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Impact of Water Management on Sustainable Development Goals

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Abstract:

Water is the essence of life. Fresh water resources have faced a crisis worldwide for the last five decades. This is manifested in numerous challenges showing the various elements of the problem. These challenges include, increasing scarcity of fresh water, lack of accessibility to adequate clean drinking water and sanitation, deterioration of water quality, fragmentation of water management, threat to world peace and security and a continuing lack of awareness of the magnitude of the problem by the decision makers and the public at large.

Water management plays very crucial role in the development of the economy. It has a significant potential to increase farmers' adoption of cleaner production practices and water management. Groundwater protection is critical for global sustainability. There is a huge challenge surrounding groundwater protection, which also threatens the achievement of the UN Sustainable Development Goal (SDG) : "clean water and sanitation," due to a lack of motivation among farmers to build harmless disposal facilities for livestock excrement. Attempting to improve farmers groundwater protection behavior (GPB).

The main objective of this study is to an exploration of the theoretical mechanisms and quantitative impacts of community participation as a way to encourage farmers for effective water management. This study considers case studies of which suggest that community participation plays very important role in effective water management in Hiware Bazar. This study suggest that fostering opportunities for community participation in water management among all stakeholders and improving understanding of the challenges and benefits of water cooperation can help countries build mutual respect, understanding, and trust, promoting peace, security, and long-term economic growth.

Keywords: SDGs, GPB

Introduction:

An Upanishad sukhat the glorification of water is in one sentence, as follows.

"II इमा इप: शिवथर: I इमा सर्वस्यभेबिजी I इमा राष्ट्रस्यवर्धिनी राष्ट्रवर्धिनी II"[1]

"Water is sacred, auspicious and a boon to the nation".

Water is essential for life. No living being on planet Earth can survive without it. It is a prerequisite for human health and well-being as well as for the preservation of the environment. The progress and development of any nation depends on water. Today in the world it appears that the nations with abundant water are developed. Countries with water scarcity are waiting for development. In that regard, it is necessary to plan and manage at the national and international level. "Water" is going to become the biggest burning issue on the

planet in the next few years if this issue is not addressed seriously. US President John F. Kennedy said many years ago, "The person, organization or country that solves the water problem should be awarded two Nobel Prizes."[5]

Beyond meeting basic human needs, water supply and sanitation services, as well as water as a resource, are critical to sustainable development. It is a major source of energy in some parts of the world, while in others its potential as an energy source remains largely untapped. Water is also necessary for agriculture and for many industrial processes. And in more than a few countries, it makes up an integral part of transport systems. Continuing population growth and rising incomes will lead to greater water consumption, as well as more waste. According to the UN World Water Development Report, by 2050, at least one in four people are likely to live in a country affected by chronic or recurring shortages of freshwater. Increasing global demands for food and freshwater is putting pressures on the world's water resources. With this increase in demand, water governance has become a salient global issue. In reaction to these issues the U.N. General Assembly declared 2013 as the U.N.'s "International Year of Water Cooperation," with the objective of raising awareness for increased cooperation for access to water and the challenges facing water management.

Water cooperation" refers to the peaceful management and use of freshwater resources at local, national, regional and international levels among various players and sectors. The concept of water cooperation entails working together towards a common goal, in a way that is mutually beneficial.

Literature Review:

1. Stella Tsani, Phoebe Koundouri and Ebun Akinsete(2020). Highlighted to improve policy implementation with the use of economic instruments. And recommendations for use of scenarios, infrastructure and knowledge transfer.[2]

2. Tess Russo, Katherine Alfredo and Joshua Fisher (2014) . Sustainable Water Management in Urban, Agricultural, and Natural Systems *Water journal* 2014, *6*, 3934-3956.[3]

3. Agriculture and Food Security:

Agriculture occupies a central place in the Indian economy, with potential ramifications for SDGs related to zero hunger (Goal 2) and responsible consumption and production (Goal 12). Scholars like Josling and Lee (2013) caution against overlooking the agricultural sector's social and environmental dimensions in pursuit of trade gains. Ensuring that agricultural trade contributes to food security while safeguarding small farmers and ecosystems remains a challenge.[4]

4. Case Studies:
Case studies gives clear information. Pawar Rajendra(2005), analyse the Impact of effective watershed management on the development of a village: A case study of Hiware Bazar (District-Ahmednagar, Maharashtra) also highlighted the how community participation works.

Methodology:

This study used secondary data to see the impact of water management on sustainable development and analyse it. By using this data we can formulate the plan accordingly so that goals of SDG's can be achieved.

India and Availability of water:

India is an agricultural country. The economy of this nation is based on agriculture. Agriculture is based on monsoon and irrigation. After independence, India started planning proper rainwater management to develop the irrigation sector and for this the government built many big dams through the National Water Policy. But as

compared to the developed nation, the expected irrigation sector in India does not seem to be developed. The per capita availability of water in India is less than that of western countries. Although its share in Gross Domestic Product (GDP) has declined from over half at Independence to less than one-fifth currently, agriculture remains the predominant sector in terms of employment and livelihood with more than half of India's workforce engaged in it as the principal occupation. Agriculture still contributes significantly to export earnings and is an important source of raw materials as well as of demand for many industries.

India with 2.4% of the world's total area has 16% of the world's population; but has only 4% of the total available fresh water. This clearly indicates the need for water resource development, conservation, and optimum use.

Table 1: Water Requirement For various Sectors

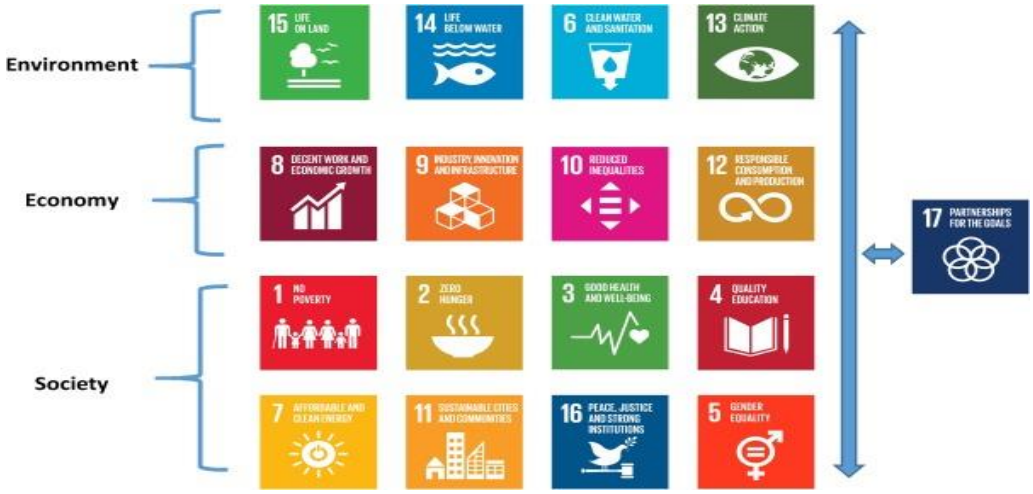
Water Demand in KM^3 (or bcm)						
Sector	Standing Sub-committee of MoWR			National Commission On Integrated Water Resource Development (NCIWRD)		
	2010	2025	2050	2010	2025	2050
Irrigation	688	910	1072	557	611	807
Drinking water	56	73	102	43	62	111
Industry	12	23	63	37	67	81
Energy	05	15	130	19	33	70
Other	52	72	80	54	70	111
Total	813	1093	1447	710	843	1180

Source: Eleventh five year plan-volume-3 , planning commission of India 2007-2012, page. No.46

According to the above data in the table 1, we can see how much water will be required in the future. Therefore, proper planning, use and management of available water is the need of the hour. Otherwise India will definitely face a huge water problem in the future.

The UN Agenda to 2030 and the SDGs linked to water management:

The UN adopted in 2015 the 2030 Agenda for Sustainable Development, for global welfare for current and future generations. Fig.1 summarizes the SDGs indicating at the same time the primary domain of relevance, i.e. economic, social and environmental. Two out of the 17 SDGs refer explicitly to water-related issues: SDG 6: Clean Water and Sanitation and SDG14: Life below Water. When looking at the threat of multiple pressures on rivers, it becomes evident that more than one SDG are relevant to the sustainable management and to the addressing of multiple pressures on water bodies.



Water management need of an hour:

Water is a key foundation, whose importance can hardly be overestimated. It is a common denominator of the leading global challenges of our time - energy, food, health, peace and security. Water management can reduce the risk of disasters, such as droughts and floods. And here cooperatives will play very important role.

How will you manage wastewater? ----Physical water treatment, biological water treatment, chemical treatment, and sludge treatment are four primary methods for treating wastewater.

Why is wastewater management important? ----The amount of garbage that is normally released into the environment is reduced as a result of wastewater treatment, therefore increasing the environment's health.

Why water management is important?

1. Our access to water is limited.
2. Water management addresses complex issues
3. Water management tackles serious challenges
4. Water management and food production are linked
5. Water scarcity affects over 40% of the world's population
6. More than 2 billion people lack reliable water services
7. Poorly-managed water resources are deadly
8. Privatizing water systems raises prices
9. Water management is a local and national issue
10. Good water management benefits everyone
11. It lowers your water-related costs
12. It reduces risks to your business
13. It's more sustainable for the environment
14. Prevent any form of natural disaster

Water cooperation through community cooperation contributes to:

• Poverty reduction and more inclusive governance of water and cooperation between different users can help overcome unequal distribution of water and increase access to water, which is essential for achieving basic human needs and reaching the Millennium Development Goals.

• Economic benefits Cooperation in the value chain and between local stakeholders can overcome the challenges of increasing water scarcity and uncertainty that industries are facing.

• Preserving water resources and protecting the environment Cooperation helps to exchange data and information and find joint management strategies.

• Promoting peace Cooperation on water can help overcome cultural, political and social tensions and build trust between different groups: water communities, regions or states.

• Floods are a recurring problem in many parts of the country. We can minimise the degradation of flood prime area with the help of cooperatives by taking initiatives like social forestry.

• Community participation at the basin level can enhance flood management.

• Cooperatives around international watercourses paves the way for regional cooperation in other domains of politics, economics, environment and culture.

• Cooperative management of water resources can improve ecological management and produce environmental benefits such as improved water quality.

• Water is key to sustainable development; It is impossible to maintain the integrity of a balanced ecosystem without an overall strategy on water resources management. We all have a shared responsibility for protecting the shared environments surrounding rivers and their associated watersheds.

• Cooperation between municipalities and private providers can stimulate resource mobilization. The Tamil Nadu Urban Development Fund, established by state authorities in 1996, developed the Water and Sanitation Pooled Fund—a 300 million rupee facility generated through bond markets for 14 small municipalities—with a partial credit guarantee from the US Agency for International Development.

Community participation provides a foundation for change: A case from Hiware Bazar:

Hiware Bazar is a small village located in the drought prone area of Ahmednagar district of Maharashtra. It is barely 17 km away from Ahmednagar city. During the British rule Hiware Bazar village enjoyed peace, happiness and prosperity. During rainy season, the low land of the village had a very good water table; and the wells used to be full of percolated water from all the surrounding slopes. The villagers used to get surplus food grains and pulses, as well as, milk. From 1970 to 1990s, the village economy declined. Due to growing demands for wood in Ahmednagar city, the forest contractors indiscriminately indulged in illicit felling of trees in all the surrounding hill-ranges of the village. With the lack of trees, the rainwater was not only wasted in floods of streams but the floods also took away the fertile layers of the topsoil. This resulted in soil-erosion and droughts, which had definite adverse effects on agriculture. The main source of income of the average farmer was no longer profitable and they faced indebtedness and bankruptcy. The village was badly hit during the 1972 drought when all the wells of the village became totally dry. The famine affected the morale of the people, which encourage more people to get addicted to alcohol and gambling.

Some educated village youth, began to get together informally and discuss the tragic conditions of their own households and their village community. They collectively requested Popatrao Pawar to assume leadership and proposed his name for the post of the Sarpanch. Before accepting the post, Popatrao Pawar had warned the people that if villagers continued quarrelling, he would quit his post within six months. The villagers gave him the assurance of unity and willing cooperation. Thus the wheel of change was set in motion in Hiware Bazar.

The activities to meet these requirements were chalked out. Some of the basic needs, which the Gram Sabah agreed upon, were Drinking Water, Fodder for Cattle, *f* Irrigation for Agriculture purposes, Educational Facilities *f* Health-care Facilities, Road facility in the Village *f* Electricity, Employment. To address these issues systematically the village panchayat collectively prepared a five-year plan for the period of 1990-1995.

Hiware Bazar demonstrates how village-level planning and Community participation can effectively harness local resources to address local issues. This village collectively solve the issues of water scarcity by sharmdan. Though various government agencies provided financial assistance, the village provided vision and direction for development activities. As Mr. Popatrao Pawar correctly pointed out, the villagers contributed local knowledge to the development process, while the government provided technical assistance.

In 1993 under the guidance of the Forest Department the villagers undertook the regeneration of the completely degraded 70 ha of village forest and the catchments of the village wells. With sharmdan, the panchayat built 40,000 contour trenches around the hills to conserve rainwater and recharge groundwater. Along with the contour building they planted 45,000 trees on 30-hectare area of government land.

Key points considered in Hiware bazar:

- Collective decision making in Gram Sabha
- Preparation of long term (5 years) as well as short term plans
- Technical support procured from the government departments
- Use of existing government schemes and funds for the activities earmarked by the village
- Use of voluntary labour contribution by the villagers to compensate for unavailability of funds
- Watershed activities designed to suit the local conditions and needs
- Supportive decisions to the watershed activities were taken (ban on grazing, planting local trees etc.)
- Transparency of the Gram Panchayat proceedings was ensured through annual social audit

In 1994 Government of Maharashtra selected Hiware Bazar as the village to be developed as a model village under the Adarsh Gaon Yojana (AGY)

Benefits of water management

Agriculture(SDG 2)	Industry(SDG 8)	Household(SDG 5,6,8)
Providing irrigation facility at cheaper rate	Providing water through its's own water bank	Providing rain water harvesting model at cheaper rate
Irrigation Technology	Waste water treatment projects with industry in collaboration	Support SHG's in water management projects
Employment generation through water management project	Employment generation through water management project	Employment generation through water management project especially women
Community participation	Community participation	Community participation

Protection of climate-Environment (Sustainable Development)

Fig 2: Benefits of water management

Conclusion:

Overall results of this paper indicates that community participation and cooperative sector play very crucial role in the water management in rural areas. All the stakeholders of the system get benefit from this model. Nurturing the opportunities for cooperation in water management among all stakeholders and improving the comprehension of the challenges and benefits of water cooperation can help build mutual respect, understanding and trust among countries and promote peace, security and sustainable economic growth.

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