Sustainable Urban Watersheds for Climate-Resilient Cities

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In the 1960s, an island nation now regarded as a global leader in urban design, planning, and water management faced conditions remarkably similar to those confronting India's metropolitan regions today. This young nation grappled with water scarcity, recurring epidemics, and frequent flooding driven by rapid urban development. Its first prime minister famously remarked that "every other policy had to bend at the knees for water survival." In response, agencies and ministries were reorganized to reflect the inherently interdisciplinary nature of water-related governance. In the early years, when the government expanded state-funded residential housing, urban flooding intensified year-by-year. In 1966 the Bukit Timah Flood Alleviation Scheme was initiated, under which several canals and drains were constructed to flush out water from the neighbourhood of Bukit Timah to the sea. Despite this, the year 1969 was the most devastating, masking 3,000 citizens homeless. This again demonstrates that good results take time and require consistent effort. Without getting demotivated, in 1972 a drainage masterplan was conceptualized in collaboration with several development agencies. The plan mandated demarcated land alongside waterways for future expansions and was the first coordinated effort. The plan was also initiated in a combined effort to ensure efficient slime development and riverfront revival, in many ways very similar to what Ahmedabad did in the past two decades. Until the 1980s the strategies for flood management were largely functional and utilitarian, concrete canals and drains aimed at rapid flood water drainage. The city nation we are talking about is Singapore. After the 1980s Singapore achieved its critical challenges of housing and employment. So the Singaporean leadership started contemplating 'How can we improve quality of life beyond meeting the basic needs?".

In 1989, the Waterbodies Design Panel (WDP) was established to integrate water bodies into the urban landscape, enhancing their aesthetic value, strengthening the city's image, and helping attract high-quality talent. This came at a time when many state-funded housing projects required an upgrade. In 2001 the Gov of Singapore merged the drainage and sewage department to create one unified agency, called the Public Utilities Board (PUB) dealing with the entire loop of the transport of water, supply, drainage, treatment and distribution. In the following year Singapore started its ambitious NEWater programme to recycle treated sewage water with membrane filtration and purify it into drinking water. In 2004 the four national taps strategy came into light, a plan to diversify water supply sources.

1. Local Catchment Water
2. Imported Water
3. NEWater Reclaimed Water
4. Desalinated Water

Singapore then sealed its position as a global leader in urban planning, management, and design with the launch of the Active, Beautiful, Clean Water (ABC Waters) Programme by PUB in 2006. The programme aimed to transform utilitarian canals and stormwater drains into multifunctional urban assets, enabling the entire city to function as an integrated rainwater catchment while closely intertwining water management with urban public life. Indian cities such as Surat, Ahmedabad, Thiruvananthapuram, and Indore have made significant strides in meeting citizens' basic needs and are now well-positioned to elevate their urban systems to a higher level in a decade or two. Urban planning must combine deep inter-agency collaboration, the consideration of socio-cultural benefits and biodiversity preservation, coupled with the sustenance of natural ecosystems habitat.

Figure 1: Conceptual Urban Vision Viksit Bharat by 2047 (Generated with Google Gemini AI)

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