Challenges and dynamics of athaphum: a longitudinal study of Loktak lake in northeast India

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As the largest freshwater lake in the region and a designated Ramsar site, Loktak lake in northeast India holds paramount ecological and socioeconomic significance, particularly for the indigenous Meitei community. This study delves into the intricate spatiotemporal dynamics of a traditional fishing technique called athaphum practised by the Meitei community in the Loktak. It utilizes the normalized difference vegetation index derived from the remote sensing satellite images to discern the athaphum and its trend over the past three decades (1988–2023). Our findings reveal significant fluctuations in athaphum due to ecological, hydrological and human factors. The findings of this study enhance our understanding of the complexities involved in safeguarding Loktak lake. They shed light on the intricate balance needed to sustain environmental integrity and socioeconomic well-being in the Loktak region.

Keywords: Athaphum, Loktak, Meitei, Ramsar, spatiotemporal dynamics.

made up of heterogeneous masses of soil, vegetation and organic matter in different degrees of decay[9]. The phumdis in Loktak lake plays a crucial role as a fertile breeding ground for fish. The thick pieces of phumdis are traditionally used to make circular enclosures called athaphum for catching fish[10]. Many fishermen live in floating huts known as phumsangs, constructed on the phumdis[4,7,11]. Other fishing practices in the Loktak include culture and the capture fishery. While the capture fishery involves fishing in open water within the lake using boats, fishing craft and various fishing equipment, the culture fishery is common in lakeshore villages[12]. It contributes over 50% of the total fish production to meet domestic demands and constitutes approximately 3% of the state's gross domestic product[13].

However, the past four decades have witnessed striking landscape alterations in the wetland. Most of these changes are the offshoot of the Ithai Barrage commissioning in 1983 for hydroelectricity generation and irrigation purposes. Following the barrage construction, the unregulated discharge of nutrients into Loktak lake escalated, leading