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Abstract

Wetlands are highly productive systems and because of their ability to regulate water and filter waste from the landscape, they are also known as ‘kidneys of the Earth’. However, wetlands around the world are under threat and are shrinking due to rapid urbanization, pollution, over-exploitation, and a variety of other factors. The goal of the study is to monitor hydrological abundance of a high-altitude wetland in the Himalayan region over the last 25 years. Loktak Lake was chosen for this work as it is a Ramsar site and one of the largest freshwater wetlands in India. Major parameters of hydrological abundance include water depth, water presence frequency, seasonality, wetland fragmentation, and hydroperiod. During the study period, there was a gradual increase in abundance of water in the lake, as well as duration or permanency of water and water depth. The restoration of Loktak Lake and dam-induced backwater reach are two major factors that have contributed to increase in water availability. The outcomes of this research will assist policymakers in developing future wetland conservation and management strategies.

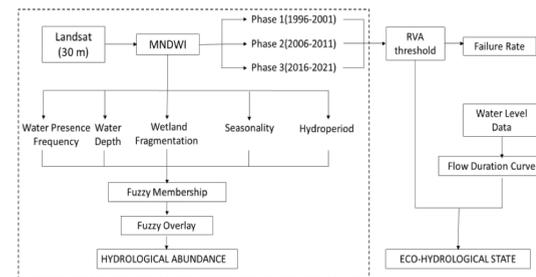
Study Area

Loktak lake is the largest freshwater wetland in North-Eastern region of India and Indo-Burma biodiversity hotspot; covering an area of 246.72 sqkm (National Wetland Atlas, 2011) and is 786.5 m above mean sea level. It is situated between 93°46'E-93°55'E and 24°25'N-24°42'N. *Phumdis* are unique features of Loktak lake, and the lake hosts world's only floating national park, Keibul Lamjao National Park (KLNPN). KLNPN is the only natural habitat for the endangered species *Rucervus eldii eldii*, locally known as Sangai.

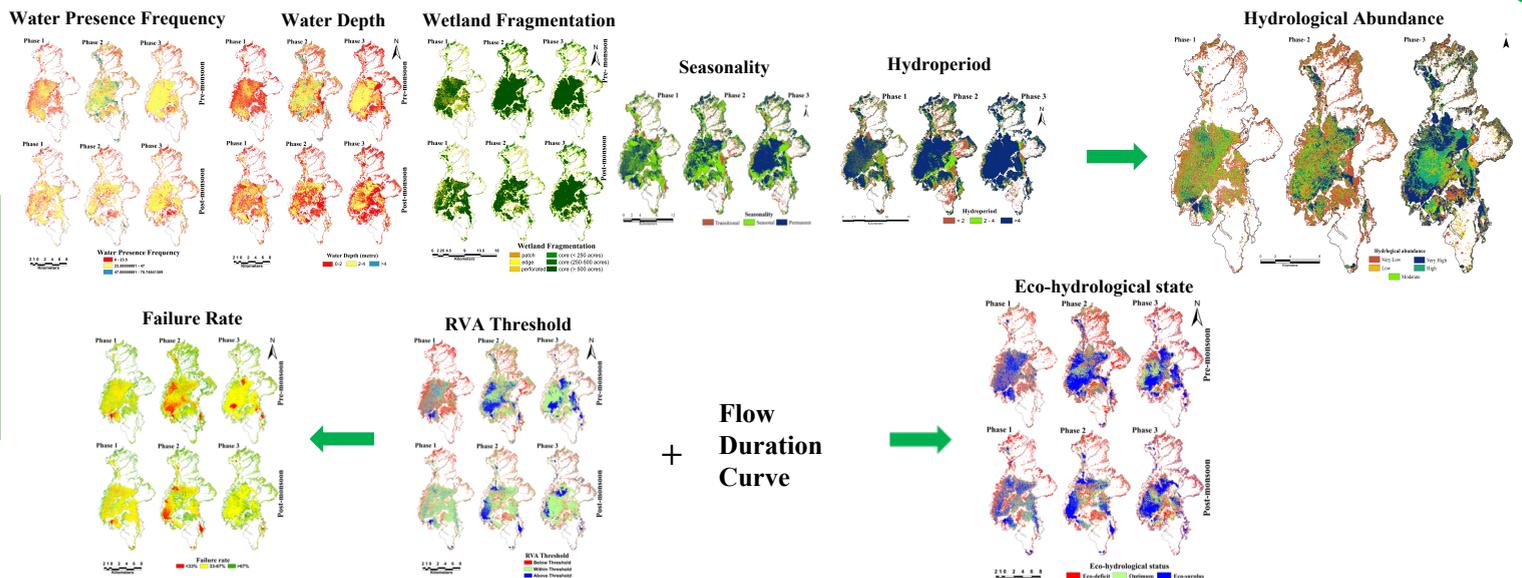
Materials and Methods

- Landsat data
- MNDWI
- Field Data
- Fuzzy logic technique

Methodology



Results



Discussion

It is observed that the abundance of water has increased from Phase 1 to Phase 3 in terms of depth as well as permanency. The two main reasons are – existing restoration policies and construction of Ithai Barrage in the southern part of the lake. Increase in hydrological abundance is advantageous to Loktak Hydroelectric Project and irrigation purposes. However, this greatly disturbs ecological cycle of *Phumdi* resulting in its thinning which directly affects habitat and population of Sangai. The study has also identified that hydrological abundance is inversely linked to hydrological failure rate and well correlated with eco-hydrological state.



Field Photographs