

## Social Background in Riverbank Erosion Areas Bangladesh : Implication for Japanese Hazard Mapping Technology

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**Background:** Since Japan and Bangladesh are frequently affected by flooding, structural and non-structural measures have been developed in each country. Some of Japanese measures are applicable in Bangladesh, if it is adjusted to fit each local condition. Bangladesh has local strategies, however technology intervention is not common in riverbank erosion area (Fig.1). In this research, social background in riverbank erosion areas is analyzed for discussing possible way of transferring hazard mapping technology, which is a Japanese major technology for flood risk reduction.

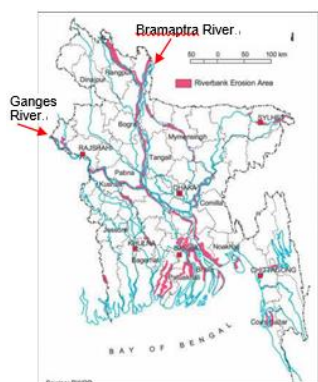


Fig. 1: Riverbank erosion area in Bangladesh (in red)  
Source: arranged BWDB

**General Issues in riverbank erosion areas:** Annual flood-induced fertile soil is utilized for farming in riverbank erosion areas. As a result, their livelihood is affected by environmental conditions such as floods, drought and river erosion. During the monsoon and drought season, local employment opportunities and available farm land are limited. As a result, people often end up in poverty and hunger. The erosion takes away not only people's homes but also their farming land (Zaman 1989). Most

low-lying areas may remain under water for three to four months during the annual floods (Younus 2014). Followings are the summary of general issues in riverbank erosion area.

- They are vulnerable to land erosion by the river, floods, droughts, and storms.
- Physical security is not secured even at home.
- They are isolated from the public and private services, such as education, medical care, information, bank, etc., because of poor communication networks. The linkage with the local government officials are weak, except during emergencies.
- Employment and income generation opportunities are limited.
- Frequent movement, mostly by boat, makes them difficult to increase their physical and financial assets.
- Usually, there is no state agencies' support for migrants to move and settle to new places, except during emergencies (Martin et al., 2013).

**Measures for flood:** Their indigenous knowledge such as raising / elevating their houses with plinth and placing sand bags on the riverbank is common and effective for mitigating annual floods. They live in the inundated land for several weeks, and they sometimes migrate to neighboring cities for seeking a job. Flood is one of the main reasons of migration from one place to another in Bangladesh (Khatun 2013). In addition to the annual seasonal migration, they move several times in their lifetimes because of food shortage and/or losing their land by erosion.

**Methodology:** Semi-structured interview and questionnaire surveys were implemented to villages

along and in Brahmaputra and Ganges rivers in 2014 for perceiving the social background.

**Result:** Their general issues in the selected areas were almost same as it was reviewed, however there was a gap between needs and demands regarding the area to move. Though the respondents' most interest during flood is the area to move, the information was not provided. Usually the villagers evacuate / migrate together based on their experiences, because there is no support to find available area to move. Other needs such as food, water, medical care and seeds are provided by local governments and NGOs.

**Discussion:** Not only for annual flood but also for extreme flood, information of evacuation places are important. Knowing the longer existing area and decreasing the number of migration will improve their livelihood and save their lives and improve their livelihood directly or indirectly. Hazard mapping technology has possibility to tell the safer / longer existing area.

Since the flood phenomena and social background in Japan and Bangladesh is different, the possibility of transferring hazard mapping technology for riverbank erosion areas is analyzed. Floods in Japan are more destructive. Even one flood hit is possible to destroy embankment, buildings, etc. and take people's lives. The duration is much shorter, within a few days in most cases. Thus, hazard map in Japan shows the possible places of flood and tells the evacuation routes and temporary evacuation places. In addition, map education starts in elementary school in Japan.

Though hazard mapping technology is already introduced in Bangladesh, it is not common in the selected riverbank erosion areas. There are three major reasons that the Japanese hazard map is difficult to be used directly. (1) The rivers and village shapes change often in Bangladesh. Most of the downstream rivers in Japan, where most people live, were fixed with high embankment for protecting

people's lives. Since rivers do not change the shape, it makes easy to update maps. Rivers in Bangladesh change the shape every after monsoon, therefore it is difficult to prepare for the updated map. (2) Local people are not able to interpret maps. One reason which they are not able to interpret is that they do not have opportunity to see local maps. Hazard map is needed to be prepared for the local scale for local peoples use. Though the national map is updated, the local maps, suitable scale for hazard map, are not even prepared. Another reason is the ability of interpreting map. The low literacy rate is related to the education level. Map interpretation skill is usually taught in higher education. The education level in riverbank erosion areas is lower than the average level, and the school dropout rate is higher than other areas. Since most teachers are not able to commute to the schools, and school buildings are inundated or used as evacuation facilities during the flood, children lose opportunity of study for a few months every year. Floods makes difficult for local people to study safely and continuously. (3) There is enough time to prepare for evacuation.

Though they are able to stay inundated area for a few months, they are not able to live as usual by farming. Even though they rely on the fertile soil conveyed by flood, the situation living in inundated area for a few months is needed to be improved. If the duration living in flood is reduced, it will save their lives from hunger and improve their livelihood.

The hazard mapping technology is considered to be useful also in the research areas. The technology to simulate the possibility of erosion occurrence area is useful to know the longer existing place. As a result, a hazard map in riverbank erosion areas is suitable to be used like land use map, which predict the longer existing areas. For introducing the longer existing areas, support by officials or experts, who are able to interpret the map, is essential.