

## **Flood-proofing Bengaluru City**

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About a year ago, Bengaluru witnessed some of the worst floods in its history. Amidst many ad hoc measures, the state responded with excavators, removing encroachments on storm water drains (SWDs). It is clear now that none of the piecemeal solutions have worked. Rainfall over the last couple of weeks has seen flooding reoccur in the same parts of the city as the previous year. We often blame climate change for the mess we are in, and to some degree, this is justified. However, climate change always manifests through complex socio-ecological changes on the ground.

Flooding in Bengaluru is a combination of climate change, poor urban planning, and disregard for the city's ecology. Fortunately, most of these issues are within our control, and it is possible to flood-proof our city.

The lakes in our city are tanks that were constructed over a period of thousands of years. Early settlers hacked the natural topography of the region to create a network of reservoirs interconnected with each other through kaluves, or drains. These tanks served agricultural purposes in the past, but they need to be reimagined for the 21st-century city.

Rapid urbanisation has seen close to 80% of the water bodies in the tanks lost to real estate and encroachment. But there is still hope for the few that remain. Tanks need to buffer additional high-intensity rainfall from climate change, excess run-off from the roads, and used water from residences while ensuring that biodiversity, livelihood, and recreational uses are unhindered.

For starters, regular desilting of tanks must be conducted to ensure that we have adequate capacity to buffer rainfall and use water. In some cases, it might be necessary to deepen the tanks in an ecologically sensitive manner. Next, tanks must be free from encroachments. Often, citizens who use tanks for their livelihoods, such as grass cutting and grazing, are seen as problematic encroachers. We must ensure that the management of tanks is inclusive and allows local livelihoods to thrive.

Finally, we need to manage 'ghost tanks', areas that were previously tanks but have been built over. With heavy rainfall, water invariably finds its way to these ghost tanks and floods properties. The maintenance of SWDs in these regions should be prioritised to allow water to flow away to the closest functioning tank.

Primary SWDs are kaluves that connect tanks; secondary SWDs feed primary SWDs, and tertiary SWDs are those that we see in front of our houses.

In some regions, the physical capacity of kaluves needs to increase to buffer higher amounts of outflow from tanks. Where feasible, we also need to think about de-concretising them to allow water to infiltrate into aquifers.

In many regions, it's the overflowing of tertiary SWDs that leads to water stagnation. Tertiary SWDs are designed to carry runoff water from roads. However, as rainfall intensity and built-up area increase, run-off increases. Many SWDs carry both runoff and sewage, compromising the capacity of drains and leading to health hazards.

Further, retrofitting SWDs with recharge wells has been suggested as a solution to hasten the drainage of SWDs, but this would only make sense in areas where there is no mixture of rainfall and sewage in SWDs. Nobody wants a rainfall and sewage cocktail in their groundwater.

Finally, we need to ensure that tertiary SWDs are given the same attention as secondary and primary SWDs. They need to be mapped, and data regarding their flow rates and capacity needs to be collected to adequately plan for future climate change scenarios.

As Bengaluru's flooding is hyperlocal, it's often citizens who have the best solutions to solve the problem. To facilitate local governance, Bengaluru has many active ward committees. Each ward receives about 60 lakh per year (based on 2021 data) to solve local infrastructural issues and actively seeks the help of interested citizens to solve local issues. For example, wards can engage in community mapping exercises of SWDs to bridge data gaps—as citizens in Karachi have shown when they were witnesses to urban flooding—enabling citizens to get actively involved with BBMP to solve concerns.

If the problem of flooding is left to urban planners, accountability is in question. Ward committees can serve as an important nodal point to ensure that local issues are solved locally, increasing accountability and transparency. We may not realise it, but the power to change is in our hands.

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