**Nature-Based Solutions to Address Lean Period Water Intake Challenges at Brahmaputra Ghat**

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**Abstract**

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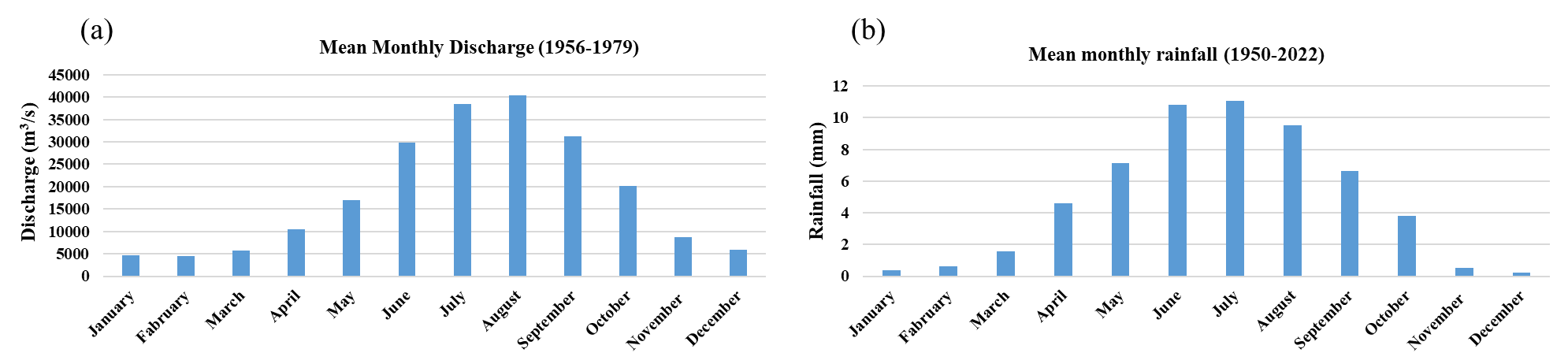
The present study aims to provide nature-based solutions for the challenges faced by IIT Guwahati in maintaining sustainable water management practices at Brahmaputra Ghat during the lean period flow. The primary issue is the formation of sandbars near the intake location during the recession period of the river flow, which causes water scarcity from December to March almost every year. Additionally, the outlet of the sewerage effluent, located just 0.5 km upstream of the intake location, deteriorates water quality during the lean period flow. To tackle these challenges, considering the around 4 km reach from Maj Gaon (upstream) to Brahmaputra ghat (downstream), the river width is around 1.5 km at Maj Gaon and at Brahmaputra ghat is around 1 km, analyzed the various datasets such as discharge data, rainfall data, and satellite imagery. The analysis showed that left bank (outer bank) sandbar erosion (near Maj Gaon) may play an important role in sandbar formation at the right bank (outer bank sandbar erosion happening due to the sinuosity effect) and eroded sediment from upstream deposited downstream. Currently, dredging techniques are used to mitigate the problem, but they are costly. The proposed solution may involve creating a low-cost barrier of woody debris and rocks at the river’s left bank near Maj Gaon. The barrier will work as an energy dissipater, leading to sediment deposition and sandbar formation, which can eventually become stable sandbars with the growth of vegetation, and maybe river thalweg will be shifted towards the right bank. This solution reduces the cost of dredging, preserves the natural habitat, and improves water quality. This study can further utilize such types of consequences in the river systems.

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**Keywords:** Nature-based solution, Lean period, Brahmaputra ghat, Sustainable water management, Sandbar



**Figure 1:** Sand bar formation process near Brahmaputra Ghat (source: Google Earth Pro)



**Figure 2:** Mean monthly Discharge (GRDC data) at Pandu Guwahati and mean monthly rainfall (IMD gridded data) at Guwahati

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