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Analysis of the Flood-induced Livelihood Vulnerability of the Riparian Villages along the Tista River in West Bengal

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Abstract

Floods add to the distressed conditions of the poor and vulnerable inhabitants of the Tista floodplain in Sub-Himalayan West Bengal. The riparian villages along the Tista River are well known for frequent and heavy rainstorms and climate-induced catastrophic events, such as flash floods due to unprecedented rains. The primary aim of the study is to determine whether there are any differences between the levels of vulnerability of riparian villages. Five villages were selected to conduct the field survey (sample size: 337, based on Cochran's method) from the Mal and Maynaguri block at the left bank of the Tista River. The livelihood vulnerability index (LVI) was assessed based on eight major components, i.e., socio-demographic characteristics, health status, livelihood techniques, food status, water status, climatic variation, flood, and social security. The study reveals LVI scored highest in PremganjMajhiali (.436) and lowest in Chat Rarpur (.328) village. Because of their location, socio-demographic profile, livelihood options, social safety, water assistance, health support, climatic variance, and flood severity, the Basusuba and PremganjMajhialiare considered the highest vulnerable. The study also indicated that, due to apathetic or indifferent attitudes, improved access to resources does not always imply that households are adopting resilience strategies.

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Introduction

Climate change is a significant subject of concern on a global scale. Climatic variations have led to vulnerability in the case of the social and economic system (IPCC, 2014). The ability to predict, manage, fight, and rehabilitate from the effects of natural disasters is called vulnerability. Vulnerability hampers the livelihood of the inhabitants of any region. Livelihood is one of the important parameters in determining the lifestyle of the people. At the same time, vulnerability is the probability that a system or unit (such as a human group or location) would be harmed due to disturbances or pressures(Schroter, et al., 2005).

The livelihood vulnerability index (LVI) is a helpful instrument for development organizations, policymakers, and public health practitioners to identify the demographic, socioeconomic, and health elements contributing to climate vulnerability at the district or community level. The sustainable livelihoods approach considers five household asset categories: natural, social, financial, physical, and human capital (Chambersand Conway, 1992). Cutter, Boruff, and Shirley first postulated the Social Vulnerability Index (SoVI) in 2003. Wu et al. (2002) manifested the vulnerability assessment to climate change using GIS technologies to examine the physical and social vulnerability of Cape May County in the United States. Hahn et al. (2009) described the livelihood vulnerability index (LVI) to measure the exposure of a human group in Mozambique, Africa, affected by climate change using the primary data. Later, it was popularised by several international researchers, including Pandey and Jha (2012), Etwire et al. (2013), Shah et al. (2013), Madhuri et al. (2014), Toufique and Islam (2014), Panthi et al. (2016), Alamet al. (2017), Adu et al. (2018), Mukherjee et al. (2019), Das et al. (2020), etc. A livelihood vulnerability analysis based on a bottom-up methodology was identified to evaluate vulnerability. The methodology was chosen since it is empirical and based on the inhabitants' local and native knowledge. Flood pulses are supposed to possess adjusted people who dwell