented. Communities seem to be willing to find solutions to their water and sanitation problems. There is still need for facilitation by NGOs to ensure that solutions are met and carried out. A more in-depth study on the success of committees set up to manage utilities from within the community in terms of power, wealth, relationships- particularly for females is necessary.

According to DSK, in one case the community defended its waterpoint by preventing mastanns from taking it over (see A guide to setting up a Waterpoint). This is valid evidence that communities' value access to decent water and sanitation and are willing to protect that source. A few waterpoints, however have fallen into the hands of the mastaan although this is not the general trend.

It would seem that NGOs still have a significant role to play. The community is unable to maintain and manage the utility single handedly as technical knowledge and lack of funds would make certain problems impossible for the urban poor to overcome.

Conclusion and recommendations

- biogas latrines are probably the most appealing due to the fact that there is less waste and the added benefit of fuel for some families. They do however require space and the cost may be prohibitive for some communities. In addition the waste removed is less contaminated than that from pit or ring slab latrines.
- tubewells should be avoided if connection to DWASA lines is possible. due to the receding water table, shallow tubewells do not seem to be a sustainable option and deep tubewells are expensive to sink
- technical issues regarding the provision of water and sanitation to the urban poor are numerous and this report is not exhaustive, further work in to other technical challenges as well as solutions is necessary
- encourage work with other NGO's which have extensive experience and acquired much expertise in the slums, so preventing overlap as differing ways of providing water and sanitation to the poor may cause problems e.g. provision of free water in an area that already established paying structures for the same service.
- education is key if improved health through better water and sanitation is to be achieved
- it is important to keep dialogue open with the communities served and involve the communities at every level of decision making. A combination of education and communities self-assessment and provision of services should try to be achieved. This is essentially participatory, although communities do not always know the options available to them without the assistance of the NGOs.
- a thorough needs assessment of the area prior to the provision of water and sanitation needs to be carried out before hand, with most of the input coming from the communities themselves – each situation is unique and different solutions apply. A clear understanding of people's present behavior, perceptions and priorities allow a better provision of service and allow education tools to be tailored appropriately.
- the projects mentioned in this report are not reaching the poorest of the poor as payment is necessary to access the services. Ways need to be found to reach them and provide them with basic facilities
- generally felt that the community-managed latrines were not maintained properly, this raises the question of whether community management is

working effectively. more research into this aspect of water and sanitation provision needs to be addressed

Sustainable human development requires safe water and sanitation. Improved water and sanitation services will improve health and quality of life, especially for women.

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- Bangladesh Bureau of Statistics (BBS), Bangladesh Demographic Statistics and 1991 Statistical Yearbook of Bangladesh
- UNDP- World Bank Water and Sanitation Program
Towards a Strategic sanitation approach: Improving the sustainability of Urban Sanitation in developing Countries by Albert M Wright

Waterpoint Survey Data Analysis

Begunbari

01-Feb-98 through 16-Feb-98

GENERAL ANALYSIS

Notes: (a) Where two figures are given side by side, the figure on the left indicates gross totals over the time period. The figure on the right (shaded) indicates the daily average over this time. (b) Due to the number of significant figures employed, some numbers may appear to be added incorrectly. (c) Discrepancies in totals for a demographic group may occur between measures. These are caused by incomplete records. For each calculation, the maximum number of records with the pertinent information are used.

Records Missing Data on: Sex: 8 (0%) Age: 125 (8%) Status: 65 (4%) Activity: 300 (18%)

At a Glance...

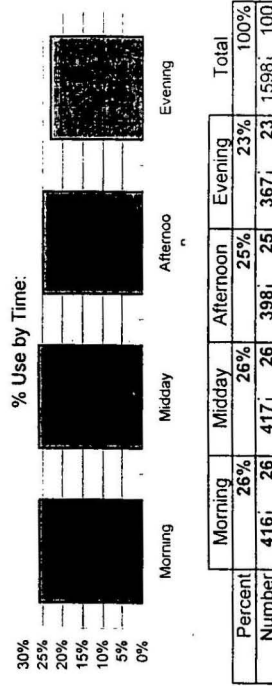
Total Users: 1663 Males: 51% Locals: 78% Adults: 63% Latrine Users: 64%
 Number of Days: 16 Females: 49% Floaters: 22% Children: 37% Water Collectors: 31%
 Average Per Day: 104 Latrine Users: 64% Water Collectors: 31%
 Bathers: 39%
 Clothes Washers: 11%

All Users By Age/Sex:

	Male	Female	Total
Adult	535	33	434
Child	205	13	357
Total	740	46	791

	Male	Female	Total
Adult	35%	28%	63%
Child	13%	23%	37%
Total	48%	52%	100%

Site Use By Time of Day:



Begunbari

ACTIVITY ANALYSIS

Activity by Sex:

	Male	Female	Total	Male	Female	Total
Bathe	403	126	529	76%	24%	100%
Collect Water	190	12	202	46%	54%	100%
Wash Clothes	122	8	130	82%	18%	100%
Use Latrine	518	32	550	59%	41%	100%

Activity by Age:

	Adult	Child	Total	Adult	Child	Total
Bathe	406	25	431	83%	17%	100%
Collect Water	316	20	336	83%	17%	100%
Wash Clothes	140	9	149	97%	3%	100%
Use Latrine	538	34	572	64%	36%	100%

3 0 2

Activity by Status:

	Local	Floater	Total	Local	Floater	Total
Bathe	286	18	304	54%	46%	100%
Collect Water	347	22	369	84%	16%	100%
Wash Clothes	99	6	105	67%	33%	100%
Use Latrine	593	37	630	68%	32%	100%

Begunbari

LATRINE USE ANALYSIS

Latrine Users By Age/Sex:

	Male	Female	Total
Adult	374	163	537
Child	106	7	113
Total	480	170	650

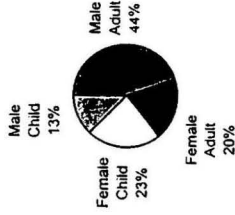
	Male	Female	Total
Adult	45%	20%	64%
Child	13%	23%	36%
Total	58%	42%	100%

Latrine users who...

	Number	Percent
Also bathe	269	31%
Also collect water	138	16%
Also wash clothes	96	4%
Do nothing else	597	68%

	Number	Percent
Are Locals	593	68%
Are Floaters	280	32%

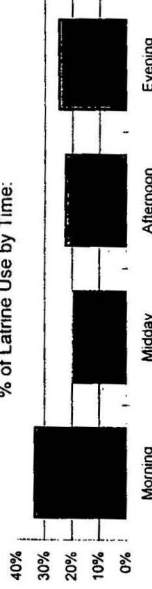
Breakdown of Latrine Users:



Latrine Use By Time of Day:

	Morning	Midday	Afternoon	Evening	Total
Percent	34%	19%	22%	25%	100%
Number	280	160	187	207	834

% of Latrine Use by Time:



Adult Latrine Users By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Adult	117	78	58	92	345
Fem. Adult	59	33	34	37	163
Total	176	111	92	129	508

	Morning	Midday	Afternoon	Evening	Total
Male	22%	15%	16%	17%	70%
Fem.	11%	6%	6%	7%	30%
Total	33%	21%	23%	24%	100%

Child Latrine Users By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Child	42	3	15	1	61
Fem. Child	62	4	34	3	103
Total	104	7	49	4	164

	Morning	Midday	Afternoon	Evening	Total
Male	14%	5%	7%	9%	36%
Fem.	21%	11%	15%	17%	64%
Total	35%	16%	22%	26%	100%

Beginbari

BATHING ANALYSIS

Bathers By Age/Sex:

	Male	Female	Total
Adult	323	83	406
Child	39	43	82
Total	362	126	488

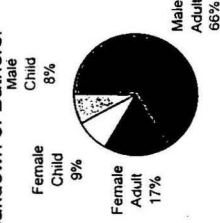
	Male	Female	Total
Adult	66%	17%	83%
Child	8%	9%	17%
Total	74%	26%	100%

Bathers who...

	Number:	Percent:
Also use the latrine:	269	51%
Also collect water:	186	35%
Also wash clothes:	142	27%
Do nothing else:	99	19%

	Number:	Percent:
Are Locals:	286	54%
Are Floaters:	239	46%

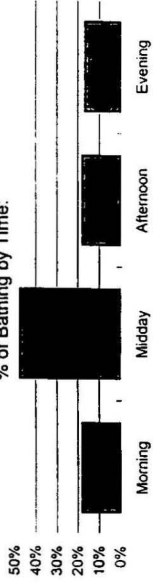
Breakdown of Bathers:



Bathing By Time of Day:

	Morning	Midday	Afternoon	Evening	Total
Percent	18%	48%	18%	17%	100%
Number	88	232	87	81	488

% of Bathing by Time:



Adult Bathers By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Adult	75	102	67	69	323
Fem. Adult	11	53	9	10	83
Total	86	155	86	79	406

	Morning	Midday	Afternoon	Evening	Total
Male	18%	25%	19%	17%	80%
Fem.	3%	13%	2%	2%	20%
Total	21%	38%	21%	19%	100%

Child Bathers By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Child	2	35	2	1	39
Fem. Child	0	42	3	0	43
Total	2	77	5	1	82

	Morning	Midday	Afternoon	Evening	Total
Male	2%	43%	1%	1%	48%
Fem.	0%	51%	0%	1%	52%
Total	2%	94%	1%	2%	100%

Begunbari

WATER COLLECTION ANALYSIS

Water Collectors By Age/Sex:

	Male	Female	Total
Adult	127	189	316
Child	31	34	65
Total	158	223	381

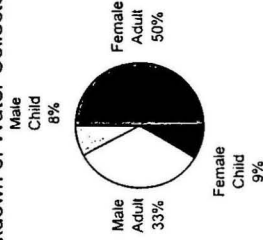
	Male	Female	Total
Adult	33%	50%	83%
Child	8%	9%	17%
Total	41%	59%	100%

Water collectors who...

	Number	Percent
Also bathe:	186	45%
Also use the latrine:	138	33%
Also wash clothes:	35	8%
Do nothing else:	220	53%

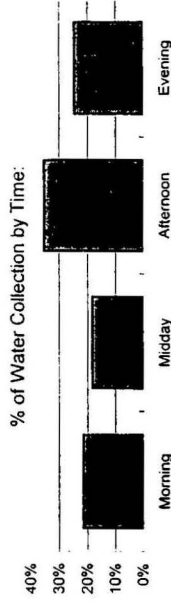
	Number	Percent
Are Locals:	347	84%
Are Floaters:	67	16%

Breakdown of Water Collectors:



Water Collection By Time of Day:

	Morning	Midday	Afternoon	Evening	Total
Percent	22%	18%	35%	25%	100%
Number	82	70	135	94	381



Adult Water Collection By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Adult	28	26	42	31	127
Fem. Adult	36	31	76	46	189
Total	64	57	118	77	316

	Morning	Midday	Afternoon	Evening	Total
Male	9%	8%	13%	10%	40%
Fem.	11%	10%	24%	15%	60%
Total	20%	18%	37%	24%	100%

Child Water Collection By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Child	8	6	8	9	31
Fem. Child	10	7	9	8	34
Total	18	13	17	17	65

	Morning	Midday	Afternoon	Evening	Total
Male	12%	9%	12%	14%	48%
Fem.	15%	11%	14%	12%	52%
Total	28%	20%	26%	26%	100%

Beginbari

CLOTHES WASHING ANALYSIS

Clothes Washers By Age/Sex:

	Male	Female	Total
Adult	115	4	140
Child	3	0	4
Total	118	4	144

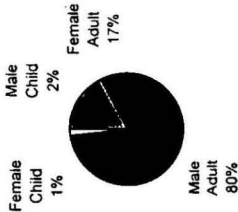
	Male	Female	Total
Adult	80%	17%	97%
Child	2%	1%	3%
Total	82%	18%	100%

Clothes washers who...

	Number:	Percent:
Also bathe:	142	96%
Also collect water:	35	24%
Also use the latrine:	36	24%
Do nothing else:	3	2%

	Number:	Percent:
Are Locals:	99	67%
Are Floaters:	48	33%

Breakdown of Clothes Washers:



Clothes Washing By Time of Day:

	Morning	Midday	Afternoon	Evening	Total
Percent	13%	49%	24%	15%	100%
Number	18	70	34	21	143

% of Clothes Washing by Time:



Adult Clothes Washers By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Adult	15	49	32	19	115
Fem. Adult	2	19	2	2	25
Total	17	68	34	21	140

	Morning	Midday	Afternoon	Evening	Total
Male	11%	35%	23%	14%	82%
Fem.	1%	14%	1%	1%	18%
Total	12%	49%	24%	15%	100%

Child Clothes Washers By Time/Sex:

	Morning	Midday	Afternoon	Evening	Total
Male Child	0	0	0	0	0
Fem. Child	1	2	0	0	3
Total	1	2	0	0	3

	Morning	Midday	Afternoon	Evening	Total
Male	0%	0%	0%	0%	0%
Fem.	33%	67%	0%	0%	100%
Total	33%	67%	0%	0%	100%

FLOATER ANALYSIS

Begunbari

At a Glance...

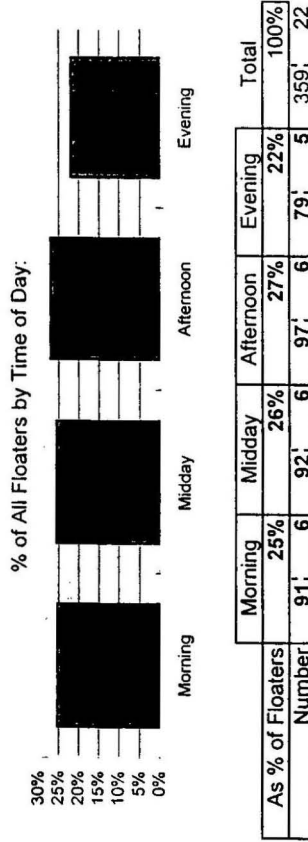
Number of Floaters: 359 Per Day: 22 As % of Total Users: 22% As % of Latrine Users: 32%

Floaters By Age/Sex:

	Male	Female	Total
Adult	18	4	22
Child	1	1	2
Total	19	5	24

	Male	Female	Total
Adult	94%	1%	95%
Child	4%	0%	4%
Total	98%	2%	100%

When are floating users coming?



As % of Floaters	Morning	Midday	Afternoon	Evening	Total
Number	91	92	97	79	359
Number	6	6	6	5	22

Floaters By Activity:

	Number	Percent
Use Latrine	280	78%
Wash Clothes	48	13%
Bathe	239	67%
Collect Water	67	19%

Begunbari

CORRELATION ANALYSIS (1 of 2)

Users who engage in:

	Number:	Percent:
Only one activity:	919	67%
Two activities:	311	23%
Three activities:	101	7%
All four activities:	32	2%
Total:	1363	100%

Correlations Among All Users:

	Clothes Washers	Latrine Users	Water Collectors	Bathers
Who also bathe:	96%	31%	45%	-
Who also collect water:	24%	16%	-	35%
Who also use the latrine:	24%	-	33%	51%
Who also wash clothes:	-	4%	8%	27%
Who do nothing else:	2%	68%	53%	19%

Females who engage in...

	Number:	Percent:
Only one activity:	550	86%
Two activities:	90	14%
Three activities:	1	0%
All four activities:	0	0%
Total:	641	100%

Correlations Among Female Users:

	Clothes Washers	Latrine Users	Water Collectors	Bathers
Who also bathe:	85%	2%	25%	-
Who also collect water:	8%	2%	-	44%
Who also use the latrine:	0%	-	3%	5%
Who also wash clothes:	-	0%	1%	17%
Who do nothing else:	12%	96%	72%	34%

Males who engage in...

	Number:	Percent:
Only one activity:	363	51%
Two activities:	221	31%
Three activities:	100	14%
All four activities:	32	4%
Total:	716	100%

Correlations Among Male Users:

	Clothes Washers	Latrine Users	Water Collectors	Bathers
Who also bathe:	98%	51%	68%	-
Who also collect water:	27%	25%	-	32%
Who also use the latrine:	30%	-	69%	65%
Who also wash clothes:	-	7%	17%	30%
Who do nothing else:	10%	49%	31%	13%

Begunbari

CORRELATION ANALYSIS (2 of 2)

Children who engage in...

	Number:	Percent:
Only one activity:	428	97%
Two activities:	11	3%
Three activities:	1	0%
All four activities:	0	0%
Total	440	100%

Correlations Among Child Users:

	Clothes Washers	Latrine Users	Water Collectors	Bathers
Who also bathe:	75%	3%	2%	-
Who also collect water:	25%	0%	-	1%
Who also use the latrine:	25%	-	0%	9%
Who also wash clothes:	-	0%	2%	4%
Who do nothing else:	0%	97%	98%	87%

Adults who engage in...

	Number:	Percent:
Only one activity:	481	55%
Two activities:	292	33%
Three activities:	69	8%
All four activities:	32	4%
Total	874	100%

Correlations Among Adult Users:

	Clothes Washers	Latrine Users	Water Collectors	Bathers
Who also bathe:	96%	42%	49%	-
Who also collect water:	24%	20%	-	38%
Who also use the latrine:	24%	-	34%	55%
Who also wash clothes:	-	6%	11%	33%
Who do nothing else:	2%	57%	48%	6%