Medicon Agriculture & Environmental Sciences
Volume 8 Issue 3 March 2025
Article Type: Short Communication
ISSN: 2972-2691

Climate Change G Its Impact on Future Water Policy of India

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Received: September 18, 2024; **Published:** March 10, 2025

Abstract

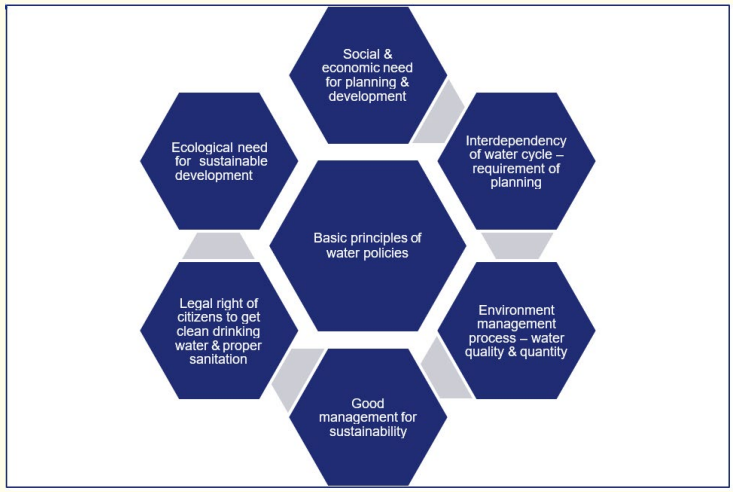
Present principles of water policy in India and its evolution over time forming National water policy in 1987 & its subsequent revision in 2002 & 2012. In specific, it introspects the state water policy of Maharashtra (2019) focusing on its concern & challenges in water supply chain of Mumbai. It addresses the need of water resource planning due to uncertain climate changes & its impact in future water policy by M/o Jal Shakti.

- Water policies in India & its evolution
- Maharashtra state water policy & its challenges
- Smart water grid for better operation & management of water resources

Water policies in India

- Current state of water in India: India has 18% of world population but only 4% of water resources, which makes it among the most water–stressed nations in the word. As per NITI Aayog report, by 2030 country's water demand will be twice the supply available, impacting a large part of the population & a loss of ~6% GDP.
- Economy being heavily dependent on agriculture, which is solely rainfed – it depends on monsoon, which is increasingly becoming erratic in nature due to climate change. Conflict over water sharing among states increases at the time of scarcity, which leads to the framework for water governance that needs to continuously evolve [NITI Aayog, 2018].
- Need for water policy: effective policy making is one of the key principle to achieve good governance. Policy includes guidelines that can help to take decision & rational outcomes. It's intended to be implemented as a procedures or protocol.

Principles of water policies in India



Ref: Rathee RK and Mishra KS. Water Policies in India: A critical review. Indian Journal of Science and Technology 14.47 (2021): 3456-3466.

Evolution of water policies in India

- Precolonial times: Due to relatively high availability of water, no water regulation was present.
- Colonial times: concept of government control over surface water emerges – control over water rights were regulated by British rule that emphasised right of land-owners to water.
- Postcolonial times: first national water policy [NWP] emerges in 1987 aiming to increase area under irrigation, increased food grain production, meet the need for drinking water & sanitation
- Subsequent revised NWP came in 2002 in the form of swajaldhara programme for national drinking water supply
- Subsequently, NWP-2012 recommends for conservation, development & improved management of water resources in the country
- Future: In 2019, M/o Jal shakti sets up an independent experts committee to draft NWP which shifts focus from supply centric approach to better demand management & distribution of water. Subsequently, each state came out with state level water policy for better management.

Maharashtra state water policy, 2019

- Principle: Ensure sustainable production & consumption patterns
- Concerns & challenges: Growing imbalance between demand & supply of water, Uncertainty in availability of water, limitation to access available water, depleting ground water, low operational efficiency, losses in urban distribution network, deteriorating water quality, lack of accurate data & trained resources, encroachment issues.
- Objective: to ensure clean water & sanitation, protection of ecosystems, strategic planning, continuous monitoring, improved water usage efficiency.
- Future: Integrated state water plan [ISWP] prepared to ensure balanced, sustainable development & management of state water resources (surface/sub-surface) with effective stakeholder engagement & sectoral monitoring.

Smart water grid

- Smart grid: water grids is an effective way to manage water network. This is to control supply & consumption, reducing health hazards and prevention of leakage. Typically, these water grids are formulated basis topological data with enriched GPS maps connecting various water bodies viz. rivers, lakes, ponds, canals, etc. While such grids are extremely complex & huge in nature, assessment of comprehensive efficacy of smart grids relies on business key performance indicators (KPI)s like, detecting deficiency in construction & operation, balance of technology and economy of planning, construction, operation & management.
- IBM smart grid maturity model: water grids span over a massive territory spread across a GPS enabled network map. To effectively manage the same, IBM smart grid maturity model uses Netcool/Omnibus probe for advanced metering infrastructure (AMI) which addresses all important dimensions of Technology, Process & Security. It's not only intelligent, interconnected & instrumented for all the layers of functioning of smart water grid model from procuring sources, planning capacity, distribution network & finally consumption but also enables proactive fixation of grid issues by preventive flow mechanism

Conclusion

- Based on the decomposition of the five stages of smart grid and the eight areas, a total of about two hundred features are raised to represent various stages of smart grid characteristics and specific performance, to help the CSPs determine their current stages, identify the gaps between the actuality and the target and find the orientation need to improve.
- The corrective flow work method has been applied in solution giving ~90% accuracy in prediction and improvisation in solution recommendation across sites
- This not only improved the functioning of smart water grid model from procuring sources, planning capacity, distribution network & finally consumption but also enables proactive fixation of grid issues by preventive flow mechanism. With introduction of IOT driven sensor replacing 2G/3G mobile network nodes, the data acquisition & processing can be further brought down near the Edge of the network for quicker analysis & faster resolution. However, this edge network needs to be secured & protected from cyber threats to accomplish the same. Ultimately, the study will lead to self-healing smart grid.

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