

# Sanitation Assessment Report: Bashuar Village, Rajshahi, Bangladesh

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This report is one in a series of project reports written by the Wastewater Agriculture and Sanitation for Poverty Alleviation in Asia (WASPA Asia) project. The WASPA Asia project aims to develop and test solutions for sanitation and wastewater management, to reduce the risks from wastewater use in agriculture. The approach involves the development of stakeholder coalitions at town and national level, called Learning Alliances, which will bring together the main stakeholders into a participatory process through which actions will be planned and implemented in a sustainable manner.

These project reports are essentially internal documents intended to inform the future activities of the project, particularly in relation to the development of Learning Alliances and participatory action plans. The reports have been made publicly available as some of the information and findings presented in them may be of use to other researchers, practitioners or government officials.

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## Acronyms and Abbreviations

ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
GoB	Government of Bangladesh
MOH&FW	Ministry of Health and Family Welfare
PHC	Primary health care
RCC	Rajshahi City Corporation
RDA	Rajshahi Development Authority
RMCH	Rajshahi Medical College Hospital
MICS	Multi Indicators Clusters Survey
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
HFPO	Health and Family Planning Officer

## **1 Introduction and Objectives**

This assessment was undertaken as part of the Wastewater Agriculture and Sanitation for Poverty Alleviation in Asia (WASPA Asia) project, which aims to improve the livelihoods of peri-urban and urban farmers who are using wastewater. Identifying key stakeholders and building learning alliances among them is at the centre of the project focus. Thus, the overall project objectives outline a series of assessments, along the wastewater generation to user pathway, including the consumers of the agricultural produce. The hygiene behavior and sanitation assessment undertaken here is one of them.

It is intended that the information gathered in this study will be combined with findings in other linked studies on water quality, industrial pollution, agriculture and institutional issues. Together these findings will be used directly in planning interventions with the community members. The studies were therefore not extensive but were targeted specifically to this purpose. They will also be followed by discussions with community members and other stakeholders to check the findings and recommendations made. These meetings will be used to plan intervention activities with stakeholders. It is envisaged that the project outputs will result in better waste management and environmental sanitation in the study area.

### **Objectives**

The overarching goal is to study the impacts of wastewater on downstream communities whose livelihoods depend on it.

The specific objectives of this study are:

- i. To identify the polluters (major polluters);
- ii. To identify the communities affected by urban wastewater; and
- iii. To assess the sanitation and hygiene behavior of communities that depend on wastewater for their livelihoods, one way or another.

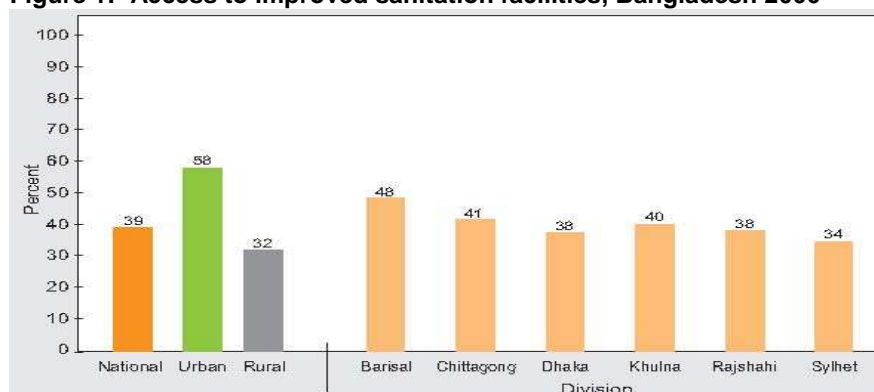
## 2 Background

The background information on the project area is given in the baseline report of Rajshahi (Clemett et al. 2006). This report provides a brief description of the hygiene behavior and sanitation status of the country and more specifically the health and sanitation issues in Rajshahi City where the assessment was carried out. Secondary data were collected from the Bangladesh Bureau of Statistics (BBS), which regularly updates various pertinent indices (<http://www.bbs.gov.bd>); and from relevant institutions in the study area such as Rajshahi City Corporation (RCC) development reports.

The best assessment carried out to capture the hygiene and sanitation status in the country was the multi-phase Multi Indicators Clusters Survey (MICS) of Bangladesh (1993). This was basically a household socioeconomic survey that assessed and monitored human development in the country. In this multi-phase program the major focus was women and children, and its ninth round was completed in 2006, with the aim of monitoring the implementation and impact of the Millennium Development Goals, the World Fit for Children Declaration and Plan of Action, goals of the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) and African Summit of Malaria (BBS-UNICEF 2007). This is the only household survey that provides disaggregated data up to District level with a large number of socio-economic indicators.

The key findings of the recent MICS study were that average household size for Bangladesh was 4.8 in the 62463 households that were successfully interviewed. The majority of households (91%) were headed by males. Of the women interviewed 68% lived in rural areas; 34% had no education; and 79% were married. In the area of water and sanitation, the Government of Bangladesh has taken great strides to provide latrines and drinking water to its people (Quazi 2006). Access to an improved drinking water sources is almost universal (98%) in both urban and rural areas. Latrine coverage however is significantly lower at just 39% for the country as a whole and 38% in Rajshahi Division (Figure 1, BBS-UNICEF 2007). However, the country still lags behind in issues relevant to environmental sanitation. A number of case studies have assessed and pilot studies have been launched to address the issue of environmental sanitation (Quazi 2006).

**Figure 1: Access to improved sanitation facilities, Bangladesh 2006**



Source: MIC survey BBS-UNICEF 2007

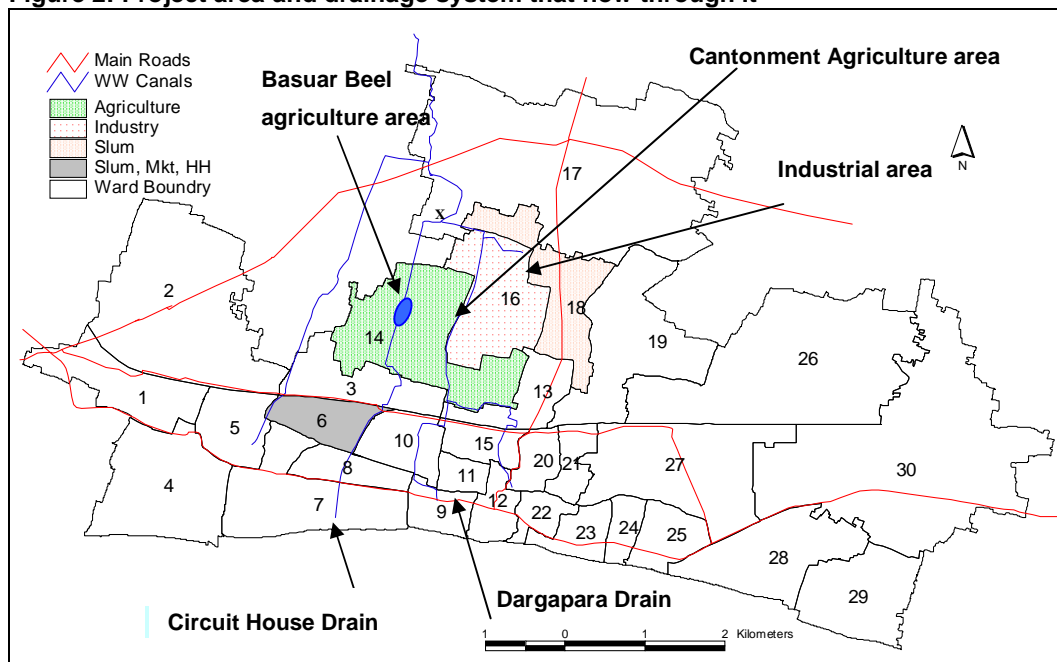
## Study Area

The study area was selected within the Rajshahi District of Rajshahi Division (latitude 24° 25' N, longitude 88° 34' E) which is a primarily agricultural area. The extent of the study area encompasses, the RCC area of 96.69 km<sup>2</sup> and has a population of 383655 (census 2001) and Paba Upazila which covers 280 km<sup>2</sup> and has a population of 262251 (BBS 2001)<sup>1</sup>.

### Surface Drainage system within the study area

The city has a network of 10 main stormwater drains and many smaller drains feeding this. Two of these flow through the project area and irrigate agricultural land, namely the Circuit House Drain also known as Basuar Beel Drain because it drains through Bashuar Beel; and Dargapara Drain, also known as the Cantonment Drain because it flows through the cantonment agricultural area (Figure 2). The starting point of the Circuit House Drain (4.5 km) is at the Circuit House Road, passing through some of the land marks such as Rajshahi Metropolitan Police, Medicine Corner, Rajshahi Medical College Hospital (RMCH), a Clinic and Women's Complex. Eventually, it enters a large water body referred to as the Bashuar Beel which is at the boundary of the RCC area.

**Figure 2: Project area and drainage system that flow through it**



Source: RCC 2006

Dargapara Drain (4 km) starts from Natore Road, and the major landmarks in its route are Rajshahi College, Sadar (Main) Hospital, the Passport Office, the Fisheries Office and the Cantonment Area. Further drainage connections are evident from the east side of the Cantonment Area, which drains water from the Bangladesh Small and Cottage Industry

<sup>1</sup> Further background information on the area can be found in Clemett, A., Amin, M. M., Ara, S. and M. M. R. Akan. 2006. Background Information for Rajshahi City, Bangladesh. WASPA Asia Project Report 2. Colombo: IWMI.

Corporation (BSCIC) (95 acre) industrial area. These inlets are further down in the peri-urban area where farmers have plots of agriculture. The Circuit House Drain and Cantonment Drain join at a point at Therokadia, Kristan Para road, and then flow on to the Baraonai River (Figure 2).

Although these drains were designed to carry storm water, in reality they contain a mixture of predominantly domestic wastewater, storm water, and industrial effluent to a greater or lesser extent depending on the specific drain. Despite this the drainage water is regularly used for irrigation and observations have been made of people bathing and washing household items in some parts of the drains, on the outer edges of the city.

**Figure 3: Irrigating with wastewater after the two drains converge**





### 3 Methodology

The sanitation survey was undertaken in a down stream community (Bashuar Village) that utilizes water from the drains. Bashuar Village is located in Horogram Union of Paba Upazila in Rajshahi District and borders a large *beel* (Bashuar Beel, 13 acre), around which agricultural activities are carried out on 98 ha of land. One of its immediate borders is the RCC area and therefore this area can be considered as a peri-urban village.

Data were collected from structured questionnaires and direct observation of daily lives (Annex I); in depth interviews and key informant interviews; transect walks (Annex II); stakeholder analysis; and during water quality monitoring studies. Guidance notes on activities were prepared prior to undertaking the assessments and final methodologies were developed from these guidance notes.

The village selection was done after the transect walks. There were two possible locations for further research based on where agricultural practices were taking place that included the use of wastewater for irrigation. Bashuar Village was selected because it was a reasonably contained unit from which a random sample could be obtained that included farmers; other users of the drainage water; and households who disposed of waste to the drains. The cantonment area would also have been an appropriate study site but it is more developed and more densely populated, and it was felt that undertaking household level research here would not readily yield results. Perhaps more importantly it was deemed to be a higher income area and part of the project purpose is to reduce poverty by improving livelihoods, hence it was felt that it would be more appropriate to work with the lower income community.

Initially the project team contacted some key community members and managed to obtain a simple road map of the village (Figure 4).

**Figure 4: Mapping Bashuar Village**



The questionnaire was piloted in Bangla, modified and re-tested. When the team was satisfied it was finalized. The team was also trained on how to undertake the observation part of the survey and some adjustments were made to this also. The responses from the questionnaire were recorded in Excel as this was felt to be a simple yet useful format for both numeric data and descriptive responses.

The sanitation assessment was not limited to the communities but also included wastewater from industries. A short checklist of questions was developed and 10 of the 86 industries in the BSCIC area were visited that week. This was to complement the water quality and industrial work already being undertaken. The findings from these components of the project are reported on separately but will be combined in a comprehensive project report.

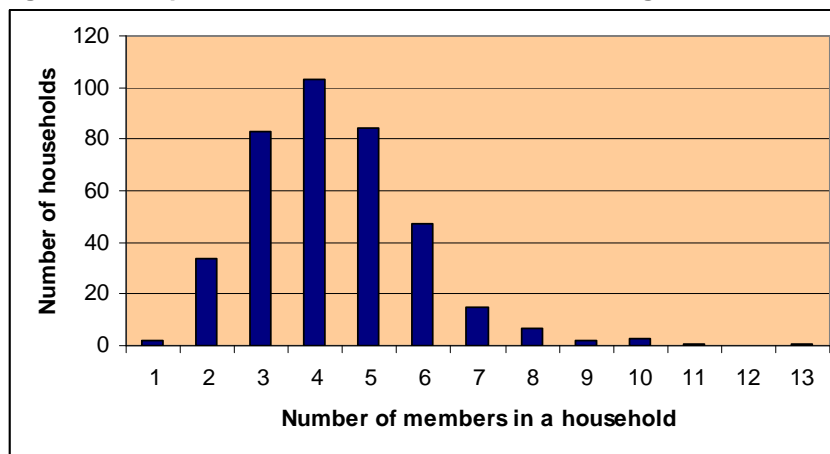
## 4 Results and Discussion

The village has nine small ponds or *pagars* (approximate size 0.5 – 0.75 acre) out of which two were receiving the overflow from house hold latrines and were therefore not used for any other purposes. The community has two mosques and also two schools (Primary and Secondary) where the children can study up to the 12<sup>th</sup> grade.

The village community engaged in a number of livelihoods, because they live close to the city center. Although agricultural activities appeared to dominate as a livelihood, not all farmers lived close to their cultivated lands and many other farmers from near-by villages also engaged in agriculture in the fields near the village, using the water from the drains and *beel*. The other livelihood activities that were evident were, livestock rearing for meat and dairy products, daily paid labor, service sector jobs, small businesses, teaching, driving and skilled labor or artisanal activities.

Of the households selected (n=87), 29% were headed by females. The average household comprised of four members and the male to female ratio was 52:48 (Figure 5). Some households were clustered within a compound with common utilities; usually because the sons and daughters had built houses next to their parents. In such cases there was overcrowding and general disregard for the cleanliness of the immediate environment.

**Figure 5: Composition of households in Bashuar Village**

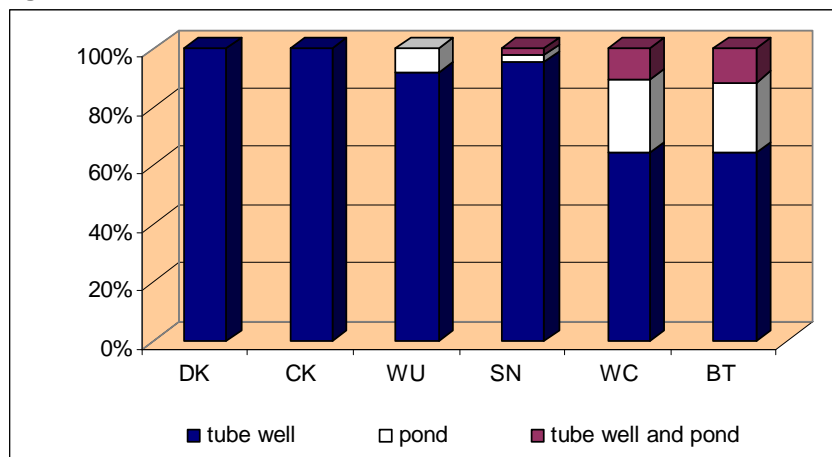


The insides of the houses were observed to be clean only in 37% of those visited with 6% being recorded as being unclean. The surroundings were clean in 30% of households but the rest had a lot of debris, animal droppings and general lack of concern for the immediate environment.

## Access to water

Ground water is the only source of drinking water in the village, which is obtained via deep (250 – 300 m) and shallow tube wells (60 – 70 m). The majority of households surveyed had deep tube wells that were well maintained (68%) and 23% had shallow tube wells; for the remaining households they were not sure of the depth or ownership and use practices could not be satisfactorily established. Most tube wells had concrete platforms (90%) and the general cleanliness was acceptable. The 10% of the tube wells that did not have a concrete platform were not maintained well and the surroundings were not kept clean. The excess water at the tube well sites was diverted to a pond or Bashuar Beel, but many had it collecting at the site itself. Tube well water was used exclusively for drinking and cooking purposes and was by far the preferred source of water for all domestic activities (Figure 6).

**Figure 6: Source of water used for various domestic activities**



DK=Drinking; CK=Cooking; WU=Washing Utensils; SN=Sanitation; WC=Washing clothes; BT=Bathing

**The system of ponds appeared to be popular for bathing, washing clothes and utensils but the ponds also collected the discharged water from drainage outlets of tube well sites. Where there were houses close by, even the grey water discharges were directed to these ponds and the community did not perceive this as an unhygienic practice. It was observed that sometimes the inhabitants used Bashuar Beel for domestic purposes even though it receives the overflow from latrines and wastewater from the city (**

**Figure 7;**  
**Figure 8).**

During in-depth interviews it was revealed that the communities preferred to carry out the final wash of clothes and utensils with the tube well water and the statistics presented in Figure 6 clearly show that tube well water is widely used for all purposes.

**Figure 7: Using the beel for washing clothes**



**Figure 8: Using the beel for other domestic purposes**



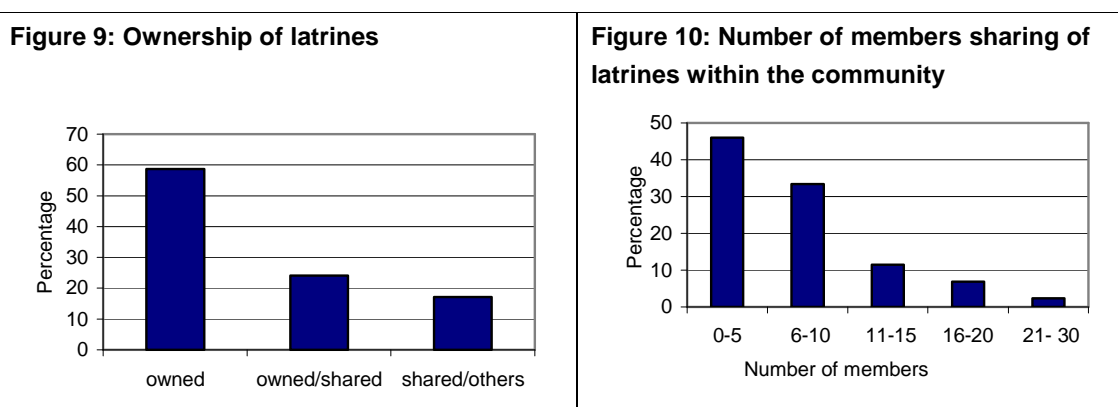
Water from the drain flows across an area of undeveloped or utilized land, and into Bashuar Beel. It flows out the other end and on through the agricultural area towards the river. In addition 12 latrines are connected to the *beel*. As a consequence it is likely that the *beel* is quite heavily polluted, but water quality testing also suggests that some improvement of water quality takes place between the drain and the *beel* either due to dilution, sedimentation or bacterial processes (see Dissanayake et al. 2007). Nearly 36% of households were located close to the *beel*, these members were observed to use the *beel* for a number of domestic purposes. This pilot study shows that the activities of daily life have an impact on the surface waters, especially with regard to pollution. These observations need to be discussed with the community members, to heighten their awareness of the environment and to teach methods for safeguarding and the sustainable use of their natural resources.

#### **Access to Latrines**

The types of latrines in the area varied: the survey showed that the majority (62%) used sanitary latrines, 37% used pit latrines and 1% used hanging latrines. The interviewers observed that overall 50 households had access to sanitary latrines, which was a little low

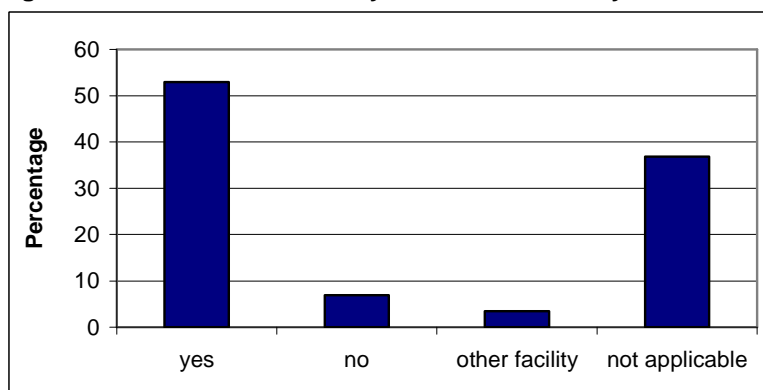
compared to the responses given by the household members but in some cases households perceive their latrine to be a sanitary latrine even if it does not quite conform with the definition. It was observed that the sanitary latrines had septic tanks but a few had ring pits with overflow pipes connected to Bashuar Beel. Similarly, the hanging latrine and a few pit latrines were also connected to Bashuar Beel.

Thus, every household had access to a toilet, which they either owned or shared with others. Within a household, men, women and children all had equal access to the latrines, but children less than four years of age tended to defecate in the household compound and parents removed the faeces. Around 59% latrines were owned by the households interviewed, of which 58% were sanitary latrines and 41% were pit latrines (Figure 9). There were no public latrines in this area but it appeared that sharing of latrines was common. Sharing was usually with fewer than 10 people, although in some instances more than 20 people used a single latrine (Figure 10).



Fifty percent of households said that children between the ages of 4 and 12 used toilet facilities. Other households did not have children within this age bracket<sup>2</sup> but 7% of households who did have children in this range said that they did not use latrines (Figure 11).

**Figure 11: The use of latrines by children as cited by adults of the household**



<sup>2</sup> This age range was selected based on focus group discussions in which it was revealed that children under the age of 4 did not use latrines and children over 12 were considered adults as they did not need parental assistance and were old enough to attend secondary school.

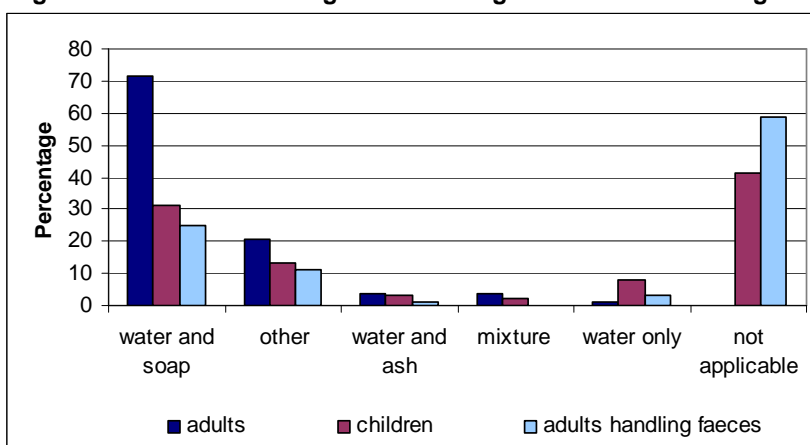
Fewer than half the toilets were clean (43%) and the rest were badly maintained, foul smelling and with flies. Some of the sanitary latrines (9%) were clean but had flies in them, which may have been because they were close to garbage dumps. Overall, the study showed that the latrine maintenance was not satisfactory. This was in part because of the sharing since the responsibility for cleaning the toilets was not shared equally, and the importance of doing so was not understood nearly as well as the importance of having clean water.

The distance between the latrines and tube wells ranged from 1 to 20 m. A very high percentage (63%) of households used a tube well that was 1-5 m away from a toilet, which is below the standard set by the health authorities and UNICEF. Only 10 tube wells were placed at distances of greater than 20 m. The direct effects of latrines will be mostly felt in shallow wells which were not observed during this study. Without testing the water quality in the tube wells it is difficult to comment on the relative quality between the shallow and deep tube wells. Nearly 40% of latrines were between 1 and 10 m from a pond: this could be a potential health hazard, but a more in-depth study is required to assess the real impact. Only eight households had no water body close to a latrine; the rest were 10 – 60 m away from a water body.

## Hygiene Practices

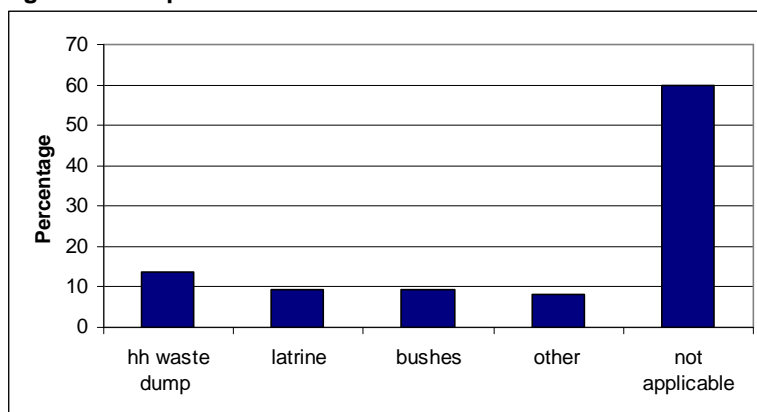
The habit of washing hands was common among the adults and children and also when the adults handled feces of children. Soap and water were the popular choice for all categories, and less than 10% used either water only or a mixture of water and ash (Figure 12). Records made by the interviewers included observations that 56% of the households did not have any soap or ash near the toilets; 24% had soap but it was dry and did not appear to be used regularly; and only 10 households had signs of soap being used. Six households had soil and water near the toilets, but none of the households mentioned that they used this for washing their hands.

**Figure 12: Habit of washing hands among the adults after using the toilet**



Of the households interviewed 40% had children under the age of 4 and therefore adults disposed of children's faeces, however only 10% of households used latrines for this and the rest threw them onto dumps or into bushes, or buried them (Figure 13).

**Figure 13: Disposal of feces of children**



### **Health services**

In order to understand the health issues of the village it is important to see how the health system operates in the country and filters down to the grass root level communities. The description that follows looks at the health related issues in the country, Rajshahi District, Paba Upazila and the project village.

In Bangladesh health related activities are carried out by the Ministry of Health and Family Welfare (MOH&FW), which, at the national level, is responsible for policy, planning and decision making at macro-level. Under the MOH&FW there are four Directorates: Directorate of General of Health Services; Directorate General of Family Planning; Directorate of Nursing Services; and Directorate of Drug Administration (<http://www.mohfw.gov.bd/hnppp.htm> accessed 24.09.07). Together, they contribute to the health delivery system of the country.

### ***The Primary Health Care System and How it Works***

Bangladesh is a signatory to the Alma Ata Declaration on Primary Health Care (PHC), and since 1988, the Government of Bangladesh (GoB) has adopted the PHC approach in developing its health care delivery system. In its initial launching 12 Districts were selected for the program and since then, eight other Districts have been included. Rajshahi District is one of the districts where this system has been adopted (*ibid*).

Primary Health Care operations are based on training staff on the elements of PHC and on the provision of basic essential equipment and supplies to facilitate effective preventive and curative care, and promotion and rehabilitative services to the vulnerable, the disadvantaged and the poor. In Bangladesh the *Upazila*, Union and Ward levels constitute the operational levels of PHC, while District, Divisional and National levels provide managerial support and technical backstopping to the operational levels. Primary Health Care Covers 109 *Upazillas* with a combined estimated population of 48268000 (*ibid*).

At national level, the Directorate of Primary Health Care and Line Director of Essential Service Package is responsible for the planning and implementation of PHC activities assisted by a deputy director and three assistant directors of PHC. At District level the Civil Surgeon and the District team provide technical and administrative support by way of periodic



supervision to the Upazila Health and Family Planning Officer (HFPO) and team. They also coordinate management of referrals from *Upazila* level and below.

The *Upazila* constitutes the first level of referral in the PHC System. Health Inspectors, Sanitary Inspectors and Assistant Health Inspectors are responsible for providing curative care and supporting preventive services. The Upazila HFPO is the overall administrative and technical head of the Upazila Health Complex, as well as all health services up to the community level through the Union level facilities, which are run by field level health and family welfare workers.

Community participation, which is one of the pillars of PHC development, is established through Village Health Volunteers nominated by the community and trained under the intensification project. These volunteers work under the leadership of the Upazila HFPO.

### ***Institute of Epidemiology, Disease Control and Research***

The Institute of Epidemiology, Disease Control and Research (IEDCR) is the national institute for conducting disease surveillance and outbreak investigation. It works under the Directorate General of Health Services of the MOH&FW. The objectives of the IEDCR are: disease surveillance; disease control; and research. The activities of the Institute include: investigation of disease outbreaks and rapid response; investigation of known and unknown diseases throughout the country; management of the outbreak (<http://www.iedcr.org/>).

### ***Health infrastructure and disease status in the RCC area***

According to a household survey for the Rajshahi Metropolitan Development Plan, 11% of people in the RCC area suffer from dysentery and 10% suffer from diarrhea. Levels are slightly higher in the extended area around the city, reaching 14% for dysentery and 12% for diarrhea (RDA 2004). Data obtained from the Chief Health Office of the RCC for 2005 based on patients seen, records a total of 1093 patients with diarrhea in all 30 wards, with only one death reported. The number of reported cases of Giardiasis, which is a diarrheal disease, was 143 for the same period. Vector borne disease prevalence appeared to be low, with only three cases of Dengue reported. Figures provided by the same source report no cases of Dengue in 2003, five in 2004 and six in 2005, of which three were from the RCC area. However it can be assumed that the numbers of these diseases may be higher as many people would not attend the hospitals or PHC Centers unless they had severe symptoms.

Health care facilities are reasonably good in the RCC area with one general hospital, the RMCH and three specialized hospitals, including a TB hospital and an infectious diseases hospital. The RCC has also established seven PHC Centers, which are run by NGOs, as part of a project with the Asian Development Bank (ADB), to provide health services to women and children. They also have a Nursing Training Institute and a Family Welfare Visitors Training Institute. In addition to the government facilities there were 25 private clinics in the city in 1998 and this number has been increasing. Consequently the patient to bed ratio in Rajshahi City was approximately 1:354 in 2004, compared to 1:1265 in Khulna City in 2001 and 1:2951 nationally (RDA 2004).

Perhaps as a result of the good access to medical facilities, people appeared to be aware of the need to seek good health advice, with 70% reporting in the survey that they visit qualified

doctors and 16% visiting government hospitals. Outside the RCC area only 48% of the households visit qualified doctors because they are less available and because people cannot afford them (RDA 2004).

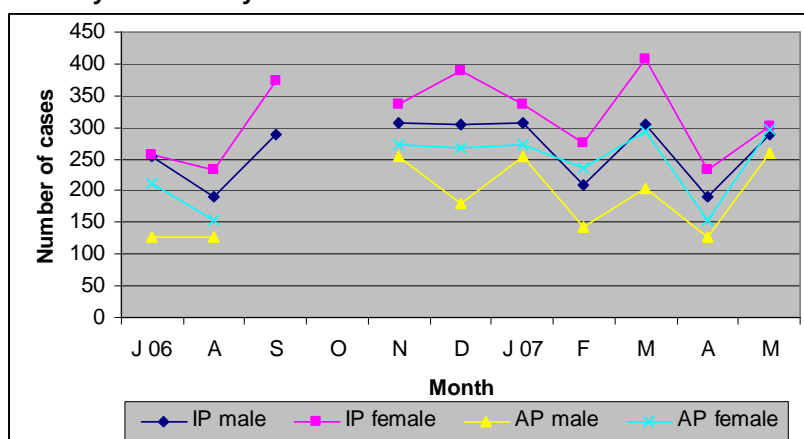
### Health Indicators in Paba Upazila

There are 37 notable diseases that are reported at the Union hospital of Paba Upazila, including diarrhea, dysentery, intestinal parasites, abdominal pain, skin diseases, malnutrition, anemia, ear and eye infections which were all reported in relatively high numbers. Malaria, filariasis and Kala azar were not reported although other parts of the District are affected with these three diseases. A national level program covering treatment for filariasis is present within the District, but no sufferers were found in the project survey.

During the period of July 2006 to June 2007, just 1% of the population, amounting to 2926 people, was reported to have diarrhea cases and 2427 to have dysentery. There is no obvious seasonal pattern in the reporting of cases although September and March seemed to be slightly lower for diarrhea, whilst August was slightly higher. For dysentery September was also when the lowest number of cases was reported, and the highest in May and June.

**There is no clear seasonal pattern for the reported cases of intestinal parasites and abdominal pain but the trend appears to be similar for the two. It is not clear as to how the diagnosis of intestinal parasites was made but it could have been based on abdominal pain and anemia, which explains the similarity (**  
Figure 14).

**Figure 14: Cases of intestinal parasites and abdominal pain reported in Paba Upazila from July 2006 to May 2007**



IP= intestinal parasites; AP= abdominal pain

Skin disease was common, with 6854 (male 3104 and female 3550) cases being reported for the same period. Skin diseases could be associated with unhygienic practices despite having adequate water. Overall malnutrition and anemia levels are low for the community living in the *Upazila* at just 0.8% (1005 males and 1221 females) and 1.3% (1488 males and 1941 females) respectively.

### ***Health Issues in Bashuar Village***

The responses to the survey revealed that none of the interviewees in Bashuar Village received treatment from the Upazila level health facilities. The majority (45%) of the households visited the RMCH for treatment, because the treatment was provided for a nominal charge. However, this was difficult to trace at the hospital as no records were kept on a day to day basis at the outpatient department. The RMCH has the capacity to treat approximately 1150 – 1200 patients per day with 530 beds available. This also shows that the health figures given for areas can be confounded by the health seeking behavior of the people of the constituent divisions. In this case, the Bashuar Beel community received treatment elsewhere because of its close proximity to the town.

A similar percentage (43%) of respondents went to a local doctor or took treatment from the pharmacy. Only 6% sought treatment at private clinics and 5% went to more than one treatment facility. Although the community has a government lady health worker, from the responses given by the community, it was evident that she was not regarded as an important person who could advise them on their health problems. The government health care system has deployed these health workers for the purpose of health education and giving the first line of care for combating diarrheal diseases until such time as medical advice is sought.

The people interviewed were not very aware of health problems that afflicted the community in general. Many of the major vector borne diseases (Malaria, Dengue and Kala Azar) reported for the District were not reported in the village. When asked through a set of structured questions, only 4% of household reported that any of the adults and 6% reported that the children had suffered an episode of diarrhea within the last two weeks. Of the 87 households interviewed 38% reported that the community did not have a special health problem to report. However 48% reported fever to be a particular problem for the community, 20% diarrhea and 29% coughs. A few households also reported skin diseases (4), measles (2) and pneumonia (2) as problems.

## 5 Conclusions and Recommendations

The peri-urban community involved in the survey, engaged in a number of domestic and income generating activities that brought them into direct contact with wastewater. This includes not only irrigation but also bathing and washing household items in open water bodies that may be polluted either by drainage water from the city or from the village itself. There appeared to be little connection made between the disposal of wastewater into ponds (especially from tube wells) and possible negative impacts on health. It was however evident that there was a preference for tube well water not only for drinking but also for rinsing items that had already been washed in ponds or the *beel*. It was not clearly established why this was the case but it provides a good entry point to encouraging the use of tube well water and of disposing of wastewater into appropriate sites that are not used for other purposes that may result in a health risk.

Despite these concerns there was no clear connection made between the wastewater and actual health impacts within the village. Certain diseases were present within the community and the wider area, but within the village only a very few households reported diarrhea within the past two weeks and 38% of interviewees stated that there were no particular health problems in the area. The problem with such a short survey however is that people tend not to remember short periods of illness, only major illnesses, and many health problems such as worms can lead to sub-clinical effects which may not be diagnosed or even noticed by the infected person. For example, worms can result in anemia but whilst a person may feel tired they may not necessarily attribute it to a health problem.

Consequently although a better understanding of the health situation may be preferable it is clear that certain interventions could have a beneficial outcome; for example, involving the lady health worker in a campaign on hygiene and diarrhea prevention. Specific areas of activity could include: hand washing; appropriate disposal of children's faeces; demarcation of ponds for bathing and others for disposal of wastewater. The latter is particularly important as the water quality analysis revealed microbial contamination of the drain and *beel* and the presence of various parasites.

The use of tube well water for most domestic purposes appears to be preferable in terms of water quality (though not necessarily ease of use as people often choose to bathe in open water) but the observations of proximity between tube wells and latrines suggests that for the shallow wells at least there may be the potential for contamination. It is very important that the relevant authorities (including the Department of Public Health Engineering) carry out analysis of the tube well water and introduce remedial measures if necessary. The community members should also be advised not to construct new latrines or tube wells within the UNICEF minimum recommended distance of 15m.

Solid waste disposal is also an issue in the village which did not come out explicitly in the survey but has been observed on several occasions. This attracts flies which spread diseases and generally impacts on the village environment. Linked to this the observations of unclean homesteads and toilets suggests that more work needs to be done to understand the behavioral characteristics within the cultural, religious and educational contexts. It is clear

that improvements can be made through awareness programs coupled with some of the basic requirements for sanitation (environment) that have to be addressed by the government. Mothers and children were viewed as key target groups for intervention.

Health record keeping was poor in the hospital system. To develop a health information system at the RMCH, where a larger number of patients seek treatment will be useful. This will serve as an early warning system for the authorities, for better preparedness to address outbreak illnesses and to deal with emerging diseases.

The campaign to combat filariasis appears to have been effective. The programme includes the provision of anthelmintic drugs and given the fact that parasites were found in the drains (Dissanayake et al. 2007) it could be beneficial to learn from this programme and to ensure that the mass scale deworming continues and is extended to areas not currently covered.

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## Annex I: Sanitation Assessment

**Explanation (does not need to be printed with every questionnaire).**

Explain the project to the respondent and ask if they would mind you asking them a few questions? Tell them how long it will take and explain that they do not have to answer any questions that they do not want to and that you will stop the interview whenever they like.

This questionnaire should be accompanied by observations which should be filled in the table below. If you can observe these things during the interview then write them down. If not then at the end of the interview ask if they would mind showing you their drinking water and sanitation facilities. If they do not want to show you then leave it.

The observations should be descriptive and full, for **example**:

Observation required	Comments – give descriptions where necessary
What condition is the drinking water supply in?	The tube well is in a concrete base with no cracks, the area around it is clean and there are no puddles of water. The tubewell is a little bit rusty though.
What type of sanitation facilities do they have?	Water sealed latrine
What condition are the sanitation facilities in? Describe them in detail.	The floor is clean but the pan is a bit dirty. There is no water supply in the latrine. The walls are concrete and good quality. There are some flies and mosquitoes.
Can you see soap or other substances for hand washing? Does it appear to be used?	There is soap by the tubewell but none in or near the latrine.
What is the distance between the latrine and the source of water used in the latrine?	The TW is about 2 m away and they use this water in the latrine.
What is the distance between the latrine and water bodies?	The nearest open water body is a pond which is about 10 m away. Water flows there from the TW

## Bashua Village Sanitation Assessment Questionnaire

Date: .....

Interviewer Name .....

Project household number .....

Observation required	Comments – give descriptions where necessary
What condition is the drinking water supply in?	
What type of sanitation facilities do they have?	
What condition are the sanitation facilities in? Describe them in detail.	
Can you see soap or other substances for hand washing? Does it appear to be used?	
What is the distance between the latrine and the source of water used in the latrine?	
What is the distance between the latrine and water bodies?	



**Section A: Basic household information**

Question	Answer
1. Name of respondent	
2. Number of household members	
3. Are any of the family members involved in agriculture using the water from the drains? (yes or no)	
4. If yes, how many?	

**Section B: Water sources and use**

What source of water do you use for:

Use	Source (tick)				
	1. Tube well	2. RCC piped water	3. Bashua beel	4. Pond	5. Other (specify)
5. Drinking					
6. Cooking					
7. Bathing					
8. Washing clothes					
9. Washing kitchen utensils					
10. For sanitation					

11. Do you get drinking water every time you need it or do you store it in the house?	1. Store 2. Collect fresh every time
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### Section C: Sanitation and Hygiene

Question	Answer
12. Do you have access to sanitation facilities?	1. Yes 2. No
13. If yes, what type of facilities do you use? <b>(note this should also be observed)</b>	1. Sanitary latrine 2. Pit latrine 3. Hanging latrine 4. Other (specify)
14. If you use a latrine do you own it, own it but share with others, share the facilities of another household or use common facilities?	1. Own and only use by household 2. Own but share with other families 3. Share a private toilet owned by another family 4. Use a public or common toilet 5. Other
15. How many <b>people</b> share the facility?	
16. Do men use these facilities?	1. Yes 2. No 3. Use other (specify)
17. Do women use these facilities?	1. Yes 2. No 3. Use other (specify)
18. Do children use these facilities	1. Yes 2. No 3. Use other (specify)
19. Do adults in the family wash their hands after going to the toilet?	1. Yes 2. No
20. If yes, what do they wash them with?	1. Water only 2. Water and soap 3. Water and ash 4. Other
21. Do children in the family wash their hands after going to the toilet?	1. Yes 2. No
22. If yes, what do they wash them with?	1. Water only 2. Water and soap 3. Water and ash 4. Other
23. When an adult in the village cleans up after a child has defecated do they usually wash their hands?	1. Yes 2. No
24. If yes, what do they wash them with?	1. Water only 2. Water and soap 3. Water and ash 4. Other

**Section D: Health**

Question	Answer
25. Have you or any adults in your family suffered from diarrhea in the past two weeks?	1. Yes 2. No
26. Have any of the children in your family suffered from diarrhea in the past two weeks?	1. Yes 2. No
27. Are there any diseases that are a particular problem in your community?	(Open answer)
28. Where do you go for basic treatment?	1. Health worker (government) 2. Health worker (non-government/NGO) 3. Rajshahi Medical College 4. Private Clinic 5. Pharmacy/local doctor 6. Other (specify)

Thank the respondents for their time. Ask if they would like to add any other comments or if they have any questions that they would like to ask you.

## **Annex II: Transect Walk**

**Objective:** To get an overview of the wastewater flows, sanitation infrastructure, their status and the general sanitary situation in the farming community.

### **Methodology:**

- Start by preparing an observation sheet, with all the points you would like to pay attention to during a transect walk. Specific issues include, to check whether a toilet looks as if it is used frequently, the presence of soap next to the toilet, availability of water close to the toilet, presence of open faecal matter. These all may indicate whether people use toilets, and what their hygiene practices may be.
- Define the route to walk. For this purpose a route along some of the canals will be useful, as well as along the homesteads.
- In the transect itself, the researcher, together with a group of representatives from the farming community a walk through the community, following the route, as identified above, using information from the mapping exercise.
- During the walk observations are made and recorded on sheets, and discussed in an informal manner with the representatives present. Try to quantify as much as possible, such as the number of toilets.