Water Resource Management and Rural Development: Challenges, Solution and Conservation in Rural Areas of Uttar Pradesh

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Abstract

Water plays a crucial role in the socio-economic development of the country and it is essential for the human life. However due to changing climate and environmental issues, availability of water has become more crucial. India is not a water-deficient country but water deficiency is making it more vulnerable and it is estimated that by the year 2050 it may become the highest water-consuming country. The groundwater extraction of the Uttar Pradesh surpasses the national average of 18.4 percent of the country and 5.4 percent of the global water resources. There is an alarming call for increasing the forest area and saving water from the hazardous pollution which can improve the health of the water resources. The rapid conservation of the water resources is necessary for maintaining the regular availability of the water in the rural areas. There is a requirement for forestation and saving water from pollution-generated industries to make the state free from pollution and sustainable management of the water for the coming generations. This paper presents the underground water resource management and challenges, solutions and conservation in the rural areas of Uttar Pradesh.

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Introduction

Water plays a crucial role in the socio-economic development of the country and it is essential for the human life. It is a fundamental for the economy and ecology. However due to changing climate and environmental issues, the availability of water has become more crucial. The country's water management cannot be left alone without in the race of modernization in India. India has only 4 percent of the world's water resources against 17 percent population. But India is not a water-deficient country but water deficiency is making it more vulnerable and it is estimated that by the year 2050 it may become the highest water-consuming country. In India, a total of 43.5 percent of drinking water needs are being fulfilled by the tap water, tubewells and hand pumps 42 percent of wells 11 percent and 3.5 percent by other resources.

The majority of the area of the Uttar Pradesh is covered by the Ganga Basin due to which it is known as the richest repository of the groundwater resources due to the largest aquifer systems in the world. Around 75 percent of the agriculture is mainly dependent on the groundwater resources in the state against the total groundwater availability of 56.93 MAF. The total water useable for the irrigation is around 48.42 MAF, out of which 36.82 MAF has been already utilized. The diverse need for water is increasing due to the rising population. Further, urbanization, environmental degradation and multiple water uses have aggravated the problem especially in the rural areas. In terms of the groundwater extraction, Uttar Pradesh stands first with 18.4 percent of the India's groundwater resources. The national average of per-capita extraction of the water is 182.9 cm while in Uttar Pradesh it is 225.0 cm. 67.9 percent of the drinking water needs of the state are fulfilled by the tubewells, 27.3 percent by tap water, 4 percent by wells and 0.9 percent by other sources. After the various studies, it has been observed that many rural areas of the Uttar Pradesh have been overexploited the underground water, which makes them critical zones. The degrading quality of water in the rural areas and its bad impact on agriculture production and human health is a cause of major concern as Uttar Pradesh is rich in agricultural productivity due to which underground water is largely extracted. Environmental pollution, irregular rainfall, rise in spatial temperature and increasing population are other issues of concern for this state. This paper presents the underground water resource management and challenges, solutions and conservation in the rural areas of Uttar Pradesh.

Water Resources in Rural Areas of Uttar Pradesh

Uttar Pradesh is remarked as the most populous state in the country with maximum rural population. There is a total of 106774 villages with 155,317,278 population according to the census of 2011. There are various agro-climatic zones

which make it more vulnerable to issues related to water. This state is the largest water extractor in the country. The rural areas of the state use 46.5 liters per capita per day. It is a symbol of over-exploitation. The temporal and spatial variations as a result of climate change lead to severe floods and droughts. For maintaining the water quality, the central government sets the standards but for the purpose of supply and management of water, the state government is responsible. According to the Composite Water Management Index (2019) of NITI Aayog, Uttar Pradesh ranks 15th in water management among the states of the country. There was a ranking based on the nine parameters divided into 28 indicators. In several indicators Uttar Pradesh stands last on several indicators. It is an issue of concern for the state as it failed to get even 50 points and has poor water management which can have a nationwide impact.

The major performance indicators for water sector development, included Groundwater Source Augmentation (-1.51); Watershed Development – Supply Side Management (- 3.21); Demand Side Management Participatory Irrigation Practices (-0.01); Demand Side Management Sustainable on-farm Water Use Practices (-0.88); Rural Drinking Water (-0.53); Urban Water Supply and Sanitation (-0.70)[1].

In the restoration of the water bodies and increase in irrigated areas also, it ranked last. In ensuring the participation of the local communities in irrigation, it was the worst performer with only 2 percent involvement. In terms of micro-irrigation also, it lags behind. The report depicts Uttar Pradesh on a high rank in accessing irrigation. It showed that the state has met the 84 percent targets of the water harvesting structure. The state stands last on the quality of supplied water being supplied to the households. In ensuring the lining of the canals and distribution network, the state stands first which reduces seepage loss. Under rain-fed irrigation, the state has less than 20 percent area.

Challenges of Water Management in Uttar Pradesh

India is not a water-deficient country but the large-scale extraction of water will threaten the sustainability of water resources as the changing climatic conditions will lead to the unmet water demand in the coming decades. The groundwater extraction of the Uttar Pradesh surpasses the national average of 18.4 percent of the country and 5.4 percent of the global water resources. These data depict the poor sustainability of the water resources and ecological system. It can be said that unnecessary usage of water and its poor management are putting us at a high risk especially in the rural areas. The water resources of the rural areas need to be managed, developed and utilized for the welfare of the people appropriately. The inappropriate data on the water usage witness an early indication of the future water

crisis in the area. The inadequate management of the water resources has put many regions like Bundelkhand and Vindhya regions in critical and semi-critical regions respectively. The situation is also aggravating due to the disappearance of ponds, lakes, and water storage facilities, and administrative failures in reviving old ponds and digging new ones to harvest the rainwater. There is an alarming call for increasing the forest area and saving water from the hazardous pollution which can improve the health of the water resources. The people of the rural areas should be made aware of the economic uses of water like sanitation and health hygiene. To give scientific information about the efficient use of water and its sustainable usage, trained staff should be employed to overcome the water crisis. Serious efforts are required to regain the flow of water in the major rivers of the state where the Ganga, Yamuna and all other rivers have lost their importance or are at the helm of losing their existence.

The government of Uttar Pradesh is making efforts to revive old ponds in the rural areas to harvest more rainwater so that the groundwater aquifers can be recharged. Although the rural areas in the state are getting adequate drinking water especially in the rural areas as a result of the measures adopted by the government and the non-government organizations in the better utilization of the available resources. The sustainability of the water can be maintained by reducing the misuse and over-exploitation of the water.

Conservation of Water in Rural Areas of Uttar Pradesh

Water is an important source of the existence of the life on the earth. But its sustainability depends on how it is used, developed and managed. India is facing a rapid consumption of water resources. It is estimated that India's water resources are at risk, and by 2050, it will become the highest water-demanding country with 2413 billion liters of water per year against the availability of 1140 cm per year. The rapid conservation of the water resources is necessary for maintaining the regular availability of the water in the rural areas. Some of the steps taken by the Government to conserve the water resources in Uttar Pradesh are as follows:

- On 24th April, 2022, the Amrit Sarovar Scheme was launched by the government to provide clean drinking water to the rural areas of the state. It aims to ensure the access to clean drinking water for every household as part of sustainability under the Jal Jeevan Mission.
- For the conservation of the water resources in Uttar Pradesh, the 'State Ground Water Conservation Mission' was started on the 17th of August, 2017. This was the first mission of its kind in any state of India. It was implemented for the purpose of rainwater harvesting and integrated

management of groundwater resources with public participation. To make it a mass movement, a water panchayat at the village level and a groundwater force at the district level were set up.

- Various schemes under MNREGA were started like pond redevelopment, check dam construction, the reconstruction of the bandhas etc.
- For the measurement of the groundwater level, hydrograph stations have been established in the state.
- Rainwater harvesting and recharge policy has been implemented in the state since 2001.
- Ground Water Day is celebrated on 10th June and Ground water week is celebrated from 16 to 22 July every year.
- In the year 2019, the Central Policy Commission declared the Jakhni village (Banda) the country's first model water village.
- The government of India has also implemented the Atal Bhujal Yojana in the 8774 Gram Panchayats and 81 districts of seven states including Uttar Pradesh. The main focus of this scheme is to ensure community participation and demand-side interventions for the sustainable groundwater management in the identified water-stressed areas.

As a result of implementing the various conservation programs, the state of Uttar Pradesh has been awarded first prize in the Third National Water Awards in the "Best State" category for its efforts and measures in the management and conservation of water resources.

Conclusion

Water is an important renewable resource for the life and requires serious efforts on the part of the government and masses to sustain it for the future generations as it is estimated that by the year 2050, the water resources of India will be at risk. Inadequate usage of water is high in rural areas of Uttar Pradesh leading to a rise in the dry and rain-fed areas. The reasons for overusage are rapid population growth, urbanization, higher dependency on groundwater for agriculture, fast-growing manufacturing units, and a change in temporal and spatial variation due to climate change and ineffective management of water resources. The state needs appropriate efforts to develop and manage water for the welfare of the people. There is a requirement for forestation and saving water from pollution-generated industries to make the state free from pollution and sustainable management of the water for the coming generations.

Suggestions

In view of the vital importance of water for human and animal life, economical and equitable use of the water resources is of utmost importance. The success of the schemes and the mission depends on the State Water Policy and the maintenance of general consensus and commitments to the principles and objectives. Masses should follow the concept of saving each drop of water and large-scale movement should be started to ensure sustainable management of water resources in the rural areas of the state. Serious efforts are required to conserve the groundwater table to save the handpumps and wells running out of water and making Uttar Pradesh an "Uttam Pradesh".

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Footnotes

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