



## Summary Assessment

# Background Information for Rajshahi City, Bangladesh

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### Introduction

This summary is one in a series of summaries written by the Wastewater Agriculture and Sanitation for Poverty Alleviation in Asia (WASPASIA) project. The WASPASIA 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.

The WASPASIA project is funded primarily under the EU Asia Pro Eco II Programme of the European Commission. It is being undertaken in Sri Lanka and Bangladesh by the International Water Management Institute (IWMI) and COSI in Sri Lanka; the International Water and Sanitation Centre in the Netherlands; NGO Forum for Drinking Water Supply and Sanitation in Bangladesh; and the Stockholm Environment Institute (SEI) in Sweden.

### Conclusions and Recommendations

This report provides background information on the sanitation and agricultural situation in the Rajshahi City Corporation (RCC) area. It includes information from the Rajshahi District level down to the Ward level where data exists. This information has been used to select a number of sites in the RCC area where the WASPASIA Project will be implemented and also presents the rationale for site selection.

The data available is not sufficient to provide a full understanding of agricultural activities, sanitation, hygiene and wastewater management at the sub-ward level in Rajshahi, and some data gaps have been identified. These data gaps exist either because the data is not collected or because it is not routinely analyzed and publicly reported; where necessary and feasible the Project team will fill these gaps through further assessments.

The areas requiring further data collection include: sources of waste entering the drains; agricultural use practices and crop yields; sanitation, hygiene and health; institutional analysis; and water quality.

### Main Findings

The data collected sets the overall context of the current conditions in the Rajshahi District, specifically covering: demographics; water resources and water quality; wastewater and sanitation infrastructure; and agriculture.

### Rajshahi District and City Corporation

Rajshahi Division is one of six administrative divisions of Bangladesh and is divided into 16 zilas (districts), 128 upazillas (sub-divisions of zilas) and 1,092 Unions. Rajshahi Zila has 9 upazilas, 70 unions, 1,858 villages and seven pourashava (municipalities), including RCC. The population of Rajshahi Division was 24% of the population of Bangladesh, making it the second most populous division after Dhaka. Rajshahi Zila has a population of 2,286,874. The Zila is predominantly rural with 63% residing in rural areas.

RCC covers an area of approximately 48 km<sup>2</sup> being bounded on the east, north and west by Paba Thana and on the south by the Padma River. Land use statistics in the 1994 Drainage Plan suggest that agriculture and horticulture is the largest land use category in the RCC area, accounting for 31.0% of the land but a study for the Rajshahi Structure Plan and Master Plan recorded a much smaller area of 18.7% of agricultural land within the RCC area but also recorded a further 48% in the extended urban area.

RCC and Rajshahi Development Authority (RDA) operate in 30 wards, with 30 Ward Commissioners. Population figures in 2001 were 0.5 million and by 2005 had risen to 0.8 million.

### **Physical Characteristics**

Rajshahi is in the western dry zone and has a mean annual rainfall of below 1524 mm. Rajshahi Zila covers five of the 30 agro-ecological zones, soil textures are Loamy and Clayey and soil pH varies from pH 4.5 to pH 7.9; organic matter content of the soils are low or medium. The minimum temperature varies from 10°C to 27°C and the maximum temperature from 24°C to 36°C.

The River Padma flows along the southern side, the Jamuna lies across the eastern border and the River Baraonai flows through the north of Rajshahi District. The city is located on the alluvial planes of the Padma and the water level rises to about 19m during the rainy season - the level of the main developed part of the town. There are several water bodies in the RCC area covering 5% of the total land area, used for bathing; disposal of wastewater; and irrigation.

Groundwater is an important source of domestic and irrigation water.

### **Socio-economic Conditions**

In the Rajshahi Zila 39% of households depend on cultivation, livestock and forestry and 34% on agricultural labour as their main source of income. The income from agricultural activities resulted in 61% of the households of the RCC area and 70% of the households in the extended area earning a monthly income of Tk. 2500-4500 (BBS 2001).

The literacy rates in Rajshahi Zila are 48% for both sexes; similar to the rest of Bangladesh. Rates are much higher in the RCC area averaging 67% for both sexes.

### **Water Supply, Sanitation and Drainage**

In Rajshahi Zila the vast majority of households relying on tube wells for drinking water, although in urban areas some 8% of households have piped water supplies compared to less than 1% in rural areas. The current water demand for the city is 103,000 m<sup>3</sup> per day and will rise to 160,000 m<sup>3</sup> per day by 2010 (BBS 2005e).

Groundwater pollution has been found to be a critical problem in Rajshahi City and the surrounding areas, especially high iron and manganese content, which exceed the national drinking water standards. High

levels of arsenic contamination have also been reported and hardness levels are above the WHO standard.

Surface water quality is similarly poor because untreated urban effluent is discharged through various drains into the khals (canals) and beels (seasonal ponds), and ultimately to the agricultural fields to the north, affecting agriculture and posing a risk to human health. Tests have shown that the water in surface water bodies in the area does not conform to national standards for drinking water or for recreational use.

The RDA reports that the drainage from the city, dumping of solid waste, overflow of pit latrines and the discharge from the sugar mill are affecting the quality of surface water, causing poor rice yields in low land areas in the dry period.

Access to sanitation facilities in urban areas is much higher than rural areas but access in Rajshahi Division was lower than in any other division in Bangladesh.

In the city area the RCC reported that in 2004 50% of households had sanitary facilities; but 10% do not have any sanitation facilities and defecate in the open. There are also public urinals from which the urine flows directly into the storm water drains.



A network of drains to collect surface run-off covers Rajshahi City, running from near the Padma in the south through the city and out towards River Baraonai. The drains are typically unlined and uncovered, and collect solid waste. As Rajshahi does not possess any sewerage system, surface run-off drains essentially act as sewers, taking the overflow from

septic tanks and increasingly being linked directly to households. They also receive a large majority of the grey water used in the city including domestic waste and waste from commercial units, markets and small industries. The units in the industrial area mostly connect directly to this system. Despite plans for treatment facilities to the north of the city there is currently no form of management.

Solid waste management is also an issue for wastewater agriculture as a proportion of enters the drains, ultimately flowing to the fields. The RCC area produces approximately 200 metric tons of solid waste per day, of which around 58 metric tons is not collected by the RCC and is therefore littered around the city. The RCC is also not responsible for collecting waste from households and in many areas the communities have organized themselves to collect the waste.

### Health and Health Care

Health care facilities are reasonably good in the RCC area with one general hospital, the Rajshahi Medical College Hospital and three specialized hospitals, a TB hospital and an infectious diseases hospital. The RCC has also established seven Primary Health Care Centers, to provide health services to women and children. In addition there are an increasing number of private clinics.

People appeared to be aware of the need to seek proper health advice however outside the RCC area fewer people visit qualified doctors because they are less available and people can not afford them.

### Land Utilization, Agriculture and Marketing

In Rajshahi Division the percentage of net cropped land is 73% (1,697,000 acres). In the area defined as “urban” under the Master Plan, 43% of the land is used for agriculture and 20% is homesteads.

In Rajshahi Division 49% of the cropped land (46,000 acres) in 2003 was irrigated, compared to a national average of 33%. The major source of irrigation water is tubewell (88%) (shallow tubewell, 65% and deep tube-well, 35%). The total irrigated area in Rajshahi Zila was 194,199 acres at the time of the 1996 Census which was 65% of the net cultivated area of 297,777 acres.



Rice production in Rajshahi stands at 2.06 million metric tons, a yield of 1.05 tons per acre compared to a national average yield of 0.95 tons per acre. Other crops produced include vegetables (spinach, cabbage and cauliflower), maize, wheat, potatoes, sugarcane and jute. Mango is a particularly important crop, with a production level more than twice the national production average. The agricultural produce is traded in 12 bazaars are transported to Dhaka and other regions, meaning that any wastewater produce may be consumed in other cities.

### Industry

There are roughly 5162 industries of varying sizes in Rajshahi Zila. These industries are dominated by hand looms, rice and oil mills, and other food industries.



The industries are located throughout the zila but around 32% are found within the RCC area and employ over 25,000 people. The Bangladesh Small and Cottage Industries Corporation (BSCIC)

established an industrial estate with 325 plots on the northern edge of Rajshahi City in an area of just under 96 acres. Of these, 173 have been filed and the others have remained vacant for 42 years. Rajshahi is not a major industrial area but is famous for its silk, and industrial wastes may have a significant effect on agricultural production where wastewater is being used.

### **Project Site Selection**

The size, population and number of drains in the city made it impossible for the project to work throughout the whole of the city. The project team selected an area drained by two main drains in Rajshahi called the Circuit House and Dargapara Drains and the Cantonment Drain.

### **Implications for WASPA**

The Background Report is important as it defines the project area and presents detailed information about the physical and social conditions within the area.

The most important implications are:

- The data available is not sufficient to provide a full understanding of agricultural activities, sanitation, hygiene and wastewater management at the sub-ward level in Rajshahi, and the project team has identified some data gaps that need to be filled. These data gaps exist either because the data is not collected or because it is not routinely analyzed and publicly reported.
- Data must be used with caution as several discrepancies exist with the information gathered and several assumptions have been made for the purposes of the project. This is mainly due to discrepancy of information held with different authorities.

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