



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Thesis Title: **Unravelling discrepancies and overlooking risks: future climate analysis & decision-making in the Brahmaputra River Basin**

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**SHORT ABSTRACT**

The Brahmaputra River Basin (BRB) is a vulnerable ecosystem increasingly threatened by climate change, impacting millions of people who depend on it. Despite its significance, geopolitical tensions in the region have limited comprehensive research on climate change's effects, raising concerns about the potential maladaptation of planned water infrastructure projects, particularly hydropower dams. This thesis investigates the relationship between climate change and hydropower development in the BRB, aiming to understand how hydropower projects incorporate scientific knowledge on future climate change.

The research begins by systematically reviewing existing literature to assess climate change projections for the basin, revealing significant knowledge gaps, especially regarding extreme climate events. It then quantitatively examines future climate extremes, finding a projected increase in monsoon precipitation by up to 38% by 2099 under high-emission scenarios, with a rise in extreme rainfall events. Finally, the study reviews hydropower policies in India and Bhutan, identifying a disconnect between scientific knowledge and policy implementation, as climate projections are rarely integrated into hydropower development planning.

The thesis highlights the urgent need for more comprehensive climate studies in the BRB and emphasizes the importance of integrating scientific knowledge into water-infrastructure planning to ensure climate-resilient development.