

## **A Case Study on Water Logging in Ward 12 of Pabna Municipality**

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### **Abstract**

Water logging is one of the most common problems in Bangladesh. Increased urban development's not providing sufficient drainage system to reduce water logging problems. This causes naturally large infrastructural problems for an area. Water logging creates adverse social, physical, economic and environmental impacts. Disruption of traffic movement and normal life; damage of structures and infrastructure; loss of income potentials are the effects of water logging on the life of the study area. Inadequate drainage sections, conventional drainage system with low capacity and gravity, natural siltation, absence of inlets and outlets, indefinite drainage outlets, lack of proper maintenance of existing drainage system, and over and above disposal of solid waste into the drains and drainage paths are accounted for the prime causes of blockage in drainage system (WARPO, 2005). This study will give a clear idea of the current drainage system of the ward no 12 and will also be helpful for identifying the responsible factors of urban drainage congestion. Besides this study will attempt to find out proper mitigation measure for the existing problem. Upper level decision-makers as well as development partners will be able to use the findings of this report for future policy recommendations. The highlight features of the urban area of Pabna Municipality are water logging and the existing drainage system; many of the drainage line are connected with "Ichamoti River". The water logging brings some negative impact on the physical environment. The overall condition of our study area is becoming poor in rainy season. If the water logging increases more and more in our study area, the area will face a serious problem in a very near future.

### **Introduction**

Pabna District is a district in north-western Bangladesh. Water logging has become a severe problem in Pabna Town with the increase of the Population and the number of increasing buildings. It has made this district more congested also. The drainage system of the Pabna Municipality is becoming worse day by day due to unscientific land use system in the town. Mainly in the central portion of this town, there is a river named "Ichamoti" but it's has no current flow but the drainage water flow of the whole municipality's slope is running in this river. This river can't catch the whole discharging water coming from the drain. Rainfall and consequently there leads a bad condition for the existing livelihood group. As a result this municipality

(ward no 12) area is badly affected in water logging after a small rainfall. All of the urban area in the our country are experiencing water logging for the last few years even a little rain is causing a serious problem for certain areas(Tushar.A, 2001). It is very difficult to cope with the increased urban development and along with to provide a sufficient drainage system. Objectives of this present study is-

- To identify the existing condition and responsible factors of water logging in the study area.
- Provide some guidelines to remove the blockage of existing drains and promote the water flow of existing primary, secondary and tertiary drains.

### Background of the Study Area

Our study area is 12 no. ward of Pabna Municipality. People are engaged in several occupations. This area is seriously affected by water logging due to the rainy season. Water logging is especially responsible for land use change of our study area. It hampers their economic conditions and day to day life. The 12 no.ward of Pabna Municipality is taken as the study area because it affects a large community. This ward is densely populated with an approximate house hold of 2354(BBS, 2011). We select this study area should have extensive water logging and where the water logged area is large enough to affect the area. The main cause of water logging is run off rain water. The drainage system of this ward is not well designed. Due to the unconcern of people, most of the drain are blogged by sever ways. So, the water cannot drain away to the “Ichamati” river and that is why the water is over flowed on my study area and makes the water logging. Average maximum temperature 36.8 °C, minimum 9.6 °C; annual rainfall 1872 mm in Pabna District(BMD,2009).

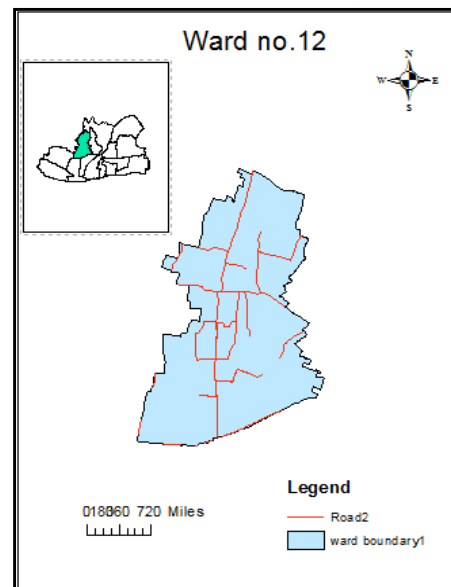


Fig.1: Map of the study area

Table 1: The Climatic Condition of Pabna District

Climate data for Pabna District													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average precipitation mm	19	18	34	56	159	300	260	294	242	201	17	3	1,603
Average relative humidity (%)	45	36	39	44	59	73	74	76	72	68	52	49	57.3

## General Information about the Study Area

Our study area is situated in the Pabna Municipality. The communication network is well enough to develop the economic activity of the area. The area is divided into four villages. They are Chak Pailanpur (Partly), Chak Cahatiani, Chok Gobinda, Radhanagar (Partly)

Table 2: Some basic information of ward no. 12

Ward no. 12 of Pabna Municipality (at a glance)	Category	Data
1	Total Household	2354
2	Total population	9662
3	Male-female ratio	98
4	Percentage of literacy rate	66%

## Methodology

In this study, both primary and secondary data has been used. Since water logging is a natural, as a result the study is mostly depended on primary data and information. It would also help to identify the drainage pattern and the trend of water logging and changing pattern of ward no 12 in Pabna Municipality. Secondary data collection includes necessary maps collection, detailed information about drainage pattern, duration of water logging, frequency of water logging, types of water logging areas etc. These information are collected several important institution of Pabna town such as Pabna Municipality and Water Development Board. After collecting data from primary and secondary sources, all have been processed in a certain manner. Several valuable analyses are also conducted to extract a meaningful report from the raw data. After the analysis of data, a draft report was prepared and submitted to supervisor for necessary correction. After completing these entire correction final has been prepared.

## Discussions and Results

### *Existing Drainage System*

During heavy rainfall various depth of water logging are seen. The highly waterlogged depth areas are from the Shideshwari Temple to the Radhanagar Wazed Ali road, central part of the Chackpailanpur Mathpara road, Naynamoti road, Lebu Sipahi road. In these areas water is at the height of knee length and even if the drains are over flow a small precipitation. It causes the direct adverse effect to the transportation system and daily life. At the time of monsoon it happens at high level where the areas are low lying and poor sewerage system. On the other hand the Pailanpur road, south Naynamoti area, Powerhouse road areas are satisfactory.

### *Water Logging Zone*

**Wazed Ali road:** The major road that runs towards the Govt. Edward College and there is a left turn that is from the Adwarshaw Girls' High School this is Wazed Ali

road. In this road the water logging is maximum . The width and the structure of this drain so poor.

**Chalkpailanpur road:** Not only the drainage condition but also the road condition is seriously damaged. After a small rainfall the water level becomes the height of knee.

**Lebu Shipahi road:** It is one of the congested zone of water logging. Here width of the minor road is not very satisfactory.

**Mathpara road:** The population density is very high in this zone. Again the drainage condition and the accessory road is not pukka. Water remains stands a long time after precipitation.

**Haji Akkel Ali road:**There was a large ditch in this area. After constructing the drain of Naynamoti this ditch has filled up somehow or the owner of the land. As a result the water flow has damaged.

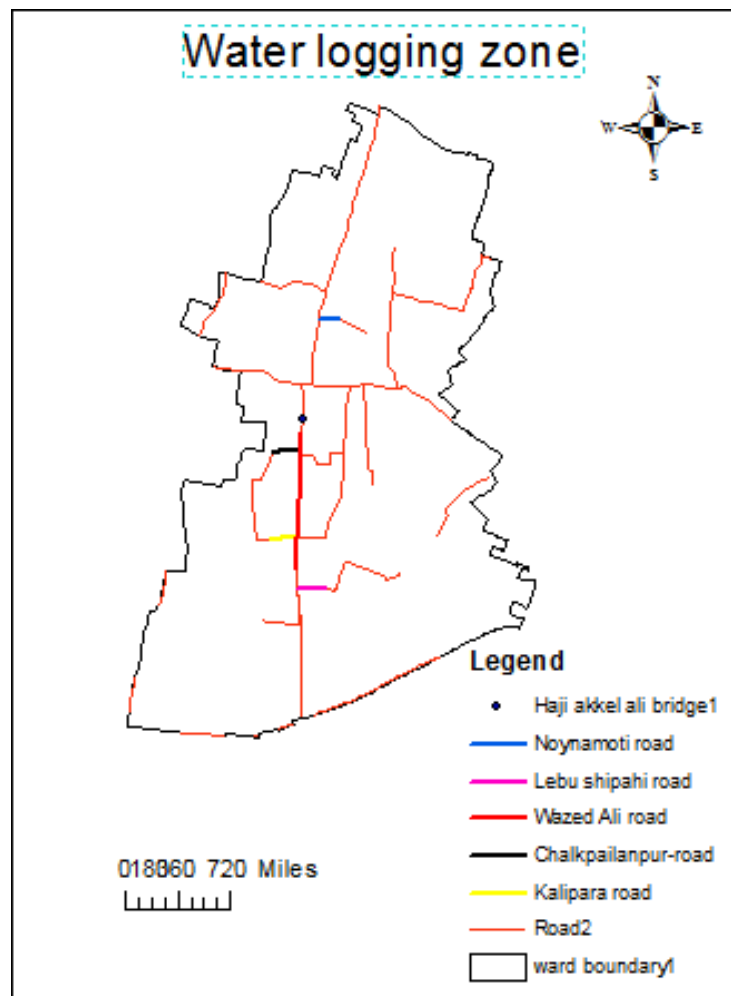


Fig. 2: Water logging zone map

### ***Duration of Water Logging***

Table 3: Duration of Water Logging in 12 no. ward (in Percentage)

Ward no	1-3 days	3-7 days	7-10 days	10 -15 days	More than 15 days	No water logging
12	73	34	21	12	2	35

### ***Effects of Water Logging in This Area***

#### **➤ Water Crisis**

The environmental quality is declined day by day because of water logging. The floating plants in water making the water dirty and this dirty water act as a breeding heaven for the mosquitoes. As a result it creates serious environmental problem. For water logging the available drinking water become highly contaminated and lead to shortage of pure drinking water.

#### **➤ Poverty**

During water logging a large number of people in our study area cannot go their working place. The day-laborer cannot go out in search of livings. Then they become unemployed and cannot afford daily expenses. It is the direct threat for on the local economy.

#### **➤ Road and Transport Management**

About two-thirds of the road networks of our study area become affected due to water logging. Holes are created due to stagnant water on the roads making those very risky and the roads remain unrepaired for many days.

#### **➤ Sewerage Management Collapsed**

The overall sanitation condition of 12 no. ward is being well. But people face a lot of problems for their sanitation facilities in rainy days. During water logging it is impossible to compose solid waste management of our study area because there is water all around.

Table 4: Sewerage Management System (in percentage)

Ward no	Households	Sanitary(with water seal)	Sanitary (no water seal)	Non-sanitary	None
12	2353	48.7	31.4	18.6	1.3

#### **➤ Disturbance in Education System**

Education also becomes hampered due to water logging. When the problem is severe the students cannot attend the institutions. As a result, their education is seriously hampered.

#### **➤ Effects on Infrastructure**

All these infrastructures face a lot of problem caused by water logging. Semi-pukka and kutchha houses are greatly damaged by the water logging. For this reason, the infrastructures have been spoiling in this area.

Table 5: Toilet facilities in the area (in percentage)

Ward no.	Number of Household	Pucka	Semi-pucka	Kutchha	Jhupri
12	2354	25.2	33.7	40.2	1.0

#### ➤ **Effects on Solid Waste Management**

In our study area there are about 25 dustbins. In the rainy season, the drain water comes into the road due to the drainage problems. As a result waste materials are mixed with the drain water. Several diseases are breakout due to this horrible management system. We can see that most of the households throw their wastes on drain. It not only creates environment problems but also creates blockage on the drain. As a result drain water cannot move freely in the rainy season and creates water logging.

#### **Recommendations**

The impact of water logging may cause permanent loss on the surroundings economy, income generating activities as well as overall socio-economic condition directly or indirectly changes the nature of ecosystem. The government should take proper initiatives to solve the problems of water logging. The government should also take immediate action on the basis of causes of water logging.

There should be communication of water flow among the “Ichamoti” river within the municipal area. Creating proper drainage system so that the natural water can be shift away. As there is a manmade cause behind water logging the overall population of the areas should be aware about the impacts of water logging. Solid waste management should be conducted properly so that water can flow easily at their natural speed have to concern about the proper run-off of rain water which creates water logging on the road; Initiate formulation of a comprehensive action plan for the sustainable recovery of the affected people. Give box culverts or pipe culverts will be required to cover the drain. The existing drains and also those will be constructed shall have to cleaned at regular interval. The Municipal authority will monitor the water level of “Ichamoti” Rivers, record the drainage congestion area of each significant storm, and maintain the existing river and also will have institutional linkages with all relevant line agencies such as BWDB, LGED and in particular with DPHE in connection with operational planned system and for maintenance of appropriate section all through its natural drainage routes.

#### **Conclusion**

Water logging in 12 no. ward has profoundly affected people of all Socio-economic background. There has been far reaching consequences of water logging on both natural and social environment. Due to water logging the income, employment and livelihood pattern of the people of our study area is dramatically changing that has significant implications on economy. The water logging brings some negative impact on the physical environment. So, logged water is a threat for public health, different production and biodiversity, etc. healthy living environment could not arise there and

privacy was usually lacking. The using water is also becoming unhygienic and non-use able. The overall condition of our study area is becoming poor in rainy season. If the water logging increases more and more in our study area, the area will face a serious problem in a very near future.

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