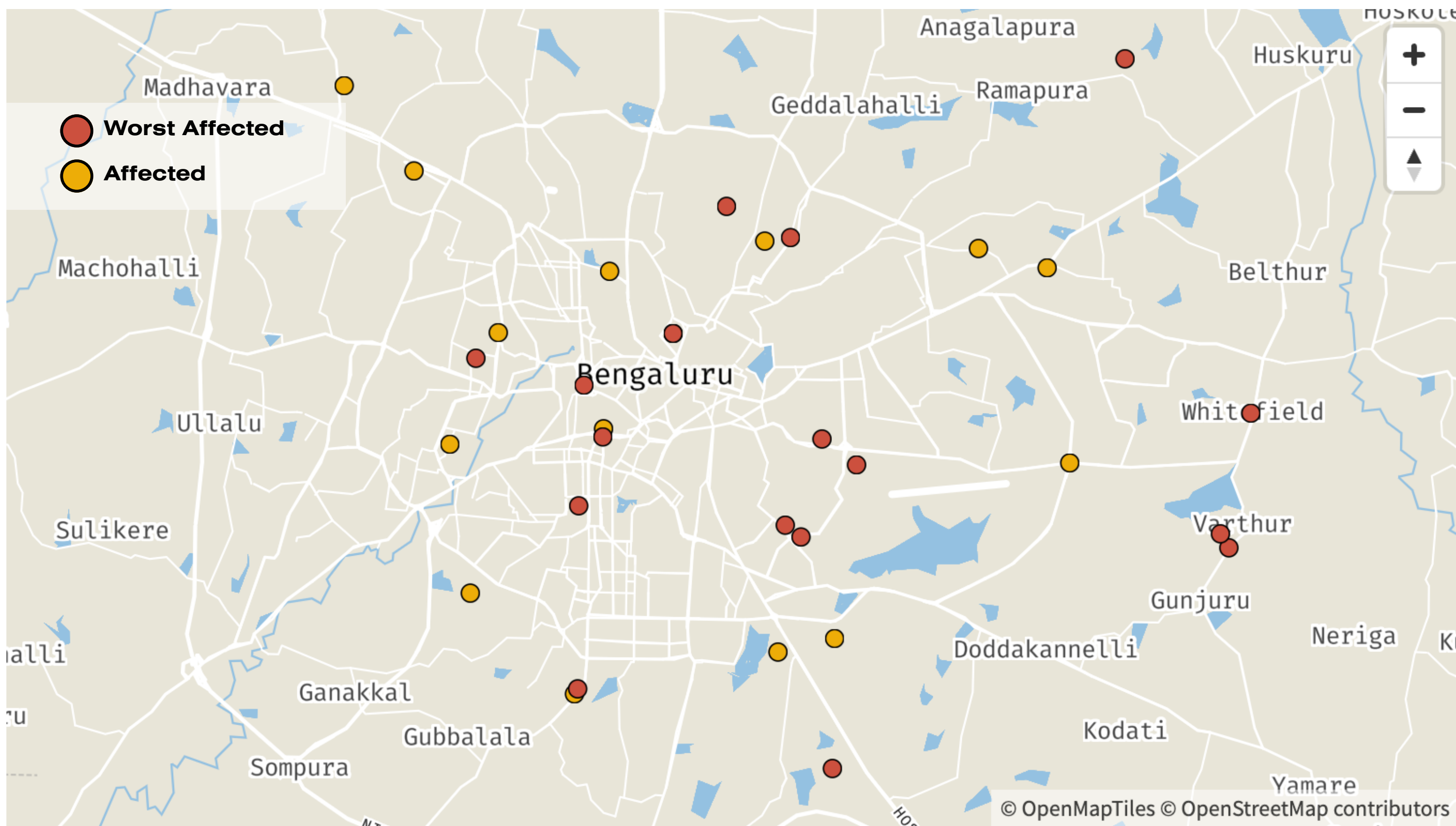


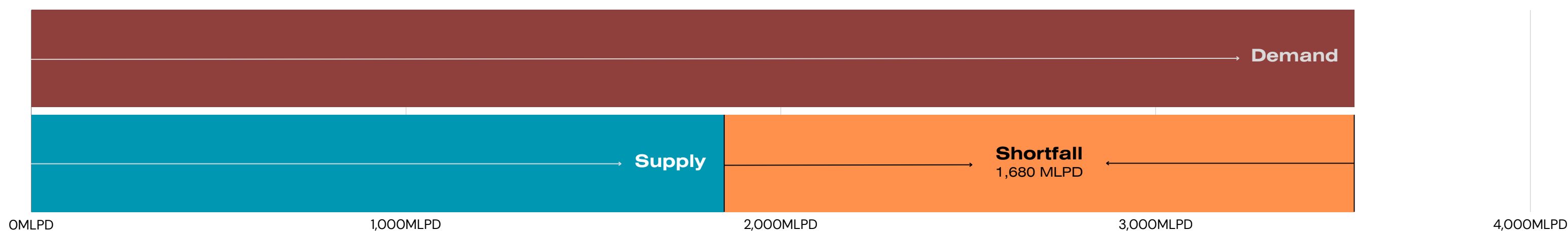
Bengaluru Another Cape Town?

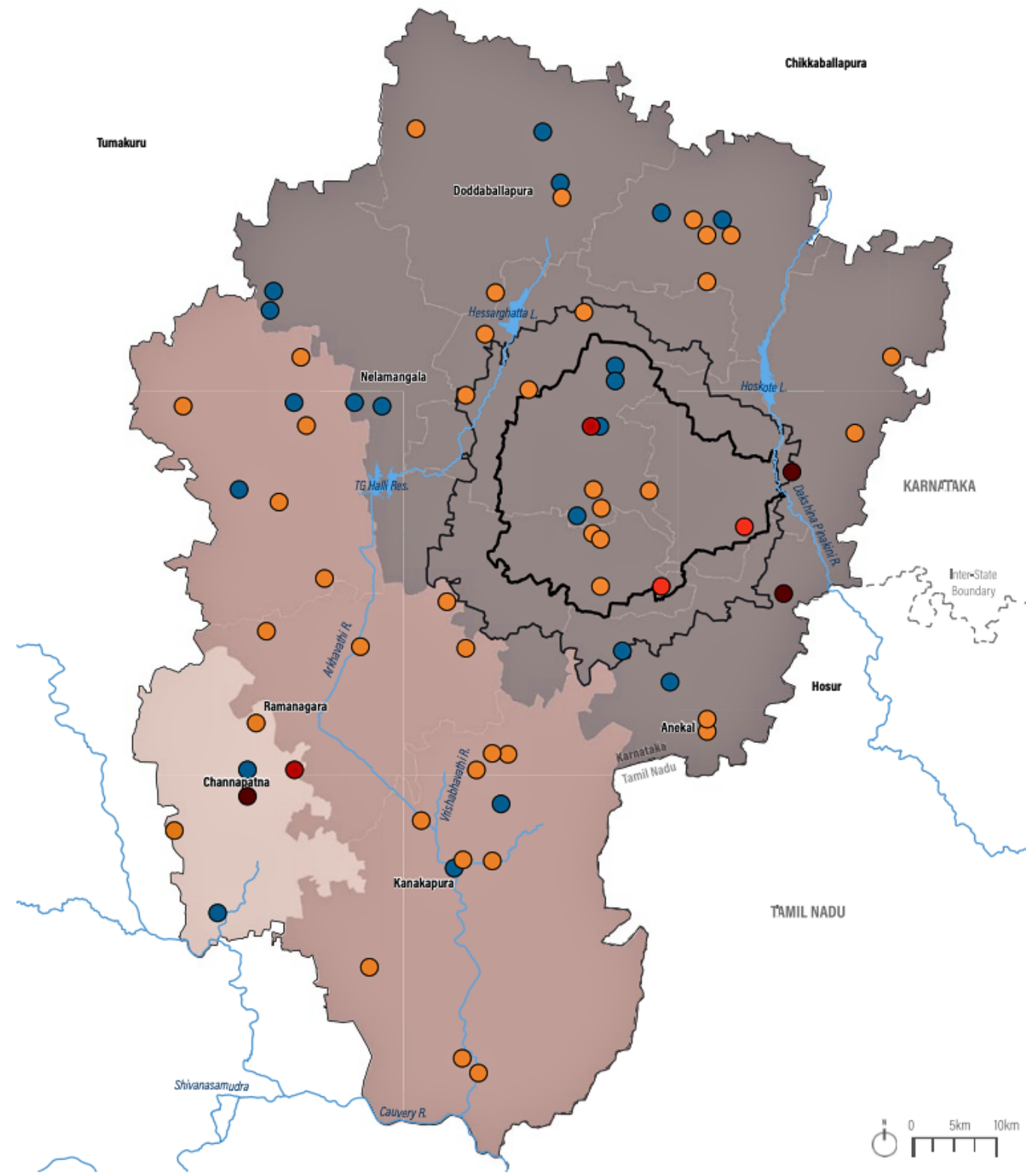
Analysis of the Water Crisis

Bengaluru, the 'Silicon Valley of India', has been witnessing an escalating water crisis leaving multiple regions of the city parched and struggling to meet basic needs. Authorities have begun to mitigate wastage, enforcing penalties for water misuse. Also, borewells are being drilled to augment the dwindling supply. These steps may solve the problem in the short term, as the state is entering its summer season— the driest the city will ever be in the year. However, a much larger question is yet to be answered. **Will these measures be enough for a city bustling with a considerable working population? Would Bengaluru be facing a Cape Town-like crisis soon? What about the brand of Bengaluru?**



Bengaluru Water Supply v Demand Discrepancy in Million Litres per Day (MLPD)





Bengaluru Pre-monsoon Groundwater Trends (1993 - 2021)

Source: WRI India



Average stage of Groundwater development (2020)

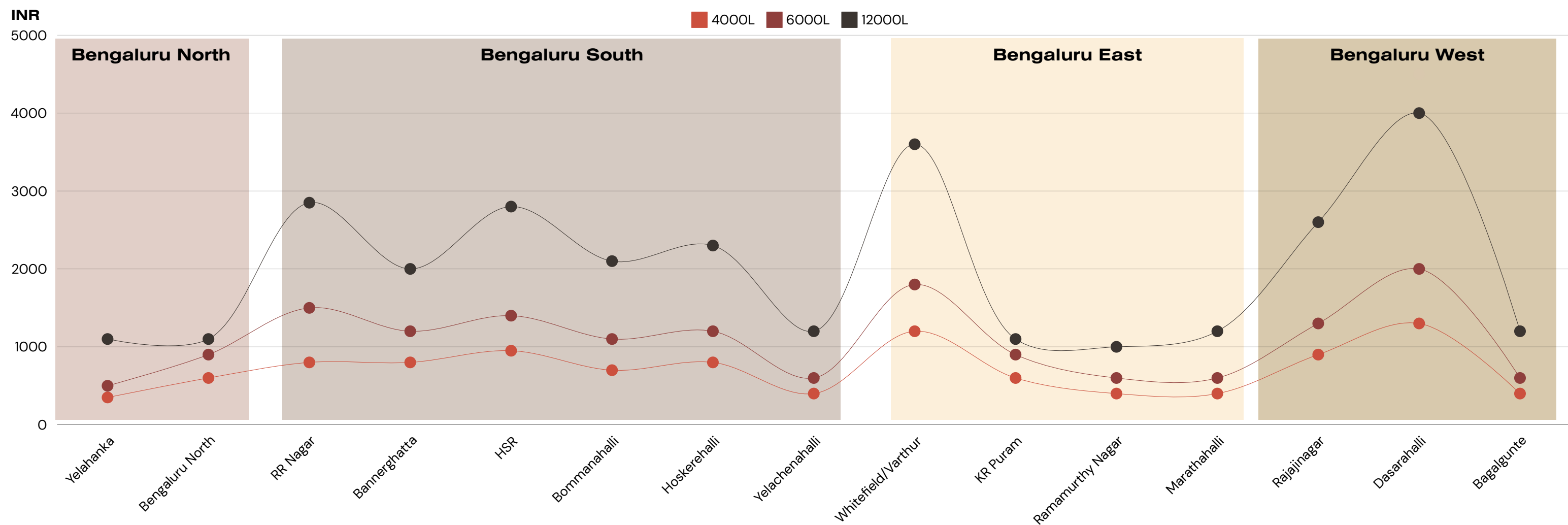


Groundwater resources are under significant stress, as seen in the graph. The central areas of Bengaluru, considering a more dense populace and rising development, have led to over-exploitation of groundwater, exceeding the natural recharge rate for an extended period.

There is significant over-exploitation, with decreasing groundwater recharge both in the central and periphery of Bengaluru urban, under the Bruhat Bengaluru Mahanagara Palike (municipal authority). All these have caused many borewells across the city to dry up, which has further exacerbated the current water crisis.

Water Tanker Prices Across Different Zones of Bengaluru

Varied Sources (as of this report) in Indian Rupees (INR)



Water Resources and Associated Challenges

Bengaluru's water crisis stems from low rainfall, overexploited aquifers, and inadequate reservoir levels, exacerbated by its geography. The city's elevation and subsequent difficulty in pumping, shortages in the reservoirs due to inadequate rainfall have all exacerbated the crisis currently facing Bengaluru.

Bengaluru's Elevation and Supply Issues

- Relies on the Cauvery River, 100 km away, and pumps water up 1000 feet due to city's elevation. Naturally, Bengaluru is not a part of Cauvery's Watershed.
- The Bangalore Water Supply and Sewerage Board (BWSSB) manages the water supply from Tore Kadanahalli (TK) Halli pumping station with treatment facilities.

Groundwater Depletion

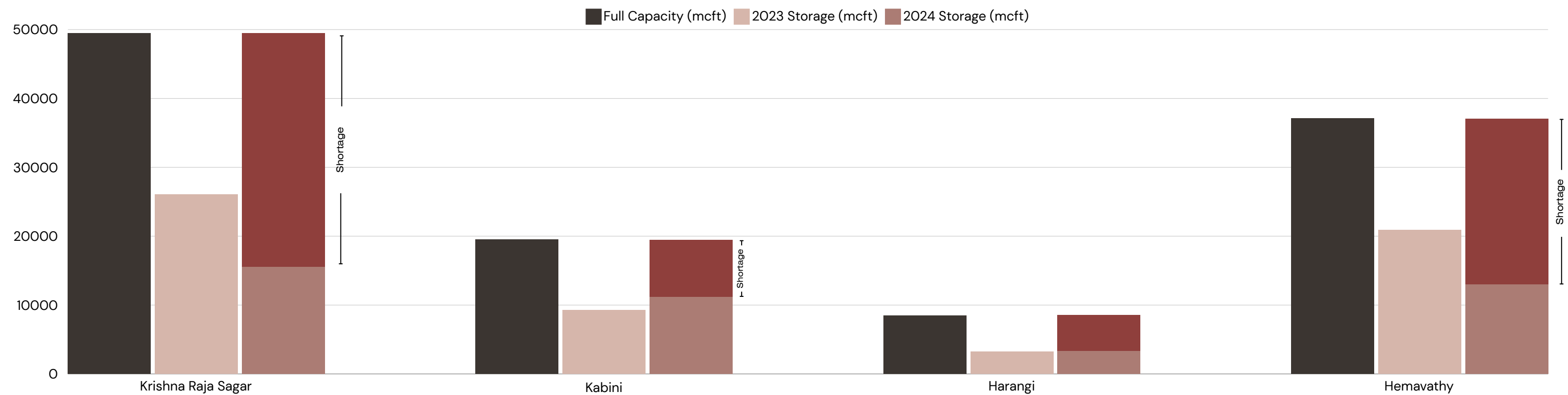
- Groundwater levels fell by nearly 4m, as of Jul 2023.
- Bengaluru city extracts up to 700 MLPD from groundwater; recharge remains inadequate, leading to a dropping water table.
- Deep aquifers are exploited through borewells, often beyond shallow aquifers' reach.

Reservoir Levels

- Krishnaraja Sagar (KRS), Kabini, and Hemavathy reservoirs' water levels are lower compared to previous years.
- Water reservoirs are operating below their capacity, and low rainfall has further exacerbated their decline.

Major Reservoirs Capacity, Storage & Shortage

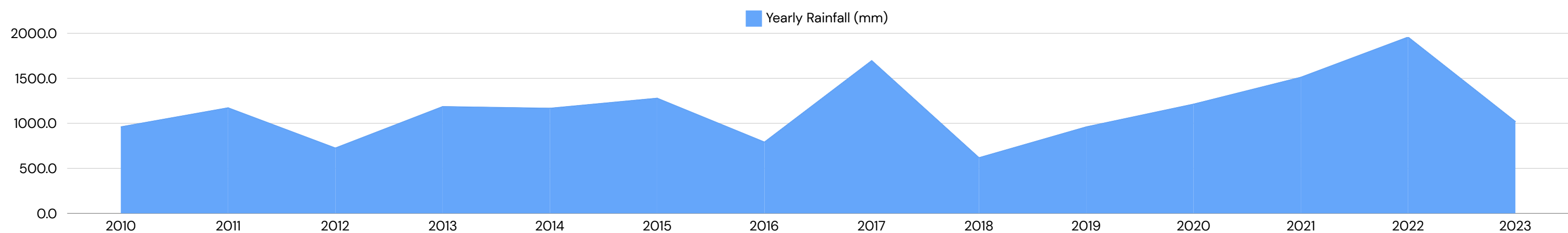
Official sources | in million cubic feet (mcft)



Rainfall Patterns: The average annual rainfall has seen a significant decrease. Low levels of rainfall have rendered the reservoirs and the Cauvery river dry to a large extent. Ground water aquifers also need rejuvenation, as it is suffering with over-exploitation.

Average Rainfall in Bengaluru (Urban)

Official sources | 2010 - 23



Bengaluru's Dry Lands: Will the Silicon Valley City Become Another Cape Town?


- **Environmental Degradation and Urban Growth:** The rapid industrialization and economic development of Bengaluru since the 1990s have led to significant environmental degradation and socio-ecological challenges. Relaxed building regulations have accelerated urban growth, resulting in an 88% reduction in vegetation and a 79% decrease in water bodies between 1973 and 2016, [as studied by the Indian Institute of Science \(2017\)](#).
- **Topographical Challenges and Water Scarcity:** Why this matters for Bengaluru is that it is situated in a disadvantageous topographical place. Water needs to be pumped to above 950 meters for the Bengalureans. It doesn't fall in the watershed of the Cauvery.
- **Comparison to Cape Town's Crisis:** 2023, with an almost dry spell, i.e., less than average rainfall and the overexploitation of borewells have rendered the city dry. Similar circumstances led to Cape Town's infamous 'Day Zero' crisis. Exacerbated by rapid urbanization, inadequate water management, and climate change-induced drought conditions, Cape Town faced its worst water crisis on record between 2015 and 2018.
- **Short-term Mitigation Efforts:** While the Bengaluru authorities are trying to solve the problem in the short term by prohibiting the usage of potable water for non-essential purposes, capping the water tanker prices, and refilling the aquifers with STP water, a robust water infrastructure is what is deemed necessary.
- **Cape Town's Recovery and Solutions:** While Cape Town's crisis was averted and the conditions were even bettered with the incoming rainfall refilled its dam capacity to 76% from the earlier 10%, Cape Town's authorities invested heavily in engineering solutions. From pressure management zones to making a shift to alternative water resources like desalination and water reuse.
- **Urgent Needs for Bengaluru:** Measures that have been taken by Bengaluru's authorities to solve the short-term crisis are inadequate. The city, still 3 months away from its monsoon time, requires the government to take some drastic measures. The shortfall is only going to get worse, as the Silicon Valley of India is even running short of alternative resources.
- **Resource Depletion and Policy Concerns:** While there are reservoirs in the city, they too suffer from incapacity, as they are fed by rainfall. Bengaluru has run dry of its traditional and alternative water resources and policies that support more drilling of borewells are only going to worsen life for Bengaluru citizens until rainfall arrives in the city.

Risk Barometer



Socio-Political Risk
High Risk

- Protests are possible to flare by housing society residents due to the handling of water tankers, and the subsequent rise in water tanker mafias using the situation to increase prices, while official prices being 'quasi' enforced.
- Possibility of street-level fights due to lack of water supply via tankers in areas facing severe shortages.
- Potential of violence by aggressive residents witnessing misuse of water in their neighbourhood.
- Bengaluru's urban body seems to lack clear contingency planning for such situations. Although, government authorities assure the city of adequate measures, it lacks water infrastructure. Hence, similar situations, if not addressed at the earliest, would continue.
- Considering the Cauvery River crisis with Tamil Nadu, any further release of water to the neighbouring state could lead to a political deadlock — and protests — within Karnataka; an issue that could be brought up ahead of the General Elections 2024.
- The city's future as a sustainable community is in jeopardy without improved water governance, threatening its status as a business hub and residents' confidence.



Business & Health Concern
High Risk

- White-collar workers (migrant) in the city residing in areas affected are expected to ask for work-from-home (WFH), leading to them leaving the city.
- Businesses will be forced to limit office days and enforce temporary measures such as a hybrid model or complete WFH.
- The cascading impact on the hospitality sector, considering the lack of water forces residents to order food from outside. This situation has a domino effect on the hospitality industry; as residents resort to takeaways due to water scarcity, affected restaurants might face the dilemma of fulfilling orders or resorting to unclean water for food preparation. These could also lead to health concerns.
- Emergency services such as fire stations, and storage of water for fire safety in office buildings, may also be hit due to lack of immediate water supply.



Economic Risk
High Risk

- Private water distribution facilities have not been adhering to government limits on tanker prices. These are expected to increase water prices thereby increasing the operational costs of businesses, as well as residential areas.
- Rise in maintenance cost levied by housing societies to ensure adequate tanker supply to residences.
- The brand of Bengaluru as the IT hub is expected to be contested assessing the extremes recorded in the city. The city is affected by severe waterlogging during monsoons and confronts water scarcity in the summer. Businesses may begin to look for alternatives.

12 Mar 2024



Bengaluru Another Cape Town?

Analysis of the Water Crisis



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Prepared at the Risk Assessment and Analysis Centre, Bengaluru

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