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## Navigating Government Policies on Groundwater

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Groundwater, an invaluable resource concealed beneath the Earth's surface, stands as a linchpin in the global pursuit of water security. As societies confront escalating demands and the formidable challenges posed by climate change, the role of government policies in groundwater management becomes increasingly crucial. This article embarks on an extensive journey through the nuanced landscape of governmental interventions governing groundwater, dissecting their objectives, implementation strategies, and the evolving dynamics in response to contemporary challenges.

### The Imperative of Groundwater Management

Groundwater, often referred to as the world's largest freshwater store, plays a pivotal role in sustaining agriculture, industry, and domestic needs. With burgeoning populations and the looming specter of water scarcity, the imperative of effective groundwater management takes center stage. **The central groundwater authority (CGWA)** illuminates the multifaceted importance of groundwater, setting the stage for a thorough examination of government policies that seek to balance utilization with conservation. It was constituted in January 1997 under sub section(3) of the Environment protection act. The CGWA is vested with the powers to regulate and control groundwater development and management. This is done by the issue of 'No objection certificates'(NOC). Through this groundwater extraction by industries, mining projects, infrastructure projects are controlled.



Logo of the CGWA

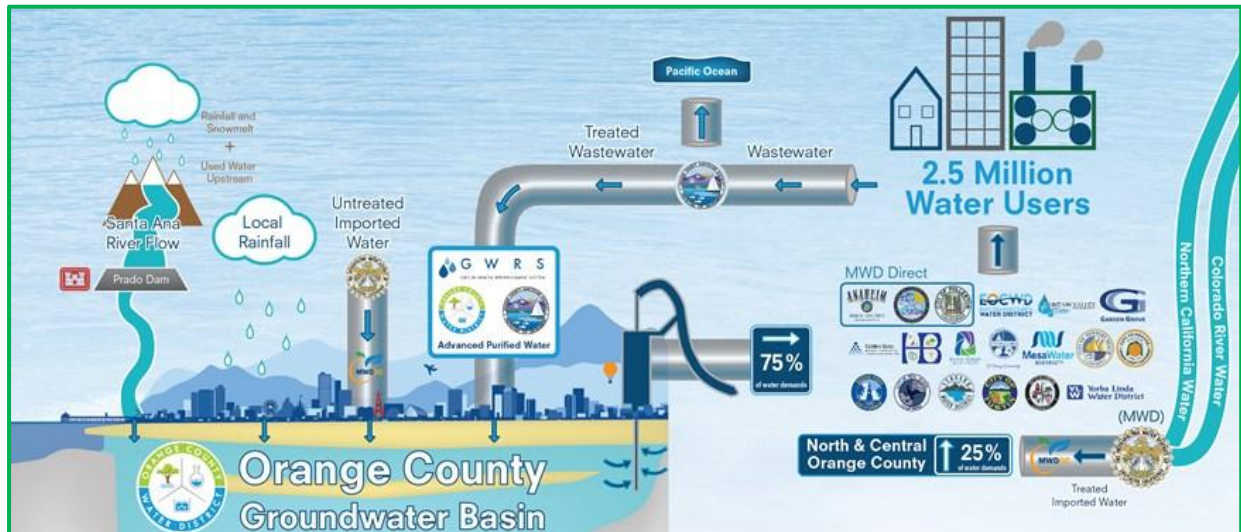
### Objectives of Groundwater Policies

The objectives underlying government policies on groundwater management span a broad spectrum. From regulating extraction rates to safeguarding water quality and ensuring equitable distribution, these policies embody a holistic approach to sustainable resource use. All projects proposing to extract groundwater in excess of 100 m<sup>3</sup>/day in over exploited and critical area and in excess of 500m<sup>3</sup>/day in areas underlain by non alluvium and 2000m<sup>3</sup>/day in areas underlain by alluvium in safe assessment units shall have to submit impact assessment reports on groundwater. The core goals that guide groundwater policies, emphasizing the interconnectedness of economic development, environmental sustainability, and societal well-being.

### Regulatory Frameworks and Legal Instruments

Governments worldwide employ diverse regulatory frameworks and legal instruments to govern the extraction and use of groundwater. Permit systems, extraction quotas, and licensing mechanisms form the backbone of these policies. As in case of Tokyo excess pumping of groundwater was addressed through technological restrictions like the diameter

and depth of wells. Whereas The orange county water district(OCWD) in California introduced a pump tax to purchase external water for artificial groundwater recharge.



Orange county water basin

### Technological Interventions

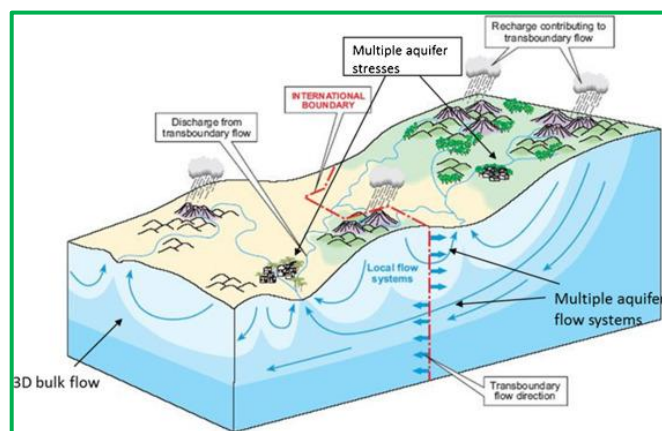
The advent of technology has ushered in transformative tools for monitoring and managing groundwater resources. Remote sensing, data analytics, and sophisticated modeling techniques offer unprecedented insights into aquifer dynamics. It can thus be understood that there exists a symbiotic relationship between technological interventions and policy frameworks, showcasing how advancements in technology enhance our understanding of groundwater behavior and contribute to more informed decision-making.



Drilling equipment

### International Collaboration

Groundwater often transcends political boundaries, necessitating international collaboration. Governments engage in bilateral and multilateral agreements to manage shared aquifers. The worldwide ISARM (International shared aquifer resources management) initiative is an UNESCO and IAH led multi-agency effort that focusses to improve the understanding of scientific, socio-economic, legal, institutional and environmental issues related to the management of transboundary aquifers. Since 2002, a number of global and regional initiatives have been launched by the ISARM. This highlights the successful



Transboundary aquifer

instances where diplomatic efforts have paved the way for equitable and sustainable use of transboundary aquifers.

### **Challenges and Adaptive Strategies**

Groundwater policies are not immune to challenges, ranging from over-extraction and pollution to the impacts of climate change. Governments must continually adapt policies to address emerging issues and ensure the resilience of groundwater management initiatives.

### **Conclusion**

In conclusion, government policies on groundwater management emerge not merely as regulatory frameworks but as dynamic instruments shaping the trajectory of a critical global resource. As societies grapple with the intricate challenges of the 21st century, the effectiveness of these policies becomes paramount. A nuanced understanding of the objectives, regulatory frameworks, technological integrations, adaptive strategies, community engagement, and international collaboration is essential for crafting policies that not only meet current needs but also safeguard the invaluable resource of groundwater for the well-being of future generations. In the intricate dance between human aspirations and environmental stewardship, the policies outlined here serve as guiding lights, navigating the delicate balance required for a sustainable water future.

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