Water Conservation through Community Planning

The water conservation programmes would be successful in achieving their objectives only if the community and the end-beneficiaries were duly engaged in various stages of the programme's implementation – from the stage of identifying the need to prioritisation of conservation activities, implementation, and community monitoring of water works.

Dr. K. K. Tripathy

Water brings life to earth. Without its availability and sustainable management, the world would not be able to attain Sustainable Development Goal 6 (SDG 6). There is enough water for all citizens, provided they accord the right value to it, and use and manage it efficiently. Delay in addressing management of water resources may severely limit our drives towards attaining other related SDGs relating to poverty reduction, food and nutrition, health, gender equality, energy, sustainable cities, economic growth, environment, etc.

The magnitude of India's population, their prevailing socio-economic conditions, and the quality of their lives demand an all-round development of basic infrastructure in order to achieve the objectives of inclusive growth with equity and social justice. Out of such immediate infrastructure needs, an important component is to arrange an adequate, timely, and affordable water supply for becoming a water-secure nation, and ensuring a healthy and economically productive society. India is home to 18 per cent of the world's population but has only 2.4 per cent of its land resources. The country receives about 1,200 mm of rainfall each year, out of

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which only 6 per cent is stored, indicating that the issue is not lack of rainfall in India but how much the country can conserve and save to meet water needs.

Need to Conserve Water Resources

The adequate availability of groundwater is important for any country to secure food and water for its future citizens. Increased demand for freshwater uses for multifarious causes, dependency on rain-fed irrigation, varied rainfall patterns, population growth, rapid industrialisation, and urbanisation have led to massive exploitation of water, and reduction in the groundwater levels. Farmers are digging borewells to irrigate their land. Fragmentation of landholdings coupled with a gradual reduction in farm-size necessitates extensive and over-exploitation of groundwater resources. Two-thirds of India's irrigation needs are met from groundwater sources. 80 per cent of India's rural and 50 per cent of its urban drinking water needs are met through groundwater exploitation. It is estimated that over the last four decades, around 84 per cent of the total incremental irrigation has been sourced from groundwater. It is, therefore, a must to understand how to conserve water resources and how to ensure that the conservation methods applied are sustainable. The country now has the responsibility to conserve every drop of water to ensure water security for the future generation. The data on groundwater extraction for irrigation purposes indicates that out of the total extraction of 244.92 billion cubic metres (BCM) of groundwater, 88.85 per cent was used for irrigation.

Community Participation in Water Conservation

Water is a 'State' subject as per the Constitution of India. Hence, steps to effectively augment, conserve, and manage water resources have remained the primary responsibility of the respective States. Such efforts are supported through various Central Government Schemes with required provisions of technical and financial assistance. Present-day development discourses have increasingly underscored the significance of the community's role in the participation and ownership of various development interventions. To limit the adverse impacts of large-scale water projects, public policy-makers and development practitioners have advocated a gradual shift from state assisted large-scale water resource management projects to community-based and participatory water resource management programmes.

Vanarai – People's Movement for Green India

Vanarai **– a Pune (Maharashtra) based organisation, dedicates its energy in empowering rural India, primarily, by focusing on natural resource management, fulfilling basic necessities, and capacity building of beneficiary client through a well-calibrated participatory approach. Founded way back in 1986, this organisation always believed in sustainable development and followed an integrated approach towards improving and innovating farming and farm practices to remove difficulties due to adverse climatic conditions. Sustainable rural development approaches involved activities viz. soil conservation, agriculture and livestock development, water conservation, and ecological restoration for ensuring sustainable livelihoods opportunities. With the active participation of community in planning and execution of identified activities, during the last 37 years of its existence, Vanarai has been able to conserve 1,460 crore litres of water benefiting 1.47 lakh acres of cultivable land and more than 10,000 livestock population. It has been able to plant 2.5 crore of trees by encouraging community nurseries and distributing saplings through the community. So far, *Vanarai* has spread its wings of action to 168 villages covering more than 4 lakh beneficiaries. The economic benefits (direct and indirect) to the society have been estimated to be Rs. 250 crore in 2022-23, where 1 lakh families have been socially and economically uplifted due to community-based sustainable drives of the institution. Cumulatively, the organisation has created 1,460 crore litres of recharge and storage capacity through construction of 3,169.8 kms of continuous contour trenches, 10,297 loose boulders, 279 cement nala bunds, 34 kms of nala deepening works and 80 earthen bunds. Its pioneering conservation efforts, so far, have been successful in conserving 2.92 lakh cubic metres of soil. The success factors of the institution are – effective and timely need-based planning, ground data analysis, conduct of socio-economic study with identification of target beneficiaries and scope of targeted intervention, and outcome-oriented scientific methods of activity implementation.**

Source: Vanarai – People's Movement for Green India [www. vanarai.org]

Civic participation in the management processes of any public development endeavour results in better outcomes. (See box on page No. 12). A number of states have done commendable work implementing various water conservation initiatives. Some of which are described in **Table 1**.

Table 1: Water Conservation Programmes Implemented by Select States

SN	State	Name of Initiative	Programme Activity
1	Andhra Pradesh	Neeru-Chettu	Rejuvenating and revitalising natural resources. De-silting of tanks and feeder channels, etc., are taken up, additional water storage is created. Aimed at collective participation and spread of awareness to make the State 'drought proof' through better Water Conservation.
2	Bihar	Jal Jeevan Hariyali	Identification, restoration, and renovation of all public water storage structures – ponds / canal / pines, etc. Construction of check dams and other water harvesting structures in small rivers / drains and water storage areas of hilly areas. The objective is to encourage farmers to participate in water conservation initiatives of the government and to get sensitised on the use of alternative crops, drip irrigation, organic farming, and other new technologies with less dependence on irrigation.
3	Gujarat	Sujalam Sufalam Jal Sanchay Abhiyan	Deepening water bodies in the state before monsoon arrives to increase storage of rainwater to be used during times of scarcity. It is a Public Private Partnership programme and government contribution is 60 per cent of the work expenditure.
4	Haryana	Jal Hi Jeevan Hai	Encouraging farmers to adopt crop diversification and sow crops which require less water like Maize, Arhar, etc., instead of water guzzling crops such as paddy so as to conserve water.
5	Odisha	Pani Panchayat	Ensuring voluntary activity of group of farmers engaged in the collective management (harvesting and distribution) of surface water and groundwater (wells and percolation tanks). Objective is to ensure optimum utilisation of water as well as improving agricultural production.
6	Maharashtra	Jalyukt Shivar Abhiyaan	Deepening and widening of water streams, construction of cement and earthen stop dams, works on nullahs and digging of farm ponds. Objective is to make Maharashtra drought-free by making 5,000 villages free of water scarcity each year.
7	Rajasthan	Mukhya Mantri Jal Swawalamban Abhiyan	Extending conservation efforts to manage rainfall, runoff, groundwater & in-situ soil moisture. Through convergence of schemes of various departments, works are executed through people's participation by motivating villagers & beneficiaries.
8	Telangana	Mission Kakatiya	Reclamation of water tanks by restoring minor irrigation sources. Aims at spreading minor irrigation in the state with community participation for sustainable water security.

Source: Author's compilation from various scheme guidelines of the respective States' websites [available online]

Water Conservation Initiatives of Union Government

India has about 141 million hectares of net sown area, out of which about 45 per cent (65 million hectares) is presently covered under irrigation of any source. Large-scale dependency on rainfall still persists in India, making cultivation in unirrigated areas a risk-ladened, low-remunerative, and less-productive profession. While assured or protective irrigation encourages farmers to invest more in farming technology and inputs, leading to increase in income and productivity, the vision of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been, inter alia, to ensure sustainable access to some means of protective irrigation to all agricultural farms in the country through efficient management of water resources and by propagating the tagline - 'Per Drop More Crop', thus bringing the much desired prosperity along with water security for future generations. Various inbuilt components of the PMKSY that require adequate community planning and participation during the implementation phases are depicted in **Table 2**.

Table 2: A few PMKSY activities needing Consistent Community Participation

SN	PMKSY Components	Programme Activity
1	**Har Khet ko Pani**	Create new water sources through Minor Irrigation (surface and groundwater); Repair, restoration and renovation of water bodies; Construct rain water harvesting structures; Command area development, strengthening and creation of distribution network from source to the farm; Create and rejuvenate traditional water storage systems [like Jal Mandir (Gujarat); Khatri, Kuhl (H.P.); Zabo (Nagaland); Eri, Ooranis (T.N.); Dongs (Assam); Katas, Bandhas (Odisha and M.P.) etc.] at feasible locations.
2	**Watershed Development**	Create water harvesting structures viz. check dams, nala-bund, farm ponds, tanks, etc.; Ridge area treatment, drainage line treatment, soil and moisture conservation, nursery raising, afforestation, horticulture, pasture development, livelihood activities for the asset-less persons; Effective rainfall management like field bunding, contour bunding/trenching, staggered trenching, land levelling, mulching, etc.
3	**Per Drop More Crop**	Programme management, preparation of State/District Irrigation Plan, approval of annual action plan, Monitoring, etc.; Promote efficient water conveyance and precision water application devices like drips, sprinklers, pivots, rain-guns in the farm; Construct micro irrigation structures; Secondary storage structures at tail end of canal system to store water when available in abundance (rainy season) or from perennial sources like streams for use during dry periods through effective on-farm water management.
4	**MGNREGA**	Create water harvesting structures on individual lands of vulnerable sections, creation of new irrigation sources, upgradation/desilting of traditional water bodies, water conservation works, etc.; De-siltation of canal & distribution system, deepening and desiltation of existing water bodies, strengthening of bunds/embankments, etc.

Source: Compiled from PMKSY Guidelines [www.pmksy.gov.in]

The Union Government has also taken other important initiatives to ensure water conservation while appealing to community participation. While Jal Shakti Abhiyan, a mission mode approach, is implemented to improve water availability including, ground water conditions, in the water stressed blocks of 256 districts in India, Atal Bhujal Yojana aims at sustainable management of ground water with community participation in identified over-exploited and water stressed areas of the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh. The construction of water harvesting and conservation works is emphasised under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).

The MGNREGA allows watershed development activities wherein the PRIs are mandated to plan, implement, and monitor Natural Resource Management works, which include watershed development for rain-fed areas, command area development for irrigated areas, afforestation, tree plantations, and horticulture. Some of the watershed development activities permitted for execution under MGNREGA, along with the community engagement profiles, are depicted in **Table 3**.

Table 3: Community Engagement in MGNREGA Watershed Development Works

Type of Watershed Development Works	Engagement of the Community
☛ Contour trenching for water conservation in plantations and grassland development. ☛ Loose boulder bunding by erecting dry stone walls across the hill slopes at pre-determined spacing for developing land for cultivation. ☛ Spring-shed development in north eastern States to revive springs and protect these against drying up during dry season. ☛ Village ponds excavation and renovation of existing ponds to increase water storage space. ☛ Bench terracing to use the hill slopes for crop production on sustainable basis. ☛ Gabion structures of stone and wire dams across drainage lines to address soil erosion issues.	☛ Intensive participatory planning exercise is adopted to prepare watershed development plans with active involvement of villagers. ☛ Identification of workable watershed boundaries [with around 500-1000 hectares of area] by referring to watershed atlas available with the States concerned. ☛ Carrying out Baseline/benchmark Surveys viz. climate, soil types, fertility, rainfall pattern, runoff volume, land-use pattern, vegetation to make the plan outcome-oriented. ☛ Active participation of community makes the programme community-driven and community managed/owned. ☛ Adoption of Participatory Rural Appraisal which combines various tools like social mapping, resource mapping, seasonal mapping, transact walk, focus group discussions enables community to express and analyse their own situation, clearly delineating location-specific water needs and priorities.

Source: Compiled by the author from Samarthya: Technical Training Manual (MGNREGA), Ministry of Rural Development [www.nrega.nic.in]

The Ministry of Jal Shakti has also taken various other steps for water conservation with active people's participation involving village panchayats, urban local bodies, Resident Welfare Associations, Non-Government Organisations and other stakeholders through, National Water Policy, National Aquifer Mapping and Management (NAQUIM) Programme, Rainfed Area Development Programme (RADP), National Perspective Plan, Catch the Rain and Sahi Fasal Campaigns, etc. Further, the Prime Minister of India has also urged all sarpanches to adopt appropriate measures to transform water conservation into a mass movement.

Why Community Planning and Participation in Water Conservation?

The community's involvement in planning and execution ensures success in the endeavour by enhancing the economic viability of the implementation of development interventions, their operation and maintenance, the better upkeep of assets due to inherent community belongingness, and also increasing the life span of the system so created. The 73rd Constitutional Amendment empowers Gram Panchayats to plan and manage rural water supply and sanitation systems. The effective planning and implementation of water conservation-related schemes demand active community engagement through Farmer's Group, Panchayati Raj Institutions (PRIs), Self-Help Groups (SHGs), and Cooperatives.

There is a need to ensure a proper capacity building and awareness generation mechanism to ensure successful community engagement in water conservation planning and implementation. Some of the important issues to be taken into consideration at the planning stage are as follows:

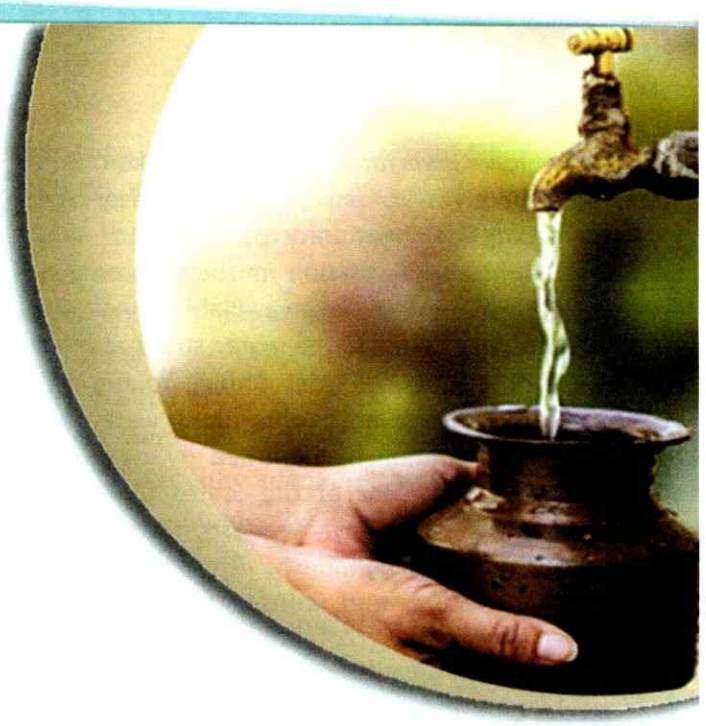
(a) How to arrest the rapid depletion of groundwater levels through judicious extraction by the farm and non-farm sectors?

(b) How to control construction activities in rural areas and remove encroachments of the erstwhile water bodies?

(c) How to identify water courses, revive, de-silt rural water bodies, and improve water storage capacities?

(d) What steps to be taken to address issues due to erratic rainfall, droughts, or drought-like conditions?

(e) How to ensure integration of crop-planning, crop-rotation, and crop-diversification planning with the conservation plans of the community?



The community, through PRIs, needs to take up the responsibility of being Programme Implementing Agencies (PIAs) not only to identify, plan, priorities and execute water conservation projects but also to plan and priorities the extraction of water for only identified purposes ensuring appropriate conservation of valuable water resources. The community should ensure the following to ensure the success of water conservation interventions in rural areas:

- Social mobilisation, initiation of need analysis, preparation of the Water Security Plan, Irrigation Plan and Village Action Plan;
- Discuss and deliberate on the sustainability of water schemes – both drinking and irrigation purposes, explore new revenue sources like user fees, operation and maintenance fees, if any, for smooth operation, maintenance, and conservation of water systems;
- Prepare a water reserve audit, water safety plan to ensure recharge, storage, and availability of water and to meet issues relating to quality water usage;
- Ensure convergence with line departments of the district to participate, plan, and execute water conservation projects under the PMKSY, MGNREGA, etc., so as to ensure water recharge and increased water availability in rural areas;
- Demand and support setting up of the technical support cells in consultation with the District/ Block administration to ensure convergence in the

community and near the water project areas;

- Coordinate with District or Block level authorities for promoting timely execution of water projects and fund utilisation;
- Coordinate with District or Block level authorities for adopting technologies and digital medium for monitoring of water schemes;
- Arranging social audit of water schemes from time to time in consultation with district line department officials;
- Arrange training and capacity building programmes on rainfall data capture, water collection, storage, and usage for grass-root workers like health workers, anganwadi workers, science teachers, high school students, panchayat members, retired army officials, etc.;
- Monitor water availability, water sources, and quality of water and get arranged awareness camps.

Concluding Remarks

India's decentralised planning process encourages the active involvement of the community in planning, implementing, and supervising public service delivery at the local level to ensure that the growth process is inclusive. To ensure effective local governance, the local self-governments are rightly put at the centre of location-specific development planning, implementation, and monitoring. Increased demand for freshwater uses, along with population growth, rapid industrialisation and urbanisation have led to massive exploitation of water and reduction in the groundwater levels, necessitating collective management of water resources.

The present-day development discourse has increasingly advocated the community's role in participation in the planning and execution of various development interventions. Further, civic participation in the management processes of any public development endeavour results in better outcomes of the intervention. Particularly in community-based water management projects, which have become popular in States of India where community participation has facilitated activities leading to the attainment of sustainable development goal parameters.

The water conservation programmes would be successful in achieving their objectives only if the community and the end-beneficiaries were duly engaged in various stages of the programme's implementation – from the stage of identifying the need to prioritisation of conservation activities, implementation, and community monitoring of water works. Thus, communities through PRIs need to take up the required responsibility of being Programme Planning, Implementing, and Monitoring Agencies and identify, plan, prioritise, and execute water conservation projects and plan, strategise and prioritise extraction of water for identified purposes to ensure appropriate conservation of valuable natural resources like water. ❑

References

1. Groundwater: A Valuable but Diminishing Resource, 22nd Report of the Lok Sabha Standing Committee on Water Resources (2022-23), Lok Sabha Secretariat, March 2023
2. Valuing Water, The United Nations World Water Development Report 2021, UNESCO, 2021
3. PMKSY Guidelines, Ministry of Agriculture & Farmers Welfare, Government of India [available at: www.pmksy.gov.in]