

Exploring Water Scarcity from the Lens of Water Governance in the Ridge Town of Himalayas: From Colonial Legacy to Contemporary Challenges and Future Prospects for Darjeeling

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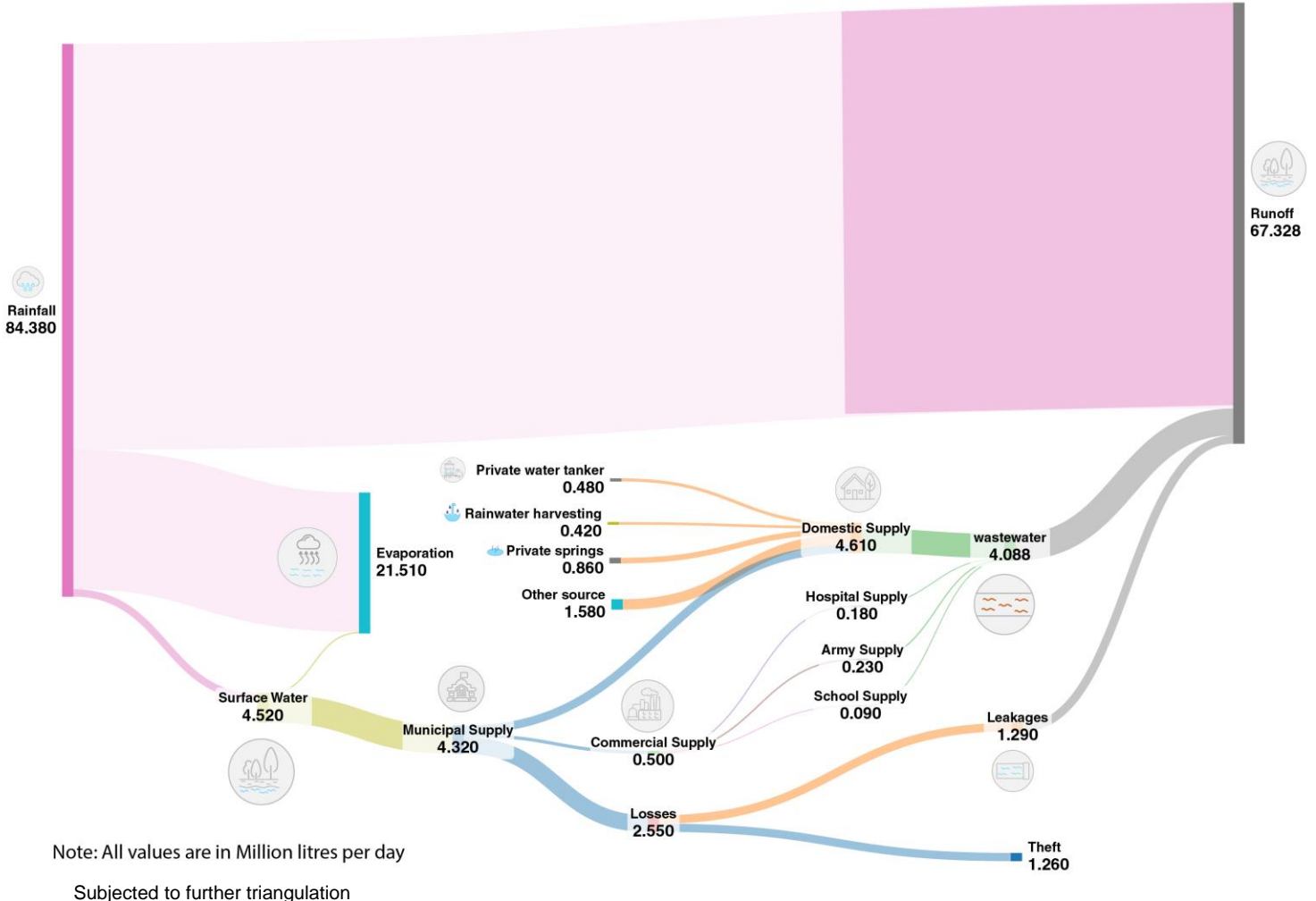


What is Ridge Town? And Why Water scarcity is a common issue in this towns?

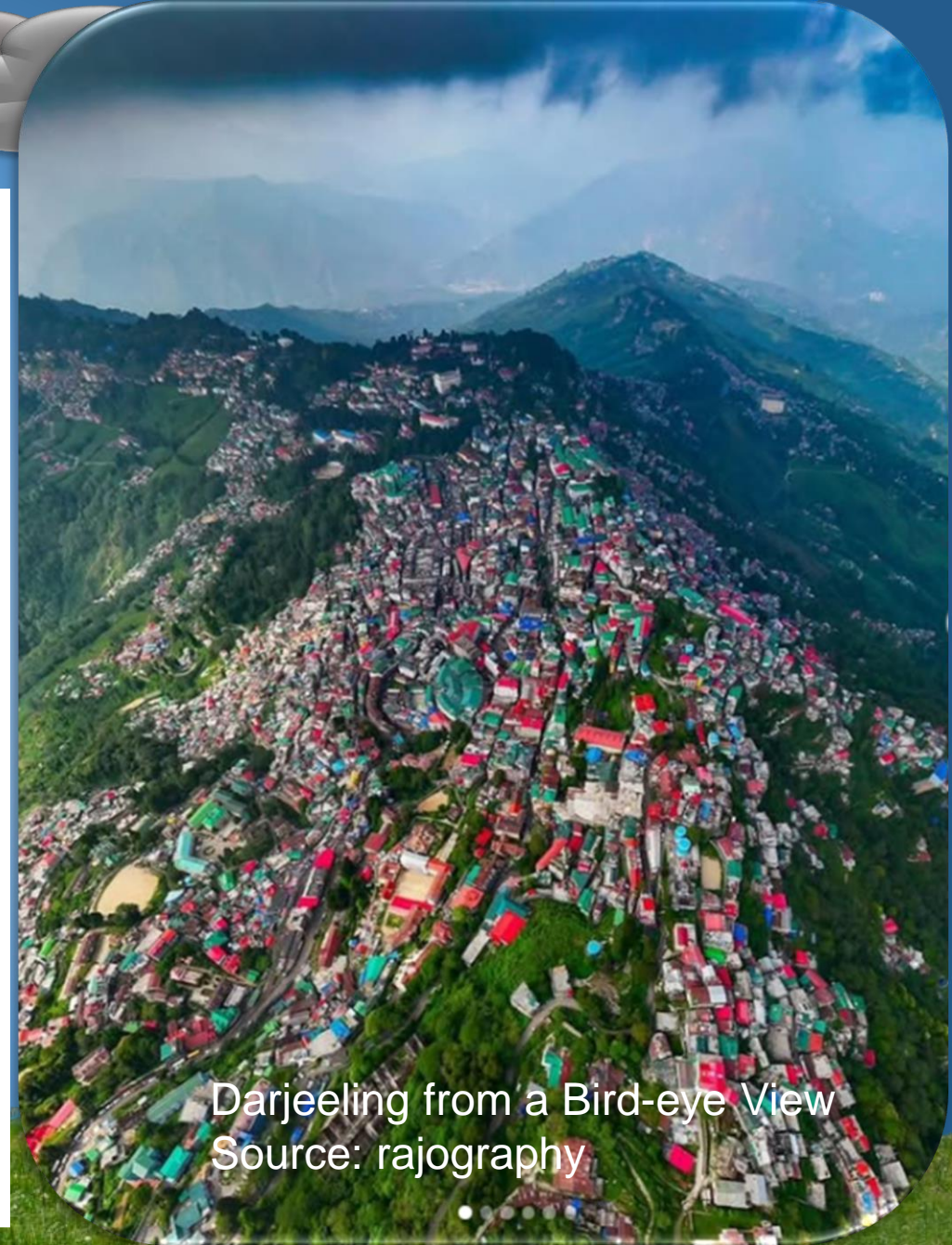


Ridge of A Mountain

Water Flow Diagram for Darjeeling Township



Note: All values are in Million litres per day
Subjected to further triangulation

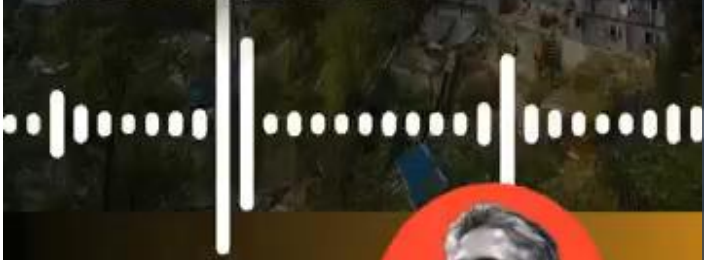


Darjeeling from a Bird-eye View
Source: rajography

MIND YOUR EARTH

A PODCAST BY 

“Despite 33 times more annual rainfall, Darjeeling faces water crisis”



Utsow Pradhan
Founding Gardener,
TIEEDI

FULL EPISODE STREAMING ON



Current Situation

- As per 2024, The projected population of Darjeeling is **148,538** (excluding the floating population).
- The current per capita water supply is **10-20 LPCD**.
- As per CPHEEO guidelines for non-sewered towns, a minimum of **70 LPCD + 15% for NRW** (totaling approximately **80 LPCD**) is required.

Situation in Past

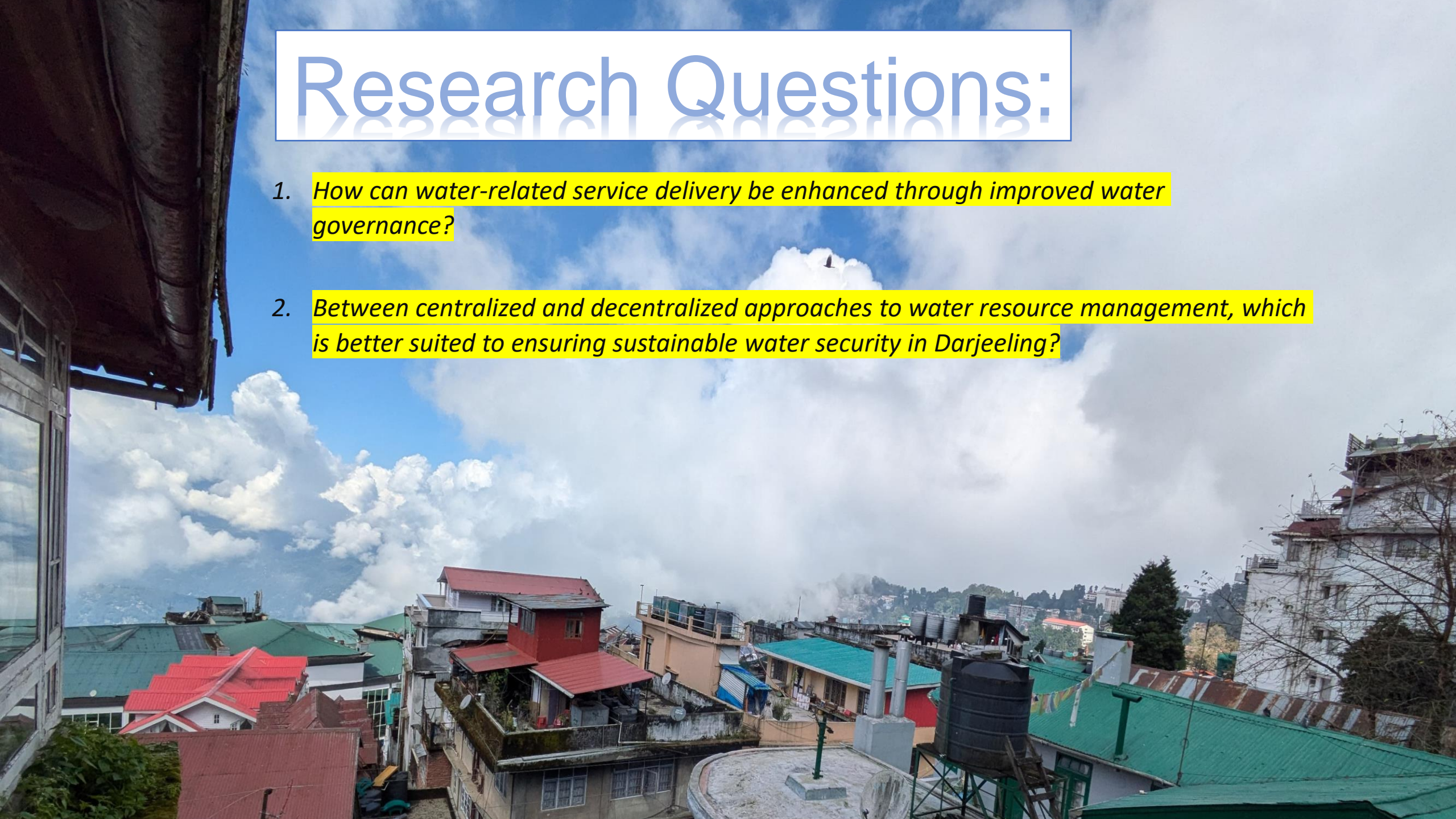
- The centralized water supply system in Darjeeling was planned between **1910-1932** to serve a population of just **10,000**.
- Over time, the town's population has increased 15 times. Despite this growth, Darjeeling still relies on the same colonial-era infrastructure, leading to severe water shortages and inefficiencies.

Samaj

- The failure of the centralized water supply system and inefficient governance forced local communities (Gaon Samaj) to seek alternative decentralized solutions, tapping into Dharas (natural streams).
- However, these streams are seasonal, making water availability unreliable, especially during dry months.

Research Questions:

1. *How can water-related service delivery be enhanced through improved water governance?*
2. *Between centralized and decentralized approaches to water resource management, which is better suited to ensuring sustainable water security in Darjeeling?*



Data Source And Methodology

25 officials from the Darjeeling Municipality, Gorkhaland Territorial Administration (GTA), Central Pollution Control Board (CPCB), and other key agencies. Additionally, focus group discussions and key informant interviews (KIIs) were conducted with 15+ representatives from Samaj, 20+ private water tanker operators, and 10+ hotel operators to capture diverse perspectives on water governance and resource management. These qualitative insights were complemented by secondary data, such as historical records, policy documents (e.g., AMRUT reports), and academic studies on water governance in the Himalayan context. Spatial and statistical data, including GIS mapping of water sources and infrastructure gaps, further enriched the analysis.



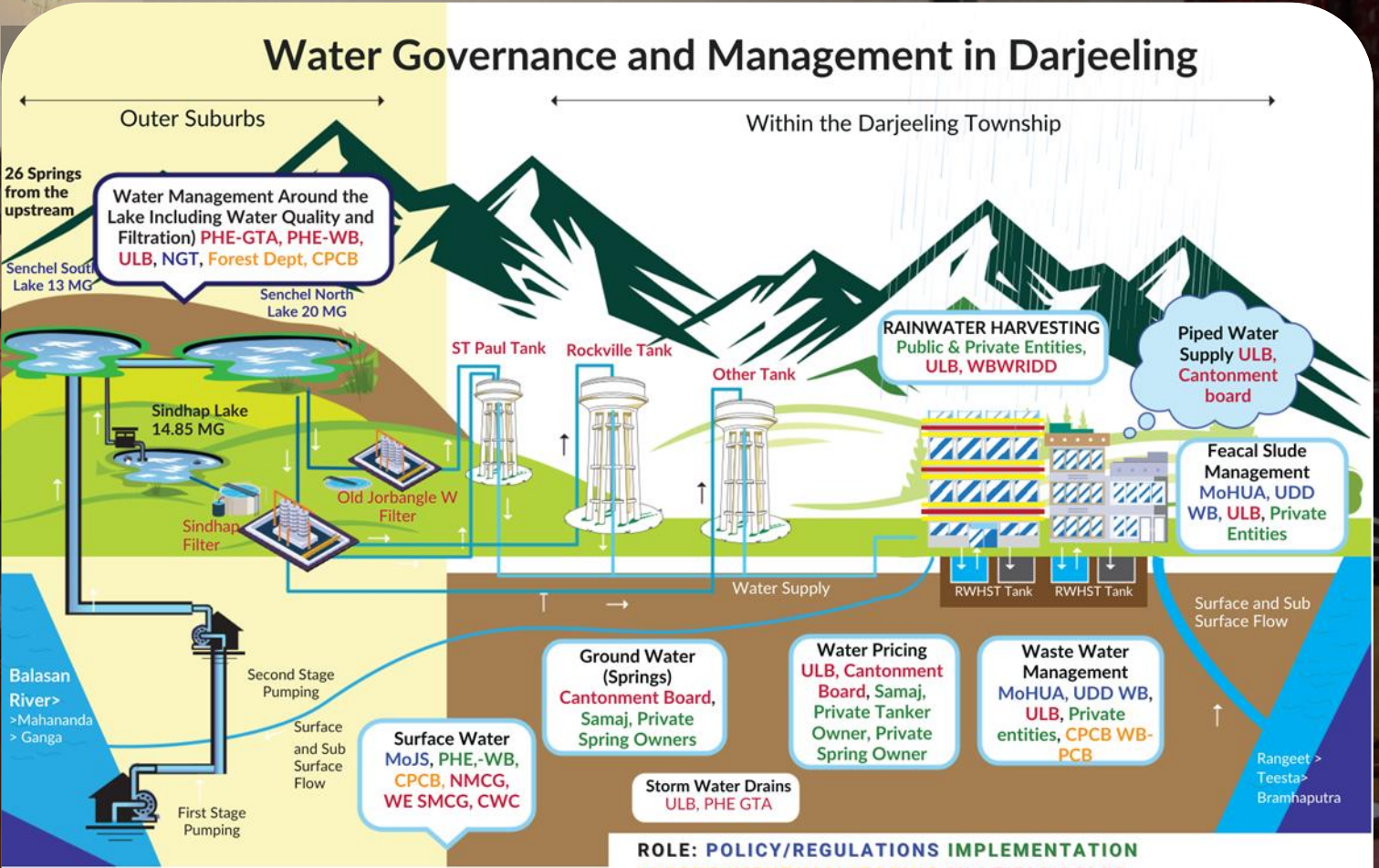
Governance and

Complexity and Tradeoff

1. Clearly Allocate and Distinguish Roles and Responsibilities

Appropriate

2. Manage W



Central Pollution Control Board: CPCB; Public Health Engineering- West Bengal: PHE-WB; West Bengal-State Mission for Clean Ganga: WB-SPMG; Central Water Commission: CWC; Public Health Engineering- State Urban Development Agency: PHE-SUDA ; West Bengal Water Resources Investigation and Development: WBWRIDD; Ministry of Housing and Urban Affairs: MoHUA; Public Health Engineering- Gorkhaland Territorial Administration: PHE-GTA ; West Bengal-Pollution Control Board: WB-PCB; Ministry of Jal Sakti: MoJS; Urban Local Body: ULB; National Green Tribunal: NGT; Urban Development Directorate- West Bengal: UDD-WB



Distinguish
Roles and
Responsibilities

2. Manage Water at the Appropriate Scale

Involvement
Stakeholder
9. Promote

Scale	Focus	Key Actions	Key Actors
Community/Local Scale	Empower local communities and decentralize water management	Rainwater harvesting, private spring management, decentralized wastewater treatment, conservation education	Private households, Samaj, ULB, NGOs
Municipal/Urban Scale	Improve infrastructure and address urban water demand, Reduce NRW	Modernize piped water supply, stormwater management, water treatment plant upgrades, fair water pricing	ULB, Cantonment Board, WB PHE, private tankers
Regional/ Sub-basin Scale	Integrate rural water sources and manage spring shed, Create Storage	Inter-basin water transfers, spring source management, watershed management programs, groundwater replenishment	Regional Water Authorities, Forest Dept, SMOG, State PCB
State Scale	Enhance coordination across jurisdictions and protect upstream water sources, and allocate extra water for the people of	State-wide resource management, disaster resilience for landslide areas, catchment conservation, align water quality with	State Govt, Ministry of Jal Sakti (MoJS), NMOG, CGWB, Brahmaputra Board CPCB, NCT

9. Promote Stakeholder Involvement

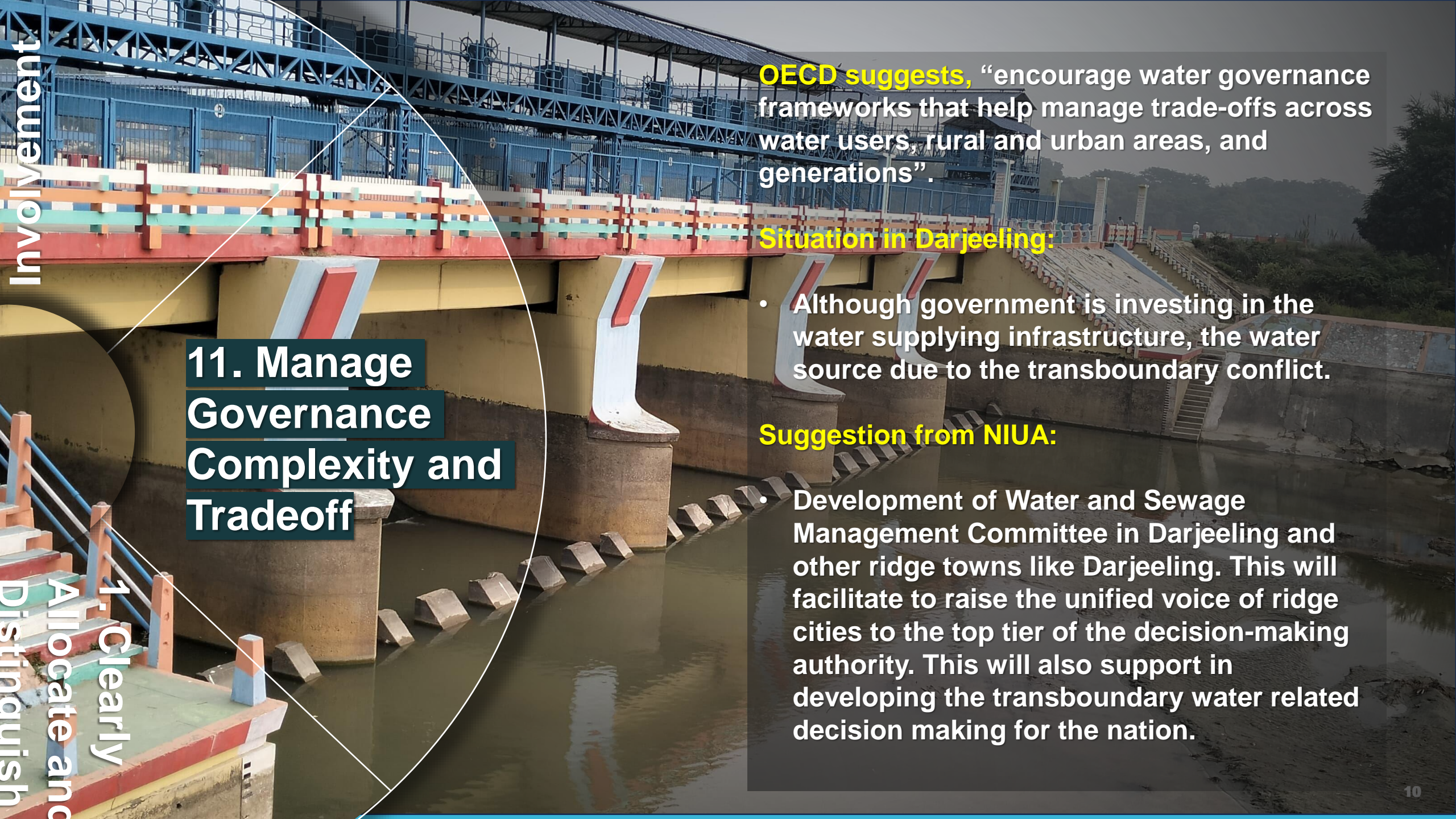
OECD suggests, “promote stakeholder engagement for informed and outcome-oriented contributions to water policy design and implementation”.

Situation in Darjeeling:

- Clear gap between the centralized and decentralized system
- And the question: Between Centralized and decentralized system which is more suitable for Darjeeling?

Suggestion from NIUA:

- Establish a linkage between the samaj and formal institutions
- Inclusion of the samaj members in the ‘Water and Sewer Management’ committee
- The paper strongly advocates that the decentralized system can be **‘COMPLEMENTARY’** but not **‘SUPPLEMENTARY’** .



11. Manage Governance Complexity and Tradeoff

OECD suggests, “encourage water governance frameworks that help manage trade-offs across water users, rural and urban areas, and generations”.

Situation in Darjeeling:

- Although government is investing in the water supplying infrastructure, the water source due to the transboundary conflict.

Suggestion from NIUA:

- Development of Water and Sewage Management Committee in Darjeeling and other ridge towns like Darjeeling. This will facilitate to raise the unified voice of ridge cities to the top tier of the decision-making authority. This will also support in developing the transboundary water related decision making for the nation.

Conclusion

Systemic Issues Identified: Fragmented governance, water commodification, and outdated policies hinder effective service delivery.

Need for a Reimagined Framework: Integrating community participation, revisiting legal structures, and addressing socio-political nuances is essential for sustainable water governance.

Hybrid Governance Model: A blended approach combining decentralized adaptability with centralized infrastructure, however ensuring that decentralized water can be complementary but not supplementary.

Policy Alignment: Aligning governance reforms with national policy/schemes/ missions

Lessons for Other Ridge Towns: Institutionalizing traditional practices within formal governance can create adaptive, resilient water management models for similar regions.





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Thank You

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