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# Water Resources Management in India: A Review

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**ABSTRACT**

**India's economy has always been based on agriculture. Therefore, the creation of water to increase crops, make the country self-sufficient and reduce poverty is paramount to planners. According to the available water demand data, agriculture is the largest user of water in India. About 83% of the water can be used for agriculture. Agricultural water use has gradually increased over the years as more and more fields are irrigated. Since independence, India's irrigated area has increased from 22.6 million hectares to 80.76 million hectares in June 2007. Irrigation using surface and groundwater resources has played an important role in India's efforts to achieve self-sufficiency in food production in the past.**

**Keywords:-Agriculture based economy, Water demand, Agriculture sector, Water resources, Consumer.**

**Water Management:-**

India has a land area of more than 3 million square kilometers and its climate, soil, geology, flora and fauna are very diverse. Water played an important role here at the end of the last century and is expected to play an even more important role in India in the future. Thus, after 60 years of independence, India's water resources are characterized by water scarcity and lack of coordination. Most of India is vulnerable to rippling floods and flooding. In many parts of the country, groundwater continues to decline due to overuse.

Urban and rural areas lack clean water security. There are currently two main points focused on overcoming India's problem; rain harvesting and access to major rivers. In Indian conditions, water availability is very unstable in space and time. The average annual total flow of Indian rivers is about 1953 cubic kilometers. The total amount of groundwater recharged annually is about 432 cubic kilometers.

Annual water and groundwater availability in India is estimated to be 690 cubic kilometers per year by 2026. With rapid population growth and improving living conditions, our water resources experience more stress when there is less water during the day. The crop increased from about 50 million tons in 1950 to 208 metric tons at that time (1999-2000).

This figure should increase to 350 metric tons by 2025. The drinking water needs of people and animals must be met.

In these hot conditions, it is important to control the water in all areas. Water management is not just about transporting water. Water management can be based on increased water use and control of water needs under stress. Monitoring, processing, storage, retrieval and distribution of information are an important aspect of water management.

**Groundwater Management:-**

According to the National Water Policy, central and state governments should prevent environmental problems caused by excessive use of groundwater. Excessive use of groundwater should be avoided, especially near the coast, in order to prevent seawater from mixing into freshwater. In very large areas, drilling adjustment should be made until the water table reaches the desired height.

These areas need additional artificial intelligence. Among the various technologies, infiltration tanks have the lowest initial cost. Many reservoirs already exist, but most of these structures have been submerged. In this case, cleaning the bottom of the tank will allow it to be reused.

**Draught Management:-**

Because of the ambiguity and uncertainty associated with the interpretation of the beginning and end of the text, the planning and control of effects seems to be the most important. Currently, the area affected by our country is approximately 51.12 Mha. Much of the process of planning and managing events usually begins after events have occurred. Agricultural

feed and water tanks can be produced in low energy areas instead of storing them in tanks to avoid bottle loading during drought periods.

Mitigation strategies will lead to a robust and precipitation-insensitive agricultural production target. For process management, a decision support system (DSS) should be developed to monitor and control water flow through the structure using the advanced capabilities of spatial information, distance, geographic information and information systems.

**Flood Management:-**
According to the Central Water Commission (CWC) of the Ministry of Water Resources of the Government of India, the average annual impact of floods is 7,563Mha. This analysis is based on data from the Indian Water Resources Society (IWRS) for the period 1953-2000. During this time, 33 million people were affected. The main causes of flooding in India are coastal erosion, silting of riverbeds and insufficient capacity of the coasts to meet high tides.

Sometimes earthquakes often disrupt the flow of water and change its direction. In flood-prone areas, poor drainage, heavy rainfall, cyclonic effects, snowmelt and glacial eruptions also cause flooding.

After the devastating floods of 1954, the Indian government launched a national flood control program. After 1954, the Government of India established several committees and from these committees received some valuable advice on flood prevention. Various measures and inadequate standards have been taken to reduce the damage caused by floods.

As a design measure, some states have used the construction of dams, dams, and spurs. Currently, 16,800 kilometers of dams and 32,500 kilometers of pipelines have been built. Currently, 1,040 cities and 4,760 villages are protected from flooding.

Non-standard measures such as flood assessments and warnings are still in use. CWC has developed a flood forecast covering 62 major rivers with more than 157 flood monitoring stations covering nearly all flood-prone states.

In 1999, the Ministry of Water Resources established remote monitoring of safe zones to help support safe zones.

**Water Conservation:-**
Conserving water means making sure there is enough water by storing it in rivers, tanks, aquifers and groundwater. Good potential for conservation and management of water resources for all uses. Upon request, a variety of economic, regulatory and societal measures can help conserve water. Due to the high population, it is necessary to control the population increase, which puts great pressure on all natural resources.

The biggest savings are in improving water quality, as agriculture uses about 69 percent of all water withdrawals. A mere 10% increase in water efficiency can save enough water to double the amount of drinking water available.

**Watershed Management:-**
The watershed is a management unit in Integrated Water Resources Management (IWRM) where surface waters and groundwater are unaffected by land use and management. Watershed management aims to create an efficient and effective framework for the integrated use, management and development of land and water resources in a watershed for economic development.

Local communities play an important role in the planning, implementation and financing of activities in participating in water infrastructure projects. In these projects, people use their traditional knowledge, resources, imagination and creativity to create water and implement community projects.

**Rainwater Harvesting:-**
Rainwater harvesting is the collection, transfer and storage of rainwater for various purposes including but not limited to irrigation. Rainwater harvesting also includes world-class systems that include landscaping for tanks or crop fields for people to direct and listen for rainwater. Old technology has become the new favorite. This is the collection of rainwater. The catchment areas need to complete the second flow and collect rainwater. Even in ancient times, people knew about rainwater and successfully protected it. Different types of rainwater harvesting have been developed to suit different regions and climates across the country. These methods include collection of runoff from rooftops, collection of runoff from local aquifers, collection of seasonal flood waters from local canals, water conservation via management rivers, etc. takes place. This technology can be used for the following purposes: to provide drinking water, to provide irrigation water, to increase groundwater, to reduce precipitation, to discharge urban floods and numerous treatment plants into sewers, to reduce

seawater ingress to shores. Regular rainfall collection; this still exists in rural areas and is done using groundwater such as lakes, ponds and reservoirs.

Kul (aqueduct) irrigation system is an example of this type. The system carries water from the glacier to the village. In big cities, rainwater should be collected from roofs and open spaces. Rainwater harvesting not only reduces the risk of flooding, but also reduces people's dependence on groundwater for domestic needs. In addition to bridging the gap between supply and demand, recycling can improve groundwater quality, increase the water level in wells and prevent rivers from overflowing and clogging.

Rainwater harvesting usually means collecting and storing rainwater. The main focus is on ground charging technology. The method is to collect rainwater on a non-polluting surface and then reduce it to soil. This allows water to enter when local demand is insufficient. Now comes the main problem. Why do I need to collect water? The three main reasons for this are:

1. Water shortage;
2. Dependence on land;
3. Urban development.

**Recycle and Reuse of Water:-**
The demand for water in India is increasing gradually due to the high population. Water demand can be reduced by practices that require less water and reduce water waste and misuse. First of all, water demand and water use should be balanced. Financial incentives or fines imposed on water quality management users. It can also be used to describe water supply systems. These can be based on tactics such as legal restrictions, financial incentives and public appeals.

**Desalinization of water:-**
About 70% of the world's water is ocean water. Since the 1970s, many desalination technologies have been developed, including distillation, reverse osmosis, and electrolysis. This technology is particularly suitable for coastal areas where drinking water and water are scarce. The cost of desalination is now down to Rs 50/$m^3$, so the above technology can be widely used along the coast.

## CONCLUSION

Water is life on earth. It is one of the most valuable materials in life and will become rare in the next decade due to the increasing demand in the country, rapid development and economic. The temporal and spatial inhomogeneity of weather characteristics determines the precipitation distribution in India. This poses challenges for existing water resources and those responsible for their management. Hydrological studies are needed to evaluate water resources under climate change. To ensure safe drinking water, it is important to have useful and accurate information about water quality. If life on earth is to be adequately supported, the water in its habitat must be carefully managed.

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