LOCAL GOVERNMENT ENGINEERING BUREAU (LGEB)

WORLD BANK MISSION, DHAKA, BANGLADESH

SOCIO-ECONOMIC SURVEY

ON

LOW COST SANITATION

FINAL REPORT

SEPTEMBER, 1989

AQUA CONSULTANT & ASSOCIATES LIMITED

40, NAYA PALTAN, INNER CIRCULAR ROAD, 3RD FLOOR. DHAKA-1000, BANGLADESH. G.P.O BOX 23. PHONE 407960, 403083.

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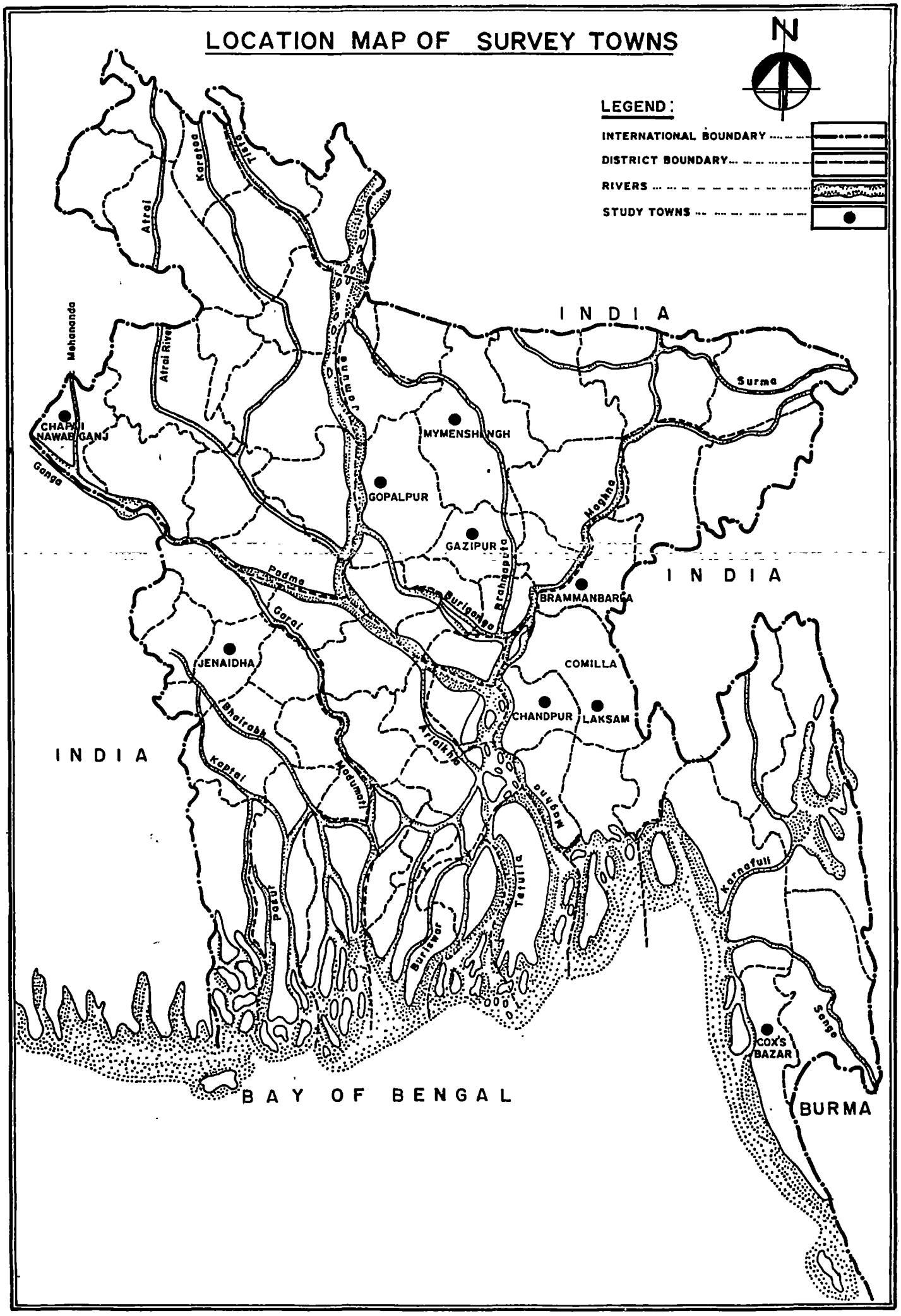
ABBREVIATIONS

AE	Assistant Engineer
ADB	Asian Development Bank
BRDB	Bangladesh Rural Development Board
CI	Corrugated Iron
CSD	Central Storage Depot
CC	Cement Concrete
DL	Demonstration Latrine
DDS	Door to Door Survey
DPHE	Department of Public Health Engineering
DANIDA	Danish International Development Agency
FGD	Focus Group Discussion
FC	Ferro Cement
GOB	Government of Bangladesh
Govt.	Government
HP	Hand Pump
HS	Household Survey
KII	Key Informant Interview
LGEB	Local Government Engineering Bureau
M.S.	Mild Steel
NGO	Non Government Organisation
PVC	Polyvinyl Chloride
PSI	Producers and Sellers Investigation
PL	Pit Latrine
RCC	Reinforced Cement Concrete
SAE	Sub Assistant Engineer
SPL	Single Pit Latrine
Sq.Km/Km^2	Square Kilometer
TOR	Terms of Reference
TAG	Technology Advisory Group
UNICEF	United Nations International Children's Emergency Fund
UNDP	United Nations Development Programme
VIP	Ventilated Improved Pit
WS	Water Seal
WSB	Water Seal Broken
XEN	Executive Engineer


LOCATION MAP OF SURVEY TOWNS
N
LEGEND:
INTERNATIONAL BOUNDARY
DISTRICT BOUNDARY
RIVERS
STUDY TOWNS
INDIA
INDIA
INDIA
BAY OF BENGAL
BURMA
Mahananda
Atrai
Karatoa
Tista
Atrai River
Jamuna
Surma
Ganga
CHAPAI NAWABGANJ
MYMENSHINGH
GOPALPUR
GAZIPUR
Meghna
Padma
Gorai
Brahmaputra
Buriganga
BRAMMANBARIA
JENAIDHA
COMILLA
Bhairab
CHANDPUR
LAKSAM
Arialkha
Kaptai
Madumati
Mogna
Pasur
Tetulia
Buriswar
Karnafuli
Sangu
COX'S BAZAR

SUMMARY

The present report is the outcome of a socio-economic survey of low cost sanitation in 9 Pourashavas namely; Laksham, Mymensingh, Gopalpur, Gazipur, Cox's Bazar, Jhenaidah, Chapai Nawabganj, Brahmanbaria and Chandpur. It has presented an analysis of household data on socio-economic variables such as sanitation practices, existing arrangements for excreta disposal, defecation practices, low cost sanitation system, willingness to acquire and ability to pay for sanitary latrines, preferabilities to consumers of LCS and the working and organization of production systems for such latrines.

The study applied a combination of methods in order to generate relevant data, while based mainly on a household survey through the use of interview schedules, it has also taken recourse to the following:

- Door to Door Survey
- Checklist by Observation
- Focus group Interview
- Key informants Interview

In the course of the study, investigations have also been made into producers' roles and interactions between the producers and consumers in market situations. 715 households were covered by interviews in the household survey and 1578 habitations were selected for a door to door survey. 502 persons including 157 females participated in group discussions. Using the observation checklist, it was found that 82 households had single pit latrines, 91 two-pit latrines, 347 unsanitary latrines and 195 no latrine. Of 502 participants in group interviews, 124 owned two-pit latrines, 91 were familiar with two pit latrines and 140 had unsanitary latrines. The remaining 147 had no latrine.

In 9 selected Pourashavas, 61 key informants such as ward commissioners, DPHE (Department of Public Health Engineering), Municipality and LGEB engineers and NGO executives were interviewed to elicit their opinion on aspects of sanitation, design preferences for low cost latrines and financial arrangements for the buyers of such latrines. 46 producers and sellers were interviewed by a supplementary questionnaire covering the production of various latrine components as well as other products, expenditure, prices and sales figures.

To make a true representation of urban Bangladesh, 9 Pourashavas were selected on the basis of administrative division and the size of populations ($\geq$35000). The population of selected towns ranges from 35,000 to

1,71,000, the highest being in Nawabganj and the lowest in Cox's Bazar (see table below).

Pourashava	Population	Administrative Division
Cox's Bazar	35,500	Chittagong
Gopalpur	38,398	Dhaka
Laksham	44,500	Chittagong
Gazipur	79,854	Dhaka
Jhenaidah	80,000	Khulna
Brahmanbaria	102,000	Chittagong
Chandpur	125,000	Chittagong
Mymensingh	170,000	Dhaka
Chapai Nawabganj	171,000	Rajshahi

To ensure geographical spread the 9 Pourashava samples were purposely drawn from different administrative divisions. Maps have been drawn for the 9 Pourashavas showing various income zones, commercial and residential areas including slums and infrastructure (see Appendix III).

Following are the major findings of the survey:

The household size considerably varies. 22% of the samples have 5 household members or less, 56% have 6 to 10 members and 20% have 11 or more. The average household size is 8.3, a much higher figure than the national urban average (6.8).

More than 90% of the respondents own their own accommodation and compound while 5% are renters, and 4% are trespassers in abandoned or self-constructed houses.

Housing types differ as to building materials and structure. Some are Pucca, some with semi-Pucca structures and others have Katcha structures. In total 75% of the samples were Katcha structures thus showing a weak economic base for the majority of the urban population. Laksham, Gopalpur and Brahmanbaria Pourashavas have the highest percentage of Katcha structures (See table-6.1 in the main body of the report). Only 7 of the sample Pourashavas have piped water supply systems serving on average 17.5% of the population through individual house connections and standposts.

Household income groupings shows a positively skewed tendency. 6.7% of the sampled households have a yearly income less than Tk.10,000, 29% between Tk. 10,000 and 20,000, 23% are found in the income group of Tk.20,000 - 30,000 and 16% have a yearly income between Tk.30,000 and 40,000, while 24% have annual income above Tk. 40,000. There is a relationship between income and accommodation type. The higher income groups generally live in Pucca houses with sanitary latrines.

About 23% of the population use sanitary latrines, 49% use unsanitary latrines and the remaining 28% do not have any kind of latrine. Of the sanitary latrine users, 4.5% have septic tanks, while 18.5% have sanitary single and double-pit latrines. Double-pit latrines with ceramic pans are found to be most popular among the users. Potholes (a very shallow pit) and surface latrines are the most common type of unsanitary latrines. Bucket latrines are found in Mymensingh, Jhenaidah, Cox's Bazar, Chandpur, Chapai Nawabganj and Brahmanbaria Pourashavas.

To maintain public health and sanitation, 8 Pourashavas, with the exception of Nawabganj, have provided 35 public toilets with 100 seats in total. Most members of households having no latrine defecate in the open field or in the bushes.

The sanitary conditions in the slums are miserable and inhuman. Most of the slum dwellers have literally no latrine and only a few have pit or surface latrines. The slum settlers defecate in the open fields, in the bushes, near the roads and on river sides. The problem is very acute with female residents who have to wait till sunset for defecation or use a neighbours' latrine, if available.

Children's defecation practices were found to be unhygienic, 67% of the children in the age group of 1-5 years defecate on the house yards, 18% use latrines while the rest defecate in the bushes or at road sides. Excreta of 52% of children below 1 year are thrown in the bush or to the back side of the house, 35% are washed in water, such as ponds and rivers and 3% under tubewells.

The health implication of unsanitary latrines or surface defecation are not properly understood by the population. The households with a higher educational level have more sanitary latrines compared to illiterate or less educated ones.

In summarizing the technology of the latrine substructures including pans and slabs and superstructures as have been found by the sample survey it is reported that CC and FC pans and slabs are widely used (36%). Ceramic pans are also in use. RCC rings are used for latrine pits by fifty percent of the users. CI sheets as roof and door materials are in common use for sanitary latrines. This kind of material is used by 45% of the households, while brick comes to use as wall materials (68%). 58% households having two-pit latrines reported the ceramic pan as "very good" and 38% reported about the same as "good". As regards the slab of the two pit latrines, 48% reported this "very good" and 45% "good". The substructure of two pit latrines was reported "very good" and "good" by 42% and 47% of households respectively. 18% households having single pit latrine reported the cement concrete pan and R.C.C. slab as

"very good" and 67% reported the same as "good" . 15% households reported the substructure of single pit latrine as "very good" and 50% reported the same as good. 53% of the households having unsanitary latrines do not have any pan. Of 47% households who have a pan, 50% reported it as "bad" and "very bad". 65% of the households with unsanitary latrines do not have any pan. Of 47% households who have a pan, 50% reported it as "bad" and very bad". 65% of the households with unsanitary latrines reported the latrine slab as "bad" and very bad", 30% reported it "good" and 5% as "very good". 70% households having unsanitary latrines reported the sub-structure as bad and very bad. 48% of households have spent less than Tk. 200.00 for their latrine substructure and 42% incurred the same amount of expenditure for the superstructure.

As regards the source of procurement of a latrine, 30% of the users reported that it was procured from private producers and installed on a self - help basis, 27% of them procured from Municipalities, 20% from DPHE and 23% from other sources such as UNICEF/NGO. With the exception of Nawabganj, 8 Pourashavas have private producers of low cost latrines and RCC rings. During 1987 the private producers within all 9 Pourashavas sold 5314 slabs and 35445 rings. There are considerable seasonal fluctuations, in demand and sale. During dry season (winter) there is higher demand for latrine components and the situation in the rainy season is reversed. The highest number of units were sold in winter followed by sales during summer. Average monthly sales in winter amounts to 721 slabs and 4350 rings and in summer the corresponding figures are 708 slabs and 4036 rings while during the rainy season average monthly sales are 181 slabs and 1187 rings(table 11.1). Relatively more rings were sold in winter since buyers had easy access to the sales centres and lower transportation costs. It is also found that RCC rings are used for the construction of dug wells in many places and it is convenient to construct the same during the winter.

Regular cleaning of the latrines is mostly done by family members (59%). 37% respondents stated that thy did not clean their latrines at all.

As regards the removal of pit materials from single and double-pit latrines, in most cases (89%) hired persons i.e. Pourashava sweepers perform the job. In 5% cases, family members do the job of cleaning. Pit changing for pit latrines is done by hired persons in 50% of the households, family members presently do it in 20% of the cases only. However, many two-pit latrine owners feel that pit changing and removal of pit material could be done by family members.

The survey findings reveal a consumers' preference for the use of smooth pans that can be kept clean and need less water for flushing instead of CC/FC pans which make excreta stick to the pan so that the cleaning becomes problematic. The proposed latrine should be free from bad smell and the arrangement should be such that the handling of fresh excreta is not needed, while removal of pit materials can be easily done at limited cost.

Of those who did not have a sanitary latrine, all expressed willingness to acquire one. All the households with single-pit water seal latrines having familiarity with the double-pit system would like to switch over and the following advantages were mentioned :

- more permanent in nature than a single pit latrine

The current manufacturing cost of a direct pit water seal sanitary latrine of five 30" dia 12" high RCC rings is about Taka 500 and that of a two pit latrine with ceramic pan, PVC soil pipe, junction box, 14 RCC rings of 42" dia. 9" high is around Tk.2500.

Respondents having no sanitary latrines showed interest in procuring good ones if the price range and monthly instalment would come within their reach. Of the households who wanted improvement, 46% can't afford to pay any price for installation of a sanitary latrine. Those who can afford are widely dispersed in the price range. 9% of the households wished to pay upto Tk.250, 13% offered the price between Tk. 250-500, 11% can pay the price ranging from Tk.500 to 1,000, while 14% feel more comfortable in their offered price ranges which are much above the procurement cost of a single pit latrine while only 7% can afford to pay the cost of a double pit latrine. The response to price was significantly higher when the respondents were given the option for instalment payment. 83% respondents having no sanitary latrine showed interest in procuring good latrines on a quarterly (29%) and monthly (54%) payment system. The ranges of instalments shows a repayment period of 3-10 years (for sub-structures only) based on type of sanitary latrine.

The present state of sanitation in the Pourashavas demand the involvement of more than one organization: Such as private producers, NGOs and municipalities, to spread the sanitation coverage within the shortest time frame. As per the 1977 ordinance, municipal authorities are responsible for maintaining sanitary conditions within the Pourashava areas. But the municipal organizations with their limited manpower and material resources are incapable of rendering the desired level of services. The municipality by the responsibilities vested in them should remain as a focal point in a township for sanitation and should co-ordinate activities and keep the records. Private producers of sanitary latrines are presently playing a vital role in the production and sales of low cost latrines and give occasional advise to users as to the installation and up-keep of latrines. They may be organised and given training, logistic support and support for product development while credit-financing aspects should be considered.

1. INTRODUCTION

1.1 Sanitation in Urban Bangladesh : Main Problem Areas

The problems of sanitation are not distributed equally throughout the country. Rural urban differences in this regard can be readily citable. In urban areas one can locate where the problems are more severe. In addition to other kinds of sanitation problems, human excreta are associated with more than 50 diseases. Human excreta spreads diseases of common types such as diarrhoea(including cholera), typhoid and worms. The sanitation problem remains acute in the Pourashavas of Bangladesh where there is

- Shortage of improved water supply
- Low coverage by sanitary facilities
- Presence and growth of slums
- No adequate service for disposal of night soil, fluid and solid waste
- Very few public toilets (that are not used by women and children anyway)
- Inadequate cleaning of latrines and public toilets (when present)
- Lack of health education and health information

The control of faeco-orally transmitted diseases will primarily be dependent on

(a) the sanitary disposal of faeces and subsequent destruction of the harmful organisms contained in the faeces.

(b) Personal hygiene, sanitary disposal of excreta and washing hands after defecation and before meals, as well as before feeding children and babies.

The sanitary disposal of faeces does not in itself control the spread of disease, a drop in incidence will only be encountered when sanitation is linked to the provision of ample water for hand-washing and bathing as well as to the introduction of sanitary latrines.

In view of the problems cited above, the present study undertakes an examination of the existing defecation practices in urban areas and the relationship between socio-economic variables and defecation practices as well as the scope for increase of the capabilities of the Pourashavas and private producers to arrange for local manufacture of LCS latrine components that can be readily available to the public. It also attempts to describe the people's interest in procurement, design preferences and the potential users affordability for low cost latrines.

2. THE STUDY

2.1 Background and Objectives

Background

The present report is written in fulfillment of the requirement of an agreement signed between the World Bank Resident Mission, Dhaka and AQUA Consultant & Associates Ltd. on August 2, 1988 to conduct a socio-economic study on low cost sanitation programme in 9 Pourashava towns in Bangladesh.

In November 1979, the Government of Bangladesh approached the UNDP Global Project to assist GOB in preparing a master plan for a low cost water seal latrine project covering 10 representative towns of Bangladesh. The study was conducted concurrently with the construction of 500 two-pit demonstration latrines in the project towns. The installation of 408 latrines was implemented during the period of study. Based on this study, a feasibility and master plan report was prepared in December 1981 suggesting phased implementation of low cost water seal latrines in 10 project towns. The project implementation did not materialise for lack of funding.

The on-going low cost sanitation project was initiated in December, 1984 as a research and training project in 51 Pourashavas with a commitment to install 5 "demonstration latrines" in each Pourashava. Such costly latrines are defined as two offset pit pour-flush water seal latrines.

In December 1986, the scope of the project was modified to include 84 pourashavas and provide for the installation of 5942 latrines. The revised project included among other things a socio-economic survey of the existing sanitary conditions as well as a study of people's attitudes and expectations in regard to improved sanitation and the costs per unit of latrine components.

The original TOR of the survey was formulated to collect household data from 15 Pourashavas based on a detailed household survey questionnaire (HSQ). The sample size was set at 40 for each Pourashava. 50% of the samples were to be selected from those households who had demonstration latrines or were familiar with such, and 50% from those who were not familiar with demonstration latrines or had other types of latrines or no latrine at all. But in the revised TOR, the number of towns was reduced to 9, while the sample size was set at 720 to form a reasonable statistical base.

The revised TOR also included the physical aspects of excreta disposal (all methods in use) and the proportions of populations served by each type as well as arrangements for the construction and maintenance of latrines including those in the slum areas. It stressed peoples' views on sanitation problems as well as their suggestions as to alternative solutions and the requirements for public health education.

The survey was carried out following the revised TOR (Appendix-1).

Objectives:

(a) General

The objective of the survey was to generate field based data on the following aspects :-

- sanitation coverage.
- defecation practices of adults and children.
- disposal practices for children faeces.
- people's views on sanitation problems and on "alternative solutions".
- consumer preferences for latrine types and designs.
- consumer willingness to pay for and the affordability of sanitary latrines.
- organisation of producers, possibly in the future to be entrusted with the responsibility for installation and servicing of latrines.

(b) Particular

- sanitation coverage by type and population served by each type.
- public toilet facilities in slums, educational and religious institutions and market places.
- assessment of public awareness on the nature and importance of sanitation and health implications for the Pourashava residents.

- assessment of additional health and hygiene education required.

- consumer's preferences in terms of latrine component design highlighting the views of consumers regarding merits and demerits of different design options.

- assessment of consumer needs for product information.

- consumer's preference for type of superstructure and the related responsibilities for building the same.

- ability of households to pay for sanitary latrines at full cost and at varying levels of subsidy.

- which (if any) types of credit arrangements would consumers prefer, the size of instalments and intervals.

- consumer's assessments regarding the service-quality of municipalities.

- consumer's preference for the management of responsibilities as installation, servicing and maintenance of facilities.

- the role of private producers and sellers.

2.2 Limitations

The study suffered from limitations some of which have been identified. The following are the main limitations :

(a) Very limited time and scope for indepth long term association of the investigators with the respondents which is an important factor of social survey in the context of the observation method applied for data collection in the present study. This limitation could not be overcome because of a very limited time schedule for the survey.

(b) Social factors limited the scope of work in data collection. Womenfolk observing purdah could not be easily contacted to generate data about women's sanitation problems.

(c) As soon as the investigators arrived at the project area, the respondents became doubtful about them till the research aim was explained. When they became aware of it, they thought that government might give them latrines free of cost.

(d) Misreporting due to memory loss and non-response as to non-reporting of respondents.

(e) Physical constraints also limited the free flow of information. Respondents occasionally expressed their reluctance to cooperate with the study team.

(f) The study was given a nice start. But due to 5 months' delay in awarding approval by The World Bank,the team leader and other experts joined another project. Because of the frequent change of experts, it was difficult to maintain a uniformity of standard and many flaws were detected. Later on necessary corrections and improvement were made on the advice of a senior professional sociologist.

3 METHODOLOGY

3.1 Selection Process of Pourashavas

To collect relevant data, the survey applied a mixed methodological strategy which included :

- observation
- expert opinion (key informants' interview)
- group discussion
- household survey

Nine Pourashavas were selected as the initial step to conduct the survey based on the above methodological techniques. To draw sample towns (9), Pourashavas where demonstration latrines were installed had been listed (60 in total) according to population size and administrative divisions. The representativeness of the samples was ensured by stratification on the basis of administrative divisions wherefrom 9 samples of Pourashava towns were drawn purposely keeping in view the population size. The selected samples were taken from all Divisions and comprised populations ≥ 35,000. The population size of the towns is given below :

Pourashava	Population	Administrative division
Cox's Bazar	35,500	Chittagong
Gopalpur	38,398	Dhaka
Laksham	44,500	Chittagong
Gazipur	79,854	Dhaka
Jhenaidah	80,000	Khulna
Brahmanbaria	102,000	Chittagong
Chandpur	125,000	Chittagong
Mymensingh	170,000	Dhaka
C. Nawabganj	171,000	Rajshahi

3.2 Preparation of Infrastructure and Income Zoning Maps

To facilitate the drawing of samples for use in the present household survey on the basis of income groups (lowest, lower middle and middle), maps of selected Pourashavas were drawn to show household clusters of different income groups. Also infrastructure such as roads, railroads, rivers and offices were marked on the maps for easy movement of the study team to contact households and relevant offices while conducting the survey.

3.3 Sample Plan of Households (the Units of Analysis)

To serve the purpose of the study, two main types of samples were selected : (A) households having familiarity

with the demonstration latrine, and (B) households having no familiarity with the demonstration latrines. Sample households of both categories were taken in the vicinity of the demonstration latrines. Households with septic tanks were however excluded from the HSQ. In total 715 households were purposely selected. 366 households have been taken as sample for A category (having familiarity with demonstration latrine) and 349 for B category (having no familiarity with demonstration latrine). Sample households were purposely drawn in the following manner :

(a)	91	samples from DL (list obtained from DPHE)
(b)	275	samples taken from the vicinity of the demonstration latrine form group A (having familiarity with demonstration latrines).
Sub-total	366	
B.	349	Samples drawn from door to door interview for group B (having no familiarity with demonstration latrine).
	N = 715	

Each main category of samples had three sub-categories by income (lowest income group, lower middle income group and middle income group) and each of these sub-categories had 120 households. Finally, each income sub-categories(particularly the lower and lower middle) included 60 households having some (unsanitary) latrines and 60 households with no latrine.

Household interviews were carried out in nine Pourashavas and 80 samples were taken from each town except Laksham where only 75 samples were collected. Thus the total HSQ samples were reduced to 715.

3.3.1 Household Survey

Three sets of questionnaires were utilized namely,

(a) household survey questionnaire (HSQ)
(b) door to door survey questionnaire (DDSQ)
(c) producers and sellers investigation questionnaire (PSIQ)

The above survey instruments were initially prepared in the head office by the experts of the relevant disciplines. Afterwards the questionnaires were field tested in Gazipur. Field tests were carried out three times to arrive at the final questionnaire version.

In all 8 investigators including two females carried out the field work. These were initially trained on practical and theoretical aspects by a Danida socio-economist and the consultant sanitary Engineer in the head office. Different latrine components were shown to the field investigators in the DPHE demonstration centre at Mohakhali and in a private shop in Dhaka. They were afterwards taken to Gazipur to complete the questionnaires by themselves under the guidance of the experts. The actual field work was taken up by the team when the experts were convinced that they had developed skills to smoothly carry out the survey. The investigators carried photographs of the various pans, rings and latrine superstructures and displayed such to the respondents, while they explained the cost involvement. The questionnaires listed above are presented in APPENDIX - II of this report. Pourashava-wise samples collected are given in table -3.1.

Table-3.1 : Samples Administered Under Questionnaire Survey

Pourashava	No. of Samples		All Producers
	Household Survey	Door to Door Survey	Producer and Sellers Survey
Cox's Bazar	80	104	4
Gopalpur	80	306	3
Laksham	75	300	7
Gazipur	80	107	7
Jhenaidah	80	306	3
Brahmanbaria	80	102	5
Chandpur	80	101	7
Mymensingh	80	152	8
C. Nawabganj	80	100	2
Total :	715	1578	46

After pre-testing, the questionnaires were administered to the household heads, housewives, door to door respondents and producers/sellers to obtain basic socio-economic information about households and data on latrine design and components i.e. detailed information on pan, slab, sub-structure, source of acquisition, expenditure incurred, latrine servicing and maintenance, willingness to acquire an improved sanitary latrine, affordability, willingness to pay, terms of credit preferred.

The household survey was accompanied by observation. The observational investigation, by using a checklist, identified the type of housing structure, the immediate surroundings and presence of public utilities. These

observational findings are addenda to interview data to indicate the affordability for households to pay for sanitary latrines.

3.3.2 Door to Door Survey

The intention behind this survey was to obtain information on the sanitation coverage of the study towns. Since HSQ did not include households with septic tanks, population coverage by this technology type was not shown. The door to door survey was therefore considered imperative to supplement information in regard to the population coverage by latrine types. In the TOR, this survey was not mentioned. But the DANIDA supervisor in consultation with AQUA Consultants agreed to conduct a survey of this nature i.e. to find out how many households have latrines, how many exclusive or shared latrines, types of latrines (i.e. tank,sanitary and unsanitary) and sources of acquisition (private-producers/sellers etc.). In all 1578 households were interviewed in 9 towns on the basis of door knocking i.e. knocking on every household door in the streets selected for the survey by type of location and habitational density. If no one was available, the next door had been the target for interview. This survey helped identifying the income sub-category of households having either sanitary latrines, unsanitary latrines or no latrine.

3.4 Focus Group Interview

In each of the nine selected Pourashavas, guided group discussions were held to generate data on preference for design, views on the services rendered by the municipal authority, and preference for organizational involvement in the installation of latrines. The groups were homogenous in respect to possession of latrines by types and familiarity with latrines. These groups were formed on the following criteria :

- those having demonstration latrines
- those who were familiar with demonstration latrines
- those having unsanitary latrines
- those who did not have any kind of latrines

When groups were selected on the basis of sex, male and female investigators were employed to conduct the discussion of the respective groups of their sex. Structured interviews and open discussion techniques were used for the focus group interviews.

3.5 Key Informant Interview

Reliable and indepth information was collected from knowledgeable persons on various aspects of sanitation facilities and technology available in the town, consumers' preference for design and the involvement of organizations for installations and servicing of the latrines. Key informants as per terms of reference were Pourashava sanitary inspectors, ward commissioners and leaders of NGOs, but in course of the survey it was realised that interviews with other officials such as SAE/AE (sub-assistant Engineers/Assistant Engineers) of Pourashavas and DPHE, LGEB, as well as high school and college teachers were needed to obtain necessary and reliable data about sanitation and the related technology.

3.6 Private Producers Survey

A private producers survey as a supplement was also undertaken. The objective behind this survey was to describe the present involvement of non-government producers in the production and marketing of latrine components.

A questionnaire survey was conducted to collect data on business type (i.e. producers, wholesalers and retailers), present and previous occupations of the manufacturers and sellers, production of latrine components, sales prices, permanent staff employed, seasonal production and sales, training background of the producers, and such advise on installation and servicing of latrines as usually given. 46 latrine producers from government and private organizations were subjects for interview. The survey did not include such sellers involved in the business of imported ceramic products only.

4. POURASHAVA PROFILE

4.1 General

It was suggested by the DANIDA Consultant that it would be useful for the survey to have a socio-economic profile of each study town. The preparation of such town profiles helps facilitating the drawing of samples for use in household surveys on the basis of income groups (lowest, lower middle and middle) and the locations for possible future urban growth. The town profiles were compiled on the basis of the above suggestions.

4.2 Sample Pourashava Profile

Field work was carried out by the field manager to collect multiple data on infrastructure, house types, commercial, institutional and administrative establishments, roads and highways, drains, water supply, sanitation, gas and electricity, etc. In the final preparation of the town profile, the sociologist held both intensive and extensive discussions with the Pourashava and district administration, public representatives and local elites. Some important data on the selected Pourashavas are presented in appendix-III, while other are given in the following sub-sections.

To bring out the socio-economic background of the sample towns, Pourashava maps were drawn showing various income zones, commercial and residential areas including slums, infrastructure, Pourashava boundaries, roads, railways, etc. These maps were prepared during field visits and are provided in appendix - III.

4.2.1 Brahmanbaria

Brahmanbaria is a district with a cultural heritage. It is located between 24^{o} - 18′ north latitude and 90^{o} -45′ east longitude and 122.28 km drive from Comilla by road.

Brahmanbaria Municipality was established in 1869 when 14.24 square km.came under its municipal area. In recent times, the municipal town has extended considerably and the urban area now exceeds 64.72 square km.. However, there is no official recognition of this fact. The town is divided into two parts i.e. north and south by a narrow tributary of the Titas river.

The town is bounded by Shaidpur Union to the north, Ramsal to the South, Kalishima to the west and the Titas river to the east.

Brahmanbaria being an old township previously an important centre of trade and commerce. Today its major function is administrative. Brahmanbaria is well-connected by rail with Dhaka and Chittagong metropolis, Comilla town and other important trade centres of the country.

The total Population of Brahmanbaria town comes to 87570, according to the population census 1981. Most of the roads and lanes in the town are narrow and congested. Common types of transport are rickshaws, motor cycles, cars, buses, trucks and push carts. Brahmanbaria has a number of small and large industries. The biggest gas field of the country is located in the northern part of the town.

As regards the residential distribution of the population, the land use report states that of 3,495 acres of municipal land, 664 acres or about 19% comprise the unevenly distributed residential area. People with high incomes mostly reside in the core area, middle and lower income groups are spread over the fringe areas of the town.

Tubewells seem to be the most common source of drinking water. Piped water with very low pressure is available for a small percent of the population.

Toilet facilities in the town include water seal sanitary latrines, service and pit latrines. Septic tanks are used in the concentric zone of the town. The municipal administration provides sweepers for cleaning 9 service (bucket)latrines. Excreta disposal sites are located on the immediate northern part of the canal. Public toilet facilities consist of 5 latrines with 2 seats each.

4.2.2 Chandpur

Chandpur Pourashava town stands by the eastern bank of the Meghna and is located between 23^{0} - 13′ west latitude and 19^{0} - 39′ east longitude. This municipal town is 72.40 km. by road from Comilla. Chandpur is accessible by road, waterway and railway from Dhaka and other parts of the country. The town is divided into Puran Bazar (old town) and main town by the river Dakatia. Puran Bazar is the commercial centre while the administrative installations are situated in the main town.

Chandpur municipality came into being in 1978 with an area of 8.28 square km.. It is bounded by Keralia village in the north, Bishnandi village in the east and village Sriramdi in the south and the river Meghna in the west. In the course of 100 years, the area did not expand much, although the population has increased manifold.

The population of the town at present is about 125000 (as reported by the municipality during survey) living on an area of 12.8 sq. km. There exists a piped water supply system in the town which is under expansion with Dutch assistance. Presently 1834 holdings are connected with piped water supply covering nearly 20% of the town dwellers. Also there are 350 street hydrants which meet the drinking water requirements of about 30% of the inhabitants. The rest of the population depend on private and public tubewells, ponds and river water.

There are 13 public latrines with a total of 36 seats within the municipal boundary, and all of them remain in working condition. The toilet problem is more acute for the female residents of the slums and low income areas.

4.2.3 Cox's Bazar

Cox's Bazar town is the administrative headquarters of Cox's Bazar district and located between 21° - 27' north latitude and 9° - 59' east longitude. The district town is 154.46 km. by road and twenty minutes by air from Chittagong.

Cox's Bazar municipality was established in 1869 to serve only two thousand people. At present the administrative area spreads over in 6.80 Sq. Km. The town is bounded by Hashemia Madrasa to the East, the airport to the North, the Bagkhali River to the South and the sea beach to the West.

The 1981 census reported a population of 18000 in Cox's Bazar town. As per DPHE source, the present resident town population is 35500.

The most important aspect of Cox's Bazar's economy is its fishery. Shrimp and prawn culture is being carried out on 50,000 acres of land. Another important economic aspect is salt production. A good number of small industrial enterprises have also emerged within the town itself.

Urban facilities are inadequate in view of the increasing number of users, except those who can afford piped water connections or private tubewells. Most of the lower income groups complain about the scarcity of drinking water. There are 3 public toilets of which only one is functioning. In order to maintain municipal services, the authority employ 20 sweepers to clean 930 service latrines. The sanitation problem in slum areas is more seriously faced by the women most of who wait for the sunset or defecate in the bush. During the rainy reason, the ordinary surface latrines overflow posing a health problem for all.

4.2.4. Laksham

Laksham town, the upazila headquarters lies between 23° -14′ north latitude and 9Ø° - 7′ east longitude. It is 25.74 km.by road from Comilla. Laksham has a big railway junction that connects Dhaka, Chittagong, Comilla and Sylhet. It is also accessible by waterway.

Laksham Pourashava town is bounded by Faizganj to the North, Gazimura to the South, Payarapur to the West and Narpati village to the East. The total area covered by the Pourashava is 19.4 square km. According to the Pourashava administration, the current population of the town is 445ØØ. The population retain many rural assumptions on life. The majority of the people are either directly or indirectly engaged in agriculture. The rest are mostly workers in different mills and factories, rickshaw pullers, small grocers and merchants. The population of the town is mostly Muslim while about 1Ø% are Hindus who are engaged in business and technically skilled professions.

Neither the Pourashava, nor the DPHE have as yet introduced piped water supply facilities in the town. Tubewells are the most common source of drinking water. For the lower income groups ponds and tanks are the only source of water supply. There are 8 public toilets all in running condition.

4.2.5 Chapai Nawabganj

Chapai Nawabganj lies between 24° -6′ and 25° -13′ north and 88° -21′ east longitude. It is a district headquarter, only 47 Km away from Rajshahi by road. The municipality of Nawabganj was established in 19Ø3. It was reconstituted in 1961 and now its jurisdiction extends over 24 square Km. 171ØØØ people live in the town (as mentioned by the municipality during survey).

The town has 3 public toilets and all are in good condition. The Pourashava has 5Ø sweepers for sweeping roads, drains and 683 service latrines . Chapai Nawabganj has a piped water supply system. There are 775 house connections and 42 standposts which serve 1Ø% of the resident population. Hand pumps serve another 4Ø% of the population and about 5Ø% depend on dug wells, ponds and river water.

According to Pourashava information septic tanks, single pit, double-pit and service latrines exist the town. Major occupational groups are grocers, traders and agriculturists. As a seasonal occupation, mango growing and selling has some importance.

Although official evidence does not confirm, still the people reported about trafficking in women and drug smuggling as the town lies close to the Indian border. Chapai Nawabganj is expanding towards the eastern side.

4.2.6 Jhenaidah

Jhenaidah is a district town situated between 22° - 47′ and 23° - 47′ north latitude and 23° -33′ and 90° -11′ east longitude. It is 37.00 km.away from Chuadanga connected by all weather road with Kushtia, Jessore and Magura. The town lies on the bank of the river Nabaganga. The river divides it into three parts.

Jhenaidah has a Pourashava having jurisdiction over 12.5 square Km with a total population of 80,000 (as reported by the municipality during survey). There are 6 public toilets with septic tanks and all are found in working condition. For cleaning roads and 360 servicing latrines Pourashava keeps 24 sweepers on its pay roll.

As regards piped water supply, the town has 781 house connections and 17 standposts that serve 20% of the population, hand tubewells serve 45% of the population. The rest of the dwellers use ponds, tanks, wells and river water.

Besides permanent settlements, a residence of floating population is found adjacent to the eastern part of the core area. Besides government employees and other professional groups, the economic activities of most of the residents are directly or indirectly related to agriculture and transport business. There are 4 rice mills, 4 textile mills, 1 pharmaceutical laboratory, 5 engineering and 10 furniture manufacturing shops, as well as 3 producers and sellers of latrine components.

The water supply system of the town has been improved recently with Japanese assistance. The town has three overhead tanks, but individual water connections are given only to the households lying along the main road.

4.2.7 Mymensingh

Mymensingh is the district headquarter and is situated between 24° - 25′ north latitude and 90° - 25′ east longitude. The area of the town is 21.7 Sq. Km. Mymensingh town stands by the side of the old Brahmaputra river and is bounded by the former Kakardhary Union and the Brahmaputra to the North and Kawakhali to the South, the river Brahmaputra to the East and Akua union to the West.

Absence of toilets and latrines is observed in the lower income town quarters. In the residential areas, the general sanitary condition is extremely poor. Open fields, bushes and road sides are the common places where people defecate.

Gazipur being an expanding commercial and industrial town has a large floating population. Squatter type settlements have sprung up around the railway station.

4.2.9 Gopalpur

Gopalpur town in the district of Tangail lies between 24^{o} -14′ north latitude and 89^{o} -56′ east longitude. It is 150 km by road from Dhaka and 50 km from Tangail headquarters.

Gopalpur is bounded to North by Dhopakandi Union, to the South by Mirjapur Union, to the West by Deulabari and to the East by Alom Nagar Union. Its total area at present is 12.5 sq. km. with a population of 38,398 (as reported by the municipality during survey).

Of the residents, about 75% are agriculturists, 15% business people, 5% service people while the remaining 5% pursue other vocations.

Gopalpur town has one upazila health complex and one municipal dispensary. The town has no piped water system and there is only one public toilet with 3 seats. Most of the lower income residents defecate on the open field, in the bush or use a neighbours′ latrine (when available). The Pourashava has only 4 sweepers on its pay roll. Although the town has no slum, a cluster of floating population, mostly day labourers, rickshaw pullers and beggars live in the settlements at Sultanpur, Voaurchar and Abainagar.

5. SOCIAL AND DEMOGRAPHIC PROFILE OF THE HOUSEHOLDS

5.1 Age, Sex and Family Size

The household data obtained by posing Q 2 and Q 3 in questionnaire-1 (Household Survey Investigation) highlighted important demographic characteristics (age, sex and family) of the households. This gives an idea of households' family composition. Answers to the questions were recorded with some non-response. 23.6% of respondents were females who were mostly housewives. The female investigators mostly interviewed the female respondents.

The weighted average of household size for the 9 Pourashava towns is 8.3 as against national average of 6.52 (statistical year book 1987). 22.7% households have less than 5 members and 56.5% have between 6 and 10 members, 15.5% have a family size between 11 and 15 and the rest 5.3% have 16 members and above. (table - 5.1) These are consolidated figures of 9 selected Pourashavas under study. The average family size of each Pourashava towns are given in table-5.2 to make a comparison between the municipal towns.

Table - 5.1 : Distribution of Households According to Number of Household Members

Members of Household	No. of Households	%
5 and less	162	22.7
6 to 10	404	56.5
11 to 15	111	15.5
16 and above	38	5.3
Total :	715	100.0

Table - 5.2 : Average Family Size in Pourashavas

Pourashava	Average size (X)
Mymensingh	8.2
Comilla	6.4
Brahmanbaria	7.6
Jhenaidah	9.1
Gopalpur	9.2
Gazipur	8.7
Chandpur	8.4
Cox's Bazar	8.3
Laksham	8.4

5.2 Education

To know the level of education of the respondents (heads of households) provision was made in the questionnaire under the box heading "interviewee profile".

Table - 5.3 : Distribution of Respondents According to Level of Education

Level of Education	No. of Respondents	%
No Schooling	248	34.7
Primary	141	19.7
Secondary	215	30.0
Intermediate	55	7.7
Degree	42	5.9
Post Graduate	14	2.0
Total :	715	100.0

Usually main earning member of the household takes major decisions in matters of financial involvement. It was therefore considered important to know the educational level of the earning members of the family. Table - 5.4 shows the level of education of the main earning members of the households.

Table - 5.4 : Distribution of Main Earning Members of the Households According to Education

Level of Education	No of Main Earning Members	%
No Schooling	219	30.6
Primary	137	19.2
Secondary	227	31.8
Intermediate	56	7.8
Degree	55	7.7
Post Graduate	21	2.9
Total :	715	100.0

5.3 Occupation

Data on occupational distribution of the respondents and earning members speak about the manifold nature of household activities. In a subsistence economy like the one in Bangladesh, the distribution pattern of primary occupations presented in table -5.6 seems to be reasonable and valid. Even in our sample towns 16.7% of the respondents on average are farmers. If we consider only the sources of employment, business and agriculture are the most important ones providing 50% of the total employment.

Wage labour is the next important occupation (21%) (table-5.6).

Table - 5.5 : Distribution of Main Earning Members According to Occupation

Occupation	No of Main Earning Members	%
Small Trade	107	15.0
Medium Trade	88	12.4
Large business	43	6.0
Service	144	20.3
Farmer	119	16.7
Skilled labourer	83	11.7
Unskilled labourer	65	9.1
Teacher	26	3.7
Housewife	6	0.8
Others	19	2.7
No work	11	1.6
Total :	711	100.0

N = 711 Missing = 4

5.4 Income

In agro-based towns under study, business and farming constitute the major sources of income of the households (51%). However, other sources were also found. Higher percentages of businessmen, serviceholders, and farmers are found in the higher income groups. 29% earn from taka 10,001 to 20,000 annually followed by 23% who have an income range of Tk. 20,001 to 30,000. Only 15% earn more than Tk. 50,000 a year. Table - 5.7 shows the distributions of household income by occupation. 13 respondents did not reveal their income in anticipation of tax imposition by the authority. So the total size of the respondents came down to 702.

To establish correlation between income and expenditure and to have a better view of monthly income, the household expenditures were recorded in table - 5.7. The household expenditure survey was carried out in 7 Pourashavas where the total samples were 555. The decision of expenditure recording were taken after the initial survey had started and data collection on Gazipur and Gopalpur was already complete.43% of the households annually spent between Tk.12,000 - 24,000 as compared to 29% of the households annually earning between Tk. 10,001 - 20,000. It seems that there is an imbalance between earning and expenditure since expenditure and income figures are not calculated from the same sample. The figures may be inadequate since 2 sample Pourashavas were not under investigation for household expenditure.

Table - 5.6: Distribution of Households According to Income and Occupation

Yearly Income Taka	House Wife	‡Unem-ployed	Small Traders	Medium Traders	Large Busine-ssmen	Far-mer	Service	Teacher	Un-Skilled Labour	Skilled Labour	Other	Row Total
Up to 10,000	1 (1)	0	7	0	0	8	5	0	13	6	7	47
	2.1(2)	0	14.9	0	0	17.0	12.8	0	27.7	12.8	14.9	6.7
	16.7(3)	0	6.5	0	0	6.7	4.2	0	20.6	7.6	38.9	
10001 - 20000	3	2	47	0	0	48	34	3	35	29	6	207
	1.4	1.0	22.7	0	0	23.2	16.4	1.4	16.9	14.0	2.9	29.5
	50.0	18.2	43.9	0	0	40.3	23.9	11.5	55.6	36.7	33.3	
20001 - 30000	1	3	53	0	0	25	33	6	13	25	3	162
	0.6	1.9	32.7	0	0	15.4	20.4	3.7	8.0	15.4	1.9	23.1
	16.7	27.3	49.5	0	0	21.0	23.2	23.1	20.6	31.6	16.6	
30001 - 40000	0	1	0	55	0	13	28	6	1	11	1	116
	0	0.9	0	47.4	0	11.2	24	5.2	0.9	9.5	0.9	16.5
	0	9.1	0	62.5	0	10.9	19.7	23.1	1.6	13.9	5.6	
40001 - 50000	1	2	0	33	0	10	13	4	0	1	0	64
	1.6	3.1	0	51.6	0	15.7	20.3	6.3	0	1.6	0	9.1
	16.7	18.2	0	37.5	0	8.4	9.2	15.4	0	1.3	0	
Above 50000	0	3	0	0	43	15	29	7	1	7	1	106
	0	2.8	0	0	40.6	14.2	27.4	6.6	0.9	6.6	0.9	15.1
	0	27.3	0	0	100.0	12.6	20.4	26.9	1.6	8.9	5.6	
Total :	6	11	107	88	43	119	142	26	63	79	18	702
Col %	0.9	1.5	15.2	12.5	6.13	17.0	20.2	3.7	9.0	11.3	2.6	100.0

Figures have been rounded upto the nearest point.
N = 702 Missing = 13

(1) = Absolute
(2) = Row Percentage
(3) = Column Percentage

Note:- 1. Small businessman, annual income limit upto Tk. 30,000
2. Medium businessman, annual income range Tk. 30,000 to 40,000
3. Large businessman, annual income above 50,000

‡ Households of unemployed catergory derive their income by renting out their farm's land to farmers.

Table - 5.7 : Distribution of Sample Households According to Monthly Expenditure

Monthly Expenditure	No. of Household	%
1000 and less	95	17.1
1000 - 2000	238	42.8
2000 - 3000	127	22.9
3000 - 4000	58	10.5
4000 - 5000	20	3.6
5000 and above	17	3.1
Total :	555	100.0

For 59.3% of the households having a yearly income of <30000, there will not be much surplus left to buy latrines.

6. HOUSING AND OTHER FACILITIES

6.1 Housing Structure

Sanitation in urban areas depends much on the structure type of dwelling houses with kitchen, store house and latrine. The present survey classifies the types of housing structures in the study area as Pucca, Semi-Pucca and Katcha structures.

Katcha housing structures (combinations)

Floor Materials	Wall Materials	Roof Materials
(1) Clay	Clay	Golpata
(2) Clay	Clay	Bamboo/CI Sheet
(3) Clay	Clay	CI Sheet
(4) Clay	Clay	Golpata
(5) Clay	Golpata	CI Sheet
(6) Clay	Bamboo	Golpata
(7) Clay	Bamboo	Bamboo
(8) Clay	Bamboo	CI Sheet
(9) Clay	CI Sheet	CI Sheet

Semi - Pucca Housing Structures (Combinations)

Floor Materials	Wall Materials	Roof Materials
(1) Clay	Brick	CI Sheet
(2) Brick	CI Sheet	CI Sheet
(3) CC	Bamboo	CI Sheet

Pucca Housing Structures (Combinations)

Floor Materials	Wall Materials	Roof Materials
(1) Brick	brick	RCC
(2) CC/RCC	brick	RCC
(3) Brick	brick	Reinforcement concrete
(4) CC	brick	CI Sheet

Table - 6.1: Town wise Distribution of House Dwelling According to Building Materials

Name of Town	Housing Type			Row Total %
	Pucca	Semi-Pucca	Katcha	
Laksham	Ø	2 (1)	73	75
	Ø	2.7 (2)	97.3	10.5
	Ø	1.7 (3)	13.5	
Mymensingh	2	12	66	8Ø
	2.5	15.Ø	82.5	11.2
	3.4	1Ø.3	12.2	
Gopalpur	3	1	76	8Ø
	3.7	1.3	95.Ø	11.2
	5.1	.8	14.1	
Gazipur	6	6	68	8Ø
	7.5	7.5	85.Ø	11.2
	1Ø.2	5.2	12.6	
Cox's Bazar	5	25	5Ø	8Ø
	6.2	31.3	62.5	11.2
	8.5	21.6	9.3	
Jhenaidah	9	3Ø	41	8Ø
	11.3	37.5	51.2	11.2
	15.3	25.9	7.6	
C.Nowabganj	28	31	21	8Ø
	35.Ø	38.8	26.2	11.2
	47.5	26.7	3.9	
Brahmanbaria	3	3	74	8Ø
	3.8	3.7	92.5	11.2
	5.1	2.6	13.7	
Chandpur	3	6	71	8Ø
	3.8	7.5	88.7	11.2
	5.1	5.2	13.1	
Column Total	59	116	54Ø	715
	8.3	16.2	75.5	1ØØ.ØØ

Count (1)
Row % (2)
Col % (3)

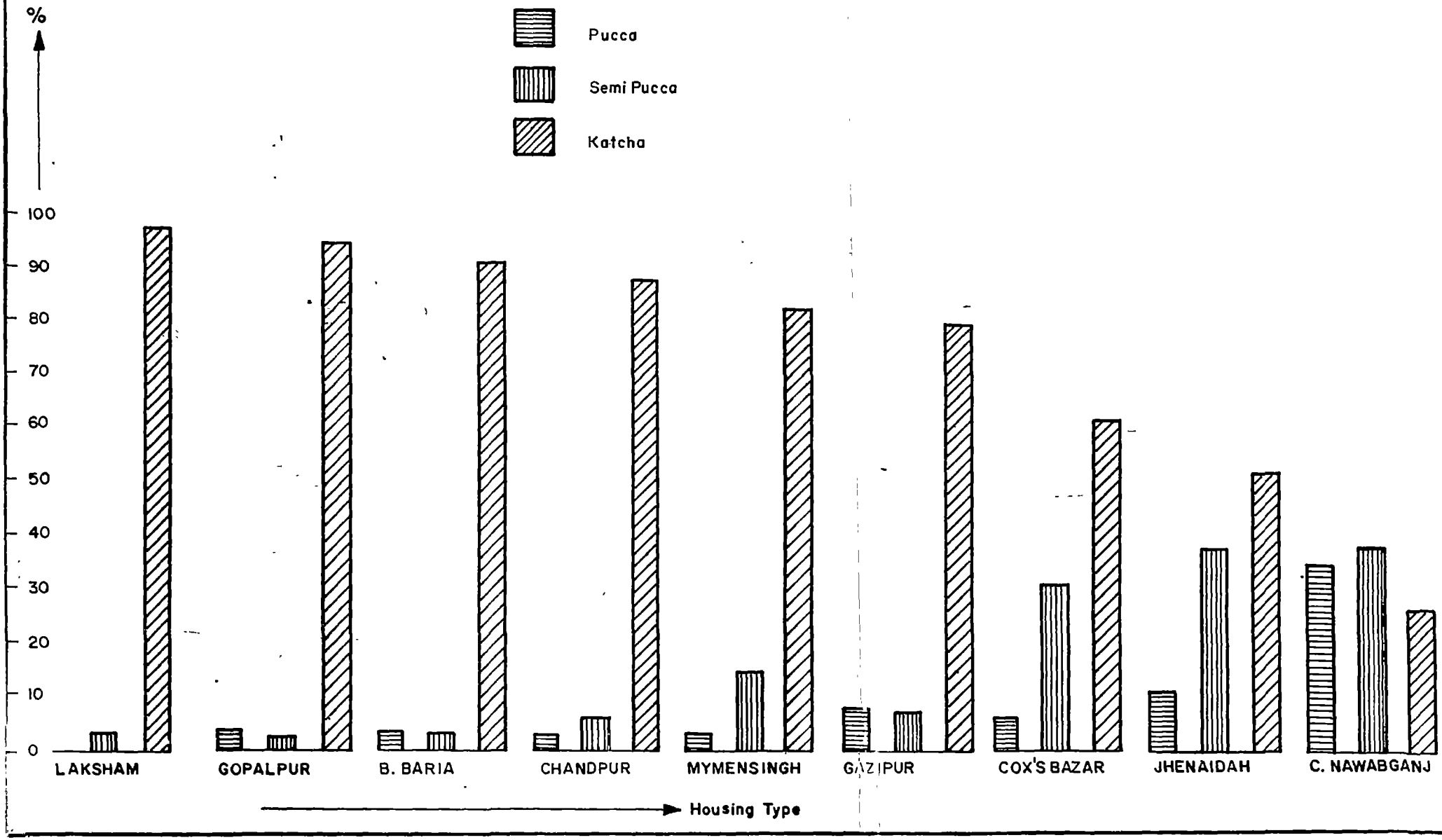
Table-6.1a : Distribution of Housing According to Combination of Construction Materials Used

Sl. No.	Floor Materials	Wall Materials	Roof Materials	No.of House-holds	Remarks
01	Clay	Clay	Thatched/Golpata	30	Katcha
02	Clay	Clay	Bamboo	5	"
03	Clay	Clay	CI Sheet	81	"
04	Clay	Golpata/Thatched‡	Golpata/Thatched	23	"
05	Clay	Jute Stick	CI Sheet	10	"
06	Clay	Jute Stick	Rice Straw/Thatched	12	"
07	Clay	Golpata	CI Sheet	24	"
08	Clay	Bamboo	Golpata	41	"
09	Clay	Bamboo	Bamboo	10	"
10	Clay	Bamboo	CI Sheet	218	"
11	Clay	CI Sheet	CI Sheet	57	"
12	Clay	Bamboo	Burnt Clay Tiles	9	"
13	Clay	Brick	Burnt Clay Tiles	7	"
14	Others‡‡ (Katcha)	-	-	13	"
			Sub-Total	540	
15	Clay	Brick	CI Sheet	27	Semipucca
16	CC	Brick	CI Sheet	38	"
17	CC	Bamboo	CI Sheet	15	"
18	Brick	CI Sheet	CI Sheet	36	"
			Sub-Total	116	
19	Brick	Brick	RCC	6	Pucca
20	Brick	Brick	CC	1	"
21	CC/RCC	Brick	RCC	36	"
			Sub-Total	59	
			Total :	715	

‡ Leaves of a tree abundantly grown in Southern Bengal.

‡‡ Others include combination of wall and roof materials such: timber/bamboo; bamboo/jute stick; bamboo/polythene; Jute stick/Polythene as wall materials and Bamboo/CI Sheet; Straw/CI Sheet; Clay tiles/CI Sheet; Clay tile/Bamboo as roof materials. In most of these cases clay is used as floor material.

TOWNWISE HOUSE TYPES
ACCORDING TO BUILDING MATERIALS



The Survey findings reveal that only few households have Pucca housing structure in the Pourashavas selected for study. The percentage of such house types is found to be highest in Chapai Nawabganj (35%), while in rest of the sample towns, the percentages remain very low. The study further finds out that a very high percentage of households have Katcha housing structures (75.5%). Distribution of households according to combination of house construction materials has been is shown in table 6.1a.

64.4% of Pucca houses have boundary walls, while the rest (35.6%) are found without them. Katcha houses mostly do not have boundary walls (92%) and the same is almost true in regard to semi-pucca houses (63%).

Table - 6.2 Distribution and Types of Sample Houses with Boundary Wall

Housing Type	With Boundary Wall	Without Boundary Wall	Row Total
Pucca	38 64.4%	21 35.6%	59 8.3%
Semi Pucca	42 36.2%	35.6% 63.8%	116 16.2%
Katcha	43 8.0%	497 93.0%	540 75.5%
Total	123 17.2%	592 82.8%	715 100.0%

6.2 Accommodation Type

Well-to-do people generally make their living accommodation in Pucca house structures with separate kitchen and exclusive sanitary latrines. But those who are poor live in Katcha houses having no separate kitchen, either they have unsanitary latrines or no latrine. The respondents accommodation type in relation to households annual income is presented in table - 6.3.

Table - 6.3 : Distribution of Respondents' Accommodation Type According to Households Annual Income

Income	Accommodation Type			Total
	Pucca	Semi-Pucca	Katcha	
Tk.1-10,000		1	46	47
		0.9	8.7	6.7
		2.7	97.9	
Tk.10,001-20,000	8 (1)	15	184	207
	13.8 (2)	13.2	34.7	29.5
	3.9 (3)	7.2	88.9	
Tk.20,001-30,000	11	33	118	162
	19.0	28.9	22.3	23.1
	6.8	20.4	72.8	
Tk.30,001-40,000	11	20	85	116
	19.0	17.5	16.0	16.5
	9.5	17.2	73.3	
Tk.40,001-50,000	6	16	42	64
	10.3	14.4	7.9	9.1
	9.4	25.0	65.6	
Above Tk.50,000	22	29	55	106
	37.9	25.4	10.4	15.1
	20.7	27.4	51.9	
Column Total	58	114	530	702
%	8.3	16.2	75.5	100.0

(1) Absolute
(2) Col %
(3) Row %

N = 702
Missing = 13

6.3 Tenure of Occupancy : Permanent Occupants and Renters

In reference to question 32 of Questionnaire - 1 of household survey, the findings have been reviewed and it has emerged that about 91% of the respondents have permanent occupancy in their own houses while 5% are renters (table-6.4). 30 respondents reported that they have neither their own houses, nor live in rented dwellings. They occupy abandoned houses where they live free of rents. The permanent occupants usually give thoughts for improvement of their latrines, but the renters, unsatisfied with unsanitary latrines, show keenness in improving the existing system (table-10.2). The trespasser residents were totally negative in regard to improvement of the unsanitary latrines they use.

Table - 6.4 : Distribution of Respondents According to Nature of Accommodation

Accommodation	Respondents	%
Own	648	90.6
Rent	37	5.2
Others	30	4.2
Total	715	100.0

N = 715

6.4 Utilities and Services other than Latrines

Observation checklist data on the availability of electricity and gas were collected. Compiled data are presented in table - 6.5.

Table - 6.5 : Distribution of Sample Households According to Housing Type and as to Supply of Electricity and Gas

Housing Type	Electricity			Gas		
	Yes	No	Total	Yes	No	Total
Pucca	46	13	59	5	54	59
Semi-pucca	83	33	116	8	108	116
Katcha	274	266	540	22	518	540
Total	403 (56%)	312 (44%)	715	35 (5%)	680 (95%)	715

6.4.1 Electricity and Gas

Of 715 households, electricity is available to 56% and only 5% have a gas connection (table - 6.5). Gas co-exists with electricity. It is therefore observed that 100% of pucca and semi-pucca households with gas supply also have electricity. Pucca and semi-pucca houses have more access to the utilities than the katcha ones have. It is to be noted here that gas supply exists in 5 only sample Paurashava towns (Laksham, Mymensingh, Gazipur, Brahmanbaria and Chandpur).

6.4.2 Water Supply

To get the idea about the sources of water supply , sample households were asked question-2 from the observation check list. The findings show that 10.3% households obtain the supply through house connections, 1.5% use neighbors tap

and 5.7% fetch water from the public standposts. In other words, 17.5% households have access to piped water supply. This figure is close enough to the 1990 target for district towns (19%) (Sector Report, Page 80, Col-1). The survey further reveals that 10.5% households still use pond water. Pourashavas with their own municipal HPS and neighbors HPS are the major water supply sources (table - 6.6). Townwise use of water sources by the households is presented in table - 6.7.

Table 6.6 : Distribution of Sample Households with Sources of Water Supply

Sources	No. of Households	%
Own Hand Tubewell	306	42.9
Pipe Water	74	10.3
Neighbour's Hand Tubewell	183	25.6
Neighbour's Pipe Water	12	1.7
Public Standpost	40	5.6
Public Hand Tubewell	25	3.5
Pond	75	10.4
Total	715	100.0

8.2% of the households use public standposts and public hand tubewells, 27.1% use neighbours hand tubewell and neighbours pipe water and 10.5% simply use common pond. In all 46.8% of the households do not have favourable conditions for affordability of sanitary latrines.

Table - 6.7 : Town-wise Distribution of Sample Households According to Source of Water Supply

Name of Town		SOURCE							
		NO. OF HOUSEHOLDS							
		Own HTW	Neigh-bour HTW	Public HTW	House Connec-tion	Public Stand-post	Neigh-bour's Pipe Water	Pond	Row Total
Laksham	(1)	44	23	2	0	0	0	6	75
	(2)	58.7	30.7	2.6	0	0	0	8	10.5
	(3)	14.4	12.6	8	0	0	0	8	
Mymensingh		32	32	1	7	7	1	0	80
		40	40	1.3	8.7	8.7	1.3	0	11.2
		10.5	17.5	4	9.5	17.5	8.3	0	
Gopalpur		42	19	2	1	0	0	16	80
		52.5	23.8	2.5	1.2	0	0	20	11.2
		13.7	10.4	8.0	1.4	0	0	21.3	
Gazipur		28	33	1	9	0	5	4	80
		35	41.2	1.3	11.3	0	6.2	5	11.2
		9.2	18	4	12.2	0	41.7	5.3	
Cox's Bazar		45	12	0	10	0	2	11	80
		56.2	15	0	12.5	0	2.5	13.8	11.2
		14.7	6.6	0	13.5	0	16.6	14.7	
Jhenaidah		48	20	4	2	5	0	1	80
		60	25	5	2.5	6.3	0	1.3	
		15.7	10.9	16	2.7	12.5	0	1.3	
C. Nawabganj		24	21	4	11	14	2	4	80
		30	26.2	5	13.8	17.5	2.5	5	11.2
		7.8	11.5	16	14.8	35	16.6	5.4	
Brahmanbaria		29	19	11	0	1	2	18	80
		36.3	23.7	13.8	0	1.2	2.5	22.5	11.2
		9.5	10.3	44	0	2.5	16.6	24	
Chandpur		14	4	0	34	13	0	15	80
		17.5	5	0	42.5	16.3	0	18.7	11.2
		4.6	2.2	0	45.9	32.5	0	20	
Column Total :		306	183	25	74	40	12	75	715
Column %		42.8	25.6	3.5	10.3	5.6	1.7	10.5	100

(1) Absolute
(2) Row %
(3) Col %

Table - 6.8 : Distribution of Households by Sources of Water, and Latrine Type

Source	No. and percentage of households							
	With Sanitary Latrine		With Unsanitary Latrine		No Latrine		Total	%
	HH	%	HH	%	HH	%		
Own Hand Tubewell	102	58.9	192	55.3	12	6.1	306	42.8
Pipe Water	50	28.9	22	6.3	2	1.0	74	10.4
Neighbours Hand Tubewell	10	5.8	83	24.0	90	46.2	183	25.6
Neighbours Pipe Water	2	1.2	2	0.6	7	3.6	11	1.5
Public Standpost	3	1.7	17	4.9	21	10.8	41	5.7
Public Hand Tubewell	2	1.2	6	1.7	17	8.7	25	3.5
Pond	4	2.3	25	7.2	46	23.6	75	10.5
Total	173	100.0	347	100.0	195	100.0	715	100.0

Paurashava-wise distribution of sample households by the sources of water supply has been shown in table - 6.7. Chandpur, Cox's Bazar and Chapai Nawabganj-all have a good number of house connections for water supply. The Number of public standposts are higher in Chapai Nawabganj and Chandpur as compared to other towns. Laksham and B. Baria have no piped water supply while Gazipur, Cox's Bazar and Laksham have no public standposts. Pond is the most important community water source but this proves unhygienic for the town dwellers (table - 6.6). On piped water supply coverage, key infomrants (17%) find similarity with survey findings (17.5%).

7. EXISTING LATRINE TYPE AND SANITATION PRACTICES

7.1. Latrine Type and Coverage

By definition a "sanitary latrine" will incorporate one of the following components:

- septic tank
- single or double pit water seal latrine

Unsanitary latrines do not have such components as mentioned above. Among the 173 households with sanitary latrines 91 (52.6%) have demonstration latrines and 78 (45%) have water seal latrines. Of the 347 households with unsanitary latrines, 193 or 55.6% have pit (Pit + Pit WSB) latrines (table - 7.1).

Table-7.1: Distribution of Sample Households as by Sanitary and Unsanitary Latrine Type

Latrine type	No of Households	%
Unsanitary:		
Pit	178	51.3
Surface	78	22.5
Hang	54	15.6
Bucket	15	4.3
Pit WSB	15	4.3
Other	7	2.0
n =	347	100.0
Sanitary:		
Demonstration	91	52.6
Water seal	78	45.0
VIP	2	1.2
Other	2	1.2
n =	173	100.0

Pit latrines (single pit, double pit and unsanitary pit) are used by (49.2%) households. This is being followed by the use of surface latrines (11%). Among other types of unsanitary latrines, hang and bucket latrines are used by 7.5% and 2% of the households respectively . An interesting finding of the HS was that in 18.3% of households where water seal latrines existed earlier, but later these were turned into unsanitary latrines by breaking water seal by accident to make cleaning easier (Table-7.2). The users lack knowledge of the functioning and utility of water seals.

The Observation Checklist question-3 was asked to know about latrine type and their coverage. Door to Door Survey

Table - 7.2: Town-wise Distribution of Households According to Type and Availability of Latrines

Name of Town		Sanitary		Latrine Type						No Latrine	Total of all Types
		SP	DP	Unsanitary							
				Pit	Surface	Hang	Bucket	SP with WSB	Other		
Laksham	(1)	11	2	36	6	5	0	0	0	15	75
	(2)	14.7	2.7	48.0	8.0	6.6	0	0	0	20.0	
Mymensing		5	12	25	6	3	2	2	2	23	80
		6.2	15.0	31.0	7.5	3.8	2.5	2.5	2.5	29.0	
Gopalpur		5	1	27	5	19	0	2	1	20	80
		6.2	1.2	34.0	6.3	23.7	0	2.5	1.2	25.0	
Gazipur		17	3	46	0	3	0	4	0	7	80
		21.3	3.8	57.5	0	3.7	0	5.0	0	8.7	
Cox's Bazar		12	22	2	12	3	3	3	0	23	80
		15.0	27.5	2.5	15.0	3.7	3.7	3.7	0	28.7	
Jhenaidah		15	1	10	10	0	2	1	2	39	80
		18.8	1.2	12.5	12.5	0	2.5	1.2	2.5	48.8	
Brahmanbaria		14	20	3	12	5	3	1	0	22	80
		17.5	25.0	3.7	15.0	6.2	3.7	1.2	0	27.7	
Chandpur		1	14	13	12	15	3	0	0	22	80
		1.3	17.5	16.2	15.0	18.8	3.7	0	0	27.5	
C. Nawabganj		2	16	16	15	1	2	2	2	24	80
		2.5	20.0	20.0	18.8	1.2	2.5	2.5	2.5	30.0	
Total		82	91	178	78	54	15	15	7	195	715
%		11.5	12.7	25.0	11.0	7.5	2.0	2.0	1.0	27.3	

SP = Single pit water seal, DP = Double pit, SP with WSB = Single pit with water seal broken

(1) Absolute
(2) %

Table -7.3 : Compilation of the Qestionnaires from the Door to Door Survey

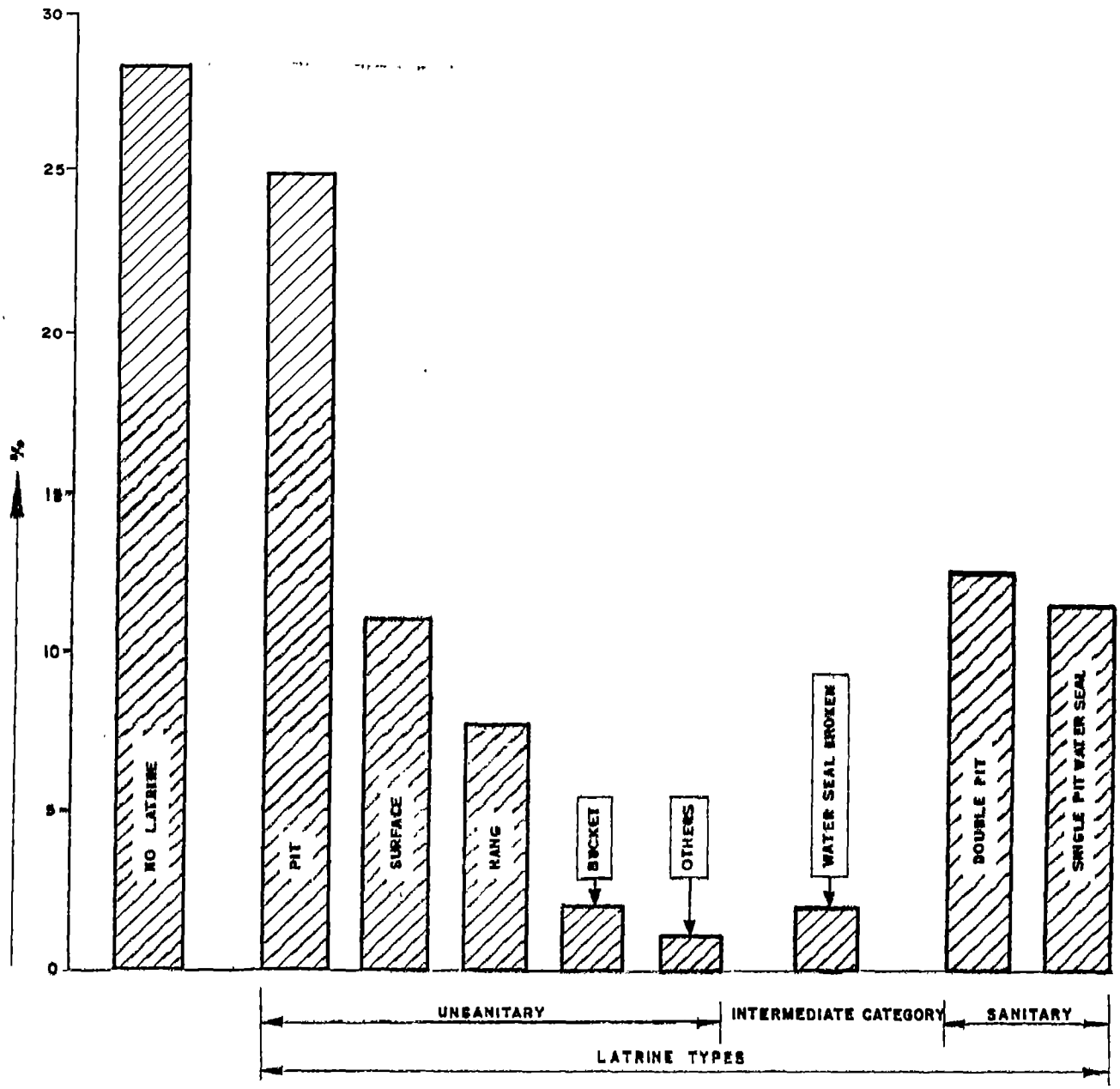
Pourashava	Total Sample	Latrine Use		Use by Household		Type of Latrine†			Functioning				Bought by Household		Household Ownership		
		Yes	No	Excl.	Shared	ST	SL	UL	Pro.	W.P	Aba.	N.U	Yes	No	Accom	Plot	Latrine
Laksham	300	233	67	146	87	18	65	150	113	120	0	0	160	43	299	299	232
Mymensingh	152	117	35	61	56	4	24	89	72	45	0	0	95	22	134	134	106
Gopalpur	306	249	57	120	129	7	34	208	51	198	0	0	204	25	299	297	226
Gazipur	107	105	2	65	40	10	31	64	35	69	1	0	85	20	90	90	87
Cox's Bazar	104	84	20	66	18	7	40	37	48	35	1	0	35	43	77	64	53
Jhenaidah	306	118	188	109	9	9	28	81	30	87	1	0	36	51	305	305	116
C.Nawabganj	100	61	39	57	4	1	25	35	24	37	0	0	24	37	100	100	61
B.Baria	102	82	20	71	11	7	18	57	27	55	0	0	43	40	102	102	81
Chandpur	101	80	21	58	22	0	23	49	33	47	0	0	36	44	101	101	31
Total	1578	1129	449	753	376	71	288	770	433	693	3	0	718	325	1507	1492	1043
%of 9 Towns		71.5	28.5	67.0	33.0	4.5	18.25	48.75	38.4	61.4	0.2	0	69	31	95.5	94.5	66.0

ST = Septic Tank, Pro. = Properly, W.P = With Problem, Aba. = Abandoned, SL = Sanitary Latrine,

UL = Unsanitary Latrine, N.U = Never Used, Accom.= Accomodation, Excl. = Excluding, N= 1578.

Note: 1129 households reported that they use latrine. But 1043 only own a latine. 86 households use a shared latrine.

AVAILABILITY OF LATRINE
BASED ON 715 SAMPLE HOUSEHOLDS



findings were compared with those of the household Survey. Data generated by the inquiries made in both the surveys have been compiled in the tables 7.2 and 7.3. The data presented in table-7.2 reveal that households use different types of latrines. Single pit, double pit and unsanitary latrines are the different kinds found in use in the study towns, but side by side, a great many of the town dwellers have no latrine for their use. 72.7% of the households have some kind of latrines, but 27.3% households have no latrine at all. Of the latrine owners, 33% have sanitary latrines, while the majority (67%) use unsanitary latrines (table-7.1). DDS findings differ slightly with the HSQ survey. It is gathered from DDS that 22.75% households have sanitary latrines (4.5% with septic tanks) and 48.75% have unsanitary latrines. In the HSQ survey septic tank owners were not included for investigation. Townwise household distribution by latrine types is shown in table-7.2 while the DDS data are provided in table-7.3.

The townwise distribution of sample households by type and availability of latrines is given in Table 7.2.

7.1.1 Latrine Type and Income

Households data on annual income (obtained by the application of Q.38 Questionnaire -1, HSQ) have been cross tabulated with latrine types. In the presentation and analysis of the findings we have an indication of the relationship between income and latrine types. Households with an annual income less than Tk.10,000 do not have any sanitary latrine, while households from the high income group will often acquire sanitary latrines, although a little above than 50% do still have unsanitary latrines for use. Among the households of the lowest income group, 42.6% have unsanitary latrines and 57.4% have no latrine. It is further revealed from the survey that a high percentage of households with incomes up to Tk.30,000 have either no latrine or have only an unsanitary latrine (table-7.4).

7.1.2 Latrine Type and Education

The relationship between respondents level of education and the type of latrines in use has been cross tabulated, and it is seen that there is an increase of the use of sanitary latrines by respondents as they progress on the educational ladder(table-7.5).

From table -7.5 it emerges that 54.9% of the respondents with no formal education do not have any latrine, while 28.2% use unsanitary latrines. The number of households with no latrine and unsanitary latrines are significantly on the decrease as the level of education goes up. The table further shows that only 1% of respondents with a post-graduation degree do not have a latrine.

7.2 Use of Latrine

The Door to Door Survey Inventory has generated data which reveal the nature of latrine use. Two types of use have been found by the survey: either exclusive use or shared use. 67% of the user households confine the use of their latrines among the family members, while 33% of the users share the latrines with the neighbours (table-7.3). Children of 5 years and under do not generally use latrines because they are installed on a raised platform which constitute a real danger for them. Moreover during the monsoon the pit is filled with water from the rains and a subsequent rise of the ground water table. Children could easily fall down in the filled pit. Since the privacy is greatly valued by women, exclusive latrines, or the bushes after sunset, are the prefered locations for female defecation.

Table-7.4: Households' Annual Income versus the Type of Latrine in Use

Annual Income Taka	Low-cost Single Pit	Low-cost Two Pit	Unsani-tary	No Latrine	Row Total %
1 to 10,000	0	0	20 (1)	27	47
	0	0	42.6(2)	57.4	6.7
	0	0	5.9(3)	14.1	0
10,001 to 20,000	11	10	93	93	207
	5.3	4.8	44.9	44.8	28.5
	13.9	11.0	27.4	48.4	0
20,001 to 30,000	16	17	86	43	162
	9.9	10.5	53.1	26.5	23.1
	20.3	18.7	25.3	22.4	0
30,001 to 40,000	15	20	67	14	116
	12.9	17.2	57.8	12.1	16.5
	19.0	22.0	19.7	7.3	0
40,001 to 50,000	12	11	32	9	64
	18.8	17.2	50.0	14.0	9.1
	15.2	12.1	9.4	4.7	0
Above 50,000	25	33	42	6	106
	23.6	31.1	39.6	5.7	15.1
	31.6	36.3	12.4	3.1	0
Column Total	79	91	340	192	702
	11.3	13.0	48.4	27.3	100.0

Count (1) N = 702
Row % (2) Missing = 13
Col % (3)

Table - 7.5 : Respondents Level of Education Versus the Type of Latrine being Used

Education		Low-cost Single Pit	Low-cost Two Pit	Unsani-tary	No Latrine	Row Total %
No formal Schooling	(1)	9	5	98	107	219
	(2)	4.1	2.3	44.7	48.9	30.6
	(3)	11.0	5.5	28.2	54.9	0
Primary		15	7	78	37	137
		10.9	5.1	56.9	27.0	19.2
		18.3	7.7	22.5	19.0	0
Secondary		29	40	116	42	227
		12.8	17.6	51.1	18.5	31.7
		35.4	44.0	33.4	21.5	0
Intermediate		10	17	24	5	56
		17.9	30.4	42.8	8.9	7.8
		12.2	18.7	6.9	2.5	0
Degree		14	14	25	2	55
		25.5	25.5	45.4	3.6	7.7
		17.0	15.4	7.2	1.0	0
Post graduate		5	8	6	2	21
		23.8	38.1	28.6	9.5	2.9
		6.1	8.8	1.7	1.0	0
Column Total		82	91	347	195	715
		11.5	12.7	48.5	27.3	100.0

Count (1)
Row % (2)
Col % (3)

8. DEFECATION PRACTICES

8.1 Defecation Practices of the Households Having no Latrine

The household survey found that defecation practices of adults and children vary according to social groups. This finding confirms actual observations made during the study.

In the previous section it was mentioned that out of 715 households, 195 reported not possessing any latrine. It is therefore interesting to know the places where the members of these households defecate. The data in the table-8.1 have been generated asking the household respondents about places of defecation for family members (Q.16, Questionnaire-1).

Table - 8.1: Distribution of Respondents of 195 Households Having no Latrine by Their Answers as to Where the Household Members Defecate

Places	Male	Female	Children
Landlord's Latrine	5 (2.6)	4 (2.1)	3 (1.5)
Neighbour's Latrine	28 (14.4)	53 (27.2)	5 (2.6)
Roadside Drain	3 (1.5)	1 (Ø.5)	12 (6.1)
Open Field	9Ø (46.2)	58 (29.7)	147 (75.4)
River,Water Bodies	24 (12.3)	25 (12.8)	13 (6.7)
Jungle	25 (12.8)	54 (27.7)	13 (6.7)
Public Toilet	2Ø (1Ø.2)	Ø Ø	2 (1.Ø)
Total :	195 1ØØ.Ø	195 1ØØ.Ø	195 1ØØ.Ø

() = %

There is a difference between males, females and children in their defecation practices. The analysis of their defecation practices indicates that there is some gender variation in defecation habits while the variation between adult and children is highly significant.

Table - 8.1 shows that 14.4% males and 27.2% females use a neighbour's latrine for defecation, while 46.2% males,29.7% females and 75.4% children defecate in the open fields. The percentage of children defecating in the open fields is found very high because children defecate more frequently than the adults and some parents instruct them not to use a latrine since the pit will fill up too fast. Females more frequently use a neighbour's latrine (27.2%) and are much more accustomed to defecate in the jungle (27.7%) than their male counterparts (14.4% use neighbours' latrine, and 1Ø.25% defecate in the jungle). For children's defecation, public toilets are seldom used. There is a gender variation among the adults in using public toilets. Womenfolks do not use public toilets at all, while males

do (10.25%). The group discussions revealed that the public toilets are not safe for women because of the lack of privacy.

8.2 Children's Defecation Practices

During group discussions it was confirmed that most of the children below 5 years in households either having a latrine or no latrine defecate in the open homestead compound. This is due either to the high altitude of the latrine door, or the squatting plate is so designed that it is difficult for children to squat comfortably. It is unrealistic to expect that children should use a fixed place for defecation, while their parents defecate indiscriminately. Many mothers do not feel the necessity to enforce strict rules on children's defecation practices, because they opine that children's faeces do not produce offensive smell, and that children's faeces are less harmful than those of adults. There is hardly any difference between households with a latrine and those without latrine in this respect.

Children's faeces are generally disposed of by washing in the water bodies (34.7%) and throwing in the jungle (52.1%). The table below further illustrates this fact.

Table-8.2: Householdwise Distribution of Methods for Children's Faeces Disposal

Ways	Frequency (f)	%
Washing in Water body	247	34.6
Washing under Tubewell	23	3.2
Throwing in the Jungle	373	52.1
Throwing in the Yard	72	10.1
Total :	715	100.00

8.3 Hand Washing after Defecation

Q 22, Questionnaire-1 generated data on hand washing after defecation. Because of the taboo surrounding the whole complex of defecation, reliable information could be obtained only with difficulty.

Group discussion reveals that womenfolks do not properly wash their hands before they prepare food. The prevalent Pourashava picture shows most of the women prepare and serve food for the family members without proper cleaning of their hands.

Table-8.3: Percentage Distribution of Respondents' Washing Hands by Different Methods after Defecation

Ways	Frequency (f)	%
Water	219	30.6
Soap	198	27.7
Ash	42	5.9
Clay	255	35.7
Others	1	0.1
Total	715	100.00

From the compiled data it is seen that hand washing is done by all the users. Availability of water is a precondition for washing hands and all the households find some source of water for hand washing. Clay, soap and ash are widely used for such washing purposes. Clay was used by 35.7% of the households interviewed, while water, soap and ash are used by 30.6%, 27.7% and 5.9% of the respondents respectively (table-8.3). Hand washing is always performed outside the latrine.

9. INSTALLATION, SERVICING AND MAINTENANCE OF LATRINES

9.1 General

In the questionnaire was included the relevant question item (Q.17-Questionnaire-1) to generate data on various construction materials being used for latrine pan, pit slab and foot-rest, sub-structure and superstructure in regard to installation of latrines. These data are presented in this section.

9.2 Sub-structure

The total number of sampled households with sanitary (173) and unsanitary (347) latrines comes to 520. For the installation of latrines mosaic, CC/FC pans are used with or without water seal. Therefore the sanitary or unsanitary nature of a latrine can not be exclusively judged by the pan type.

Sanitary latrines have slabs, pans and pits which provide the better service efficiency as they are technically well-set with water seals. It is observed that some of the unsanitary latrines have almost same types of slabs,pits and pans as found in sanitary latrines. But owing to owner's lack of knowledge about their technical setting with water seal, these latrines remained unsanitary by type. The percentage breakdown of sanitary and unsanitary latrines having pans, pits and slabs are shown in the tables 9.1a, 9.1b and 9.2.

Table - 9.1a: Distribution of Households having a Latrine by Type of Pan

Type of Latrine	No.of House-hold	Type of Pan					
		Ceramic	Jute Plastic	CC/FC	Mosaic	Nil	Other
Sanitary	173	87	14	60	12	0	0
(%)	(100)	50.3	8.1	34.7	6.9	0	0
Unsanitary	347	1	0	127	7	201	11
(%)	(100)	0.3	0	35.6	2.0	57.9	3.2

Table - 9.1b: Distribution of Households having a Latrine by Type of Pit

Type of Latrine	No.of House-hold	Type of Pit					
		RCC Ring	H.Comb Brick	Earth-en	Bamboo	Nil	Other
Sanitary	173	155	13	5	Ø	Ø	Ø
(%)	(100)	89.6	7.5	2.9	Ø	Ø	Ø
Unsanitary	347	104	3	105	3	121	11
(%)	(100)	29.9	Ø.9	30.2	Ø.9	34.9	3.2

9.3 On-ground structure

The present survey reveals that a wide variety of materials are used for latrine floors. The highest percentage of households (62.4% sanitary latrine owners and 38.3% unsanitary latrine owners) use a RCC slab for floor. Next comes brick masonry (33.5% sanitary latrine owners). Clay is never used for floor construction because it gets muddy with water. Bamboo slabs are used by 33.77% of unsanitary latrine owners. The distribution of households by floor slab type is shown in table-9.2.

Table - 9.2 : Distribution of Households having a Latrine According to the Type of Slab

Type of Latrine	No.of House-hold	Type of Slab					
		RCC	Brick/ CC	FC	Wood Plank	Bam-boo	Tree
Sanitary	173	108	58	7	Ø	Ø	Ø
(%)	(100)	62.4	33.5	4.1	Ø	Ø	Ø
Unsanitary	347	133	36	7	42	117	12
(%)	(100)	38.3	10.4	2.0	12.1	33.7	3.5

9.4 Super-structure

9.4.1 Roof

The study investigated the type of materials used for the different components in latrine superstructures.

13.7% of all sanitary latrines were found to be without a roof. The data are presented in table 9.3.

Table-9.3 : Distribution of Sanitary Latrines According to the Materials used for Construction of Roof

Type of Latrine	No Roof	RCC	Burnt Clay Tiles	CI Sheet	Bamboo	Poly-thene	Jute Stick	Timber	Row Total %
D.L (1)	10	25	1	41	5	1	1	1	85
(2)	(11.7)	(29.4)	(1.2)	(48.2)	(5.9)	(1.2)	(1.2)	(1.2)	(52.8)
W.S	12	15	2	31	9	1	2	0	72
	(16.7)	(20.8)	(2.8)	(43.0)	(12.5)	(1.4)	(2.8)	0	(44.7)
VIP	0	2	0	0	0	0	0	0	2
	0	(100.0)	0	0	0	0	0	0	(1.2)
Other*	0	1	0	1	0	0	0	0	2
	0	(50.0)	0	(50.0)	0	0	0	0	(1.2)
Total	22	43	3	73	14	2	3	1	161
Col %	(13.7)	(26.7)	(1.9)	(45.3)	(8.7)	(1.2)	(1.9)	(0.6)	(100.)

(1) Number
(2) Row %
DL = Demonstration Latrine.
VIP = Ventilation Improved Pit N = 161
WS = Water Seal Missing = 12
( ) = %

* Note : The field investigators found the other type "different" from DL-WS and VIP, but it appeared to them as sanitary latrine because excreta was not exposed.

9.4.2 Doors

Only 2.5% of households had latrines without doors. The doors of 43.4% of latrines were made of CI sheet followed by 28.6% constructed of timber. A good number households, generally from the lower income groups, use bamboo doors (16.8%) since bamboo is cheap and locally available (table-9.4).

Table - 9.4 : Distribution of Sanitary Latrines with Materials Used for Doors

Type of Latrine	No Door	Spiral Brick work	CI Sheet	Bamboo	Hessian Cloth	Poly-thene	Jute Stick	Timber	Row Total %
D.L (1)	2	2	44	12	2	1	0	22	85
(2)	(2.3)	(2.3)	(51.8)	(14.1)	(2.4)	(1.2)	0	(25.9)	(52.8)
W.S	2	1	26	15	6	1	1	20	72
	(2.8)	(1.4)	(36.1)	(20.8)	(8.3)	(1.4)	(1.4)	(27.8)	(44.7)
VIP	0	0	0	0	0	0	0	2	2
	0	0	0	0	0	0	0	(100.0)	(1.2)
Other*	0	0	0	0	0	0	0	2	2
	0	0	0	0	0	0	0	(100.0)	(1.2)
Total	4	3	70	27	8	2	1	46	161
Col %	(2.5)	(1.9)	(43.4)	(16.8)	(5.0)	(1.2)	(0.6)	(28.6)	(100.0)

N = 161 (1) = Number
Missing = 12 (2) = Row %

* See table 9.3 note

9.4.3 Walls

The walls of sanitary latrines, were made of bricks, CI sheets, bamboo, polythene, jute sticks and timber. 68.3% of the walls of sanitary latrines were constructed with bricks followed by 20.8% bamboo constructions. CI sheet was found in very limited use (7.5%) (table-9.5).

Table-9.5 : Distribution of Sanitary Latrine Superstructure Accourding to Wall Materials

Type of Latrine	Open	Brick	Cl Sheet	Bamboo	Poly-thene	Jute Stick	Timber	Row Total %
D.L (1)	1	67	4	12	Ø	Ø	1	85
(2)	(1.2)	(78.8)	(4.8)	(14.1)	Ø	Ø	(1.2)	(52.8)
W.S	Ø	39	8	21	1	2	1	72
	Ø	(54.2)	(11.Ø)	(29.2)	(1.4)	(2.8)	(1.4)	(44.7)
VIP	Ø	2	Ø	Ø	Ø	Ø	Ø	2
	Ø	(1ØØ.Ø)	Ø	Ø	Ø	Ø	Ø)	(1.2)
Other*	Ø	1	Ø	Ø	Ø	Ø	Ø	2
	Ø	(1ØØ.Ø)	Ø	Ø	Ø	Ø	Ø	(1.2)
Total	1	11Ø	12	33	1	2	2	161
Col %	(Ø.6)	(68.3)	(7.5)	(2Ø.6)	(Ø.6)	(1.2)	(1.2)	(1ØØ.Ø)

N = 161 (1) = Number
Missing = 12 (2) = Row %

* Note : At the time of survey this (Open,DL) latrine was not in use.

Table: 9.6 Distribution of Respondents Valuation of Quality of Latrine Components

Latrine Type	Total Number of Latrines	Sub-structure			
		VG	G	B	VB
Low Cost (1)	82	13	52	17	Ø
Single Pit (2)	Ø	2Ø.97	29.55	15.32	Ø
Double Pit	91	42	47	1	1
	Ø	67.74	26.7Ø	Ø.9Ø	Ø.68
Unsanitary	345*	7	77	93	145*
	Ø	11.29	43.75	83.78	99.32
Total :	518	62	176	111	146
	Ø	1ØØ.Ø	1ØØ.Ø	1ØØ.Ø	1ØØ.Ø

(1) = Absolute (2) = Row % on total latrine under each type.
VG = Very good, G = Good, B = Bad, VB = Very bad

* Since the excreta is directly disposed on the top of the ground, most respondents feel that their substructure is very bad. Virtually there exists no sub-structure in such latrines.

[Since data on respondents' valuation on superstructure have been unfortunately lost, it is not possible to provide the data analysis in that respect.]

Table-9.7: Distribution of Respondents According to the Cost Incurred for Sub-structure, Superstructure and Corresponding Latrine Type

Range (Tk)	Sub-structure				Superstructure			
	Sanitary		Unsanitary		Sanitary		Unsanitary	
	(f)	%	(f)	%	(f)	%	(f)	%
1- 50	0	0	104	14.55	2	1.16	129	37.18
51- 100	0	0	73	10.21	12	6.94	86	24.78
101- 200	15	8.67	61	8.53	13	7.51	63	18.16
201- 500	37	21.39	55	7.69	26	15.03	33	7.51
501-1000	18	10.41	37	5.17	25	14.45	16	4.61
1001-1500	13	7.51	5	0.70	22	12.72	7	2.02
1501-2000	9	5.20	6	0.84	25	14.45	9	2.59
2001-2500	15	8.67	2	0.28	6	3.47	0	0
2501-3000	35	20.23	2	0.28	19	10.98	1	0.29
> 3000	31	17.92	2	0.28	23	13.29	3	0.86
Total :	173	100.00	347	100.00	173	100.00	347	100.00

Tk. = Taka f = Frequency

Of 520 existing latrines, 173 and 347 are found sanitary and unsanitary respectively. Both the sanitary and unsanitary latrines have sub-structure and superstructure of different costs and quality. The costs incurred for the construction of sub-structure for sanitary latrines are more in amount and frequency than those for unsanitary latrines. 44.51% of sanitary latrine owners spent within the range of Tk.201-2000 for construction of substructure (Table-9.7).

The percentage distribution of respondents bearing cost for sub-structure construction indicates top heavy expenditure incurred for the construction of sub-structure of sanitary latrines.

In regard to cost incurred for superstructure construction, there is concentration of sanitary latrine owners in the range of Tk.201 - 2000 (56.65%) while for unsanitary latrines,the range stretches between Tk.1 - 200 (table-9.7).

9.5 Sources of Procurement of Components

As regards the sample of latrine procurement, the reply of the respondents obtained by the survey is tabulated in the following table. Misreporting has been detected after tabulation as, out of 715 households, 520 have latrines and 173 only have sanitary latrines. According to table 9.8 DPHE, LGEB, Municipality, UNICEF and CONCERN mentioned as the sources for procurement by 309 respondents. In fact these agencies only supply sanitary latrines.

Table - 9.8 : Distribution of Households by the Sources of Procurement of Latrine

Source	No. of Household	%
Don't Know	8	1.5
DPHE	102	19.6
LGEB	29	5.6
Municipality	143	27.5
Private Producer	4	0.8
Self Help	196	37.7
NGO	3	0.6
UNICEF	4	0.8
CONCERN	31	5.9
Total :	520	100.0

9.6 Servicing and Maintenance

Servicing and maintenance of latrines are essential for public health and the quality of life for town dwellers. There is accordingly an increasing understanding among urban residents of the need for regular cleaning and maintenance of latrines.

The present survey gives us an idea about existing household practices. Data have been generated by the instrument of Q. 24 in Questionnaire-1 on the various aspects of cleaning and maintaining latrines and such data are presented in table-9.9. The table shows that 58.6% of the latrines are being regularly cleaned by family members. Hired persons and servants clean the latrines in 4.3% of the households. 36.8% households latrine owners never cleaned their latrines (table-9.9).

To know more about servicing and maintenance of latrines, additional data on pit material removal, pit changing and alternate pit use were collected. Such data are presented in tables 9.10, 9.11 and 9.12.

Through HSQ, 82 single pit latrines and 91 double pit latrines were investigated (table-7.2). From table 9.10, it is seen that 104 had removed pit material. Out of this figure, 9 had cleaned their pits with the help of hired persons (mostly municipal sweepers). Pit cleaning by self and family member is done by only 1% of the households. As regards pit cleaning for double pit latrines 24 households had done it so far. 50% of them had it done with the help of hired persons,33% by family members and servants (table-9.11). When the respondents were asked about how many pits were filling (for two pit latrines) at a time, out of 73, 9 replied that both the pits were filling at the same time (table 9.13).

Alternate pit use was reviewed during group discussions.It appeared from the discussions that problems were being faced regarding pit changing and pit cleaning. Sticking of excreta in the CC/FC pan was reported by the users. Cleaning of such latrines requires large amount of water.Faced with the problem users sometimes resort to breaking the water seal. To pit emptying, most of the latrine owners depend on Pourashava scavengers and have to spend Tk.150-250 for each cleaning.This cost is nearly one fourth of a new single-pit latrine including installations.

As regards pit changing arrangements, it is clear that the facilities have not been inspected by the agencies which have supplied them latrines.

Table-9.9 : Regular Cleaning of the Latrines

Cleaned by	No. of respondents	%
Self and Family Members	304	58.9
Servant	16	3.1
Hired Person	6	1.2
Does not Clean	190	36.8
Total :	516	100.0

N = 516
Missing = 4

Table - 9.10 : Pit Material Removal

Cleaned by	No. of respondents	%
Self and Family Members	5	1.0
Servant	2	0.4
Hired Person	93	18.3
Other	5	1.0
No need yet	318	62.6
Not applicable	80	15.7
Does not remove	5	1.0
Total :	508	100.0

N = 508
Missing = 12

Table - 9.11 : Pit Cleaning of Double Pit Latrines

Cleaned by	No. of respondents	%
Self	2	2.2
Family Members	3	3.3
Servant	3	3.3
Hired Person	12	13.2
Other	4	4.4
No need yet	67	73.6
Total :	91	100.0

Table - 9.12 : Alternate Pit Use

Pit Use	No. of respondents	%
One pit filling at a time	64	87.7
Two pits filling at a time	9	12.3
Total :	73	100.0

10. INTEREST IN PROCUREMENT AFFORDABILITY AND WILLINGNESS TO PAY FOR LATRINES

10.1 Willingness to Pay for Installation

10.1.1 Occupant Owners

The survey investigated the willingness of respondents to pay for the installation of sanitary latrines. This has been influenced by their perception of the technology through acquaintance with DL. The level of awareness of the importance in having a well functioning latrine is demonstrated by the willingness to pay for the installation of sanitary latrines. Q 33 & 35 in Questionnaire-1 generated data in this regard.

Respondents were asked whether they were satisfied with the existing latrine. Out of 715 respondents, only 22.8% replied that they were satisfied while the remaining users (77.2%) (table 10.1a) expressed their dissatisfaction with the existing facility (Q 27 in Questionnaire -1). Most dissatisfied respondents were willing to pay for the installation of a sanitary latrine (table-10.1b).

It emerges from table-7.2 that 173 households have single and double pit latrines and all who have such latrines expressed their satisfaction with the exception of 10 users who perhaps have problems with a broken goose neck.

Respondents were further asked about their opinion whether they would like to improve the existing latrines. 75% of the respondents wanted improvement while 22% did not and 3% gave no reply. It is therefore inferred that the respondents who were not satisfied with their existing latrines, nearly all of them were interested in improvement. In other words, those who did not have sanitary latrines wanted such kind of improvement (table-10.1).

Table - 10.1a : Percentage of Respondents Satisfied with Their Latrines

Categories	No. of Respondents				Total	%
	DL	WS	Unsani-tary	No Latrine		
Satisfied	85	70	8	0	163	22.8
Not satisfied	6	12	339	195	552	77.2
Total :	91	82	347	195	715	100.0

Table - 10.1b : Percentage of Respondents Wanting Latrine Improvement

Respondents	Willingness to Improve		No Reply	Total
	Yes	No		
Number	536	157	22	715
%	75	22	3	100

10.1.2 Renters

Out of 36 lessees, 24 (i.e. 66.7%) were willing to pay more house rent if latrine facilities were improved, because they felt that sanitary latrines would provide them with hygienic living conditions(table-10.2).The existinglatrine availability of the lessees is provided in table - 10.2a.

Table - 10.2: Percentage of Lessees Willing to Pay Higher Rent for Improved Latrine

Willingness to Pay more Rent	No. of Households (Lessee)	%
Yes	24	66.7
No	12	33.3

Table - 10.2a : Existing Latrine Facilities of Lessee

Willingness to Pay more Rent for better Latrine	No.of Lessee	Type of Latrine			No Latrine
		Double Pit	Single Pit	Unsani-tary	
Yes (%)	24 (100)	3 (12.4)	6 (25.0)	11 (46.0)	4 (16.6)
No (%)	12 (100)	2 (16.6)	2 (16.6)	8 (66.8)	0 0

Respondents' willingness to acquire "good latrine" was demonstrated by participants in Focus Group Interview. Such discussions were held in each town with male and female groups separately (Table - 9.3)

Table - 10.3 : Pourashava-wise Distribution of Male and Female Members Who Participated in the Group Discussions

Pourashava	DL			FDL			SSL			No Latrine		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F
Chandpur	28	16	12	10	8	2	19	16	3	15	12	3
Mymensingh	4	0	4	5	0	5	10	0	10	8	0	8
Gazipur	4	0	4	5	0	5	9	0	9	8	0	8
B.Baria	20	18	2	14	14	0	18	18	0	20	20	0
Gopalpur	7	7	0	5	0	0	7	7	0	10	10	0
Cox's Bazar	28	18	10	18	10	8	13	7	6	26	12	14
Jhenaidah	0	0	0	0	0	0	25	25	0	25	25	0
C.Nawabganj	23	13	10	26	16	10	29	15	14	25	15	10
Laksham	10	10	0	8	8	0	10	0	10	10	10	0
Total :	124	82	42	91	61	30	140	98	52	147	104	43

Total	= Male	- Female
502	345	157
%100	68.73	31.27

Note:
DL = Demonstration Latrine
FDL = Familiarity with DL
SSL = Some Sort of Latrine
M = Male
F = Female

The groups who were aware of single and double pit latrines, but did not possess such types of facilities and the groups who had no latrines mostly wanted to acquire sanitary latrines.

The groups who have hang or surface latrines stated a number of inconveniences emerging from them:

- They cause various diseases
- They give bad smell
- They give scope for spoiling the adjacent places with excreta
- They lack privacy for women.

Respondents who had no latrine, wanted to have good ones to ensure privacy for women as well as hygienic conditions for the family. Many wanted to acquire such "good latrines" to enhance their social status. Those who were familiar with demonstration latrines with ceramic pan wished to procure such type of latrines.A few of the participants in the group discussions were motivated to acquire two pit latrines on seeing a photo during the demonstration. They did not give any reason for their liking but they became inclined to possess them by the impact of the photo demonstration.

Except those who were familiar with the demonstration latrine, others could not mention their preference to the type of sanitary latrine they wished to acquire.

10.1.3 Range of Price Potential Consumers are Wiling to Pay

Out of 715 respondents investigated by HSQ, 535 (75%) wanted to improve their existing latrines. Of these 535 only 54% offered a price as to the procurement of a "good latrine". From the analysis of socio-economic data it is further revealed that 56% HHS (table-6.5) have electricity, 10.5% of the same have a piped water connection, 42.8% have their own HTW (table-6.6), 63.8% HHS have an annual income of Tk.20000 and above (table-6.3). By interpolation of these data, it is safely inferred that about 60% households have the purchasing power to buy sanitary latrines. 22% HHS have already acquired sanitary latrines and 38% may immediately opt for the same.

The distribution of respondents willing to acquire sanitary latrines within the offered price range is shown in table-10.4.

Table - 10.4 : Distribution of Rrespondents According to the Range of Prices Offered for "Good Latrine" (Single Down Payment)

Price Range (Tk)	No.of Respondents	%
0	248	46.0
1 to 250	47	8.8
251 to 500	68	12.7
501 to 1000	61	11.4
1001 to 1500	7	1.3
1501 to 2000	56	10.5
2001 to 2500	13	2.4
2501 to 3000	7	1.3
Above 3000	30	5.6
Total :	535	100.0

From the above table it is seen that 46% of the respondents though willing to improve their latrines were not prepared to pay for acquiring a "good latrine". In other words, they want to have it free of cost.

If the payments are to be made at a time, 14.2% of the households would be willing to pay for the sanitary latrines when the price falls within the range of Tk.1001-2500, while 6.9% would be prepared to have them if the price level is above Tk.2500. 11.4% of the households would pay a price between Tk. 501 and 1000.

In the event of instalment payment, 35.2% of the household respondents are willing to pay a monthly instalment of Tk. 31-50, while 21.6% are willing to pay a monthly instalment ranging between Tk.76-100.

The modal instalment category has been found to be Tk.31-50 which would be feasible for the majority of the consumers in the context of both time preference and the subsequent interest payment (table-10.5).

Table - 10.5 : Distribution of Respondents by their Offer of Monthly Instalment Converted by Interpolation of Monthly and Quarterly Instalments Offered

Monthly Instalment Range (Tk)	No.of Respondents	%
10	22	5.0
20	60	13.6
21 - 30	39	8.8
31 - 50	156	35.2
51 - 75	18	4.1
76 - 100	96	21.6
> 100	52	11.7
Total :	443	100.0

Households income groups and their corresponding price offer have been shown in table - 10.6.

Table - 10.6: Income Distribution of the Households and the Prices they were Willing to Pay for New Latrines

Annual Income Taka	Price Willing to Pay for Each New Latrine						
	1000 or Less	1001 or 2000	2001 or 3000	3001 or 4000	4001 or 5000	Above 5000	Row Total (%)
10,000 and Less	(1) 11 (2)(84.6) (3) (6.3)	1 (7.7) (1.6)	0 0 0	0 0 0	1 (7.7) (1.6)	0 0 0	13 (4.5)
10,001 to 20,000	57 (78.0) (32.4)	10 (13.7) (15.9)	4 (5.5) (20.0)	1 (1.4) (33.3)	1 (1.4) (5.6)	0 0 0	73 (25.3)
20,001 to 30,000	43 (64.1) (24.4)	15 (22.4) (23.9)	4 (6.0) (20.0)	0 0 0	4 (6.0) (22.2)	1 (1.5) (11.2)	67 (23.2)
30,001 to 40,000	32 (60.4) (18.2)	14 (26.4) (22.2)	1 (1.9) (5.0)	1 (1.9) (33.9)	1 (1.9) (5.6)	4 (7.5) (44.4)	53 (18.3)
40,001 to 50,000	20 (62.5) (11.4)	6 (18.8) (9.5)	1 (3.1) (5.0)	0 0 0	5 (15.6) (27.7)	0 0 0	32 (11.1)
Above 50,000	13 (25.5) (7.3)	17 (33.3) (26.8)	10 (19.6) (50.0)	1 (2.0) (33.3)	6 (11.8) (33.3)	4 (7.8) (44.4)	51 (17.6)
Total :	176 (61.0)	63 (22.0)	20 (7.0)	3 (1.0)	18 (6.0)	9 (3.0)	289 (100.0)

1. No.
2. Row %
3. Col %

11. PRODUCTION (GOVERNMENT AND PRIVATE) AND SALES OF SANITARY LATRINES

11.1 Production and Sale Centres

To know about production and sales of latrines and the related components, a separate questionnaire was designed (Questionnaire-III) under the sub-heading "Private Latrine Producers and Seller Survey Investigation." To make further inquiry into the organization and management of production, business type, training and location of worksites, 46 producers, sellers and a NGO were covered by interviews in 9 sample Pourashavas. Data were obtained with the help of the questionnaire mentioned above. Out of 46 production and sales centres, 39 were producers, one a wholesaler while 6 were retailers. In addition to production, 8 producers were also involved in wholesale business. Of 39 interviewees, 14 were government producers, 24 were private producers and one NGO (CONCERN in Mymensingh) production centre. Private production centres operate from abandoned Khas lands (unused government owned land) by the roadside easily visible to the public eye. Pourashava-wise breakdown of producers and sellers is provided in table-11.1, while a detailed list is given in appendix-IV.

Table - 11.1 : Pourashava-wise Breakdown on Latrine Producers, Wholesalers and Retailers

Name of Pourashava	Number of Producers			No.of Whole Salers	No.of Retai-lers	Total
	Govt.	Private	NGO			
Laksham	3	3	Ø	Ø	1	7
Mymensingh	3	1	1	1	2	8
Gopalpur	Ø	3	Ø	Ø	Ø	3
Gazipur	1	4	Ø	Ø	2	7
Cox's Bazar	Ø	4	Ø	Ø	Ø	4
Jhenaidah	Ø	3	Ø	Ø	Ø	3
C.Nawabgonj	2	Ø	Ø	Ø	Ø	2
B.Baria	2	3	Ø	Ø	Ø	5
Chandpur	3	3	Ø	Ø	1	7
Total :	14	24	1	1	6	46

The above findings do not include such retailers as are only dealers in ceramic and mosaic pans and other sanitary fittings.

11.1.1 Description of Locations of Production Centres and Work Sites, Consumers Access and Transport of Materials.

Mymensingh

Government Production Centres

One of the government production establishments lies to the North of Women Teachers' Training College; to the South stand GPO, D.C. and LGEB Offices. The old Brahmaputra river flows to the West.

Another government production unit is situated to the South of Mymensingh Public Hall and Police Line. To its North lies Golapjan road and to the West stands the forest office.

Both the government production centres are well-situated and have good approaches by roads. Consumers have therefore easy access to the centres.

Private Production Centre

The private producers have several production sites. Yusuf Ali is a private producer. His production centre is situated to the South of Taltala Bazar at a distance of approximately 300 meters from the Bazar. To the North lies railroads at a distance of 200 meters. Kagdar Bazar lies to the East at a distance of about 500 meters. Three sides of the production centre are bounded by paddy fields. Sine no approachable road to the production site is found, the transport of materials is difficult.

Jashim Ahmed's production centre lies to the West of the old Brahmaputra river at a distance of approximately 40 meters. To the East is situated Mymensingh Chamber of Commerce and Industry and to the South stands Divisional office of Sonali Bank at a distance of 500 meters. Ahmed's production centre is well-connected by roads and easily approachable. The transportation of latrine materials also is easy.

Khurshid Alam's and other private production centres are well connected by roads to the easy access for consumers. Transportation of latrine materials by the buyers becomes easy.

Brahmanbaria

Government Production Centres

There are two government production centres in Brahmanbaria Pourashava. One is situated to the East of Brahmanbaria College Hostel at a distance of 150 meters. To the West

lies Brahmanbaria Railway Station at a distance of 250 meters.

Brahmanbaria Government College is situated to the South of the Centre. The Centres are accessible to the buyers by road. Another government production centre lies adjacent to the court buildings in the city centre. The centers are therefore easily accessible to the customers and transportation of materials becomes an easy.

Private Production Units

Ranjit Roy's Production Centre

The Titas river lies to the East of the production centre. To the West, stands residential quarters and to the South a Hindu temple is found while Ananda Bazar lies to the North at a distance of 200 meters. The roads leading to the production centre are good and transportation of materials is easier.

Sakhawatullah's Production Centre

To the East, lies Sadar Upazila Office at a distance of 400 meters. There is a pond adjacent to the production centre. To the South and the North there are residential development houses. The road links to the production centre are good and transportation of materials is easier.

Faruque Miah's Production Centre

It is located adjacent to T.A. road to the South of the district council office, Roads leading to the centre are generally good and there is no difficulty for the transportion of latrine materials.

Cox's Bazar

Private Production

There are four private production centres in Cox's Bazar Pourashava. All are located by the side of the main road and easily approachable by the buyers. Transportation of materials to different areas of Pourashava poses no problem to the producers.

The work site and working conditions are not satisfactory. The factory has a poor housing complex with thatch - roofs and no boundary wall to protect the factory.

Gopalpur

There are three private producers in Gopalpur Pourashava. Faizul Huq Khan's production centre lies near the Gazipur Bus stand. It is centrally located and has a good road linkage for transporting latrine materials.

Nazimuddin is the proprietor of the production establishment. His business establishment is located very close to the Dhaka-Gazipur road. So there is hardly any difficulty in transporting the latrine materials.

Shatish Chanddra Pal owns a production establishment. It lies adjacent to the Gopalpur-Tangail road, but at a distance of approximately 400 to 500 meters from the residential areas. Materials can be easily transported from Dhaka, and there is no difficulty of access to the production centre for the buyers.

Chapai Nawabganj

Chapai Nawabganj has two government production centres. One of the centres is housed within the premises of Chapai Nawabganj Pourashava on the from Godagari road. Both transportation and supply of finished products to buyers is easy.

The second government production centre is located at DPHE office premises adjacent to the Main Road. All the roads leading to the centre are easily accessible, so transportation of latrine components is easy.

Chandpur

Chandpur Pourashava has three government and three private latrine production establishments.

One of the government production centres is situated very near to Pourashava water works. The condition at the work site is satisfactory. Materials and latrine components are easily transportable to buyers since roads leading to the center are in good shape.

Two other government production centres are situated near the govt. office buildings and are well-connected by roads. So latrine components and materials are transportable to the buyers very easily.

The three private production centres are owned by Ruhul Amin at Miji, Mosharraf Hussain and Rashid Khandaker respectively and they lie at easily accessible places within Pourashava. So it is easy to transport materials.

Laksham

Laksham Pourashava has three private and three government production centres. The government centres are located on the premises of the LGEB and DPHE offices. Road linkages were found good.

Private Production Centre

Ibrahim Mia, Ajit Kumar shaha and Shamsul Huq run three production units. These business establishments are well connected with roads and railways. Shamsul Huq's establishment lies adjacent to Laksham-Noakhali road and Shaha's production centre is situated near the railway station. So all these business centres are easily approachable by the intending buyers.

Jhenaidah

Jhenaidah has three private production establishments. All of them are located by the side of the main road and easily approachable by the buyers.

11.2 Organization and Management of Production

Production is organized and managed by three types of producers-private, government and NGO.

Private production is organized by the proprietor himself. Latrines materials are purchased from Dhaka and Comilla on cash payment and then transported to the work site by hired trucks. No sub-contact is given at any stage in the production process. In case of private production, proprietors do not import cement for the construction of latrine components. Producers in some Pourashavas (Laksham)jointly organize production. They carry brick chips, sand and cement from Dhaka/Comilla by truck or tractor. Transport costs are jointly borne by them. Raw materials such as sand is collected locally and sometimes M.S. rod, cement, bricks are purchased from the local market. For the burnt clay rings(page 60), clay is purchased on cash payment from the owners of land at a long distance and it is carried over to the work site by boat during the rainy season at a comparatively low cost.

All management tasks are carried out by the proprietor himself in organizing private production. All supply and procurement activities are performed by him. Supervision is provided by the proprietor at the design and construction stage of latrine components. Sometimes salaried staff take part in supervisory activities.

The government production process is indirect as it is generally carried out through a contract system. Raw materials are supplied by the contractors on tender basis as and when required and all disbursement activities are done by the Divisional DPHE Office. One engineer on the permanent staff of the production establishment supervises the production activities. For wholesale buyers outside the Pourashava, a contract system is being followed for all kinds of production, supply and installation of sanitary latrines.

In a few instances of government production, an officer is appointed to manage production. He co-ordinates the work and takes part in procurement of local materials. Sometimes UNICEF supplies cement and rods, while local materials are procured by the contractor himself.

NGO (CONCERN in Mymensingh) production process is not carried through contractors. Every stage of production is coordinated and strictly supervised by NGO staff directly. Materials are not generally obtained from th local markets. Only a very few items like connecting pipes is obtained locally on cash payment by the responsible officer or his assistant.

11.3 Product Description and Consumers Preference

11.3.1 Latrine Components

Private producers and sellers manufacture and sell various types of latrine slabs, pans and rings in the Pourashavas to the choice of consumers. The government is also a production partner. In Chandpur Pourashava government is a major producer of latrine components. Materials are supplied through sub-contractors. Workers at the production centre receive training at Mohakhali, Dhaka in arrangement with the DPHE. Private producers are also engaged in the production of components from materials purchased in Dhaka.

In Laksham Pourashava private producers go for production of sanitary latrine components. Materials are purchased from the Dhaka market and transported to production sites.

In Mymensingh Pourashava, the government is one of the producers of latrine components. Labour and masons are trained by the LGEB for the production of components. Since the LGEB has no production centre, production come under direct Pourashava management. Latrine components are also produced by local businessmen who purchase materials from the Dhaka wholesale market and transport them to the production site. No complete latrine set is produced, only different components are put on sale.

Only private producers are engaged in the production of latrine components in Cox's Bazar. The materials are locally available for production.

In Brahmanbaria, Gopalpur, Chapai Nawabganj the production of latrine components is mainly carried out through private entrepreneurs. Only the government is engaged in larger production of components in Chapai Nawabganj.

Based on seasonal consumer's demand, the producers produce RCC pipes, ventilators etc. Locally produced slabs are mainly of two types: water seal and slab with chute or open hole which is made of M.S. rod, brick chips and sand. Similar kinds of technology are applied in the production of latrine components in all the sample Pourashavas. Ferro-Cement slabs are produced in government production centres, while only RCC slabs are produced by private producers. If demanded by customers against additional payment, the slabs are given a finishing touch with red oxide.

Cement concrete (CC) pans, Ferro-cement (FC) pans and mosaic pans are most often manufactured at production centres. In Gazipur, Jhenaidah and Cox's Bazar pourashava, 7 producers manufacture mosaic pans along with other kinds. The remaining 32 producers only produce CC/FC pans.

The following components were generally produced by government and private producers in the towns under study:

(a) Squatting slab with water seal pan
(b) Connecting pipe
(c) Junction box
(d) Pillar
(e) Ventilator
(f) Mosaic pan
(g) Mosaic Siphon

All the producers produce RCC rings except those in Gopalpur Pourashava. In Gopalpur town burnt clay rings are in use. One ring of 2'-0" dia. and 6" height is sold at Tk. 10.00 compared to RCC rings of similar size, clay rings which sell at half of the price. Two production centres, one in Laksham and the other in Gazipur Pourashava produce CC rings.

11.3.2 Other Products

Private production Centres also produce and sell a number of other concrete components. These are:

- RCC pipes (4"-36" dia)
- CC Ventilators
- CC trap (for indirect pit latrine)
- Concrete blocks used in housing

- RCC pillars (4"x6") for demonstration
- CC gamla or container (used for mixing cow's fodder)

The prices of these product items are variable based on size and quality.

11.4 Sale: Seasonality

The present survey revealed that the production centres always maintained stocks of their produce and buyers were able to purchase them from the ready stock. As regards seasonal sale, it was found that the highest sales of latrine components took place in winter in all the sample Pourashavas being followed by summers sales. The lowest sales were recorded during the rainy season. The production capacity of the centres are matched with the demand without causing any problem. Pourashava-wise seasonal sales of slabs and rings are presented in table-11.2. The figures do not include those of Government production centres. The products are used within as well as outside the municipal boundary.

Table-11.2 : Private Sales of Latrine Slabs and Rings During Various Seasons in 1987

Pourashva	Winter Nov - Feb		Summer Mar - May		Rainy June - Oct		Total 12 Months	
	Slabs	Rings	Slabs	Rings	Slabs	Rings	Slabs	Rings
Laksham	320	2000	280	1200	110	700	630	3900
Mymensingh	484	2600	400	2400	250	1750	1134	6750
Gopalpur	0	600	0	800	0	0	0	1400*
Gazipur	510	4200	360	2000	75	1000	945	7200
Cox's Bazar	640	1960	550	1700	290	1000	1480	4660
Jhenaidah	90	500	55	290	15	150	160	940
C.Nawabganj	10	140	150	1200	25	175	185	1515
B.Baria	600	3300	300	1500	100	800	1000	5600
Chandpur	230	2100	110	1020	40	360	380	3480
Total	2884	17400	2125	12110	985	5935	5914	35445
Monthly Average	721	4350	708	4036	181	1187	492	2953
Ratio	1:6		1:5.7		1:6.6		1:5.6	

Note: * Slabs are procured from the DPHE.

11.5 Services for Installation

It has been found by the present survey that households run into difficulty with the installation of their sanitary latrines unless services are offered to them. Such help they seek from the producers, government staff, friends and experienced people who have gained experience in having installed latrines earlier. Both private and government producers do not generally offer their services in the process of latrine installation since they lack adequate manpower skilled and trained enough.

Private producers in rare cases given advise to the customers regarding different installation techniques. Large producers do not usually advise about installation. But those who do, provide services for digging pit, setting rings, pan and slab(against extra payment).

The Government usually does not advise or render service for the installation of latrines. However, installation services are provided by contractors on the basis of contractual obligations contained in the tender documents.

11.6 Sales and Distribution Centres

Survey findings indicate that there is a lack of adequate sales outlets wherefrom finished latrine components may be purchased by consumers and transported easily to their homes. Consumers go to retailers who are widely dispersed in Pourashava towns, Producers usually sell their products to the wholesalers who transport the products to their places of storage. The retailers are to purchase the products from the wholesalers. The private producers have fewer transport problems, their production centres usually being located in town where different types of transport are available. For transport of materials for production,government department utilize the given departmental transport networks. Private producers utilize public and private transport as available.

APPENDIX : 1

SOCIO-ECONOMIC SURVEY ON LOW COST SANITATION

TERMS OF REFERENCE FOR CONSULTANCY SERVICE (REVISED)

1. INTRODUCTION

The Low Cost Sanitation Project (BGD/85/004) initiated by the Government seeks to introduce low cost sanitation system in 84 Pourashava Towns of Bangladesh. The objectives of the project, will include, among others, the following :

(i) Improvement of the capabilities of Pourashavas for effective management of the programme including the arrangement for local manufacture of low cost latrine components; and

(ii) Promotion of people's motivation for, and participation in the installation of such latrines.

In order to achieve these objectives, an immediate key activity will be to prepare an Investment Plan which should indicate :

(a) How many latrines are required to cover the population's needs ;

(b) What is the real cost of these latrines, including both hardware and software components ;

(c) How much can the individual consumer be expected to pay of this total cost.

(d) What will be the total liability to Government and over what time period should Government spread this liability to be most financially sound :

(e) What are the credit facilities and programme available to reduce the financial cost to individuals ;

(f) Through what Government, private, and voluntary institutions should the programme be implemented for maximum effeciency and low cost ;

(g) What management structure and systems are the most appropriate to monitor and control a programme with many complex elements; and

(h) What marketing and promotional schemes are the best and most appropriate to inform and convince an often sceptical public about the advantages and benefits of latrines.

2. SOCIO-ECONOMIC STUDY

Among others, a socio-economic study will provide essential input for the investment plan. A competent authroity (Research Agency) will have to conduct this study and prepare necessary chapters as a part of the Investment plan document. The study will seek to answer the following specific questions :

1. What percentage of the Pourashava households already have sanitary facilities? What are the existing arrangements with a view to seeking whether and social aspects should be investigated. The physical aspects are the actual arrangement for disposal of excreta. All methods in use should be described and an effort made to indicate proportion of population served by each type. The system of disposal of children's faeces should be marked. The health implication of each type should be noted. The social aspect concerns the arrangements made for construction and maintenance of facilities. For example, in many slums, people contribute to construct latrines. How wide spread is this practice? How are these latrines organised and maintained?

2. What are the people's views on the nature and importance of the sanitation problems and on "alternative solutions" There should be stress on maintenance and operations. The survey should also provide insights on the extent to which additional public education is required (on relationships between sanitation and health) in addition to or instead of more physical inputs.

3. Of those who dc not have sanitary latrines, how much are the households able and willing to pay for sanitary latrines? A distinction should be made here by tenure of occupancy.

4. How many of households, based on the ability, willingness and estimated cost of facilities, can be expected to afford a latrine at full cost and at varying levels of subsidized cost.

Contd Page (II)

5. What are the consumer preferences in terms of latrine design and siting and what would they need in terms of product information?

6. What kind of credit arrangement consumers would prefer, number of instalments and intervals?

7. What kind of superstructure would the households prefer and what responsibilities would they take (or would like municipal authority or any other agency to take) in building up the superstructure?

8. How do they assess the service quality of the municipal authority and who should be entrusted with the responsibilities of installation, servicing and maintenance ?

3. DATA AND METHODS

In answering the above, data will have to be gathered by a combination of methods, as described below ;

3.1 Households Survey Investigation (HSI)

This will be a sample household survey by using interview technique seeking to provide data on :

a. Income, major source (s); expenditure by major heads, property owned, assessed value of property and occupation of household members.

b. Tenure of occupancy : owner occupant, renters, others.

c. Existing sanitation facilities (or absence) and public utilities in the house.

d. Willingness to pay for new latrine, its installation, and superstructure construction benefits perceived; economic value/weight given to sanitary latrine.

e. Preference for design components, financing arrangements, terms of credit, siting of latrine.

f. Preferred arrangement for servicing and maintenance of sanitary latrine; agencies to be involved.

Contd Page (III)

3.2 The survey of household by interviewing will be accompanied by observation. The observational investigation by using a check list will identify the type of housing structure, the immediate surrounding and presence of public utility. These observational data will supplement interview data to indicate affordability of households to pay for sanitary latrine.

3.3 Focus Group Interview

This will be a guided group discussion to generate data on : preference for design, views on the services by the municipal authority; preference for NGO involvement in the installation of latrine. This method may be applied in a limited number of Pourashavas (say 9) the same pourashavas selected for household survey, and in each of these, three group interview sessions may be conducted. The groups should be homogenous --those who already have demonstration latrines, those who do not & a group composed of women having familiarity with low cost sanitary latrines and interviewed by female investigators such that women's opinions, without being influenced by men, are available. Care should also be taken to include renters and owner occupants in each of these groups.

3.4 Key Informant Interview

Selected Key Informants are taken to be knowledgeable persons on the subject of interest. Limited in number, such Key Informants are likely to provide reliable and indepth information. For the present investigation, Key Informants will be taken from among Sanitary Inspectors, pourashava Ward Commissioners and Leaders of local non-government agencies. Six informants (i,e. two from each category) may be selected from a pourashava; and for 9 sample pourashavas there will be a total 54 Key Informants included in the study.

Key Informants should be able to draw upon official records to provide data on the frequency of sanitary latrines. In addition, they will provide information supplementing consumer's preference for design and involvement of various institutions (e.g. municipal authority, NGO etc.)

With help of the Key Informants attempt will be made to identify private producers, whole-sellers and retailers of nonsewer, non-septic tank latrines in the locality. From these producers and sellers information on consumer's preferences for various product designs, cost and demand may be obtained.

Contd page (IV)

Important :

It is important that intensive interviews with "Key Informants" and "focus groups" are carried out and some of these should precede household survey to ensure that the right questions are asked.

4. Sampling of Households

The household survey will be conducted by taking samples of households. Precision of population parameters for sample is not the important criterion for determining the sample size in this study. On the other hand, reliability of information on the items of investigation stated in the previous is most desired. Therefore quality interviewing by keeping the sample size limited is preferred. Care should be given to elicit reliable information on appropriateness of the latrines, design, preferences for design alternatives with varying cost, arrangement for cost sharing, and economic value placed on sanitary latrine (in the given and modified designs). Furthermore, data on affordability indicators should be highly reliable and therefore, the sample size may not be too large to cause any compromise with the quality of interview data.

Given the purpose of the study, it would be desirable to have two main samples; (A) households having good familiarity with the demonstration latrine, and (B) households having no familiarity with the demonstartion latrines. Samples households of both the categories may be taken from the vicinity of th demonstration latrine. The sample households of the second category should, see at the time of interview, portable models/photographs/ drawings of sanitary latrines. Necessary information on latrine desions to be provided to the respondents so that they are able to state their preferences and willingness to pay for the latrines, on the basis of some knowledge about them.

Sampling should allow analysis by classifying the sample households into three economic groups : lowest, lower middle income group from both renters and owners occupants. Further more, it would be desirable to make some analysis in terms of households having some kind of unsanitary latrines and those having no latrines at all, particularly in the lowest and lower middle income categories. Therefore, in the sampling process it would be necessary to include households of both the categories. Households having septic tanks should be excluded from sampling. In ortder that analysis is possible by

Contd page (V)

having the classification of households as above, a minimum sample size of 720 households to be aimed at Fifty one Pourashava Towns where domonstra tion latrines have been installed and some other towns where the public Health Engineering Department has installed domonstration latrines (total estimated to be about 60 towns) will provide the sampling frame. Of those 60, nine towns may be selected at random for sampling of households.

From these 9 selected towns, 360 households will be taken for each of the main sample categories. Care should be taken to include a balanced representation of owner-occupants, and renters. Each main categories of samples will have three sub-categories by income (lowest income group, lowest middle income and middle income group), and each of these subcategories will have 120 households. Finally, each income sub-categories (particularly the lowest and the lower middle) will include 60 households having some (unsanitary) latrines and 60 households having no latrine. (These targets should be viewed as approximations). The sample structure described above may be seen in the following diagram :

Total Households Sample (n 720)

A (n_1 = 360)			B (n_2 = 360)		
Lowest	Lower Middle	Middle	Lowest	Lower Middle	Middle
120	120	120	120	120	120
60 60	60 60		60 60	60 60	
++ ++	+ ++		+ ++	+ ++	

\+ Households who have some of unsanitary latrines

++ Households who do not have any sort of latrines.

5. Levels of Investigators.

The Investigators for household investigation should be the ones who have social science background and have training and experiences in socio-economic survey. They will work under experienced Supervisors. Focus Group Interview and Key Informant Interview should be done by Senior Investigators/Supervisors.

Contd page (VI)

[redacted]

... Study Instruments Workplan

[redacted]

he Consultants shall prepare standard household survey schedule checklist [redacted] group discussion guide as per scope of work of the study. These have [redacted] e pre-tested and approved by the project authority before finalisation [redacted] use in the survey. Some changes to the survey instruments may also be [redacted] cessary on interview with "Key informants" and "focus group".

[redacted]

he Consultants will be required to formulate instructions to investigators [redacted] planatory notes to supplement the study instrument as to how to sample [redacted] interview households, fill up schedules and checklist and conduct [redacted] oup discussion sessions.

[redacted]

he Consultants will prepare and submit detailed workplan including [redacted] budget and personnel showing specific tasks to be done at each stage [redacted] work, data collection and supervision, data analysis and computerization, [redacted] paration of reports etc.

[redacted]

he Consultants shall submit detailed sampling plan and also field work [redacted] an along with field investigation monitoring chart.

[redacted]

ROCESSING AND ANALYSIS OF DATA

[redacted]

The Consultants shall carefully edit the data collected from the field and [redacted] all submit a plan of analysis for approval by the project authority.

[redacted]

he Consultants may avail of the services of a recognised and reliable [redacted] mputer centre for processing and analysis of the data.

[redacted]

he household survey schedules to be used in the survey, therefore, [redacted] be appropriate in design so as to facilitate computer processing [redacted] data.

[redacted]

STUDY PERIOD AND REPORTING

[redacted]

The time allowed for the study (from the date of signing the contract [redacted] the submission of report) will be five months. An interim progress [redacted] will have to be submitted after the field investigatio. The draft report will have to be submitted before the end of five months. After the project authority comments on the draft the report will be finalised within a period of two weeks. A draft report shall be submitted in 15 (fifteen) copies and the final report in 30 (thirty).

SEPTIC TANK YES/NO

Interviwer No.____

Date / /1988

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROGRAMME, BGD/85/004

QUESTIONNAIRE-I
Household Survey Investigation (HSI)

Pourashava .....
Sl. No.

1. Name of the family head .....

1a. Holding No. ..... 1b.Road .....

Interviewee Profile:

2. []Male []Female
3. Age .....
4. Education(yrs) .....
5. Occupation .....

6. Family size: Total [____] = Male [____] + Female [____] Children(below 5yrs) [____]

Main earning member 7. Education(yrs) ..... 8. Occupation .....

9. Do you own a latrine? []YES → 10. Year of installation 19...
[]NO → 11. Source: []DPHE []MUNICIPALITY []PRIVATE PRODUCER/SELLER
[]LGEB []SELF HELP []NGO []OTHER .....
12. Cost(Tk.) Substructure _____ Superstructure _____

13. Are you familiar with demonsration latrine? []YES → 14. How far it is from your house .....meter
[]NO

15. Type of Latrine

[] Sanitary
- [] Demonstration
- [] water seal
- [] VIP
- [] Other .....

[] Unsanitary
- [] Pit
- [] Surface
- [] Hang
- [] Bucket
- [] Pit,W8B
- [] Other.. .....

[] No Latrine

16. Where do you/ your family members defecate?

	Adult male	Adult female	Children
Landlord's latrine	____	____	____
Neighbours' latrine	____	____	____
Roadside drain	____	____	____
Open field	____	____	____
River/water bodies	____	____	____
Public toilet	____	____	____
Other	____	____	____

GO TO QUESTION NO 22/27

17. Desoription of the latrine:

Latrine pan
- [] Ceramic
- [] Jute plastic
- [] CC or FC
- [] Mosaic
- [] Nil
- [] Other

Pit
- [] RCC ring
- [] Honeycomb brick
- [] Earthen pit
- [] Bamboo
- [] Nil
- [] Other

Slab & foot rest
- [] RCC slab [] FC Slab
- [] Brick Masonry/CC
- [] Bamboo
- [] Wood Plank [] Tree

Superstructure

	Roof	Door	Sideeall	Spiral
RCC	____	____	____	____
Brick	____	____	____	____
C.I. sheet	____	____	____	____
Bamboo	____	____	____	____
Hessian Cloth	____	____	____	____
Polythene	____	____	____	____
Jute stick	____	____	____	____
Timber	____	____	____	____
Others	____	____	____	____

18. Is the latrine in use? [] YES [] NO

19. User identification:	20. Container type used in latrine:
[] Adult male	[] Aluminium Badna
[] Adult female	[] Clay badna
[] Children	[] Plastic badna/mug
[] Servant	[] Metallic badna/mug
[] Neighbours	[] Bucket/Large container
[] Other	[] Other

18-a. Reason(s)
- [] Not accustomed
- [] No superstructure
- [] Chocked
- [] Pit is full
- [] Other(mention) .....

GOTO QUESTION 15, NO LATRINE PART

21. Is the latrine flushed immediately after use by user? []YES []NO

22. Do you wash your hands after defecation? []YES []NO

[]ONLY WATER []SOAP []ASH []CLAY []OTHER

23. Where does the handwashing takes place?

[]INSIDE LATRINE []OUTSIDE LATRINE

24. Latrine servicing and maintenance:

Regular cleaning	Pit material removal	Pit changing	Special case- Alternate pit
[] Self	[] Self	[] Self	[] One pit filling at a time
[] Family members	[] Family members	[] Family members	[] Two pits filling at a time
[] Servant	[] Servant	[] Servant	
[] Hired person	[] Hired person	[] Hired person	
[] Other.....	[] Other.....	[] Other.....	
[] No practice	[] No need yet	[] No need yet	
	[] Does not remove		

25. Whom do you contact when you have some problem of your latrine?

[]MUNICIPALITY []LGEB []DPHE []NGO []SWEEPER []NONE []NO NEED YET []OTHER.....

26. Present condition of the latrine

	Very Good	Good	Bad	Very Bad
Latrine Pan	[]	[]	[]	[]
Substructure	[]	[]	[]	[]
Slab & footrest	[]	[]	[]	[]
Superstructure	[]	[]	[]	[]

27. Existing facility []SATISFACTORY []NOT SATISFACTORY

28. Should any improvement be done?

[]YES []DON'T KNOW []NO -> ASK 32 & GOTO 38

29. Why do you want to make improvement? _____

_____

30. How do you want to make this improvement? _____

_____

31. What type of low cost sanitary latrine do you prefer? (SHOW PHOTOGRAPHS & GIVE PRICE INDICATION)

- [] Ceramic pan
- [] Jute plastic pan
- [] Fibre glass pan
- [] Mosaic pan
- [] Ferrocement pan
- [] No opinion
- [] RCC ring with hole
- [] Honey comb brick pit
- [] No opinion
- [] Any Other (mention)_____

32. Accomodation nature: []RENT []SELFOWNED []OTHER

33. Are you willing to give higher rent if a better latrine is installed for your use?

[] YES [] NO

STOP

34. How much taka you are willing to pay for your preferred latrine?

[]7000 []5000 []2000 []1000 []500

[]250 or NOT AT ALL

35. Could you pay more if it is by installment?

[]YES []NO []NO OPINION

36. Amount (taka) _____

37. Amount per installment either monthly Tk _____

or quarterly Tk _____

38. Number of household members with income:

	1	2	3	4
Yearly income, last year :	Tk_____	Tk_____	Tk_____	Tk_____
Monthly income, last month:	Tk_____	Tk_____	Tk_____	Tk_____
Weekly income, last week :	Tk_____	Tk_____	Tk_____	Tk_____

[] NONE

39. Children's (age between 5-15) education:

	Age	Sex	Go to school	Primary	Secondary
i)		M / F	Y / N	[]	[]
ii)		M / F	Y / N	[]	[]
iii)		M / F	Y / N	[]	[]
iv)		M / F	Y / N	[]	[]
v)		M / F	Y / N	[]	[]

40. Further Note:

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROGRAMME, BGD/85/004

Interviewer No. ____
Date / /1988

OBSERVATION CHECKLIST
Household Survey Investigation (HS1)

Pourashava .....
Sl. No.

1. Housing:

(a) Type [ ]PUCCA [ ]SEMIPUCCA [ ]KACHA

(b) Description:

Component	RCC	Brick wall	CC floor	C.I. Sheet	Bamboo	Clay	Polpata/ Thatched
Roof	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Wall	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Floor	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

2. Source of water

[ ] Own HTW
[ ] Pipe Water
[ ] Neighbour's HTW
[ ] Neighbour's Pipe Water
[ ] Public Stand Pipe
[ ] Other.....

3. Latrine type

[ ] Low cost single pit
[ ] Low cost two pit
[ ] Unsanitary
[ ] None goto 7

4. Superstructure

	Roof	Door	Sidewall	Lateral
RCC	____	____	____	____
Brick	____	____	____	____
C.I. sheet	____	____	____	____
Bamboo	____	____	____	____
Hessian Cloth	____	____	____	____
Polythene	____	____	____	____
Jute stick	____	____	____	____
Timber	____	____	____	
Others	____	____	____	____

5. Open distance from main housing .....

6. Upkeep of latrine

Material damage: [ ]YES [ ]NO
Cleanliness: [ ]GOOD [ ]MODERATE [ ]BAD
Smell: [ ]TOO MUCH [ ]TOLERABLE [ ]NIL

7. Boundary wall

[ ] YES [ ]NO

8. Availability of public utility:

ELECTRICITY [ ] YES [ ] NO

NATURAL GAS [ ] YES [ ] NO

9. General Neighbourhood (Area Type):

[ ] COMMERCIAL
[ ] ADMINSTRATION
[ ] INDUSTRIAL
[ ] RURAL
[ ] LOW DENSITY RESIDENTIAL
[ ] MEDIUM DENSITY RESIDENTIAL
[ ] HIGH DENSITY RESIDENTIAL
[ ] VERY HIGH DENSITY RESIDENTIAL
[ ] OTHERS

10. Specific Neighbourhood:

[ ] HIGH INCOME
[ ] BAZAR
[ ] PARA
[ ] RURAL
[ ] PERMANENT BUSTEE (GOV'T. LAND)
[ ] PERMANENT BUSTEE (LAND OWNED BY NON RESIDENT)
[ ] PERMANENT BUSTEE (MAINLY LOCAL OWNERSHIP)
[ ] TEMPORARY BUSTEE

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROGRAMME, BGD/85/004

Interviwer No _____
Date / /1988

DOOR TO DOOR SURVEY
Household Survey Investigation (HSI)

Pourashava.....
Road .....

1 Do you use a latrine? []YES []NO ---------▶GOTO 6

2 If YES, specify your access: []EXCLUSIVE []SHARED

3 Type of latrine: []SEPTIC TANK []SANITARY []UNSANITARY

4 Funtioning []PROPERLY []WITH PROBLEM []ABANDONED []NEVER USED

5 Year of installation 19____ []DON'T KNOW

6 Did you buy from private producer/seller? []YES []NO

7 Ownership desoription: []ACCOMODATION []PLOT []LATRINE

8 Further Notes:

Interviwer no. ___

Date / /1988

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROGRAMME, BGD/85/004

QUESTIONNAIRE-III
Private Latrine Producers & Sellers Survey Investigation

Pourashava .....
Sl. No.

1. Name of the proprieter/Responsible officer .....

1a. Age _____ yrs. 1b. Education _____ yrs.

2. Address .....

Map showing the location of the shop/center

3. Desoription of the location and work site: _____

4. Business type:

a) [ ]PRODUCER [ ]WHOLE SELLER [ ]RETAILER [ ]OTHER

b) [ ]GOVERNMENT [ ]NGO [ ]PRIVATE [ ]OTHER

5. Are you a local person?
[ ]YES [ ]NO

6. Year of establishment: 19_____

7. Previous occupation/bussiness type of the proprietor: _____

8. Product description:

	Latrine Component	Produced ₹	Imported(specify wherefrom) ₹	Sale Price, Tk		
SLAB	Squating slab with water seal pan	[]	[]	_____	_____	_____
	Slab with hole	[]	[]	_____	_____	_____
PAN	Ceramic	[]	[]	_____	_____	_____
	Jute plastic	[]	[]	_____	_____	_____
	CC or FC	[]	[]	_____	_____	_____
	Mosaic	[]	[]	_____	_____	_____
	Connecting pipe	[]	[]	_____	_____/ft	_____/ft
	Junction box	[]	[]	_____	_____/ft	_____/ft
RING	RCC ring	[]	[]	_____	_____	_____
	CC ring	[]	[]	_____	_____	_____
	Burnt clay	[]	[]	_____	_____	_____

9.

Other Product	Produced ₹	Imported(specify wherefrom) ₹	Sale Price, Tk			
i. Filler	[]	[]	_____	_____	_____	_____
ii. Ventilator	[]	[]	_____	_____	_____	_____
iii. PVC Pipe	[]	[]	_____	_____	_____	_____
iv. Syphon	[]	[]	_____	_____	_____	_____
v.	[]	[]	_____	_____	_____	_____
vi.	[]	[]	_____	_____	_____	_____
vii.	[]	[]	_____	_____	_____	_____
viii.	[]	[]	_____	_____	_____	_____
ix.	[]	[]	_____	_____	_____	_____
x.	[]	[]	_____	_____	_____	_____

10. Who organiges the production? []Proprietor himself []Manager []Mason
[]Responsible Officer []Other

11. Number of permanent staff: Family member without salary _____ Salaried family member _____
Other _____

12. How import is organised? _____

13. Subcontractor (supply and production) describe: _____

14. How did the Owner(s) and/or worker(s) become trained? _____

_____

_____

_____

_____

15. If further training needs: [ ]YES [ ]NO

If YES, describe: _____

_____

_____

_____

16. Do you need any support? [ ]YES [ ]NO

If YES, describe: _____

_____

_____

_____

17. Describe Seasonality in sales by product:

	PRODUCT NAME	WINTER	SUMMER	RAINY
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				

18. Do you advise people regarding benifits, utility and installation of your products or your items? [ ]YES [ ]NO

If YES, describe: _____

_____

_____

_____

19. Do you provide service for latrine installation? [ ]YES [ ]NO

If YES, how and to what extent? _____

_____

_____

20. Give approximate no. oflatrine units produced? 1987 _____ 1986 _____

21. Give approximate no. of latrine units sold? 1987 _____ 1986 _____

22. How the production center/sales outlet is advertised? _____

_____

_____

_____

23. Product or procurement cost:

	Latrine Component	Cost, Tk.	
SLAB	Squating slab with water seal pan	_____	_____
	Slab with hole	_____	_____
PAN	Ceramic --------	_____	_____
	Jute plastic--------	_____	_____
	CC or FC --------	_____	_____
	Mosaic --------	_____	_____
	Conneoting pipe-----	_____/ft	_____/ft
	Junction box- -----	_____/ft	_____/ft
RING	RCC ring----------	_____	_____
	CC ring ----------	_____	_____
	Burnt clay --------	_____	_____

24. Further Notes:

APPENDIX:III

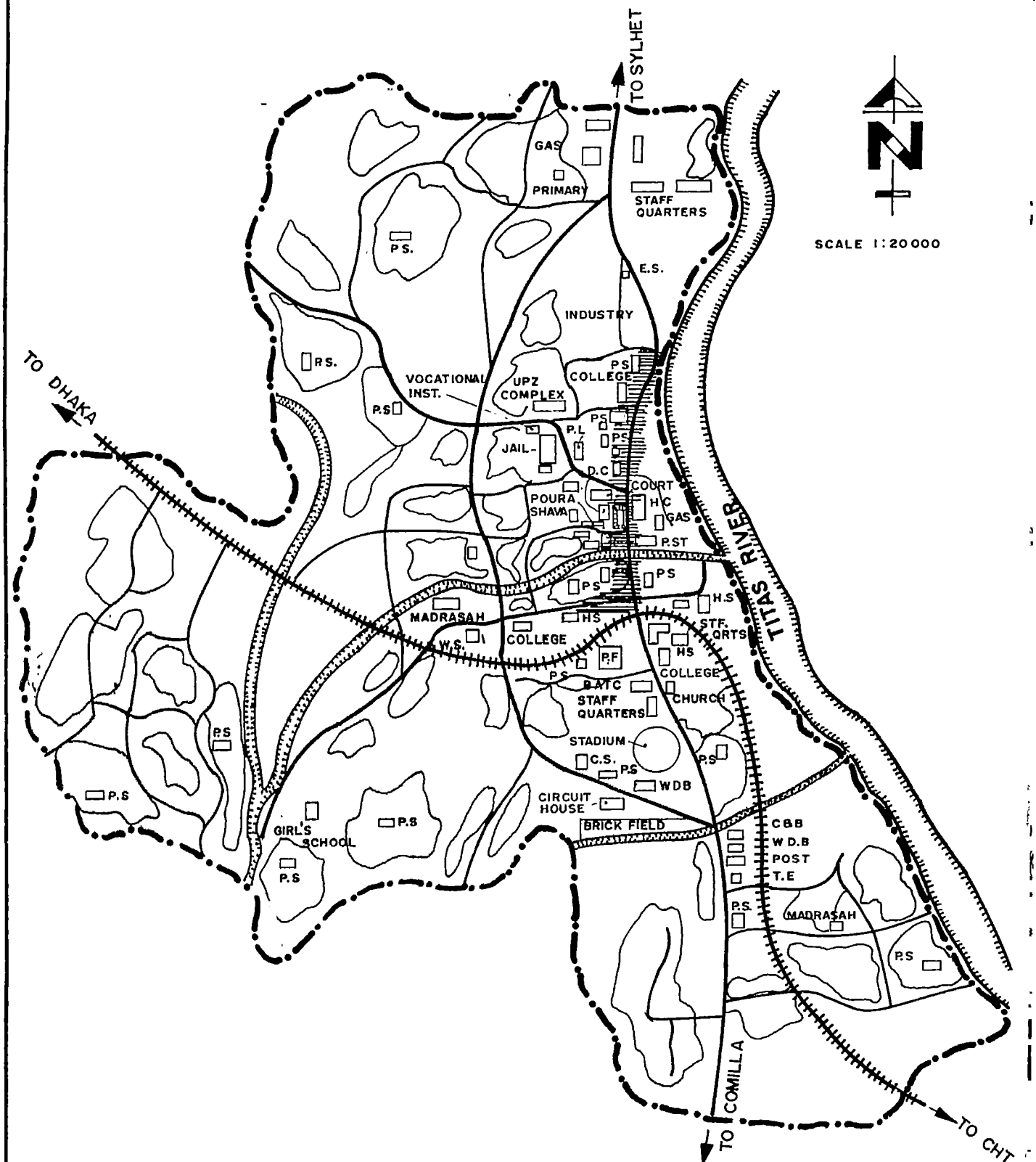
GENERAL INFORMATION OF NINE POURASHAVAS

Name of Pourashava	Area Sq. Km.	Present Population	Road in Km.			Drains in Km.		Water Supply		Sanitation by Population					Public Toilet	
			M	B.S	K	Lined	Katcha	HC	SP	ST	SPL	DPL	UL	NL	No.	Seat
Laksham	19.4	44,500	6.4	4	19	1	2	0	0	5	4	1	50	45	8	18
Mymensingh	21.7	170,000	75.6	5	115.6	25	114	1934	202	15	21	2	40	22	3	18
Gopalpur	12.5	38,398	8	6	33	1.5	3	0	0	2	12	0	66	20	1	3
Gazipur	47.9	79,854	38	16	153	0.5	1	800	12	10	25	1	50	14	2	6
Cox's Bazar	6.8	35,500	13.7	12.9	9.5	5	24	450	20	7.5	20	4.5	50	18	1	3
Jhenaidah	12.5	80,000	24.5	24.5	205.7	2.6	9.3	781	17	8	10	1	49	32	2	6
C.Nawabgonj	24.0	171,000	56.5	28	83	17.5	65	775	42	2	8	2	48	40	0	0
B.Baria	14.3	102,000	35.5	7	18	12	16	1,200	6	12	20	2	46	20	5	10
Chandpur	12.8	125,000	27	5	13	5	9	1,900	350	5	18	2	45	30	13	36
Total :	171.9	846,252	285.2	108.4	649.8	70.1	243.3	7,840	649	8.4	15.8	1.8	47	27	35	100

P = Pucca, SP = Semi Pucca, K = Katcha, M = Metalled, B.S = Brick Soling, HC = House Connection, SP = Stand post, ST = Septic Tanks, SPL = Single Pit Water Seal Latrine, DPL=Double Pit Latrine, UL= Unsanitary Latrine, NL=No Latrine.

Appendix- III
Fig- I

BRAHMANBARIA POURASHAVA



SCALE 1:20000

Legend:

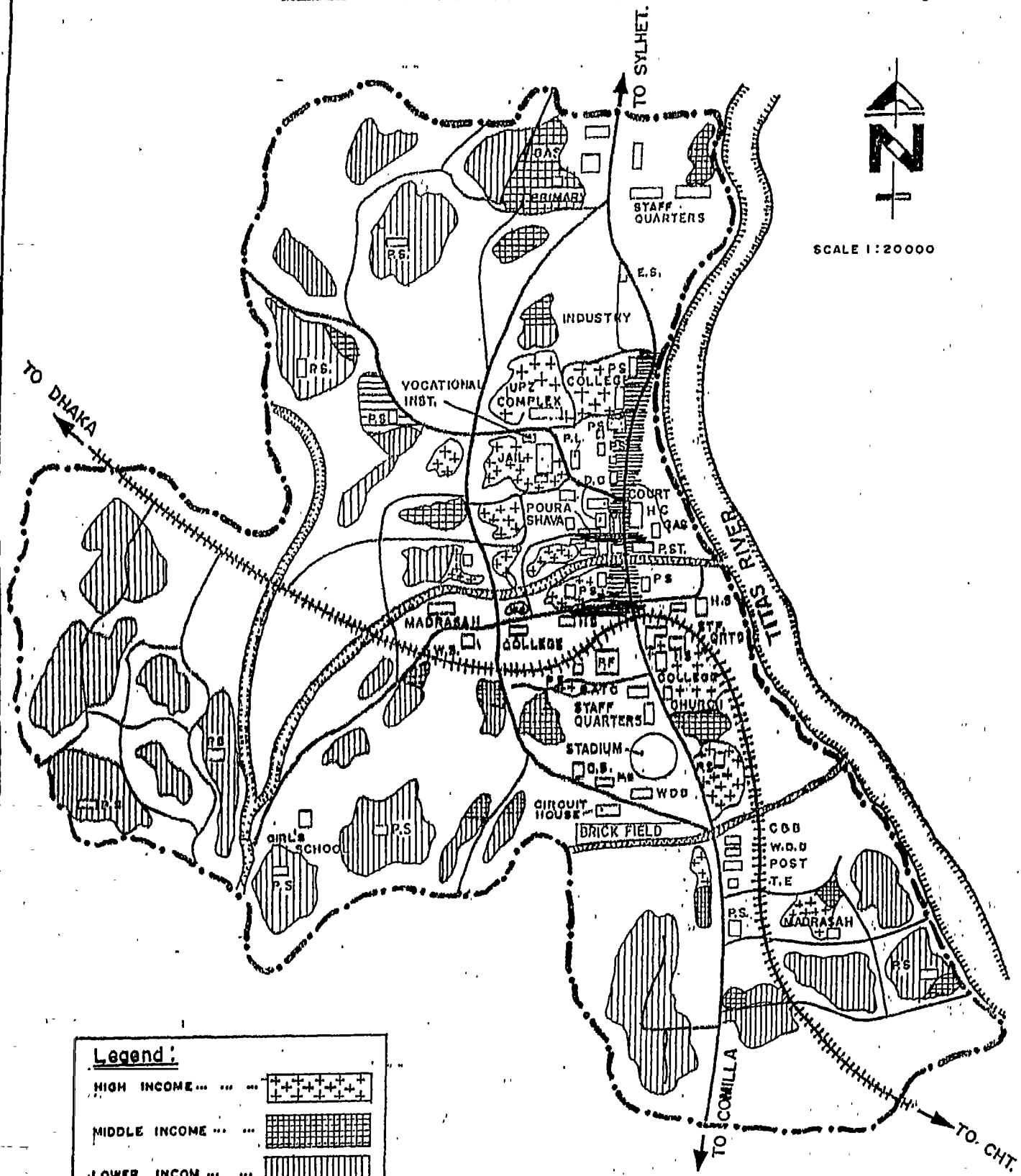
- POURASHAVA BOUNDARY
- ROAD
- RAIL WAY LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000.

BRAHMANBARIA POURASHAVA

Appendix - III
Fig - 2



Legend :

- HIGH INCOME
- MIDDLE INCOME
- LOWER INCOM
- COMMERCIAL AREA

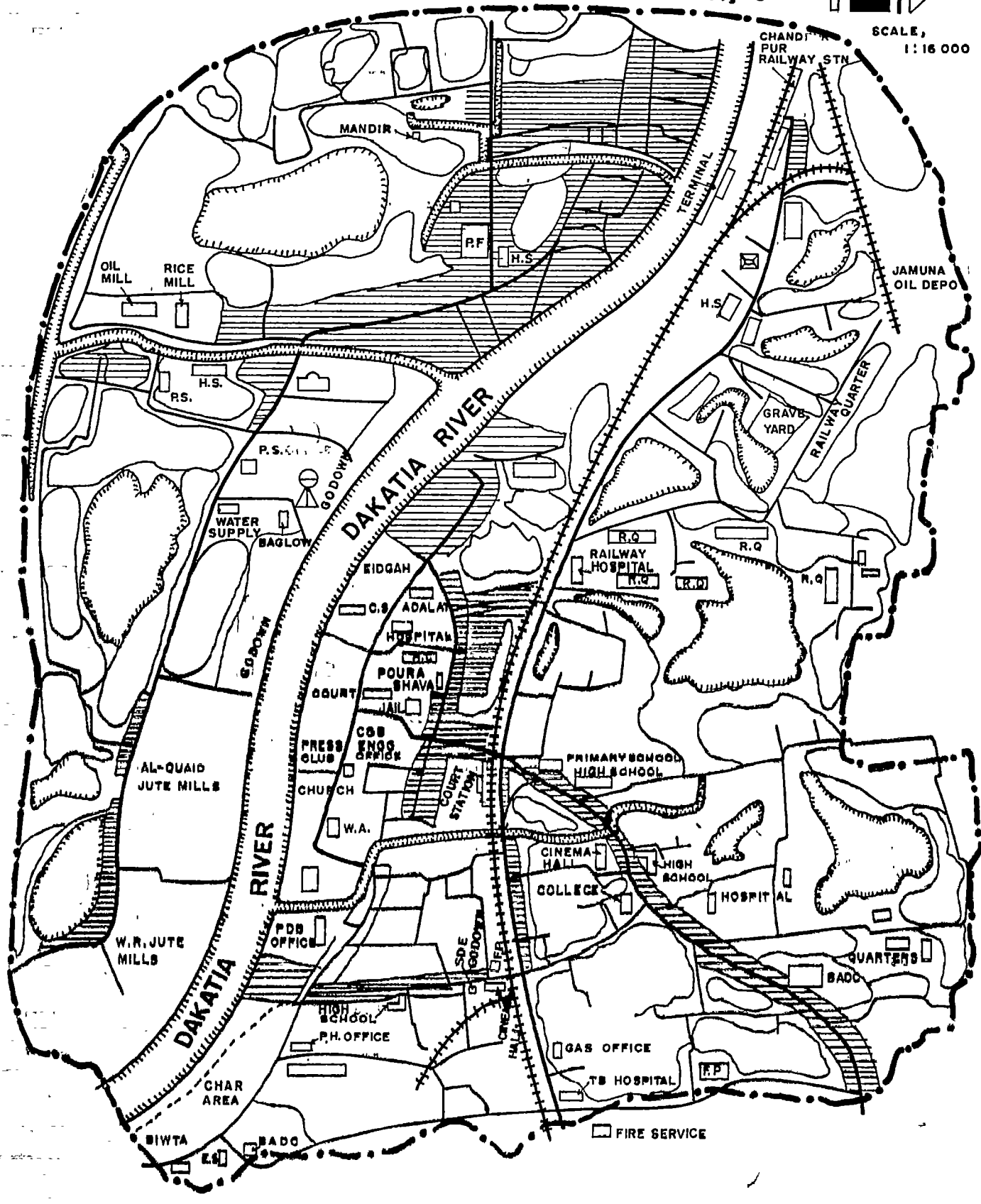
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000,

CHANDPUR POURASHAVA AREA

Appendix- III
Fig- 3

SCALE, 1: 16 000



Legend:

- POURASHAVA BOUNDARY
- ROAD
- RAILWAY LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA
- DITCH

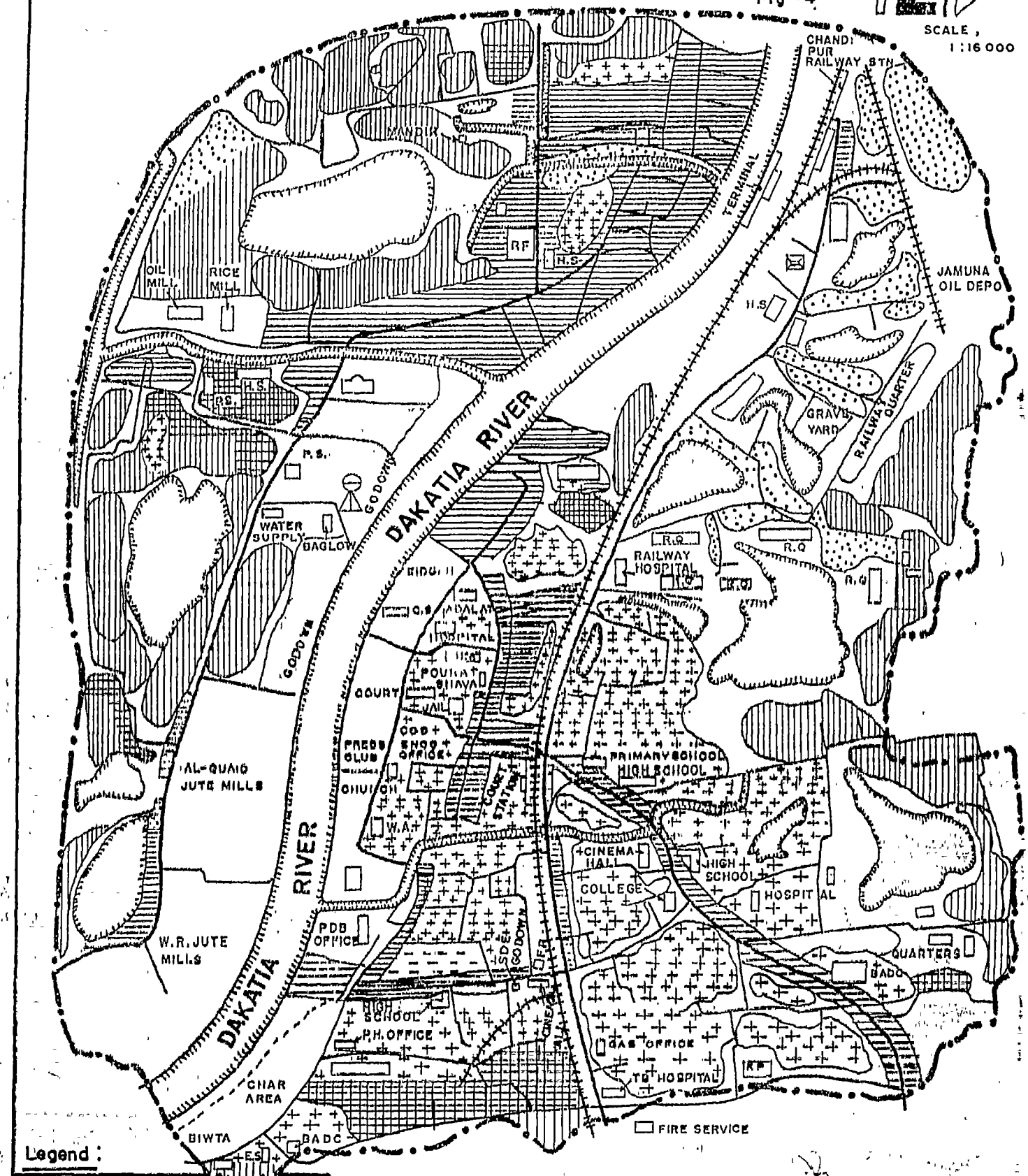
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN DHAKA-1000

CHANDPUR POURASHAVA AREA

Appendix- III
Fig - 4

SCALE, 1:16000



Legend :

- COMMERCIAL AREA ... ...
- HIGH INCOME ... ...
- MIDDLE INCOME ... ...
- LOWER INCOME ... ...
- SLUM ... ...

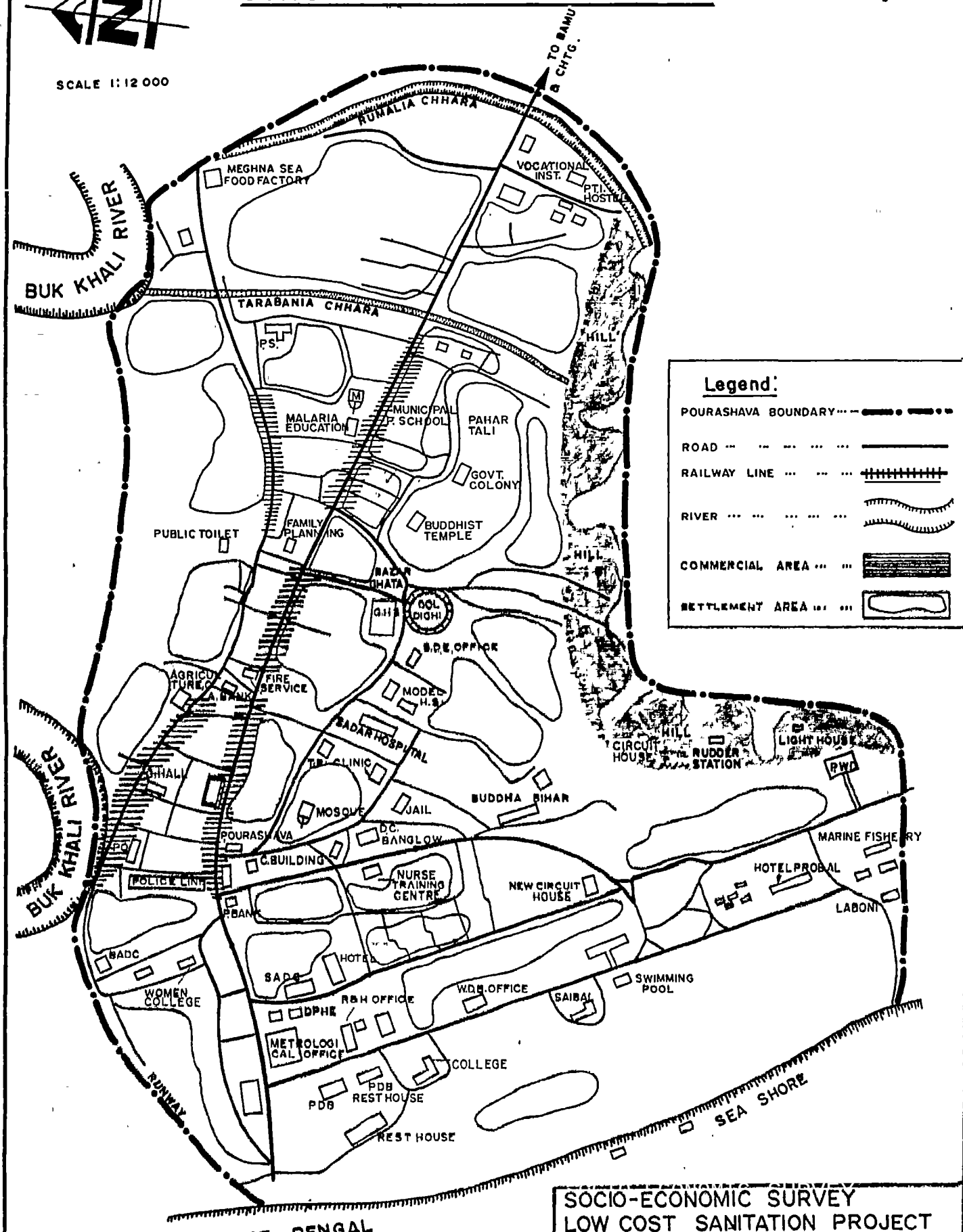
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN DHAKA-1000

Appendix- III
Fig- 5

COX'S BAZAR POURASHAVA AREA

SCALE 1: 12 000



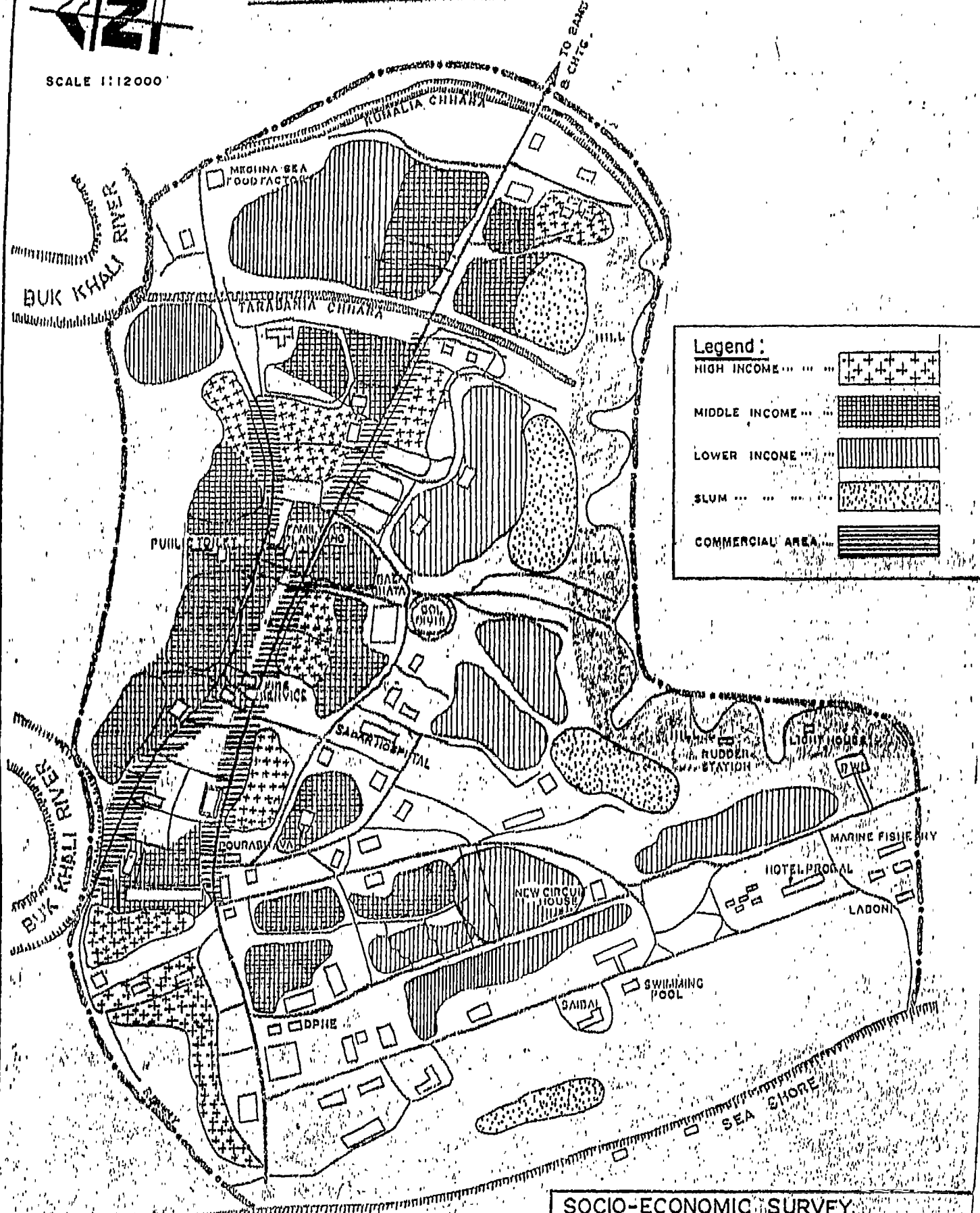
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000.

Appendix – III
Fig – 6

COX'S BAZAR POURASHAVA AREA

SCALE 1:12000

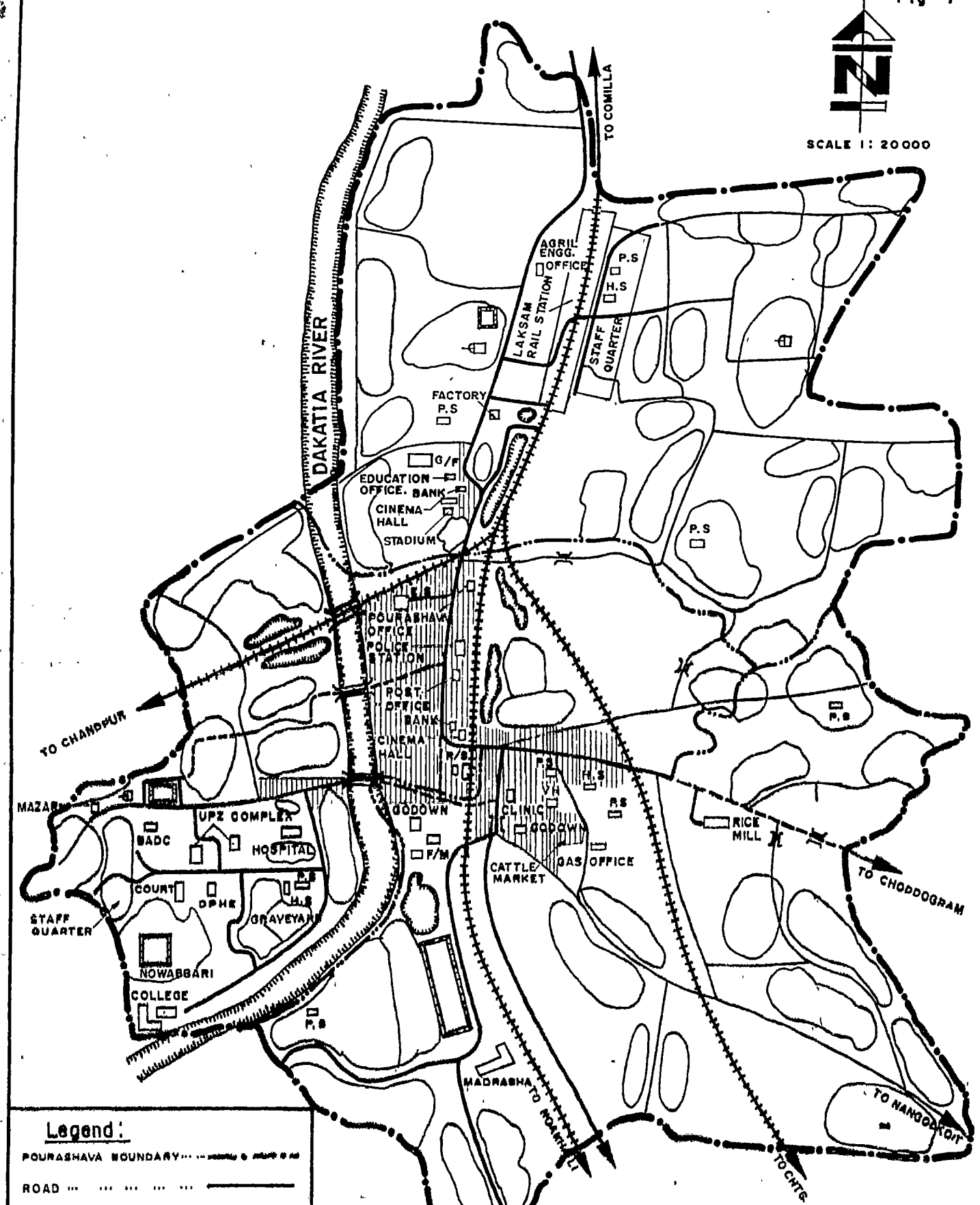


SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LIMITED

LAKSAM POURASHAVA

Appendix – III
Fig – 7



Legend :

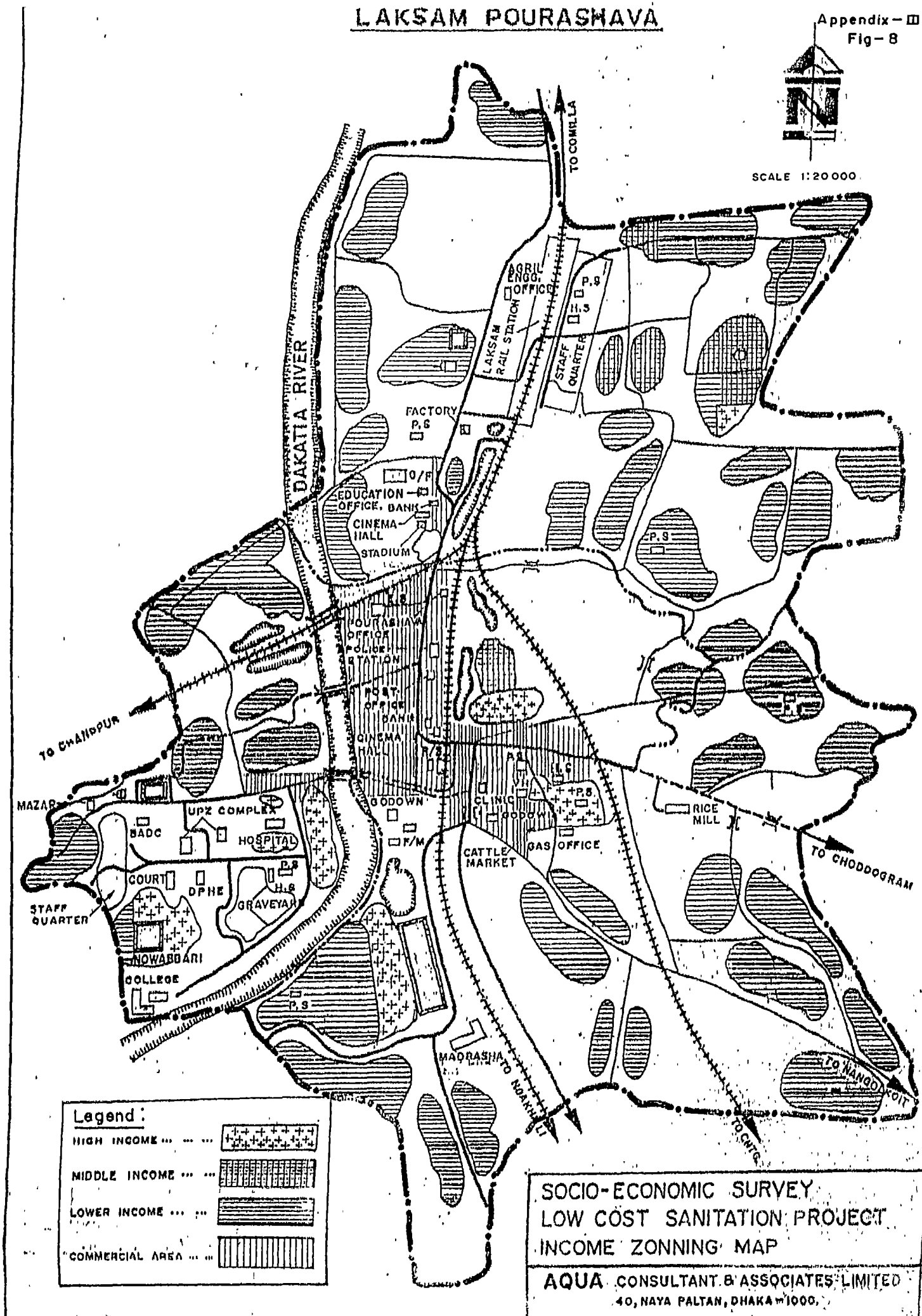
- POURASHAVA BOUNDARY
- ROAD
- RAIL WAY LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA – 1000.

LAKSAM POURASHAVA

Appendix – III
Fig – 8



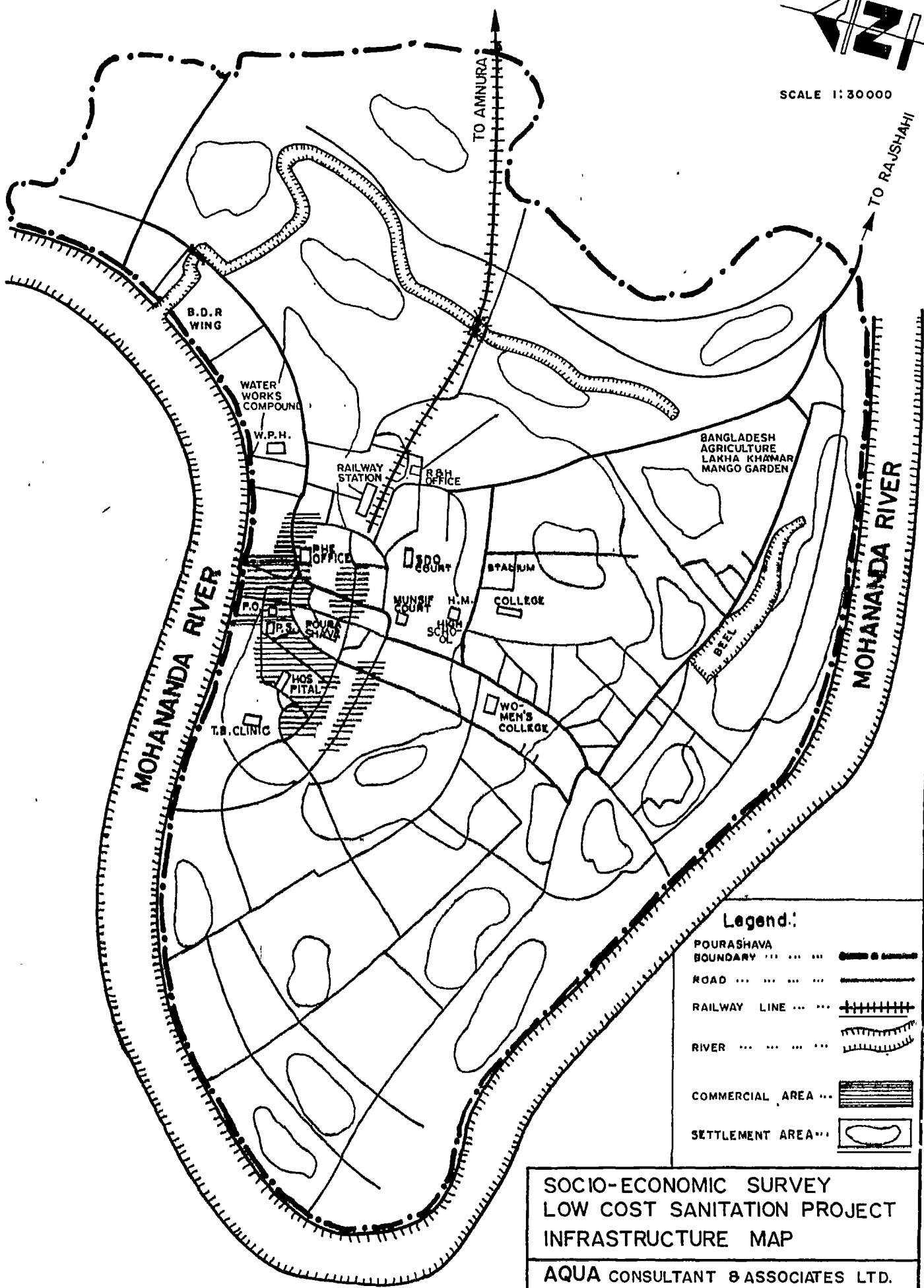
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000.

Appendix – III
Fig – 9

NAWABGANJ POURASHAVA AREA

SCALE 1:30000

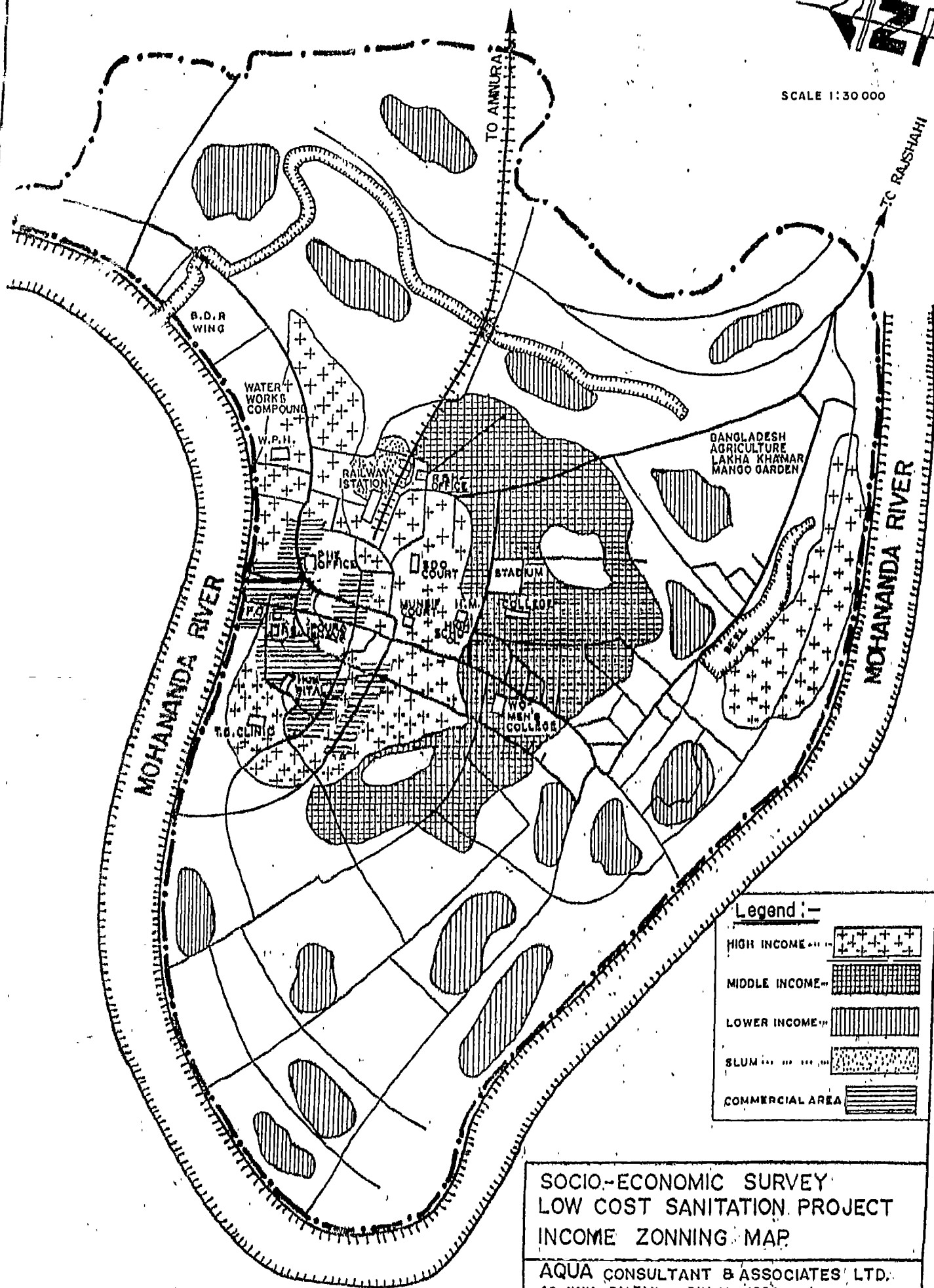


SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN, DHAKA – 1000

Appendix - III
Fig - 10

NAWABGANJ POURASHAVA AREA

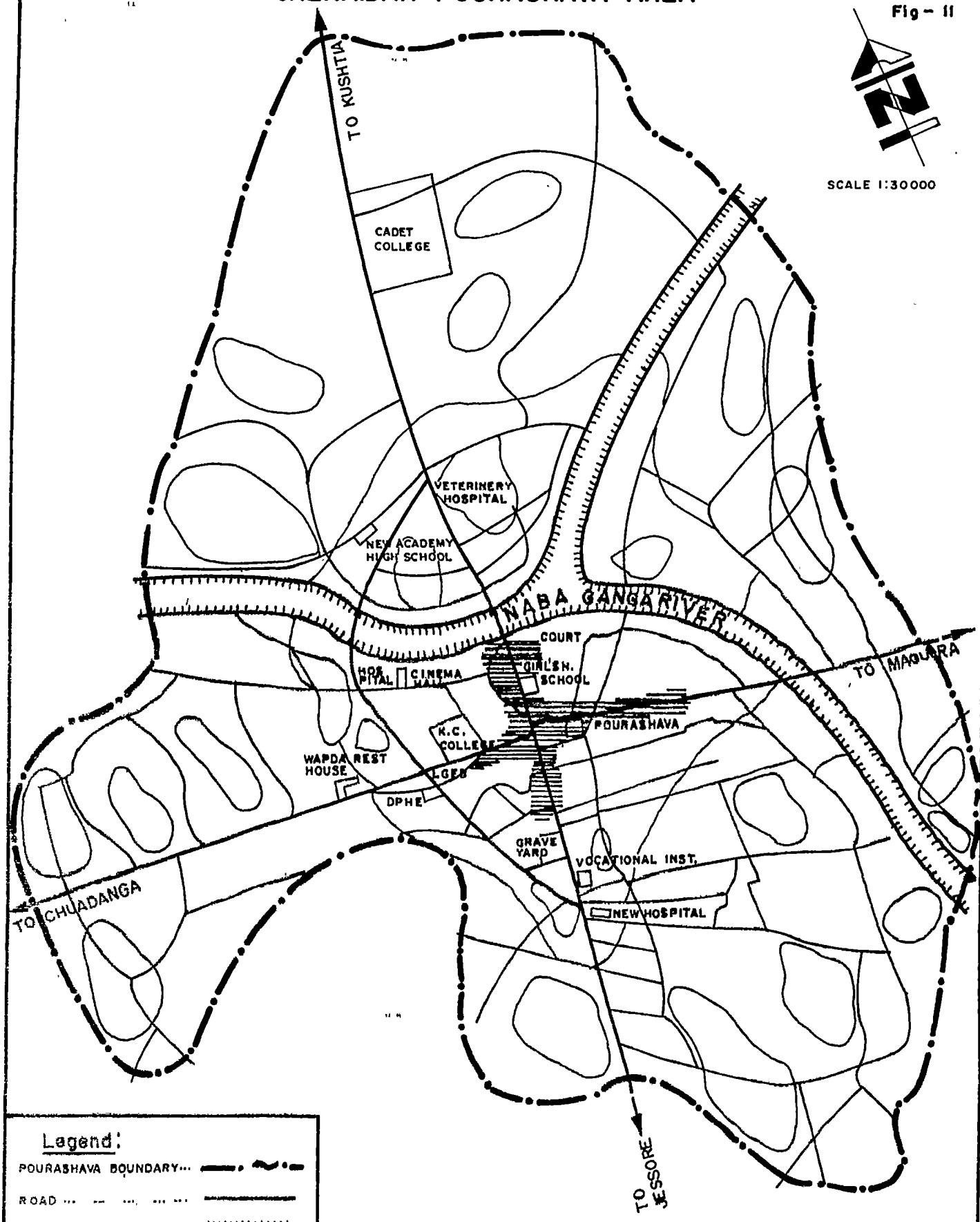


SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN, DHAKA - 1000

JHENAIDAH POURASHAVA AREA

Appendix- III
Fig - II



SCALE 1:30000

Legend:

- POURASHAVA BOUNDARY
- ROAD
- RAILWAY LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA

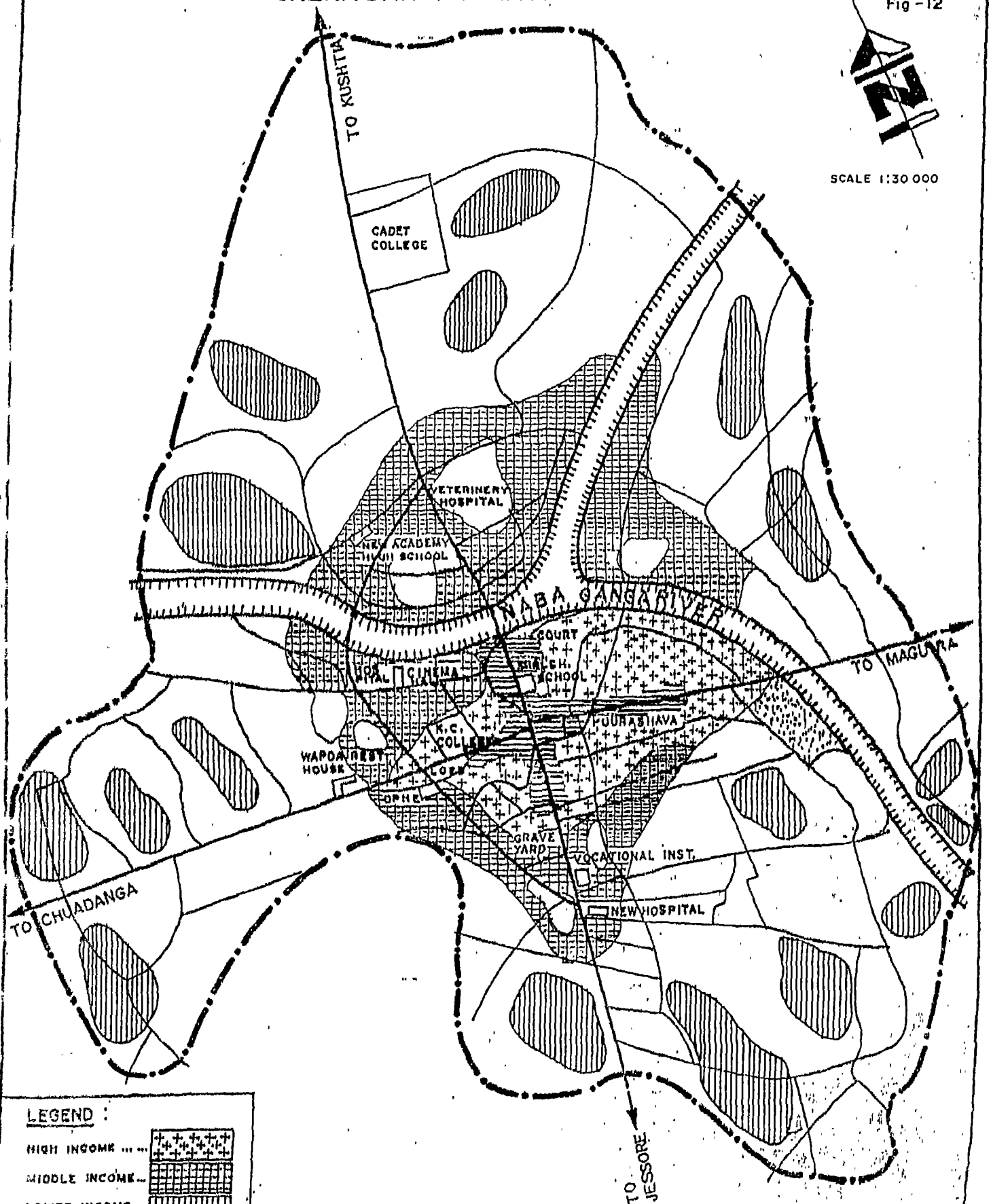
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN, DHAKA-1000

JHENAIDAH POURASHAVA AREA

Appendix - III
Fig - 12

SCALE 1:30 000



LEGEND :

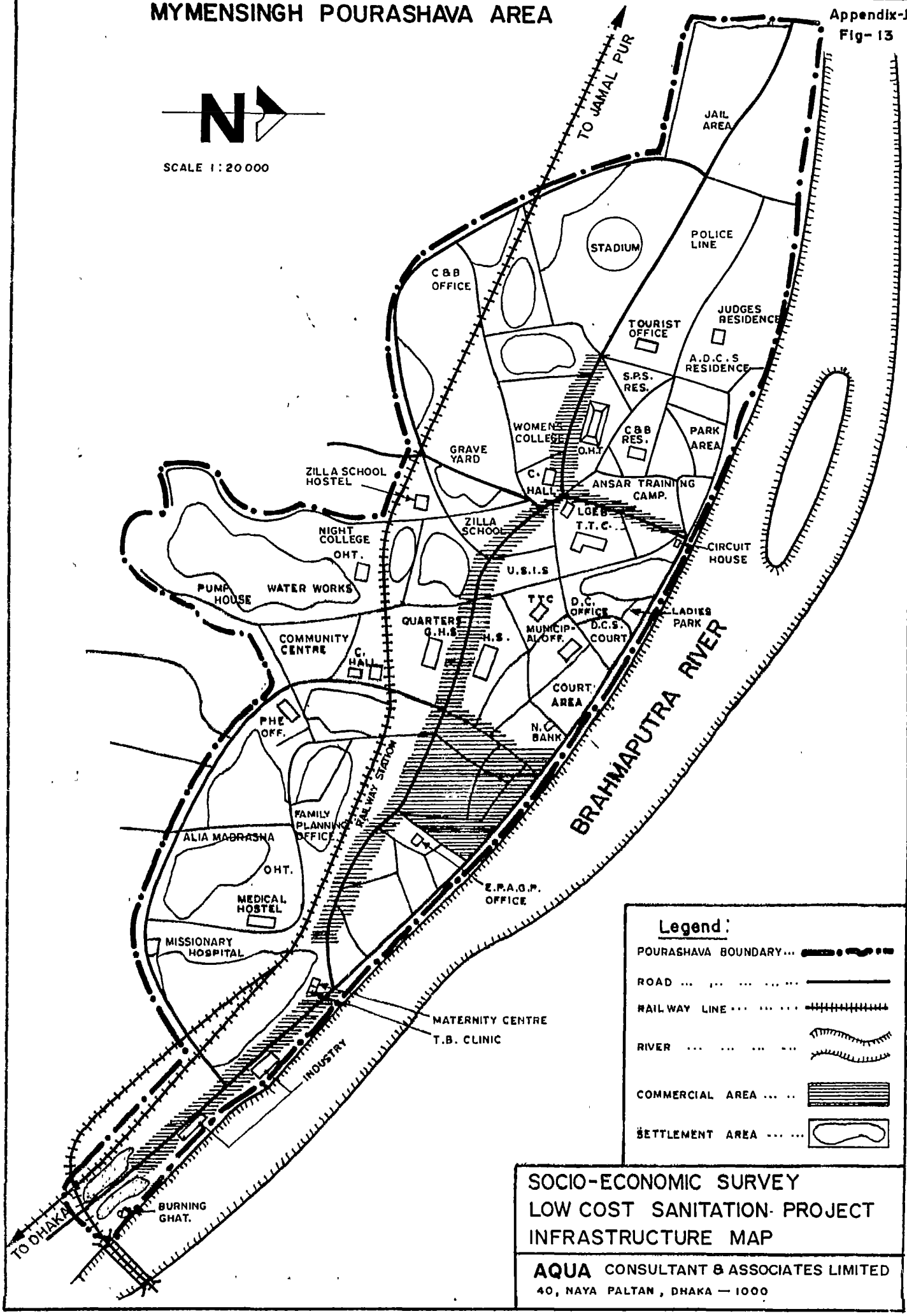
- HIGH INCOME
- MIDDLE INCOME
- LOWER INCOME
- SLUM
- COMMERCIAL AREA

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000

MYMENSINGH POURASHAVA AREA

Appendix-III
Fig- 13

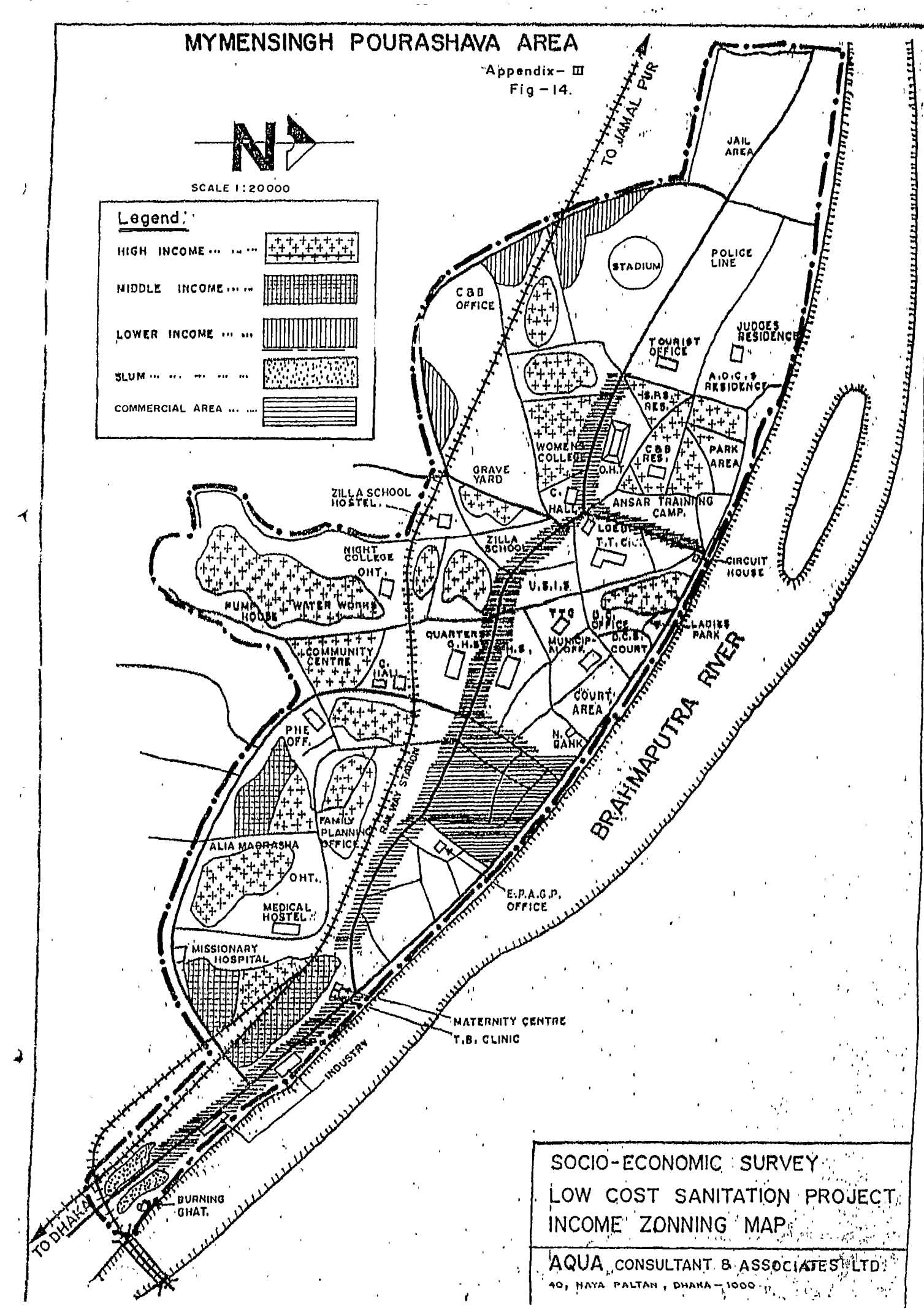


SOCIO-ECONOMIC SURVEY
LOW COST SANITATION- PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN , DHAKA — 1000

MYMENSINGH POURASHAVA AREA

Appendix- III
Fig - 14.



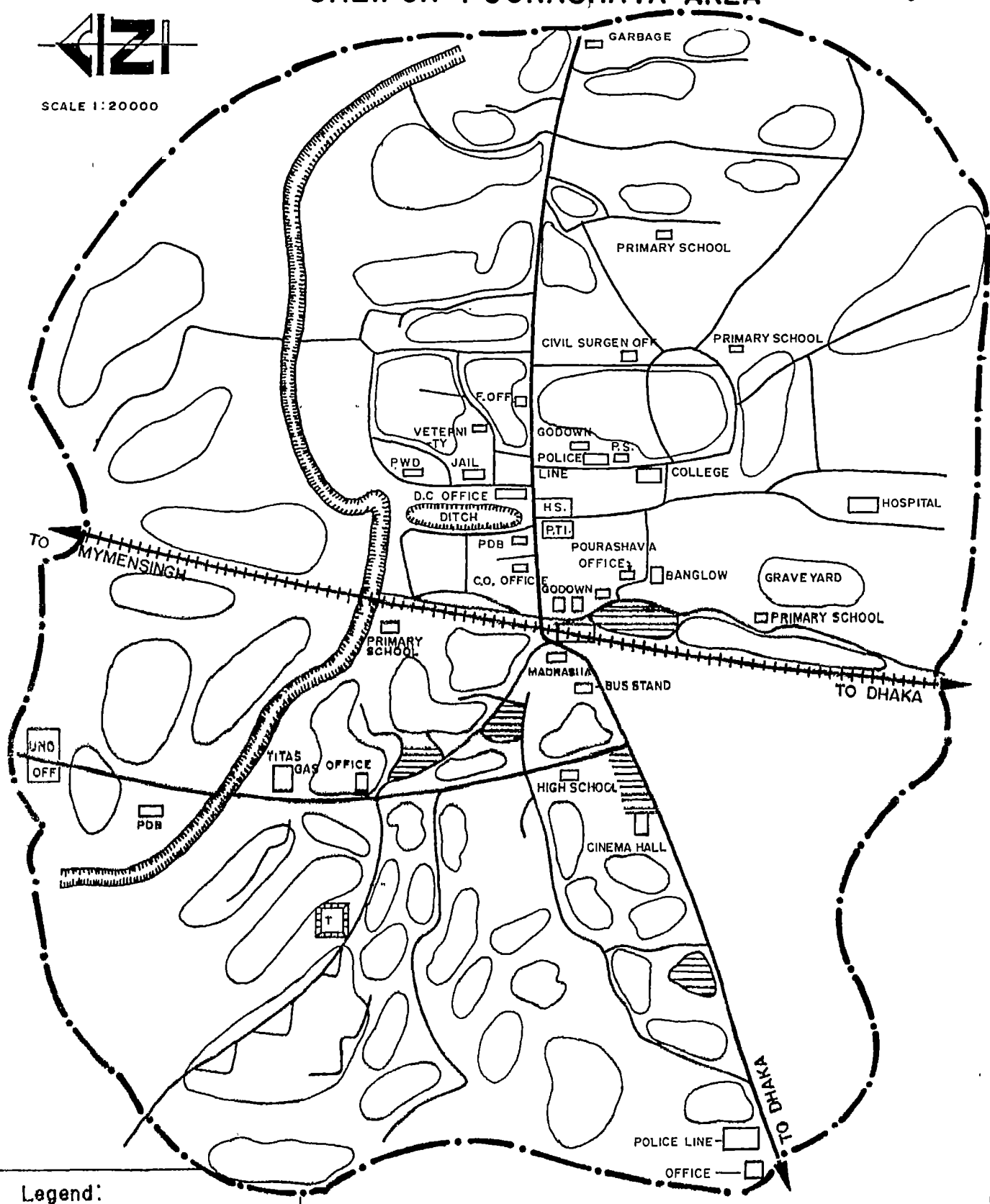
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN, DHAKA-1000.

Appendix - III
Fig - 15

GAZIPUR POURASHAVA AREA

SCALE 1:20000



Legend:

- POURASHAVA BOUNDARY
- ROAD
- RAIL WAY LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA

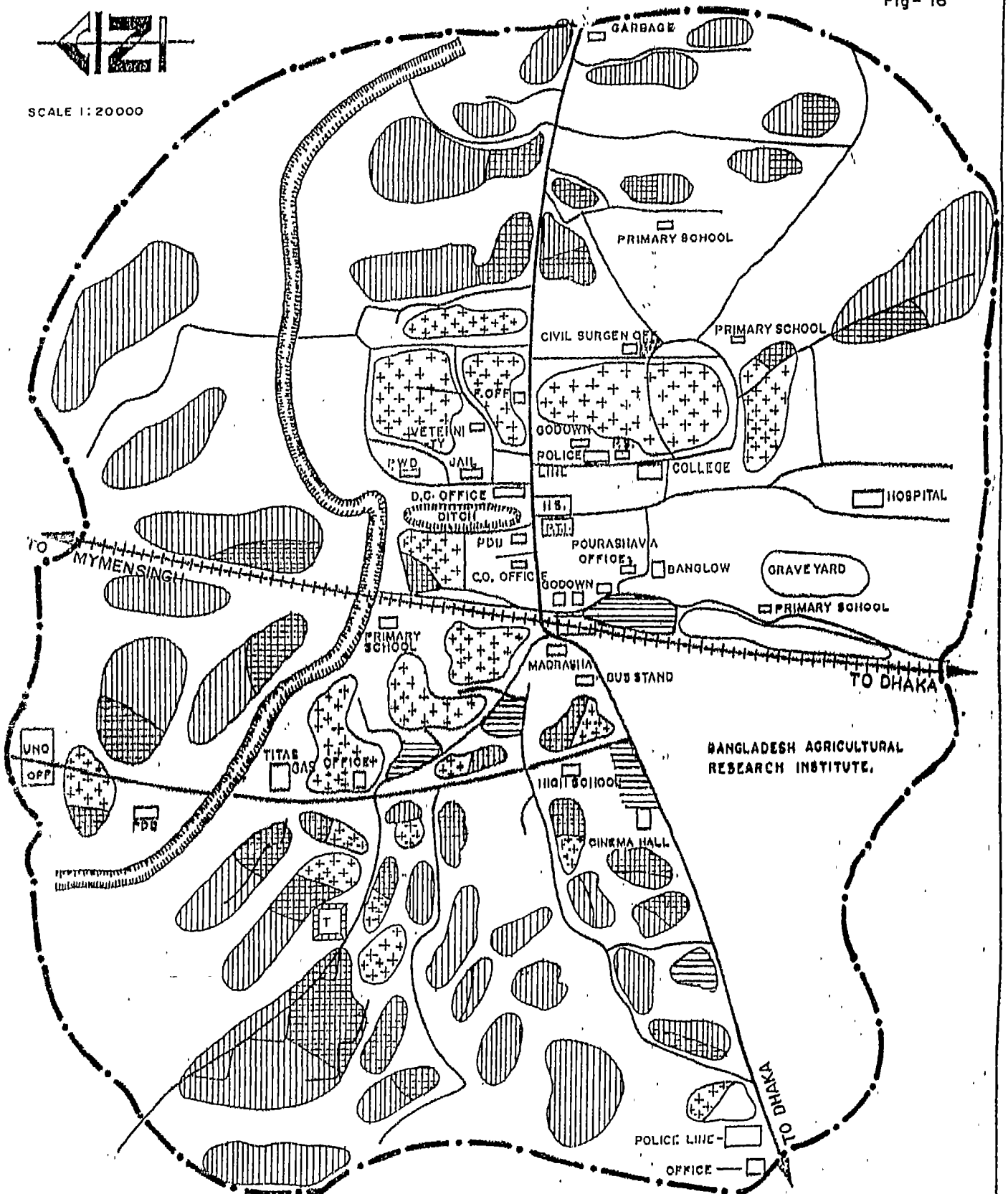
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN, DHAKA-1000

Appendix– III
Fig– 16

GAZIPUR POURASHAVA AREA

SCALE 1: 20000



Legend:

- HIGH INCOME
- MIDDLLE INCOME
- LOWER INCOME
- COMMERCIAL AREA

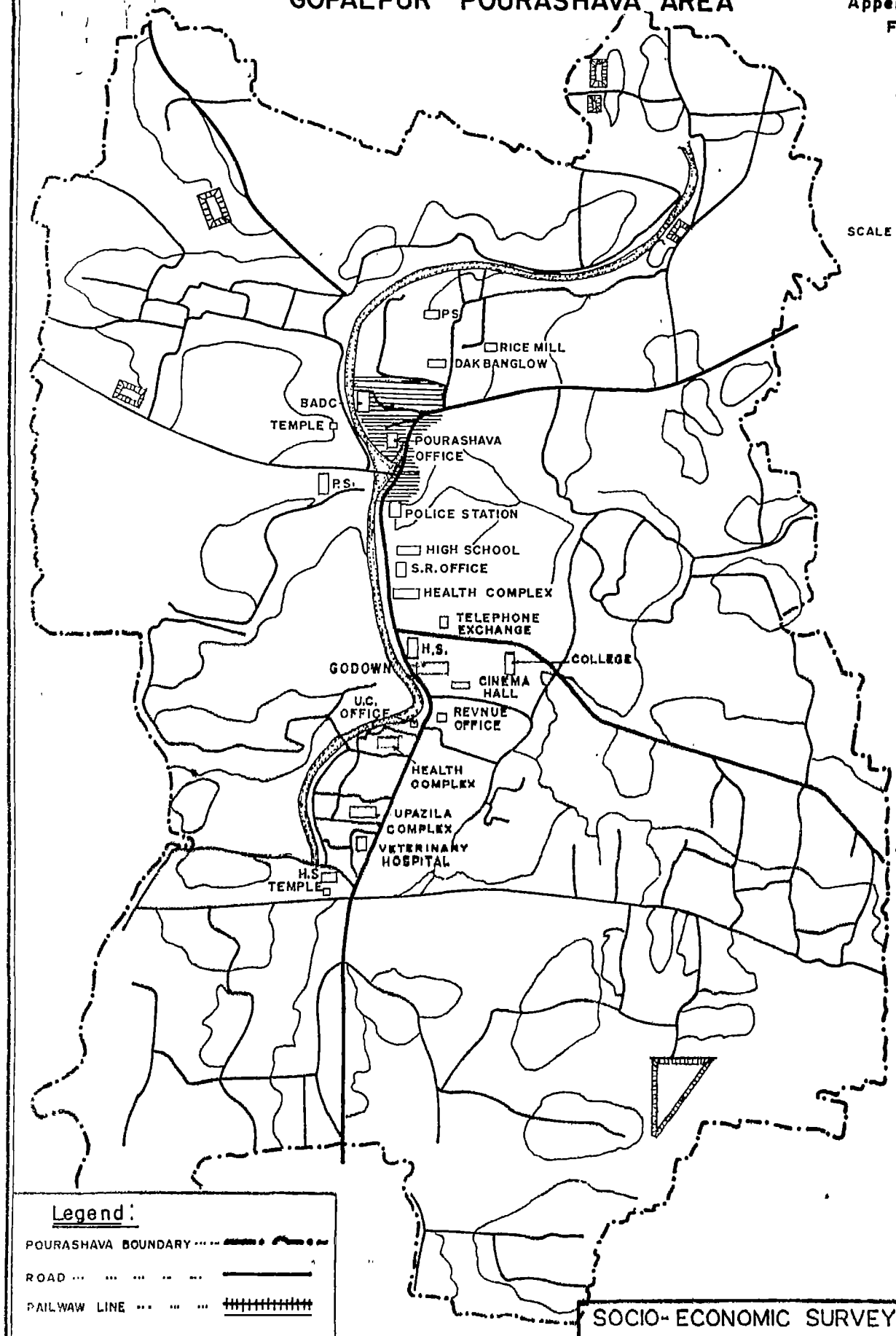
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LIMITED
40, NAYA PALTAN , DHAKA – 1000

GOPALPUR POURASHAVA AREA

Appendix- III
Fig - 17

SCALE 1:20000



Legend:

- POURASHAVA BOUNDARY
- ROAD
- RAILWAW LINE
- RIVER
- COMMERCIAL AREA
- SETTLEMENT AREA

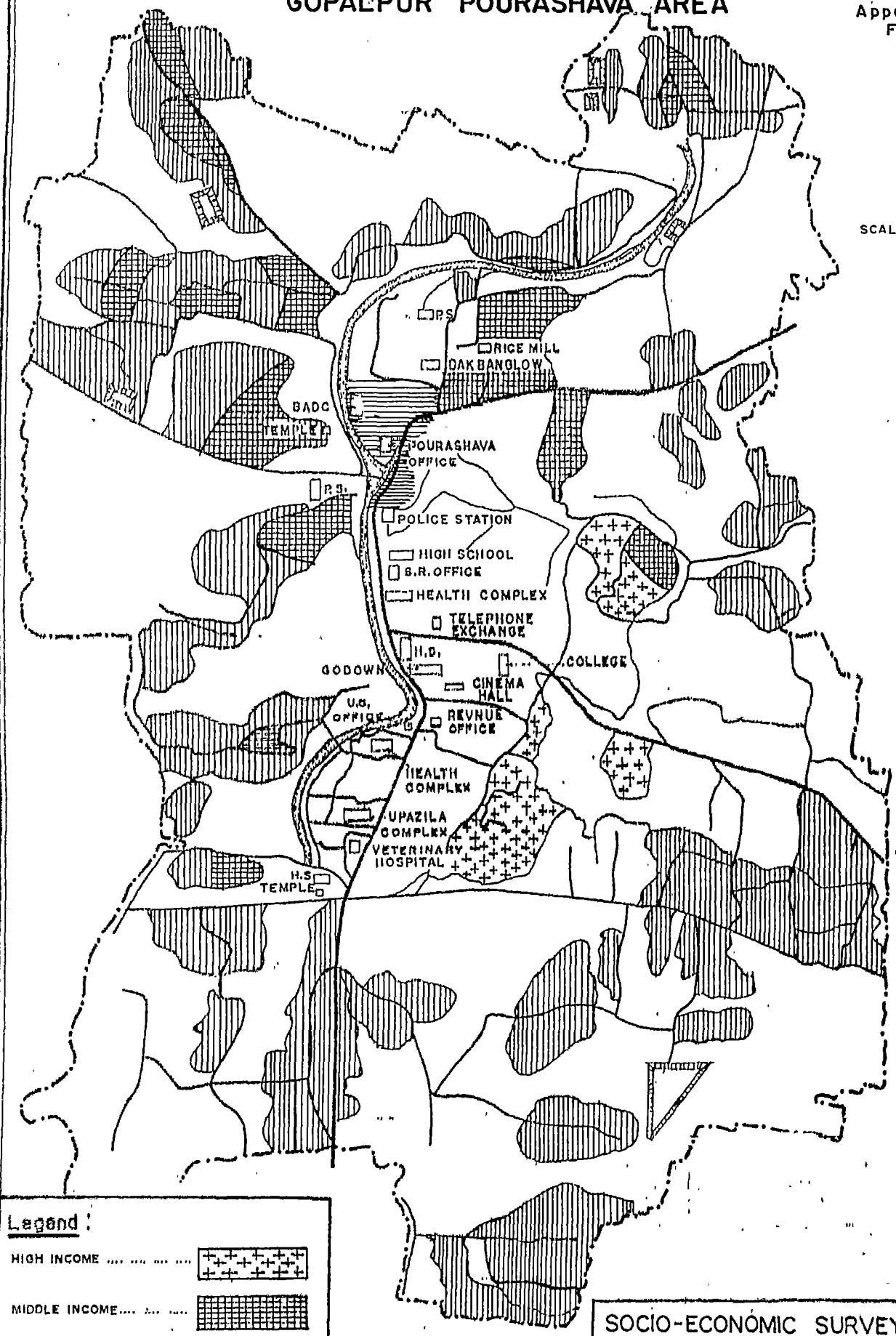
SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INFRASTRUCTURE MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN. DHAKA—1000

GOPALPUR POURASHAVA AREA

Appendix – III
Fig – 18

SCALE 1:20000



Legend :

- HIGH INCOME ....
- MIDDLE INCOME.... ....
- LOWER INCOME... ....
- COMMERCIAL AREA .. ..

SOCIO-ECONOMIC SURVEY
LOW COST SANITATION PROJECT
INCOME ZONNING MAP

AQUA CONSULTANT & ASSOCIATES LTD.
40, NAYA PALTAN, DHAKA – 1000.

APPENDIX-IV

TWO PIT LATRINE

DESIGN TECHNOLOGY AND PREFERENCE

General

During the on going socio-economic survey of the Low Cost Sanitation Project BGD/85/004 certain technical aspects of the two-pit latrines were investigated by the study team. The same issues were raised during group discussions. Since the matters concern the users, it is considered worth while to put forward the issues for future improvement or rectification. Out of the 9 municipal towns where the present survey was carried out, two-pit latrines had been installed in significant numbers (above 100 units) under the DPHE programme in 6 towns. The technical issues which will be discussed below are based on field information obtained on these latrines.

Technology of the Two-Pit Latrine

Under the ongoing DPHE programme the two pit latrine, sub-structure (pit) is made of 14 RCC rings, 7 for each pit. These rings are 3'-6" dia and 9" high. The pan is ceramic and is manufactured by Bangladesh Ceramic and Insulator Factory Dhaka. P. Trap, junction box and divider is made of ferro cement at local DPHE production centres. The connection pipes are 4" dia (RCC) and is also produced at DPHE centres.

Problems Reported and Observed

A few technical problems of the latrine were raised by the users and were verified by the field staff. The problems are mentioned below:

- Diameter of the pan hole (75mm) is rather small. This creates obstruction for the easy passage of the excreta and involves large amounts of water in cleaning.
- The F.C.P. Trap is rough and forms an adhesive surface for semi-solid excreta creating obstruction and requiring large amounts of water for cleaning.
- The P. Trap is not always water tight and therefore leaks and turns the water seal non-functional. This causes release of gas through the pan and spreads foul smell.

- The connection pipe is made of RCC and is poor in quality, cracks are often noticed. Since sewage is corrosive, the pipe also gets corroded. At many places, these pipes have been found leaking, polluting the environment and spreading bad smell.

- After repeated use, the steel ring mould for casting RCC rings gets deformed. The size of the pit cover, remaining the same, sometimes does not fit well the top ring. This causes release of gas and sometimes overflow, when the pit is full. At present no catch hook for lifting the pit cover has been part of the design. This causes inconvenience in lifting the cover.

- The present CCP Trap or siphon has a 20 mm water seal but due to a design fault the water seal exceeds 20 mm and thus large quantities of water are required to flush the latrines.

Remarks on the Problems

To ensure consumers satisfaction, the problems encountered by the users due to the faulty design should be looked into and proper design alterations/modifications be made.

The 3 inch outlet hole of the ceramic pan is adequate. Increasing the diameter the hole will mean greater water consumption but will not solve the problem of cleaning of the latrine. Easy flushing with less water depends on a lower height for the water seal. The main problem regarding flushing the latrine lies with the present construction of the CC trough. Due to the manufacturing difficulty, the water seal of CC trap becomes very elevated (nearly 75 mm) and should not be more than 25mm. Moreover, the CC trough is manufactured in two parts and then joined together where the joint is not perfectly water tight. So, during night time (when the latrine is seldom used) the trap dries up releasing gas and in the morning one gets bad smell. This can be overcome by providing a PVC P. Trap where a proper water seal can be maintained due to a superior manufacturing technique. At the same time the PVC Trap will be perfectly water tight, more smooth and hence less resistant to flushing.

PVC connection pipes may be used instead of RCC pipes. But in that case, the pipe should always remain in shade. Sometimes, soil around the pipe is washed by rain and flood and the pipes become exposed to the sun. Care should be taken to keep the PVC pipes always buried under soil by putting extra earth over the pipes. PVC pipes exposed to sun get brittle and break under very moderate impact.

The thickness of the RCC pit ring is 37 mm. Immediately after the casting, the steel mould is taken off so as not

to bind to the pipe. As a result, the ring sometimes bulges out at the top, widening its diameter. Such rings do not fit exactly with the pit cover. This problem can be avoided if bulged out rings are used at the bottom and the best on for the top. Alternatively, the diameter of the pit slab may increase by 50 mm. However, this problem will not encountered where masonry pits are installed and care is provided during the construction of rings.

The use of a catch hook or ring for lifting the pit slab as pointed out by some users, should be considered. This will facilitate lifting the pit cover for cleaning purposes.

Some users of two pit latrines wanted a gas bent pipe to get rid of bad smells. This point should be looked into and the pipe top should be provided with fly proof net.

Some users suggested a ceramic foot rest as ceramic pans are being used and this will make the latrine floor more attractive with little increase in cost. This point also needs consideration.

LIST OF PRODUCERS & SELLERS
WITH FEW OTHER INFORMATION.

Sl. No.	Name of Pourashava.	Name & Address of Owner/Responsible Officer.	Private/ Govt.	Education. (yrs)	Year of Establishment.	No. of Permanent employees.	Producer/ Seller.
1.	Laksam	Arshad Mia Doulatgonj Railgate (South), Upazila road.	Private	0	1984	5	Producer/ Seller.
2.	"	Md. Ibrahim Mia Doulatganj purba Bazar, Chouddagram Road.	Private	0	1986	4	Producer/ Seller.
3.	"	Mr. Ajoy Kumar Saha DoulatganjBazar, Railgate, Laksam.	Private	14	1983	5	Seller.
4.	"	Mr. Samsul Hoque Doulatganj Uttar Bazar, Laksam.	Private	0	1987	4	Producer.
5.	"	Eyar Ahmed Sarkar Upazila Parishad Area.	Govt.	17	1976	3	Producer.
6.	"	Mir. Moshtaque Ahmed Jahangir (Upazila Engg.), Upazila Parishad, Paschimgaon, Laksam.	Govt.	17	1984	1	Producer.
7.	"	A.T.M. Mahiuddion Khandakar, (Sub-Asst. Engg) Laksam.	Govt.	13	1985	1	Producer.
1.	Mymensingh	Md. Abdul Karim (Executive Engg.), Dist. Counsil office (K.B. Ismail Road)	Govt.	19	1984	0	Producer.
2.	"	Md. Nazrul Islam Asst. Engineer, Mymensigh Pourashava.	Govt.	13	1987	5	Producer.
3.	"	Mr. Delwar Hossain (Sub-Asst. Engg. DPHE 95, Jail Road, Khanchijhuli.	Govt.	15	-	3	Producer.

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LIST OF PRODUCERS & SELLERS
WITH FEW OTHER INFORMATION.

Sl. No.	Name of Pourashava	Name & address of Owner/ Responsible officer.	Private/ Govt.	Education. (Yrs)	Year of establishment.	No. of Permanent employees.	Prodecer or Seller.
4.	Mymensingh	Mr. Santosh Jubilee road, Near Ladies Park.	N.G.O.	15	1984	-	Producer.
5.	"	Usuf Ali M-19, Dholadia	Private	2	1985	2	Producer.
6.	"	Jasim Ahmed (Mymensingh Sanitary Stores)	Private	14	1974	3	Seller.
7.	"	Khorshed Alam 12,Jubilee Road.	Private	14	1987	3	Seller
8.	"	Tapan Kumar Majumder (unique Sanitation Store).	Private	16	1982	3	Seller.
1.	Gopalpur	Mr Nepal Chandra Paul Suti Palash Para	Private	10	1944	4	Producer/ Seller.
2.	"	Ballav Chandra Paul	Private	4	1944	6	Producer/ Seller.
3.	"	Mr. Ramani Mhanta Paul Suti Palash Para.	Private	0	1973	3	Producer/ Seller.
1.	Gazipur	Mr. Syed Shamsul Alam (Alam & Brothers) Sher-e Bangla Market Mosjid road.	Private	14	1987	4	Seller.
2.	"	Mr. Motiur Rahman (Mukta Fitters & Sanitary).	Private	12	1983	3	Seller.
3.	2	Md. Faizul Hoque Khan (Gazipur Pipe Sanitary Industries), Mosjid Road. Gazipur.	private	14	1986	16	Producer/ Seller.
4.	"	Md. Nazim Uddin (Mymensingh Sanitary works), Chandra Road, Joydebpur, Gazipur.	Private	6	1984	4	Producer/

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LIST OF PRODUCERS & SELLERS
WITH FEW OTHER INFORMATION.

Sl. No.	Name of Pourashava	Name & address of Owner/Responsible Officer.	Private/ Govt.	Educa-tion. (yrs)	Year of Estabi-ishment.	No. of per-manent emp-loyees.	Producer or Seller.
5.	Gazipur	Mr. Hariz Ahmed (Janata Sanitary works), Rajbari road, Joydebpur.	Private	5	1968	10	Producer/ Seller.
6.	"	Mr. Satish Chandra Paul, Dubail Purba para.	Private	0	1935	7	Producer/ Seller.
7.	"	Md. Nazmul Hossain SDE,DPHE.	Govt.	16	1985	2	Do
1.	Cox''s Bazar	Md. Nurul Islam Rumalia Chara, Cox''s Bazar.	Private	10	1986	5	Producer.
2.	"	Md. Nurul Huda Rumalia Chara, Ghilanga, Cox''s Bazar.	Private	10	1986	8	Producer.
3.	"	Md. Abul Hossain Rumalia Chara	Private	14	1984	10	Producer.
4.	"	Md. Samsul Hoque	Private	5	1981	8	Producer.
1.	Jhenaidah	Md. Ruhul Amin 92/Agnibina Sarak, Jhenidah.	Private	14	1987	2	Producer.
2.	"	S.M. Hamidur Rahman Sikdar Traders/ Agnibina Sarak, Jhenaidah.	Private	14	1984	4	Producer.
3''.	"	M.M. Ismail Hossain Imania iron store, Jhenaidah.	Private	9	1986	2	Producer.
1.	C.Nawabgonj	Md. Abdul Mojid Pourashava, Chapai Nawabgonj.	Govt.	15	1985	0	Producer.
2.	"	Afzal Hossain SDE, DPHE, Chapai Nawabagonj.	Govt.	16	1962	2	Producer.

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LIST OF PRODUCERS & SELLERS
WITH FEW OTHER INFORMATION.

Sl. No.	Name of Pourashava.	Name & address of Owner/Responsible Officer.	Private/ Govt.	Education (Yrs)	Year of Establishment.	No. of Permanent employees.	Producer or Seller.
1.	Chandpur	Mr. Abdus Salam SDE DPHE, Natan Bazar Balurmath, Chandpur.	Govt.	15	1947	4	Producer.
2.	"	Mr. Ruhul Amin Miji	Private	4	1988	2	Producer.
3.	"	Mr. Masarraf Hossain (Sikha Enterprise)	Private	12	1985	3	Seller.
4.	"	Mr. Liaquat Ali Mukharjee Ghat, Chandpur.	Govt.	14	1985	0	Producer.
5.	"	Mr. Abdur Rasid Khondakar, Truck Ghat, Chandpur. (Bagadi Road).	Private	10	1986	3	Producer.
6.	"	Mr. Siddque Patwary & Mr. Harun Miji, Truck Ghat, Bagadi road, Chandpur.	Private	10	1988	3	Producer.
7.	2	Mr. Abdur Rab Chandpur Pourashava, Chandpur.	Govt.	13	1986	3	Producer.
1.	B. Baria	Mr. Ranjit Roy Paik para. B.Baria.	Private	14	1976	4	Producer/ Seller.
2.	"	Mr. Md. Sakhawat Ullah, West Medda Bari.	Private	10	1987	2	Producer.
3.	"	Mr. Faroque Miah T.A. Road	Private	12	1985	1	Seller.
4.	"	Mr. Milan Khanti Bhattacharja, A.T. Road, B.Baria,	Govt.	19	1984	0	Producer.
5.	"	Mr. Rafiqul Islam SDE-DPHE, Paik para Sylhet road.	Govt.	16	1984	3	Producer.

Total : 46

LIST OF KEY INFORMANTS

LAKSHAM POURASHAVA :

1. Mr. Eyar Ahmed Sarker
   SAE, DPHE
2. Mr. Mastaque Ahmed Jahangir
   Upazila Engineer, LGEB
3. Mr. A.T.M. Mohiuddin
   SAE, Pourashava.

MYMENSINGH POURASHAVA:

1. Mr. Khurshed Alam
   XEN, DPHE
2. Mr. Nazmul Hoque
   Ward Commissioner
3. Mr. Salim
   Ward Commissioner
4. Mr. Santosh, Project Officer,
   Concern.
5. Miss Eileen, Field Officer
   Concern.

GOPALPUR :

1. Upazila Rural Development Officer, BRDB
2. Upazila Training Officer, BRDB.
3. SAE, DPHE
4. SAE, Pourashava
5. Secretary , Pourashava.
6. Chairman , Pourashava.
7. Sanitary Inspector
8. Mrs. Mamotaj Begum
   Ward Commissioner
9. SAE, LGEB,
10. Upazila health administrator in charge.

LIST OF KEY INFORMANTS

GAZIPUR :

1. SAE, Pourashava
2. Secretary Pourashava,
3. SDE, DPHE
4. Civil Surgeon
5. XEN, LGEB
6. Commissioner ,Pourashava

COX'S BAZAR :

1. SDE, DPHE
2. XEN, Pourashava
3. Sanitary Inspector
4. XEN, LGEB

JHENAIDAH :

1. Md. Ayub Ali Bishwash
   SAE, Jhenaidah Pourashava
2. Md. Azizur Rahman
   Sanitary Inspector, Jhenaidah Pourashava
3. Md. Bazlur Rahman
   Commissioner, Ward No.-1
4. Md. Abdul Momin Khan
   XEN, LGEB
5. Md. Mahbubul Alam
   SDE, DPHE
6. Md. Amanullah
   Principal, K.C. College, Jhenaidah.

LIST OF KEY INFORMANTS

CHAPI NOWABGONJ :

1. Md. Afzal Hossain
   SDE, DPHE
2. XEN, LGEB
3. Md. Nazrul Islam
   Sanitary Inspector, Pourashava
4. Mr. S.M. Nurul Islam
   Commissioner, Ward No.-1
5. Md. Altaf Uddin
   Teacher, Harimohan High School,
   Chapi Nowababgonj.
6. Mr. Uartin Bayer
   AE. Christian Commission for development of
   Bangladesh. (C.C.D.B)
7. Md. Tariqul Islam
   Principal, Nawabganj Women's College.

B. BARIA :

1. Md. Sirajul Islam
   Sanitary Inspector
2. Mr. Safiqul Islam Bhuyan.
   Sanitary Inspector (Conservency)
3. Mr. Abul Hossain
   Commissioner, Ward No. 5.
4. Mr. Syed Montaz Uddin
   Commissioner, Ward No. 1
5. Mr. Nazmul Hoque
   Field Officer In charge, Proshika, B. Baria
   Development Centre.
6. Mr. Minnat Ali,
   President, Concern on National Problem(CONP)
   N.G.O.

LIST OF KEY INFORMANTS

CHANDPUR :

1. Mr. Abdul Bari Advocate
   Commissioner, Ward No.-3 & 5.
2. Mr. Md. Rafique
   Commissioner, Ward No.-2.
3. A.K.M. Mantaz Uddin
   Sr. Sanitary Inspector, Pourashava.
4. Mr. Abul Hossain Bhuyan
   Sanitary Inspector. Pourashava.
5. Miss Jannatul Mawa
   Project Co-ordinator (N.G.O.)
6. A.K.M. Kader
   Counsellor. Cum.Superintendent incharge
   Bangladesh Association of Voluntary
   Sterilization (B.A.V.S).
7. Mr. Abdul Karim Patwary
   Ex. M.P. & Chairman.
8. Mr. Abdul Awal Advocate
   Ex. M.P.
9. Mr. Abu Zafar Moinuddin
   Ex. M.P.
10. Mr. Sirajul Islam Advocate
    Ex. M.P.
11. Mr. Abul Bari Advocate
12. XEN, DPHE
13. SAE, DPHE
14. SAE, Pourashava.