

## Flooding in Kashmir Valley

Srinagar valley is often said to be a place known to man as heaven and paradise. The September deluge in 2014, is touted as being the worst to affect Srinagar since 1902, the beautiful valley rampaged by the floods. A closer look, however, underlines Kashmir Valley's increasing vulnerability to extreme events as its natural buffers, the extensive network of wetland ecosystems, have been rapidly destroyed and degraded.

Life in Srinagar rolled back several decades when devastating floods hit the region in the first week of September, 2014. On September 5 alone, the city received 156.7 mm of rainfall, which was nearly three times the monthly average. By September 6, River Jhelum, which cuts across Srinagar engulfed many low-lying parts. In the coming days, critical infrastructure like flood control bunds were washed away, bridges collapsed, power and communication lines snapped, roads and highways were disrupted or caved in, and hospitals flooded and without electricity. Nearly 500 lives were lost, 22,000 injured, and over 0.12 million houses damaged.



Image 1: Central Market in Srinagar, during the floods.

The City of Srinagar has evolved on the floodplains of River Jhelum. Wetlands, through their ability to moderate flow regimes, are its natural and primary flood defense. However, the urban sprawl has engulfed large chunks of these fragile ecosystems. Wular, Dal, Nigeen and Achar have shrunk significantly in the recent times, whereas Batmaloo nambal, Rakhi- Gandakash, Rakh-i-Art and Rakh-i-

Khan no longer exist. During summers, as River Jhelum, its tributaries and hill streams ebb with high volumes of water received from the melting glaciers, the wetlands used to accommodate the huge volumes of floodwater and release them gradually during winters. Floodplains of River Jhelum and its channels have been encroached and constructed upon. At the same time, concretized surfaces with high surface run-off during precipitation events have increased exponentially.

In 2007, the Department of Wildlife Protection, Government of Jammu and Kashmir, entrusted Wetlands International South Asia with formulation of management action plan for restoration of Wular Lake. Located 34 kilometre northwest of Srinagar City, Wular is the largest wetland of the Kashmir Valley spanning 160 km<sup>2</sup> with 18 km<sup>2</sup> as associated marshes. Besides, its role as a flood buffer to the Valley, migrating waterbirds of the Central Asian Flyway use Wular and its associated marshes as habitat for feeding and roosting. Communities living around the wetland harvest fish, water chestnut, and lotus rhizomes for their livelihoods. The Kashmiri Sultan, Zain-ul-Abidin is reputed to have ordered construction of an artificial island of Zaina Lank in middle of the wetland as a storm refuge for boats, for Wular often witnessed strong gales from the mountains of Erin and Bandipore. In 1990, Wular was designated as a Ramsar Site by the Ministry of Environment, Forest and Climate Change of Government of India.

Assessments undertaken during the course of management planning indicated that during the last century, the area of Wular and its associated marshes have shrunk by over fifth (from 217 km<sup>2</sup> in 1911 to 178 km<sup>2</sup> in 2007). The marshes associated with Wular have been extensively converted for agriculture and settlements. Construction of embankments to protect the agriculture fields has reduced connectivity of the wetland with the Jhelum River and inflowing streams. Extensive degradation of catchments and plantation of willow inside the wetland have resulted in rapid siltation and reduced water holding capacity. Being located in the downstream reaches of Kashmir Valley, Wular is a receptacle of all untreated sewage and solid waste dumped into the waterbodies by upstream and adjoining settlements. Fish species as schizothorax has declined significantly due to pollution and changes in habitat. Reduced availability of water chestnut, fish and lotus rhizomes has increased food insecurity and poverty within wetland dependent communities.

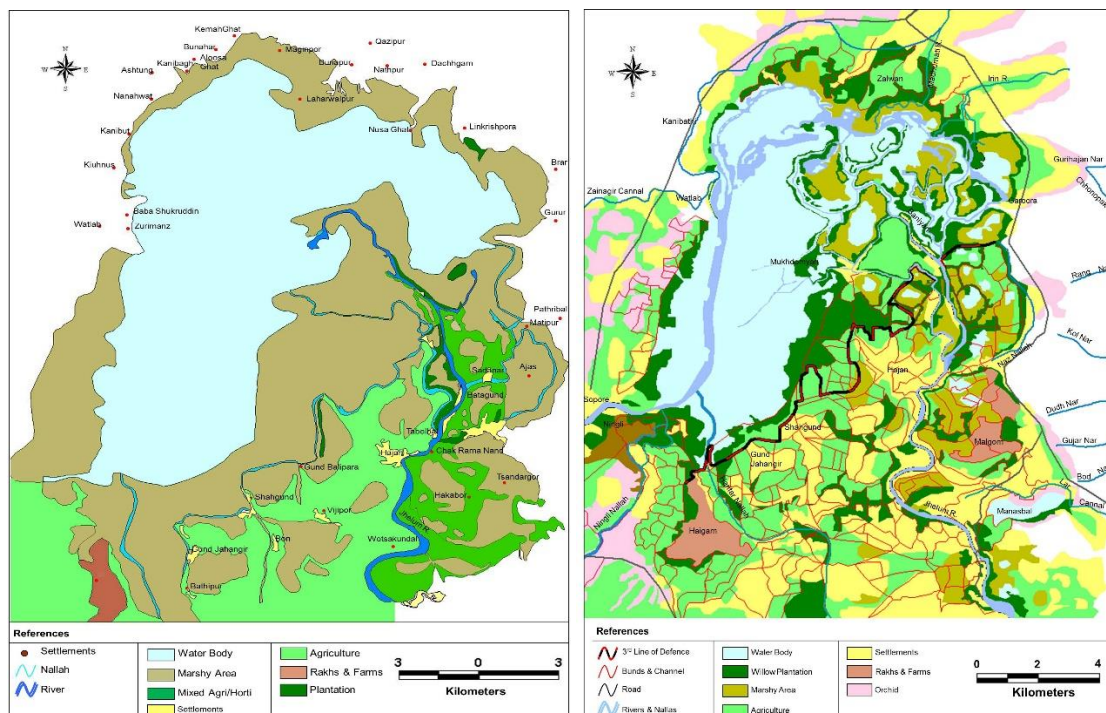


Figure 1: Map depicting loss of Wetlands from 1911-2007

The management plan stresses on the flood buffering role of the Wular ecosystem. Measures for rejuvenating the marshes and increasing water holding capacity of the wetland, alongwith conservation of catchments, sustainable development of fisheries and improvement of livelihoods of wetland dependent communities are proposed. However, to date, plan implementation has been highly fragmented and limited.

The September 2014 deluge is a grim reminder of the ways in which societies are rendered vulnerable due to loss of wetland ecosystems. As measures of urban reconstruction and flood risk reduction are being identified and implemented for Kashmir Valley, it is important that the role of wetlands is brought to fore, and integrated as 'ecosystem based solutions'.