The NEWS Minute

Environment

Buffer zones in Bengaluru lakes increase capacity, help mitigate floods: IISc report

The SC had recently reserved its verdict on a petition by the Karnataka govt and private builders seeking a reversal of the NGT order increasing the buffer zone for lakes.

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As the Karnataka government and some private builders contest the 2016 National Green Tribunal (NGT) mandated 75 m buffer zone for lakes, an Indian Institute of Science (IISc) report has come to light that highlights the importance of buffer zones in flood mitigation. While the 2016 NGT order was welcomed by environmental activists, it brought panic to builders and home owners as their houses became "illegal" overnight.

Buffer zones are wetlands or green belts around lakes that are essential for the survival of lakes and that also act as a buffer between the lake and neighbouring lands. According to law, no permanent structure can be constructed within 75 m of the lake periphery. In the same 2016 order, the NGT had fixed a buffer zone of 50 metres, 35 metres and 25 metres for primary, secondary and tertiary storm water drains respectively.

The Supreme Court in January end had reserved its verdict on a review petition filed by the state and realtors Mantri Techzone, Core Mind over the implementation of the extended buffer zone in Bengaluru. Both the petitioners are seeking a reversal of the 2016 NGT order which had extended the previously set buffer zone of 30 m. The report gains importance as the petitioners have quoted some studies advocating a zero buffer zone for lakes.

In his argument in the Supreme Court, Karnataka Advocate General Udaya Holla said a retrospective implementation of the NGT's order would mean that 95% of the city's buildings have to be demolished. Senior advocate Sajan Poovayya, who represents NGO Forward Foundation, the petitioners in the NGT case, however, claimed that the NGT order was only applicable for future constructions.

What the IISc report says

The Environmental Information System Technical Report: 152 of December 2018 — Need to preserve the buffer zone integrity of water bodies— authored by scientists TV Ramachandra, Vinay S and Bharath H Aithal – concluded that buffer zones contribute towards retaining rain water and contribute positively especially at a time when concretisation is at an all time high. Taking the case of Bellandur, the researchers noted that despite 88% silt deposition and increased concretisation of the catchment area, a 75 m buffer zone provides additional storage capacity of 1.5 million cubic metres.

The report notes: "Bellandur lake has a surface area of 367.4 hectares with a catchment area of 159.5 sq km. The water body has a current storage capacity of 6.1 million cubic metres. The catchment receives annual rainfall of 750 to 900 mm with the highest rainfall of about 175 mm during September month. The lake catchment is urbanized (concretised) to 80% due to the unplanned urbanisation. Due to the concretised landscape in the catchment, the catchment has lost its hydrological function (ground water recharge with the percolation of water during monsoon) and hence most of the rainfall flows away from the catchment as overland flows.

"The Bellandur lake also has silt deposit (to about 88%) and hence without much storage in the lake, the water flows downstream. The catchment yields about 20 million cubic metres of water as overland flows in the month of September (175 mm rainfall), the lake has a storage capacity of 6 million cubic metres while the upstream lakes having a total area of 455 hectares has the storage capacity close to 6.2 million cubic metres. Considering the earlier BDA norm of 30 m, and assuming a storage capacity of 1.5 m in these 30 metres, the upstream lakes can store close to 3.5 million cubic metres of water, the balance of 4.5 million cubic metres need to be handled by the area in the buffer zone of Bellandur lake. Having a buffer zone of 75 metres around Bellandur lake allows additional storage of 1.5 million cubic metres of water at a depth of 1.5 m while the remaining 3 million cubic metres flows downstream."

Buffer regions upstream lakes and storage		
Buffer Distance	**m**	**30**
Storage Capacity	**M.cum**	**2.4**
Buffer Distance	m	45
Storage Capacity	M.cum	4.1
Buffer Distance	m	50
Storage Capacity	M.cum	4.5
Buffer Distance	m	75
Storage Capacity	M.cum	7.1
Buffer Distance	m	100
Storage Capacity	M.cum	9.9

Buffer regions Bellandur lake and storage		
Buffer Distance	*m*	*30*
Storage Capacity	*M.cum*	*0.6*
Buffer Distance	m	45
Storage Capacity	M.cum	0.9
Buffer Distance	m	50
Storage Capacity	M.cum	1
Buffer Distance	**m**	**75**
Storage Capacity	**M.cum**	**1.2**
Buffer Distance	m	100
Storage Capacity	M.cum	2

The same report also reiterated how recently, between 2002 and 2016, both the lake and buffer zones of Bellandur lake have been encroached citing a 2016 study conducted by the IISc. The report had noted encroachments are due to soil filling (construction and demolition waste, solid waste from the city) and unauthorised buildings, which has increased from about 0.5 % (2002) to 3.1% (2016). Similarly, in the buffer zone, built up areas have increased from 1.5% (2002) to 45% (2016) at the cost of vegetation cover.

Figure 11.1 Land cover dynamics in Bellandur Lake and buffer zone

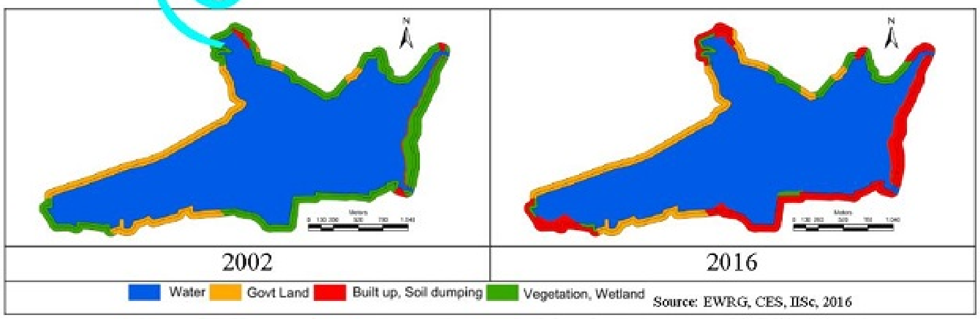

Figure 11.2: Landscape dynamics up to 75m buffer zone of Bellandur Lake.