DRAINAGE IMPROVEMENT TO PROTECT FOOD AND LIVELIHOOD SECURITY OF THE POOR AND VULNERABLE URBAN HOUSEHOLDS

An experience gathered from the Mapping of Drainage Networks of four Pourashavas

Presented by

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1 INTRODUCTION

The dwellers in the urban and sub-urban areas of Bangladesh suffer due to the congestion of drainage and sewerage. Frequently during the monsoons, the drains overspill and dwellings get submerged. During the remaining period of the year unhygienic conditions prevails due to stagnant wastewater. The poor class living in slums in the low-lying areas are the most affected segment of the population. It has become difficult to manage the drainage and sewerage due to non-existence of systematic information including proper drainage networks map. It is not possible either to establish a basis for future development and management systems. CARE Bangladesh with the financial assistance from US-AID under took a project to support food and livelihood security of the poor and vulnerable households in the high-risk urban areas through drainage improvement. CARE identified four pourashavas Tongi, Mymensingh, Jessore and Dinajpur as pilot areas. During execution it was realised that an effective improvement might not be possible through structural measures without conducting a survey of the existing facilities. Accordingly, CARE decided to conduct a field survey of the drainage networks.

The Institute of Water Modelling (IWM) having similar type of experiences was selected as the most qualified organisation for carrying out the job. During various level of execution of the survey frequent interactions were made with the relevant staff of CARE, LGED and US-AID. During the interactions it was realised that a geo-referenced map and user-friendly database of the drainage systems from the survey results will be highly useful to implement the construction of drainage facilities. Considering the usefulness of the product IWM agreed to provide a set of drainage network maps and an Interactive Information System (IIS) Database. The map contains the alignment of the existing drainage routes including the bottom and top level of the same having properly geo-referenced. The map also provides an indication of the catchments of individual drains including flow direction and outfall locations. The database containing most of the information relating to the drainage systems is easy to edit, update and print. The database also provides a photographic impression of the important drainage facilities including the problem areas. Latest survey equipment and software including DGPS, Data Logger, Pathfinder and ArcInfo, ArcView were used for the survey and data processing.

2 OBJECTIVES

The objective of the work is to protect and promote livelihood security of the poor and vulnerable households in the high-risk urban areas.

3 ACTIVITIES PERFORMED

The major activities involved in connection with the project include:

- Survey of the alignment and cross sections of the existing drains and roads;
- Geo-referencing of the drainage structures and other important features in the pourashavas;
- Identification of the problem areas;
- Identification of the prominent drainage outfalls and temporary storage area;
- Mapping of the networks of existing drains;
- Development of an IIS database;
- Training and Technology Transfer to the users and stakeholders of the database;

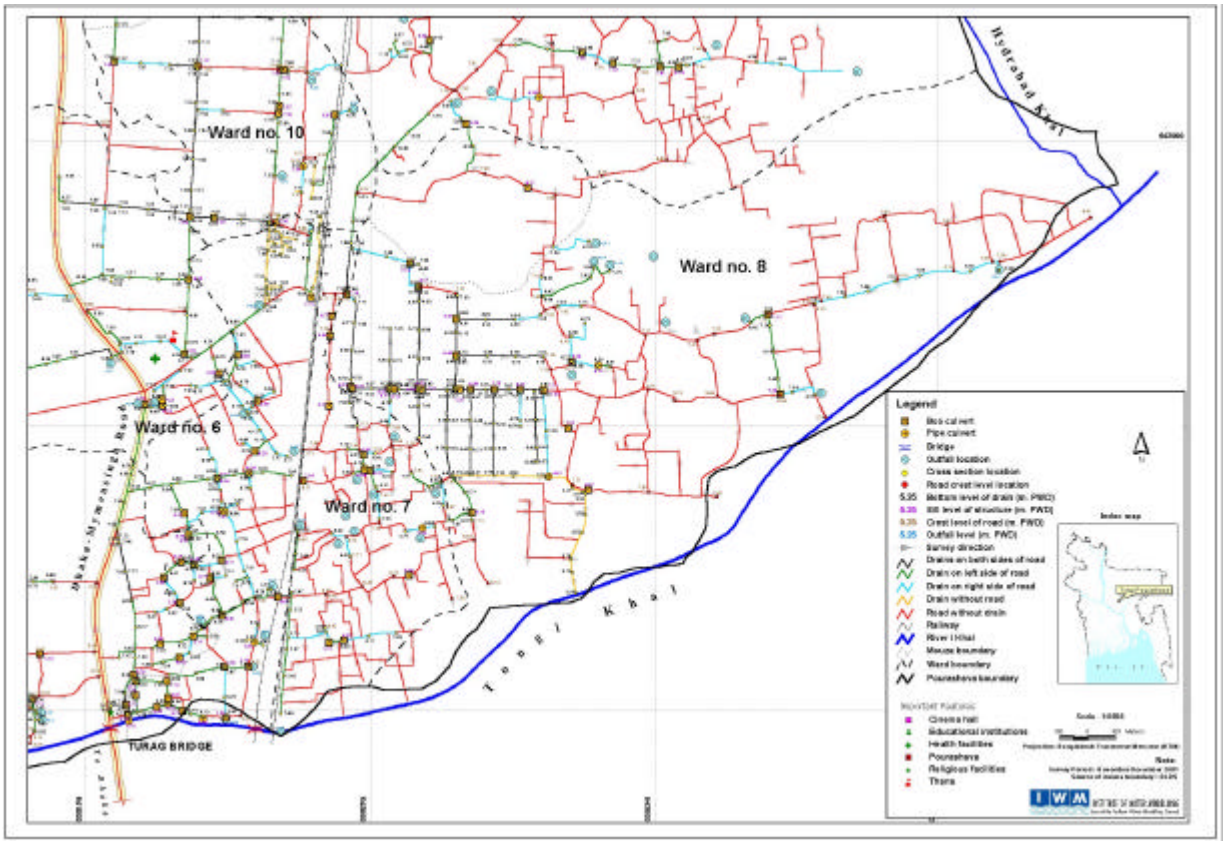
Attempts were also made to collect the liquid volume of domestic and industrial wastes, but it was not successful due to the absence of proper record with the relevant authorities.

4 OUTPUT

The following outputs have been achieved from the job:

- Inventory of drainage facilities including dimensions of the canals, structures and the roads in the pourashava areas;
- Maps showing drainage canals and road networks including the types of drains, outfalls and depression areas; figure below shows sample drainage networks map;
- Establishment of geo-referenced benchmark pillars for future use;
- Interactive Information System (IIS) Database having facilities for prompt display of digital data as well as visual pictures at important locations;
- Training to the CARE and Pourashava staff to be able to utilise the IIS database for planning and decision making towards improved drainage management

Drainage Network Map of Tongi Pourashava (partial)



5 EXPERIENCE GATHERED

While getting through the assignment the relevant professionals of IWM had the opportunity to get insight in to the problems associated with drainage congestions in the urban areas. The experience gathered in this connection could be highlighted in the following.

- Understanding the complexity of the Drainage Networks in the small Urban Areas
- Assessment of the need for a comprehensive drainage and sewerage management for the urban household and small townships
- Developing an IIS database to support planning and decision making
- Building capacity within the Relevant Organisations to support Planning and Decision Making by using the state of the art tools and technology

6 CONCLUSION AND RECOMMENDATIONS

In Bangladesh the development of geo-referenced map including a GIS database of the drainage networks of the pourashavas is indeed a new venture. The maps and database would be step forward towards taking comprehensive decision for drainage and sewerage management. The map and database could be also useful for developing other service facilities, education and immunities. The most effective use of the map could be towards removal of localised congestions. However, this map should not be sufficient for developing a Drainage Master Plan for the pourashava area. Because, at critical situations during monsoon periods the drainage flow is dominated by the river stage at the outlets. For an effective planning the permissible stage of the nearest river should be established first. Then the optimum bottom level of the drains including slope and dimensions should be established. This requires an integrated approach of computing the volume of domestic and storm sewerage at different junctions of the drainage networks and the allowable limit of outflow at prevailing river stages. At worst situations the river stage might be so high that create back flow, under such situations provision should be kept to close the outlets. This requires a comprehensive knowledge base at the desk of the planners and decision makers. In the present days a mathematical modelling study could provide such support with a minimum efforts and time. Unfortunately such study was conceived at the time of project formulation. During implementation due importance was given towards interaction and training of the users and stakeholders form CARE, Pourashava and LGED to be involved with development of maps and database. However, training would be useful only with the real life application of the maps and database including updating of the knowledge as a continuous process.