Management of Unanticipated Extreme Flood:

A Case Study on Flooding in NW Bangladesh during 2017

Partho Das, Institute of Water and Flood Management, Bangladesh University of Engineering and Technology, Bangladesh

Rezaur Rahman, Institute of Water and Flood Management, Bangladesh University of Engineering and Technology, Bangladesh

ABSTRACT

South Asian countries (Nepal, India, and Bangladesh) experienced extreme flooding in August 2017 which is one of the deadliest in the recent few decades. Being the downstream country of this Himalayan region Bangladesh experienced immense flooding both in its flood prone and less flood prone areas. Northwest Bangladesh district Dinajpur is known for its high topography where flooding is not a common phenomenon. Due to this reason flood control and flood management practices by concerned agencies are very rare in this region. Such negligence in river and floodplain management turned this region a vulnerable one due to flood. The unexpected August 2017 flood in Dinajpur bears an example that this region is no longer flood free. This study aims to study the insights of this August 2017 flood event bi investigating causes, flood time and after flood recovery, existing management practices and damage information etc. Based on those primary and secondary assessment, future directions for flood management in this region has been proposed.

KEYWORDS

Extreme flood, Flashy River, Flood management, Northwest Bangladesh, Regional cooperation

INTRODUCTION

During 2017 monsoon the South Asian countries (Bangladesh, India, Nepal) experienced devastating flooding. Total 41 million people were affected by this flood and more than 1200 mortality was reported in the end of August. As per IFRC over 950,000 houses were damaged or destroyed in these three south Asian countries due to flood (Siddique, 2017; George, 2017). In the first stage the flooding occurred in the Brahmaputra and its tributaries (NE India) and after that it was continued to various tributaries of the Ganges River (Alfieri et al., 2018). Being the downstream country, Bangladesh was one of the most affected countries. As per CNN estimation, a third of Bangladesh went under water during this August 2017 flood (George, 2017). Studies have reported that there was a first monsoon wave in mid-July and after that second spell started on 12 August (Alfieri et al., 2018). The Ministry of Disaster Management and Relief (MoDMR) of Bangladesh reported the floods as the worst in the last four decades (UNICEF, 2017). As per IFRC, this 2017 flood has affected more than 7.4 million people in Bangladesh, damaging or destroying more than 697,000 houses (Siddique, 2017). According to government estimates, till the end of august a total of 61,877

hectares of cropland, mostly rice, have been "completely damaged," while 531 million hectares have been "partially damaged." (George, 2017).

As per IPCC, the world is experiencing a change in extreme climatic events since 1950. Near surface and tropospheric air specific humidity is reported to be increased since 1970. So global scale heavy precipitation is seen over the second half of the 20th century. Globally the regions of increased precipitation are more compared to the decreased precipitation region. Such increased trend in heavy precipitation is giving rise in flood risk on regional scale. Again, as global population is increasing, exposure to flood is also increasing. So, flood damage has also been increasing since 1970s (Pachauri et al., 2014). There is a clear indication of occurrence of unforeseen extreme events in Bangladesh. Dry seasons are getting prolonged. Such phenomenon is causing huge vapor in atmosphere. So, heavy precipitation is seen during the monsoon spell. The 2017 flood in the south Asia is reported due to this heavy monsoonal rainfall in the Himalayan foothills (Bangladesh, Nepal and India) (Siddique, 2017).

Dinajpur district in north-western region is considered to be one of the least flood affected districts of the country. As per Eastern Water Studies, depth of flooding in this Dinajpur district always remains within 0 to 90 cm (Rogers et al., 1989). However, this district is not flood free anymore. During 2017 flood, the district was affected heavily and very suddenly catching everyone off-guard. The aim of this present study is to make a quick assessment of the August 2017 flood in one of the highland district of Bangladesh and identify the possible management measures in near future.

STUDY AREA

Dinajpur is one of the North most district of Bangladesh. According to BBS 2011, the total population in Dinajpur is around 3 million. Population density in this district is 868 people in per sq. km. Agriculture is the major source of income in this district. So almost major part of the population leads a rural life which is also reflected in BBS estimation of rural household. In Dinajpur, the rural percentage of total number of HHs is 85.3%.

Geographically north part of Bangladesh is steeper than the south. Like other NW districts of Bangladesh Dinajpur is also a highland. Due to this high topography NW districts of Bangladesh are in general not subjected to prolonged and deep flooding (Mott MacDonald Int. Ltd., 1993). In the past, this district was flooded only during the major events like 1988 flood.

According to this Northwest Regional study (Mott MacDonald Int. Ltd., 1993) the major rivers of Dinajpur is the Tangon, the Punarbhaba, the Dhepa and the Atrai. Surface hydrology of this district depends on different national (Dhepa, Atrai) and international (Tangon, Punarbhaba) rivers. All of those rivers are seasonal in nature except Atrai. Four of those rivers are non-tidal in nature and maximum flow is found within July to September. Spillage during normal flood is common phenomenon for all of those major rivers. Siltation of the river bed of all of those major rivers is reported. Little Jamuna, Tulsi Ganga, Kharkharia rivers are flowing through this northwest district (BWDB, 2011).

In general, the climate of the NW Bangladesh is extreme. Due to the nearby location of the Himalaya, the temperature becomes very low (As much as 3-degree C) in winter (November- early March). Again, the summer season is reported to be getting started with strong westerly winds around the starting of March and continues upto early June. According to Northwest regional study (FAP-2, Mott MacDonald Int. Ltd., 1993), The North-West region of Bangladesh is particularly prone to dry spells during the monsoon. Moreover, monsoonal rainfall is reported abundant during the months of June, July, August and September.

Analyzing data of the BMD station Dinajpur over the period 1948-2015 the maximum recorded daily rainfall is 508 mm (During the year 1996). According to BBS 2011, the average annual rainfall for Dinajpur is 2536 mm. Over the period 2007 to 2015 the maximum recorded temperature is 41 °C (During the year 2007) and the minimum recorded temperature is 3.2 °C (during the year 2013). This clearly depicts how extreme the climate in this study district is.

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/article/management-of-unanticipated-extreme-flood/212684

Related Content

Strategies to Prepare Emergency Management Personnel to Integrate Geospatial Tools into Emergency Management
Tricia Toomey, Eric Frostand Murray E. Jennex (2011). *Crisis Response and Management and Emerging Information Systems: Critical Applications (pp. 245-261).*
www.irma-international.org/chapter/strategies-prepare-emergency-management-personnel/53998

Contact Tracing Apps in the COVID-19 Pandemic: Exploring the Underlying Personal Data Processing
Natalia Baxevanou, Sotiria Triantafyllia Sotirhouand Konstantinos Limniotis (2022). *Modern Challenges and Approaches to Humanitarian Engineering (pp. 194-212).*
www.irma-international.org/chapter/contact-tracing-apps-in-the-covid-19-pandemic/298497

A Unified Localizable Emergency Events Scale
Eli Rohnand Denis Blackmore (2011). *Crisis Response and Management and Emerging Information Systems: Critical Applications (pp. 214-226).*
www.irma-international.org/chapter/unified-localizable-emergency-events-scale/53996

Mortality Awareness of Parents Affected by the Kahramanmaras-Centred Earthquake Disaster in Turkey
Ali Maz (2024). *Rebuilding Higher Education Systems Impacted by Crises: Navigating Traumatic Events, Disasters, and More (pp. 311-327).*
www.irma-international.org/chapter/mortality-awareness-of-parents-affected-by-the-kahramanmaras-centred-earthquake-disaster-in-turkey/343842

Serious Game Design for Flooding Triggered by Extreme Weather
Jaziar Radianti, Mattias N. Tronslien, Kristoffer Kalvik Thomassen, Max Emil Odd Molandand Christian Anker Kulmus (2017). *International Journal of Information Systems for Crisis Response and Management (pp. 55-75).*
www.irma-international.org/article/serious-game-design-for-flooding-triggered-by-extreme-weather/207714