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Jalasamvad

A Dialogue on Water
Editor: Dr. Datta Deshkar

Cover Story:

Water Conservation work at Nafarwadi
Tal: Patoda Dist.: Beed By Seva Vardhini Trust

Famous rivers in the world

(1) Purus river

(2) Yukon River

(3) Sao Francisco River

(4) Mamore river

Jalsamvad

Mouth Piece of Bharatiya Jala Sanskriti Mandal

■ **June 2023**

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Contents

Editorial .....

The water used for irrigation comes from dams through canals, or reservoirs, or is pumped from the ground. The rainwater falling on the field is not stored for irrigation by the farmer. Our farmers happen to be ignorant about how much it rains in their fields. If this water is collected and stored in the field itself, will it not be used for agriculture? One of my friends, Mr. Ulhas Paranjape insists that the rainfall in every individual farmer's field be measured and the entry of that should be made in his official '7/12' form so that the information of how much rainwater falls on his field will be known to him and he may at least think of blocking that water on his farm.

Maybe all the farmers will not necessarily be under the command of an irrigation project on a river. It means that not every farmer would get river water. Same is the fact with lakes. In such a situation, if water is not available, should the farmer sit quietly with his hands folded? This is the real question. Storing water on farms and making use of it whenever the need arises for crops is not the practise in agriculture. However, if you think deeply about it, you will realize its benefits. We know that the rain is often stressful. At such times, if we have even a little bit of water with us, it can prove useful in protecting the crops. If we have a horticultural farm, it always becomes a topic of concern as to how to sustain it in a scarcity situation. In such a situation, stored rainwater can support and save the entire horticultural farm.

One question will surely arise in everyone's mind as to how much area will be required for creating such a water storage system. In North India, there have been some experiments in this regard. It was found through it that, if the tenth part of the field is used for water harvesting, the remaining 90 percent of the land can be irrigated through the farm pond. An expert at IIT Kharagpur, Mr. Panda, with the help of his colleagues, conducted a project like this on experimental basis in Madnapur, Bengal. They reserved 10 percent of the field for water storage. From the water gathered, they took the rabbi crop there successfully. The organisation ISKCON dug a trench 700 feet long, 50 feet wide, and 15 feet deep in the lower area of the field in Talasari, thereby accumulating water in it. A 10-acre paddy field and one more rice crop thereafter were successfully harvested from that collected water. If agricultural universities in Maharashtra (which are many in number) try to do this kind of experiment, the dry land farmers can get a good boost.

Once, I took some of my friends to a village, through our Rotary Club, where there was an acute water problem. Due to the non-recharging of water in spite of good rains, they had to face a water shortage after December. We held a meeting with the villagers and requested that they implement a water recharge scheme in a big well in the village. We also told them that we were ready to provide the necessary help for that work. A favourable effect was seen on the faces of the villagers. But the Sarpanch was reluctant. He said he had been promised by the current political leader that he would bring water to the village from a dam 10 km. away, and so they don't feel any need to do this work. In fact, the proposed project would at least take five to six years to get approval from various government departments and for the actual work to start. So, I presented the difficulties women face in fetching water from far away in the summer, etc. However, the Sarpanch was not ready to accept our proposal. At last, we had to return disappointed. When will society understand that we too can recharge water, and not only that, but it is also our primary responsibility?

Mr. Paranjpe started as a professor in one of the engineering colleges after obtaining a degree in civil engineering. Whenever he went to his village, his friends would ask him, "what was the use of his high education for the village where he was raised". He seriously started thinking over this, and from there he came up with the idea of ferro-cement tanks. He experimented with it in his own village first, and when the experiment there was successful, he solved the water problem in villages by constructing hundreds of ferro-cement tanks not only in Konkan but also at other places in Maharashtra. He says that if the village receives an average of 500 mm of rain on an acre of the farm, 20 lakh litres of water are collected. How much water to collect on one's own farm is one's own discretion. But he should at least collect 25 percent of the water. Five lakh litres of water can be useful to him for various tasks. People who do not have access to agriculture can use this medium to meet their daily needs.

This is a topic of entirely different study. It is necessary to study it in depth. I have opened up the discussion in front of you. I would also love to hear your thoughts

Dr. Datta Deshkar, Editor

Village Nafarwadi

Shri Promod Kale, Pune

M : 9881400296

(Seva Vardhini, a Pune based NGO is engaged in helping the undeveloped / underdeveloped people living in villages spread all over Maharashtra. It is also working in area of "Water Conservation" all over Maharashtra, in some selected villages. An international Group of Industries i.e. "Atlas Copco" has extended all sort of co-operation to Seva Vardhini, which also includes full financial support, in this work of total Integrated Development of all such villages. Let us know some examples.)

Preamble:

Marathwada region of Maharashtra frequently faces scarcity. The whole area receives yearly rain fall ranging from 500 mm to 700 mm. Comparatively the rain fall is received at a later stage. District Beed is one of the prominent region of scarcity. In fact the original name was Bheer.. भीर which itself means water. Once upon a time there may be plenty of water in this area. Unfortunately, that stage is nowhere seen. All the talukas from this district face water scarcity every year.

General information of area tackled

Nafarwadi is a small village with population 1379 souls, lies in Taluka Patoda of District Beed. It is situated on the bank of River Manjra. The land pertaining to this village is 489.65 Ha. This village can be found on map using Latitude & Longitude as below.

Latitude – 18.774
Longitude – 75.498
2 Location map:

Situation earlier :

This village faced frequently the shortage of water for drinking as well as irrigation. To solve this problem, Government of Maharashtra had started construction of a K.T. Weir in 2004. The main object of this construction was to store water for Rabi season. The K.T.Weir. It comprises of 26 number of piers and two abutments. The required numbers of Vertical Gates 80 numbers & o.5 m height, were also purchased by Government of Maharashtra. The gates were laying on site. Because of some reason or the other this work could never be completed at all.

A NGO viz. Rashtriya Sarvangin Gramvikas Sanstha, based in Pune, is already working for the social welfare of the people in District Beed. The villagers had approached this NGO to have an amicable solution to their problem.

Another NGO, viz. "Seva Vardhini" also based at Pune was conducting its Jaldoot-2 training program from 2019 at Pune. It had designed &

conducted a two years training for enthusiastic and sharp youth from villages, in which complete practical training regarding measurements of rainfall, calculation of expected yield for a particular village & how this knowledge can be best applied for development of the village in all respects. The training schedule also comprised of basic

information of Ground water, recharging of it & methods for optimum use of the same. The training for Agricultural farming, horticulture etc.

The Sanstha approached "Seva Vardhini" & discussed the possible better solution to the problem. It was then decided to complete the necessary remaining work of the K.T. Weir.

Project Proposal: The following works were decided to be completed.

1. Raising all 26 piers of the abundant K.T. Weir by 1 meter or so as to bring all piers in one & same level.
2. Providing and constructing pier caps for all 26 piers and two abutments to receive & distribute evenly the load of slab proposed to be provided on these piers.
3. Providing fabricating and supplying 58 numbers of MS Gates of 0.5 m height each, which are required for storing the water.
4. 2Î Gates are already available, which will be remodeled where necessary.
5. Providing and constructing 1.2 m wide RCC slab 0.15 m thick, in between both the abutments covering all 26 piers.
6. All the concrete work shall be cast in C.C. M-20 (as per I.S. 456).
7. The required design for reinforcement required was also done.
8. The slab shall be provided with collapsible hand railing which will take care for the people crossing the river during monsoon.

4 Execution of Work :

Once the decision of carrying out various works as mentioned above was taken, the actual work started in May 2021. Agency had deployed various skilled labours like mesons, carpenters, bar benders as & when required. The work started vigorously and was carried out within five months. As a parallel activity, the fabrication work of M.S. gates 58 numbers, was allotted to a local and experienced fabricator, who has already fabricated such types of gates. These gates were fabricated and brought on the site in time.

The concrete work of the piers, pier-caps and RCC slab and some small remaining work was completed after the rainy season was over. Only first set of gates holding about 0.7m to 0.8m of water column could be placed in time.

5 Benefits of the Project:

- Small height of water column was stored in the weir. Because the river slope was flatter, water could extent about 600m on upstream. At full capacity of the storage, this water fetch will be about 1km. in next year when full water up to designed FRL is stored, this fetch may increase up to 1200m
- The Villagers enjoyed this availability of water for sowing rabi crops also.
- After the survey it was found that, about 23 dug wells on both banks of the rivers were full of water. This indicates the quantum of water with so much small water storage.
- TherŤ was a change in rabi crop pattern also. Because of plenty of water cultivation of fodder was raised considerably. The villages in Nafarwadi had a side business of milk production using cow cattle in general. This side business was seen to be flourishing because of the additional plenty of availability of fodder.
- Next year, this side business can grow furthermore if planned properly. Khawa is another byproduct which is produced in large quantities since long, will be seen increasing unimaginably if

managed properly.

- The villagers are now do not worry about water availability for domestic needs. The villages are happy and satisfied about the work completed.

Site photos:

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Water And Irrigation Panorama of India - 6

Dr. Suresh A. Kulkarni

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PART 6 : IRRIGATION DEVELOPMENT

1. Evolution of Irrigation

The history of irrigation develoŮment in India can be traced back to prehistoric times. Ancient Indian Vcriptures referred to construction of wells, canals, tanks and dams and their efficient operation and maintenance. Irrigation to produce food grains is known to have been in existence for over 5 000 years. There is evidence of irrigation being practised since the establishment of settled agriculture during the Indus Valley Civilization (in 2500 BC). These irrigation technologies were in the form of small and minor works. Traces of irrigation structures dating back 3700 years have been found in the state of Maharashtra. During the Mauryan era (2 600-2200 years ago), it is reported that farmers had to pay taxes for irrigation water drawn from neighbouring rivers.

The Grand Anicut (Canal) acrŮss the Cauvery river in Tamil Nadu was constructed more than 1800 years ago and its basic design is stilŰusedĚ today. In Í 800, some 800 000 ha were irrigated in India. Major irrigation canals were built following the major famines at the end of the nineteenth century and, in 1900, the Indian peninsula (including Bangladesh and Pakistan) had some 13 million ha under irrigation. Central Board of Irrigation was established in 1927. At the tůme of iŰdependence, in 1947, India had abŰut 22 million ha under irrigation. High priority has always been given to irrigation with nearly 10 percent of all planned outlays since 1950 were being invested in irrigated agriculture. This has resulted in the development of, on average, 0.5-0.6 million ha new irrigated schemes every year.

A separate Ministry of Irrigation and Power was set up in 1952 to look after the irrigation works. In 1969, an Irrigation Commission was set up to prepare a framework of future irrigation development programme in the country in a comprehensive manner. A separate Department of Irrigation was set up in 1974 under the reconstituted Ministry of Agriculture and Irrigation to help in ensuring unified and coordinated programme for the speedy implementation of 'Irrigation and Command Area Development Projects' as well as for providing other inputs for maximizing agricultural produce. In1980, the erstwhile Department of Irrigation was raised to the level as the Ministry of Irrigation and Power. In addition to major and medium irrigation schemes, minor irrigation schemes/ structures, both surface and groundwater as well as Command Area Development (CAD) Programme were brought within the purview of Ministry of Irrigation and Power.

In 1985, the Ministry of Irrigation and Power was bifurcated and the Department of Irrigation was re-constituted as the Ministry of Water Resources (MoWR) which was given responsibility for laying down policy guidelines and programmes for the development and regulation of the country's water resources. The Central Water Commission (CWC) acts as the Ministry's technical arm. The National Water Resources Council adopted the India's first water policy in 1987. Subsequently a National Water Board was constituted in 1990. In 2014, the Ministry was renamed as Ministry of Water Resources, River Development and Ganga Rejuvenation. Further in 2019, the Ministry was again renamed as Ministry

of Jal Shakti bringing together the two Departments i.e., Department of Water Resources, River Development and Ganga Rejuvenation and Department of Drinking Water and Sanitation.

Irrigation development has enabled diversification of cropping patterns with crops grown all year round. The expansion of irrigation has not only directly enabled yield increases, it has also facilitated high input agriculture involving the use of chemical fertilizers and high-yielding varieties of wheat rice and maize. The food grain production has increased almost sixfold from about 50 metric tones in 1951 to 297 million tones in 2020, besides the horticulture production of 320 million tons. Although irrigated crop yields have increased considerably, they are still low compared to those of other countries.

The emphasis on irrigation development was initially on run-of-the-river schemes. Subsequently, the need was felt for storage projects for either single or multiple purposes. Irrigation projects in India are classified based on culturable command area (CCA) of the project. A project having CCA of more than 10,000 ha is termed as major irrigation project while a project having CCA between 2,000 and 10,000 ha is called a medium irrigation project. Major and medium irrigation projects are generally surface water projects. All surface water and groundwater schemes having CCA upto 2000 ha are classified as minor irrigation schemes. The minor irrigation projects (schemes) are further divided into two categories viz. surface water schemes and groundwater schemes.

2. Source-wise Irrigation Development

The main sources of irrigation water in India are surface water and groundwater. There is also some irrigation from untreated/ treated domestic wastewater. The surface water stored in various major, medium and minor reservoirs and small tanks is conveyed through canals mostly by gravity or on higher elevated areas by pumping through canals or pipelines. Groundwater is pumped from tube-wells and open dug wells and is conveyed to fields through field channels or pipelines.

The Total Annual Ground Water Extraction of the entire country for the year 2022 has been estimated as 239.16 bcm. Agriculture sector is the predominant consumer of ground water resources. About 87 % of total annual ground water extraction i.e. 208.49 bcm is for irrigation use. Only 30.69 bcm is for Domestic & Industrial use, which is about 13 % of the total extraction.

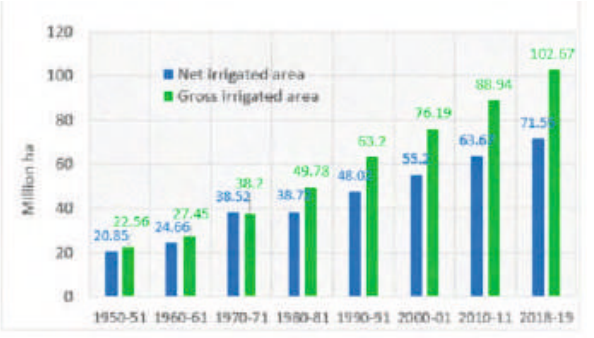
Ground water has steadily emerged as the backbone of India's agriculture and drinking water security. Of the total water withdrawal in India, groundwater accounts for nearly 62 percent of the total requirement of water in irrigation, 85 percent in rural water supply and 45 percent in urban water supply. Of the total groundwater withdrawal (248.7 km3), estimated 89 percent (221.46 km3) for irrigation, 10 percent (24.87km3) for domestic, and approximately 1 percent (2.38 km3) was used for industrial purposes.

Irrigation potential utilized through the groundwater schemes was 63.4 million ha and that of minor surface water schemes was 7.9 million ha. Data of ownership of minor schemes reflects that almost 97 percent of the minor irrigation structures were owned by private entities and only about 3 percent were in the domain of public ownership. In the case of groundwater schemes almost all type of schemes (99 percent) had private ownership. For energizing minor irrigation schemes, electricity was the major source (71 percent) followed by diesel (25 percent) and the balance 4 percent deployed renewable energy sources like windmills, solar pumps, animal operated devices. In 2018, more than 21 million agricultural pump sets were energized by electricity. The Government of India has been aggressively promoting solar pumps for irrigation in recent years. On the back of significant government subsidies, more than 0.6 million off-grid solar pumps have been deployed in the country by 2021.

In India, the area equipped for irrigation is reported as net and gross areas as also from surface water and groundwater. The gross and net irrigated areas were 20.9 million ha and 22.6 million ha in 1951 which grew to 31.1 million ha and 38.2 million ha in 1971, 48.1 million ha and 63.2 million ha in 1991, and 71.6 million ha and 102.7 million ha in

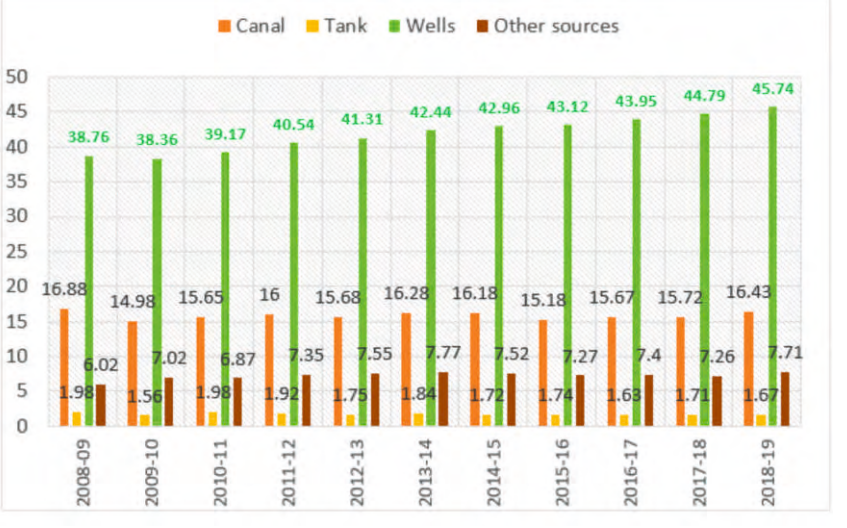
2019, respectively (Figure 1).

Figure 1. Net and Gross irrigated area at the country level



Of the total net irrigated area of 71.6 million ha, 25 percent was irrigated from surface water sources (16.43 million ha from canals and 1.67 million ha from tanks), 64 percent from groundwater sources (45.75 million ha from tubewells and 1.10 million ha from other wells) and 11 percent (7.71 million ha) from other undefined sources (Figure 2). The top five irrigation area states covering more tha half of the total gross

Figure 2. Source-wise net irrigated in India



irrigated area of India are Uttar Pradesh (20 percent), Madhya Pradesh (12 percent), Rajasthan (11 percent), Punjab (7 percent), and Bihar (5 percent). Kaleswaram, the world's largest lift irrigation project is located in the state of Telangana. It has complex system of barrages, tunnels, pumphouses, and canals. Water is lifted from Godavari River to a height of over 618 meter to irrigate 1.83 million ha area.

3. Sprinkler and Micro irrigation

Sprinkler irrigation was not widely used in India before the 1980s; however between 1985 and 1996 more than 200 000 sprinkler sets were sold. In 1996, the area under sprinkler irrigation was 0.7 million ha which doubbled (1.4 million ha) in 2004. During the last 20 years the sprinkler irrigated area has increased five fold which is 7.16 million ha in 2021. Drip/ micro-irrigation is also expanding rapidly in India. This can be partly explained by the active involvement of the central and state governments to prmote it in a mission mode, increase in area of horticultural and cash crops, liberal support of subsidies an the presence of large number of international and local pressurized irrigation component manufacturers. From about 1 000 ha in 1985, the area under drip irrigation increased to 70 860 ha in 1991, 0.31 million ha in 2001 and sice then it has grown rapidly to 1.5 million ha in 2009, 3.4 million ha in 2015 and 6.32 million ha as on 31 March 2021. The statewise sprinkler and drip irrigated area as per the Ministry of Agriculture and Farmers Welfare (2021) is shown in Table 1.

From 2015-16, the Government of India has been promoting drip and sprinkler irrigation in the country for enhancing water use efficiency at farm level under 'Per Drop More Crop' component of Pradhan Mantri Krishi Sinchyaee Yojana (PMKSY). The leading fiive states in the sprinkler irrigation area coverage are Rajasthan (24.2 percent), Karnataka (19.3 percent), Gujarat (10.7 percent), Haryana (8.4 percent), and Maharashtra (8.0 percent). The

five leading micro-irrigation states were Andhra Pradesh (22.0 percent), Maharashtra (21.4 percent), Gujarat (13.7percent), Tamil Nau (12.7 percent) and Karnataka (12 .5 perecent),

Presently, more than 45 crops are grown on drip/ micro irrigation. The major drip irrigated crops being grapes, banana, papaya, pomegranate, citrus, mango, coconut, fig and cash crops like

Table 1. State -wise drip and sprinkler irrigated area in India (ha)

State/ UT	Drip irrigated area	Sprinkler irrigated area	Total area
Andhra P.	13,88,126	5,19,165	19,07,291
Arunachal P.	4017	3494	7511
Assam	4208	16,217	20,425
Bihar	13,763	1,06,979	1,20,742
Chhattisgarh	31311	3,31,283	3,62,594
Goa	1386	1346	2732
Gujarat	8,65,959	7,64,933	16,30,892
Haryana	40,018	6,00,461	6,40,479
Himachal P.	7934	6403	14,337
Jammu & Kashmir	1779	280	2059
Jharkhand	25,686	17,713	43,399
Karnatak	7,88,981	13,84,281	2093262
Keral	24,168	9096	33,264
Madhya P.	3130,335	2,58,100	5,88,935
Maharashtra	13,49,979	5,76,325	19,26,304
Manipur	358	7039	7397
Meghalaya	308	307	615
Mizoram	5551	1744	7295
Nagaland	3589	6210	9799
Odisha	29,425	1, 15,396	1,41,821
Punjab	36,416	14,055	50,471
Rajasthan	2,87,619	17,30,876	20,18,495
Sikkim	6667	7943	14,610
Tamil Nadu	8,05,282	3,48,010	11,53,292
Tripura	444	1651	2095
Telangana	203279	74871	278150
Uttar Pradesh	41,273	2,27,897	2,69,170
Uttarakhand	12737	10,300	23037
West Bengal	10,347	92,984	1,0,3331
Total	63,20,945	71,55,859	1 34, 76,804

sugarcane, cotton, vegetables, spices, flowers and plantation crops. With the objective of mobilizing resources to expand coverage of micro-irrigation, a Micro-Irrigation Fund (MIF) with a corpus of Rs. 5000 crore was created under National Bank for Agriculture and Rural Development (NABARD) during 2018-19. States like Karnataka and Maharashtra have constructed a few large-scale community micro-irrigation schemes.

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जलसंवाद हे मासिक मालक व प्रकाशक डॉ. दत्ता देशकर यांनी
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UN 2023 Water Conference

News

The UN 2023 Water Conference concluded on 24 March. It confirmed that water truly unites the world as a determined global community came together to make a difference not only for the future of water but for the future of the world.

A key outcome of the Conference, the Water Action Agenda has grown in both size and scope since the Conference opened. Commitments have been shared throughout both official sessions and side events, with several commitments mobilizing millions, and in a few cases billions, of dollars for water action.

The closing session of the Conference featured summaries from the five interactive dialogues which got to the heart not only of what water is, but what it can be: a driver of equality, a solution to the climate crisis, a facilitator of peace, and much, much more.

Secretary-General Antonio Guterres addressed his closing remarks to a packed room, thanking everyone for their commitment to #WaterAction. He noted: "The commitments at this Conference will propel humanity towards the water-secure future every person on the planet need." He emphasized that water is for health, for peace, for sustainable development, and that's why water needs to be at the centre of the global political agenda.

Addressing the closing Plenary, President of the General Assembly Csaba Kőrösi emphasized some of the gamechangers that can bring "transformative action…leaving nobody behind" such as integrated water and climate policy, Global water info system, early warnings for all, inclusive transboundary water agreements and more. He commended efforts that highlighted that the water cycle is a common good, an approach which will impact how water is governed. He also emphasized the importance of meaningful stakeholder engagement: "Civil society and the private sector are at the heart of this transformation."

UN-Water chair and Director General of ILO Mr Gilbert F. Houngbo concluded: "Water is and shall remain everyone's business". He noted that the Conference demonstrated the importance of cooperation across sectors, stakeholders, and borders. With one example of this being Iraq acceding to the UN Water Convention during the

Conference.

As the Closing Plenary, and Conference, concluded, the sentiment was one of a breakthrough response to the global water crisis. Governments, businesses and civil society committed billions of dollars to advance the water agenda, a dealmaker for accelerating sustainable development overall.

The Water Action Agenda, the key outcome of the Conference, captured over 700 commitments by Friday evening. Commitments aimed at driving transformation from a global water crisis to a water-secure world. The agenda represents the global community's bold resolve to address the water challenges through a more coordinated and results-driven approach and it remains open for the registration of more commitments.

Member States

• The US announced a commitment of up to $49 billion in investments to support climate resilient water and sanitation infrastructure and services.

Japan will proactively contribute to the solution of water-related social issues faced by the Asia-Pacific region by developing "quality Infrastructure", providing financial assistance worth approximately 500 billion yen ($3.65 billion) over the next five years.

• Vietnam pledged to develop policies for major river basins management by 2025 and to ensure all households would have access to clean running water by 2030.

• Switzerland submitted 5 commitments to contribute to the UN's work, including in the areas of the Water Convention and transboundary cooperation. Switzerland is the cochair of the Interactive Dialogue on Water for Cooperation.

• The Niger Basin Authority (NBA) and the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) made a joint commitment of $21.2 million in funding for a project that strengthens the Niger Basin Authority (NBA) and its member countries.

• The Government of Mozambique committed to taking all necessary steps to accelerate achievement of the UN Sustainable Development Goal (SDG) 6 by 2030 with investments of $9.5 billion.

• With the Continental Africa Investment Programme (AIP), the African Union Commission aims to close Africa's water investments gap by mobilising at least US$30 billion/year by 2030 through a range of initiatives, including the International High-Level Panel on Water Investments for Africa.

• By 2030, the EU aims to support the access of 70 million individuals to an improved drinking water source and/or sanitation facility. The EU will also support Member States with €20 million funding to accelerate the deployment of wastewater surveillance for COVID-19.

• More than 50 leading global companies unite to make collective commitment to SDG 6.

Multilateral Banks

• The Asian Development Bank commits to investing $11 billion dollars in the water sector in the Asia-Pacific Region and $100 billion to the water sector globally by 2030.

Private Sector

• Starbucks, Ecolab, Gap Inc., Reckitt and DuPont joined forces with U.S. Government to invest nearly $140 million in Water Access Fund with the goal of reaching 5 million people with access to water, sanitation and hygiene.

• DANONE is launching a water acceleration blending fund to give daily safe water access to 30 million people in need.

• Xylem and 16 other companies commit $11 billion dollars in Research and Development.

• World Benchmarking Alliance has pledged to assess 1,000 global companies across 22 industries on their impact towards achieving water-related goals every two years to helps close the corporate accountability gap.

NGOs

• World Vision committed to raising and investing $2 billion by 2030 to extend the impact of transformative water, sanitation, and hygiene (WASH) services work across 50 countries in six regions. Note: All Water Action Agenda commitments are posted here.

The Earth Negotiations Bulletin followed the official proceedings of the UN 2023 Water Conference, sharing daily overviews and in-depth coverage along with photos that are free to use.

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Stockholm Water Prize-2013

Dr. Peter Morgan, Zimbabwe

Shri. Gajanan Deshpande, Pune (M) : 9822754768

(An article series has been launched in August 2020 to learn more about the World Water Prize winners and their work.)

Zimbabwe's Dr. Peter Morgan was fortunate enough to receive the 2013 Stockholm Water Prize. In the last four decades, Dr. Morgan's work has led to the discovery of cost-effective, practical, and advanced solutions for making the water used by millions of people around the world cleaner and safer. As a result, countless global communities now experience safer water, a cleaner environment, and an improved quality of life as a result of his pioneering work in developing practical water and sanitation technologies for those most in need.

The Stockholm Water Prize Committee states in its citation that “many existing solutions to providing clean water and sanitation are unaffordable, impractical, and beyond the reach of the world's poorest people.

Today, more than 7.8 billion people lack access to safe water, and 2.5 billion lack adequate sanitation facilities. More than 5,000 people die every day due to unsafe water, unsanitary conditions, and the diseases they cause.

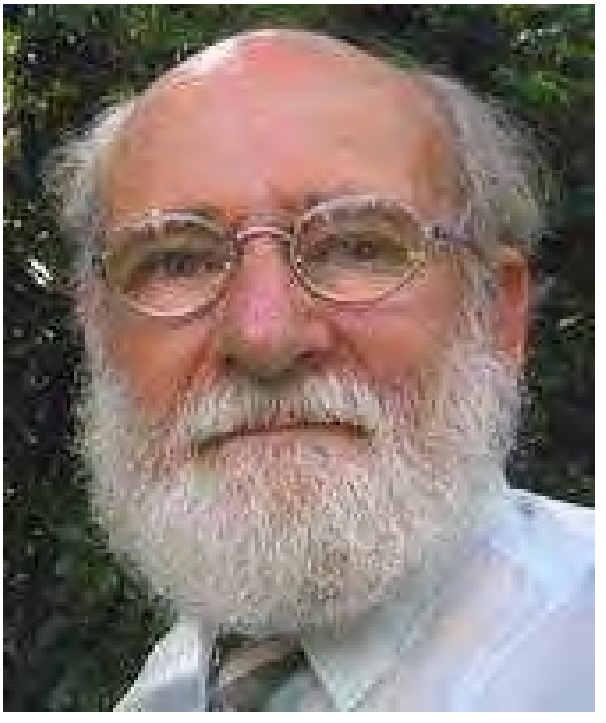
Dr. Morgan is admired as a world-class researcher on clean and safe water and also for health-related sanitation issues. He has invented a wide range of simple, smart, and low-cost water and sanitation technologies. Several of his major innovations, including the "B" type bush pump and the Blair Ventilated Improved Pit (VIP) latrine, have been adopted as national standards by the Zimbabwean government. There have been a large number of Blair toilets built for both families and schools, and millions of people in Zimbabwe alone have received this service. Many more such toilets have also been built around the world. Dr. Morgan also introduced the concept of the 'improved family well', whereby families could support themselves on their own. The concept now helps half a million people improve the quality of water they get from conventional wells.

Dr. Morgan is strongly committed to empowering local communities to develop their own solutions to their problems and to sustainably run them to become self-sufficient communities. He has developed extensive training and educational materials for each type of technology they produce, enabling local professionals to install, maintain, and, if necessary, modify those systems. E.g., the Blair VIP toilet has been redesigned so that it can be upgraded in stages as the need or opportunity arises. Today in Zimbabwe, various forms of Blair VIP, "B" type bush pumps, and community awards for improved wells have become the backbone of rural water and sanitation programmes.

Dr. Morgan is also known as a leading developer and proponent of environmental sanitation solutions that enable the safe recycling of human excreta and waste to increase soil quality and crop yields. Its 'Eco-San' toilets are now in use in many countries around the world, with the focus now on turning a sanitation problem into a productive resource. A lot of work has been done by schools in this regard.

Dr. Morgan says, "Great strides have been made in providing safe water and sanitation to people around the world. Yet millions of people still lack access to these facilities. This prestigious award recognises my role in protecting and improving the supply and conservation of water, which is our most precious resource, and encourages me to be more prompt in implementing and making these sanitation services reach more people".

Dr. Morgan currently serves as the Director of 'Aquamore', a non-profit company working in the rural water supply and sanitation sector in Zimbabwe. He has previously served as Chief Research Officer and Acting Director of the Blair Research Laboratory and as a consultant to the Ministry of Health in Zimbabwe. Throughout his career, Dr. Morgan freely shares the designs and innovations he creates and makes sure that the local communities in which they are used can



implement and improve them themselves.

A great and highly respected scientist Dr. Morgan is the author of over 100 published research papers. He previously served as president of the Zimbabwe Scientific Association and editor of Zimbabwe Science News. He works as a consultant on rural water supply and sanitation programmes in countries across Africa, such as Botswana, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Tanzania, South Africa, Sudan, Uganda, and Zambia. Dr. Morgan has received numerous awards and honours, including several international research awards like the Amkav AfrikaSan' award for technological innovation in sanitation and the "Rural Water Supply Network Award' for lifetime service to rural water supply.

Born in 1943 in Wellingborough, United Kingdom, Dr. Morgan is a naturalised citizen of Zimbabwe. He holds a Ph.D. in marine biology from the University of Hull and was awarded a Member of the Most Excellent Order of the British Empire in 1991.

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Note : While designing the issue of Jalsamvad - English we find very interesting news, information and articles specially on water and its management. That tempts us to include the same in our issues. Getting formal permission for this inclusion is that way difficult. Therefore our effort is to print them as it is in our magazine. We may kindly be excused for such inclusions. We express a deep sense of gratitude to the original writers.

Thanks.

Organization - Indian Water Foundation (IWF)

Shri Vinod Hande

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Indian water Foundation (IWF) is a New-Delhi based civil society established in 2008. IWF is generating awareness among people about water conservation, health prevention activities , keeping national rivers free from pollution and also promoting rainwater harvesting and other water related issues. It is non profit organization and established public awareness among people of all over India regarding the vital role water plays in our daily lives. In recognition of its own activities in water, energy, environment and other related fields IWF has been accorded special consultative status by Economic and Social Council of the United Nations (UN-ECOSOC) since March 2015. Observer status Governing Body of United Nations Environment Assembly (UNEA), observer status organization with United Nations Framework Convention on Climate Change (UNFCCC), CTCN membership for Southern Asia.

With adoption of the sustainable Development Goals by the UN General Assembly in September 2015 water has assumed added significance in the realization of target because water is the key to sustainable development and climate change. Out of 17 Sustainable Development Goal (SDGs) of the Paris Agreement on Climate Change IWF is engaged in 7 components of Sustainable Development Goals namely SDG-1 on about Ending Poverty, SDG-2 about Food Security, SDG-6 about Water & sanitation, SDG-7 about Energy, SDG-12 about Responsible Production and Consumption, SDG-13 about Combating Climate Change and SDG-17 about Partnerships, for the Goal in Asia-Pacific region in general and particularly for India. IWA also put stress on familiarizing the people regarding the vital role of water, energy and environment play in human life, their impact on health, economic growth, livelihood of people and also calamities that causes havoc due to non-judicious use of these natural resources. IWF is also engaged in ensuring environmental security, water security, energy security and food security which are essential for sustainable development.

IWF is a knowledge partner of MDBA (Meghalaya Basin Development Authority) in Meghalaya and played an important role in promoting water - food - energy nexus approach. IWF is also replicating the same thing as per requirement of Sikkim Govt. in the field of water resources, Environment and sustainable development. IWF also works in Uttar Pradesh and Uttarakhand state of India.

IWF's vision is to strengthen community led development activities and achieve positive social, economic and environmental change across Asia pacific Region by 2050 by integrating IWRM(Intigrated Water Resource Management), Nexus and EbA (Ecosystem based adaptation) approaches as key components. IWF works amongst the people at the grassroots level especially amongst the marginalized and weaker section, women, tribal people and poorest communities in India and Asia-Pacific region in cooperation with local, state and national government and with people of like minded organizations to help them to develop water, sanitation, hygiene services. This can be done through seminar, conferences, symposia and personal contact programs.

IWF is a direct member of ICID(International Commission on Irrigation &

Drainage), Member of the general body of the CAPART(Council for Advancement of People's Action and Rural Technology) under the Ministry of Rural Development, Government of India and it is a national Key Resources Centre (KRC) of the Ministry of Drinking Water and sanitation, Government of India. IWF is also a member of the World Water Council and Member of Global Compact Network India.

Dr. Arvind Kumar is a President of IWF having a 25 years of experience in the field of water, sustainable development, rural development and climate action. As per president Dr. Arvind Kumar IWF regards water as not merely a sector but it's a connector that provides solutions that can support strategies to tackle climate change and hassle free adaption. Water is the most effective tool to tackle climate change because climate change is water change says President. IWF is of the opinion that PPP (Public-Private-Partnership) is inadequate to attain SDG's within stipulated period so we must move from PPP to ABC partnership. In ABC partnership Administration, Business and Civil society are partners of the same standard.

India@75 and Beyond- On this 75th Independence year of India to celebrate 'Azad ka Amritmahotsav' IWF is bringing out publication 'India@75 and beyond with perceptive from policymakers, Ministers, bureaucrats, influencers, experts to analyze the achievements of India in these last 75 years specially in the last decade while looking to the goals we must achieve in the coming decade.

IWF is a "Key Resource Hub of Networking" by NCSTC (National Council for Science and Technology Communication), Ministry of Science and Technology, Govt. of India. This strengthens the ability to move towards a positive direction. As a key hub of Networking IWF will'

- Catalyze people towards capacity building
- Create conditions of innovation
- Bringing leadership in youth
- Strategizing and adopting Eco practices.

IWF works on following programs in it's mission.

• **Establish visibility and focus to move forward**- next level of growth and prosperity through spreading and deployment of scientific knowledge and technological innovation.

• **Enabler & facilitator -** efforts to ensure involvement of community members in decision making and to enable them to acquire all skills of leadership , innovation, problem solver and execution.

• **Knowledge management -** It will promote a culture to learn, sharing and knowledge creation.

• **A prospective future -** Aligning with agenda of Sustainable Development Goals 2030 and Paris Agreement on climate Change.

• **Bringing science from lab to land -** to take scientific knowledge from laboratory to the masses to spread scientific information and scientific literacy.

• **Convergence -** to set right connection between stakeholders and the government to enable benefits reach ground level.

• **Revive nature base solutions -** to develop management of natural resources to ensure water, energy and food security, which provides benefits to human well being and biodiversity.

• **Becoming Jal Mitra -** Collective efforts to make world 'water security' and not 'water scarcity'.

Jal Mitra :

Fast depletion of underground water, pollution of surface water resources and faster melting of glaciers in Himalaya adding water misery in India. IWF and Delhi based civil society is

generating awareness among the people about water related issues through individual and community campaign with the help of school children and other volunteers by means of public meetings, seminars and via social media. You can be a part of solution by becoming a Jal Mitra by paying annual fee of Rs.100/- and in return you get,

• Regular feed on the activities of IWF.
• Invitation for conference/Seminar .
• You can send water related grievances in and around you and IWF will take up issue.
• You will be part of IWF's water related campaign.

Indian water Foundation (IWF) has certain work priority areas. These areas are,

▸ Sustainable Development Goals
▸ Ecosystem Restoration
▸ Generating Livelihood
▸ Climate Change
▸ Water and sanitation

Sustainable Development Goals

As mentioned earlier that IWF is working on 7 SDGs of 17 goals. Working on these agenda IWF is supporting and working hand in hand with its partners for environmental conservation, climate change, conserving biodiversity, empowering women, supporting poor, promoting green economy to achieve Sustainable Development Goals. IWF says that they played a pioneering role in developing leadership capacity for sustainable development. IWF believe that while working on SDG's we should make sure that the goals are translated into national and local policies and have proper arrangements to coordinate it's implementation at the country level.

Ecosystem Restoration

Since long development has come at the expense of nature. Is it possible nature and people can bloom in the same place forever ? Is it possible communities could become resilient to climate change and support their livelihood and food security without destroying nature? IWF aim to create self sustaining, scalable conservation models that can be adapted from one country to another by focusing on large ecological systems. This integrated sustainable Ecosystem Restoration approach is offering lessons, for how humanity can restore ecosystems without biodiversity loss. IWF support nature-based development approach in the world's most important places by,

• Working with partners to demonstrate that when ecosystem is restored, human well being improves.
• Developing innovative ways to combine government, corporate and donors to help nature based development.
• Creating and demonstrating viable models that link public demand, sustainable consumption, protection of essential resources and local benefits.

Generating Livelihood

Sustainable development is built on sustainable livelihoods. Since 2012 IWF's Integrated livelihood programme has been working with governments, civil society and local communities to build and strengthen their capacity for sustainable natural resources management to improve livelihood by,

• Enhancing the capacity for local governance of natural resources as a basis for mitigating conflicts and promoting resources based economic opportunities.
• Improving the ability of local communities to manage disaster risks and adapt to the effects of climate change.
• Increasing the capacity of local people to

participate in economic activities.

Climate Change

To prevent harm to Earth's systems, humanity must emit less climate warming greenhouse gases and also take steps to remove excess carbon from atmosphere. Global average temp. are now 1.2°C higher than the pre industrial era. Even if the world stopped using fossil fuel completely scenario will not change unless until we stop destruction of ecosystem such as forest that absorb and store carbon. It is important to become a net-zero emission economy. To limit carbon emissions every country, sector, industry and each one of us must work together to find ways to cut carbon that we produce. As per IWF natural live ecosystems are worth than dead. For short term economic gain we have forgotten long term value of forest. To achieve net zero emission IWF,

• Guide companies, organizations and institutions on how to achieve net zero emission.

• Working with businesses and governments to minimize deforestation.

• Indentifying and mapping high carbon ecosystems such as mangroves, tropical peatlands and tropical forest that once lost are difficult to replace.

• Supporting local and local communities to protect forest on their lands.

Water and sanitation

When we talk about water it is interlinked with other sector like agriculture, industry, energy, infrastructure, environment, health etc. Water connects policy areas, economy sectors and societies as such it is a tool for cooperation and trust. SDG6 has links with other SDGs related to poverty & hunger, sustainable consumption and production, groundwater, agriculture etc.. Sustainable development and ecosystems are linked together. IWF believes availability of an adequate quantity and quality of water is mandatory to sustain socio economic development, livelihood, health and economy. Access to water, sanitation and hygiene anr interconnected and are also essential for achieving other development goals. It plays an important role in eliminating poverty and hunger, reduction of inequalities. In achieving good health water plays an important role.

Projects of Indian Water foundation

Ongoing projects of IWF

•'Scientific approach towards bridging science and Health divide in sustainable way' supported by NCSTC Department , Ministry of Science and technology, Government of India.

• Integrated Basin development Livelihood Programme in Meghalaya State.

Past Projects

• Survey on information Collection of Water supply and Sanitation in Urban Slums Areas in Delhi funded by Japan International Cooperation agency.

• Capacity Building in Ganga Grams (villages) in Meerut under Namami Gange Programme.

• Mission Eco- Next: Eco-Routes and WASH Dialogue for Eco –Intelligent Rural Rejuvenation and Field Capacity Enhancement for Ambitious Districts in Uttar Pradesh and Uttarakhand.

• Integrated approach to empower communities for ecology, water body conservation, sanitation and hygiene through awareness enhancing campaigns and use of environment-friendly technologies in Meerut South Block.

• Training in Hydrogeomorphological mapping for groundwater across 20 States in India.

This project was undertaken by IWF, awarded by Ministry of Drinking Water and sanitation , Government of India in Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Bihar Jharkhand, Meghalaya, Assam, Tripura, West Bengal, Punjab, Uttarakhand, Sikkim, Telangana,, Haryana, Gujarat, Odisha, Maharashtra. IWF has also conducted 2 days residential training program in each of the 20 states and Union Territories for staff and members of State water and Sanitation Mission, Panchayat Raj Institutions, Public Health Engineering Departments and Civil Society Organizations.

Past events of Indian Water Foundation

• 23 Oct. 2020- The Future of Liquid Waste management amidst COVID-19.

• 2 Feb. 2021- World Wetland day Celebration

• 1-5 Nov. 2022 – 7th India Water Week 2022

• 21-26 March 2022- 9th World water forum in Dakar, Senegal
• 18 March 2023- UN 2023 Water conference.

As Indian Water Foundation is working at nation and international levels they are working as advisor and observer on many organizations. Of them few are listed below,

• UN –ECOSOC
• United Nations Environment Assembly (UNEA)
• UNFCCC(United Nations Framework Convention on Climate Change).
• World Water Council
• Global Compact Network India

In India Indian Water Foundation has signed MOU with following State governments.

• Meghalay Basin Development Authority (MBDA) Shilong , Meghalay
• Water Security and PHED , Govt. of Sikkim
• Institute for Management Studies, Thimphu , Bhutan
• The Meghalaya water Foundation , Shilong, Meghalaya.
• Centre for Skill Development & Engineering Consultancy (CSDEC), Institute of Engineers, Shimla, H.P.
• Himalayan Institute for Environment , Ecology & Development (HIEED), Deharadun, Uttarakhand
• ACWIFER, Pune
• Alternative Global and India Pvt. Ltd.,New Delhi.

India water Foundation is having 22 awards at their credit in different category including Life Time achievement Award for recognizing decades of consistent action on behalf of the planet and its inhabitant.

To run an organization successfully and devotionally, financial side matters. IWF accepts admission fee and annual subscription from the Corporate, donors, Associate Corporate, Institutions as per mentioned in the following table.

Membership category	Admission Fee (Rs.)	Annual Subscription (Rs.)
Corporate	1500000	-
Donor	500000 and above	-
Associate Corporate	100000	-
Institutional	50000	For Five years
Life	20000	-

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Direct Phone No: 91-11-26349533
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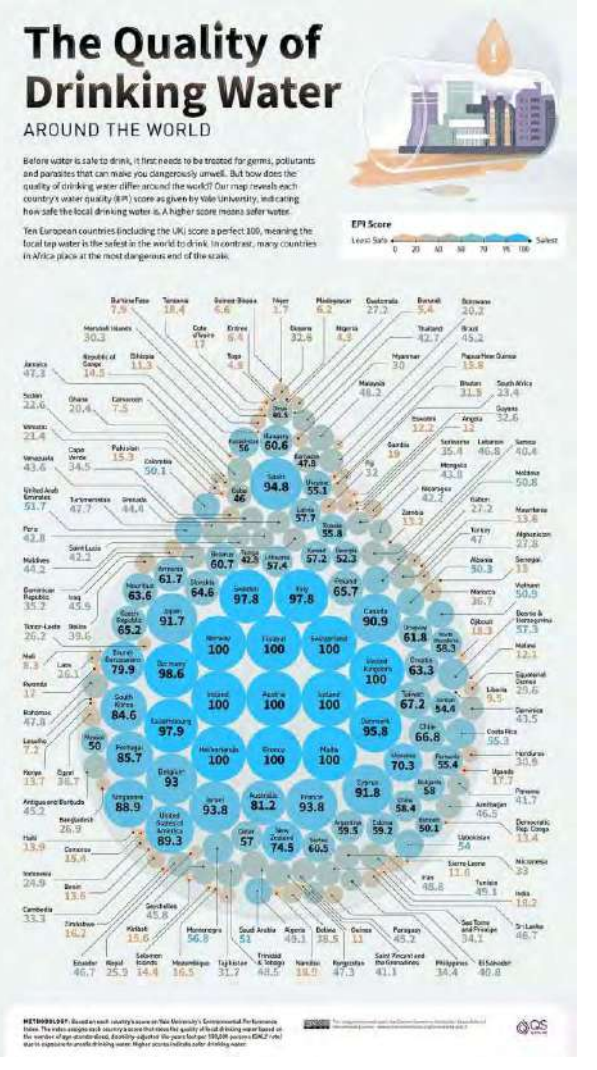
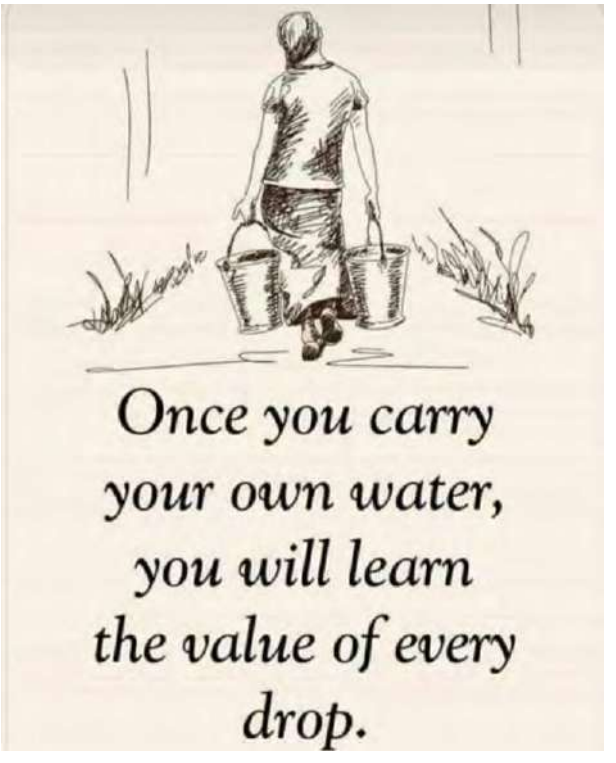
Website: http://www.indiawaterfoundation.org





Shri Nitin Gadkari - An Iconic figure in the water Sector as well

Dr. Datta Deshkar, (M) : 0235203109

(English Translation by shri Gajanan Deshpande)

The concept of an iconic figure changes with time. Changing ages, changing social conditions, and changing thoughts may be the reasons behind this. Recently, the previous Governor of Maharashtra, Shri Bhagat Singh Koshiari, had regarded Shri Nitin Gadkari as an iconic personality of Maharashtra. Inadvertently, he even compared Shri Gadkari with Chhatrapati Shivaji Maharaj, which became the cause of ridiculous accusations from some corners and created a stir in the political circles of Maharashtra for no reason. (Of course, afterward all these dignitaries have been silenced by the court's verdict) In fact, calling the likes of Shivaji Maharaj, Mahatma Gandhi, Tatyarao Savarkar, Netaji Subhash Chandra Bose, and Babasaheb Ambedkar icons, is rather unfair; as they are recognized beyond this status.

A person can be iconic in different fields from different perspectives. For a long time, I looked up to Gadkariji as an icon in the transport sector. I have always been an admirer of this man for his revolutionary work in the fields of road construction, shipping, port development, alternate fuel, toll collection, etc. So, from my point of view, he is an icon in these fields as well. But, when I also see his work in the water sector, he has set himself up as an icon in this field as well. Some people are tremendously gifted; no matter what field they go into, and they do not rest unless they excel in that field. One is astonished and wonders at the ability of a man, having been educated in commerce, to perform in the water sector in such an extraordinary way. I am an activist in the water sector. So, I simply cannot resist the temptation of calling this man an icon in the water sector, who has done so much valuable work in this field.

Maybe he doesn't know that we have had close ties with the Gadkari family. His close relative, Mr. Balabhau Pandey, was a close friend of my father. As a child, I went to Gadkariwada several times with my parents to meet him. Balabhau's son, Vasanta, often came to our house in Shankarnagar. My father-in-law, Shri Annabhau Panchbhai on the other hand had a very close relationship with the Gadkari family. I have seen Shri Nitin Gadkari at various ceremonial functions held at Panchbhai's house. We are also very close to the Sangh Parivar. Shri Sanjay Joshi, a very close friend of Narendra Modi, is my maternal uncle's grandson - I mean, my nephew. One of my nephews, Shri Atul Deshkar, was a BJP MLA from Bramhapuri.

1. Reuse of water :

There are some developed countries in the world that use the same water seven to eight times. But ours is a country that uses water only once. If the same water is reused over and over again, the demand for water naturally decreases. Singapore is a country that meets 35 percent of the country's total water needs through recycling. The water issue can be looked at from three perspectives: water conservation, water management, and water quality. However, all our attention is directed towards water conservation, leaving the other two perspectives completely ignored. In this regard, the work of Mr. Gadkari is outstanding.

Despite treating a little of the sewage that accumulates within the limits of the Nagpur Municipal Corporation, the municipality earns around Rs 350 crore every year by selling the water

to the power generation plant. Sewage also contaminates other water resources. But if we look after its proper disposal at this location, this question does not arise. Many municipal corporations and municipalities are functioning in our country. If they do this experiment in their city, not only will water be used properly, but a new source of income will also be available to each municipal corporation. He says that in a similar experiment, 80 mld of water was sold to Indian Oil near Mathura for Rs 20 crore.

2. Promoting transport through water routes :

In his own words, road transport costs Rs 10 per km, rail transport costs Rs 3, and water transport costs only Rs 1 per km. Today is the age of competition. If we reduce the cost of production and other incidentals, we can survive in the global competition. For this reason, Gadkari has given a strong boost to water transport. By opening the Ganga River for transportation, he has made available the benefit of exporting goods abroad to states like Uttar Pradesh, Bihar, and Odisha. Not only this, but he has also established dry ports at other places and connected them with this transport route. Export preference is a simple formula for increasing foreign reserves. How farsighted is he !

3. Road construction and water conservation, dual benefits :

A man can do anything if he is creative. Construction of national highways requires a lot of soft rock and murram. Realising that if the soft rock and murram were obtained from the fields adjacent to the roads to be constructed, there would be no need for transportation of these materials, and moreover, water storage would be created in the pits due to the excavation there, he immediately took the initiative in this regard. This is called "Amke Aam Aur Guthali Ke bhi Daam" in Hindi idiom. It had a dual benefit. Murram was readily available for road work, and at the same time, water conservation also took place on a very large scale. This has a very good effect on the groundwater. The water accumulated in the pits percolates into the ground, and due to this, the groundwater level also increases considerably.

4. Changes in the design of bridges over rivers and streams :

This is indeed a great idea. Bridges are built over rivers and streams for transportation, and water flows down under these bridges. If a barrage is built under the same bridge, another purpose that would be achieved is that it would obstruct the flowing water and cause it to stagnate there. The fundamental principle of water conservation "Make running water move, moving water crawl, crawling water stop, and stagnated water percolate", is solidly inculcated in his mind. If the bridge and embankment are built together, it can be done at a lower cost. Farmers can benefit from this accumulated water for agriculture. This water percolates into the ground and can benefit nearby wells. He has also successfully implemented this experiment in water conservation.

5. The world's tallest fountain is now in India :

Have you ever been to Vrindavan Garden in Mysore? There is an attractive fountain in that place. When different colours are splashed on that fountain, an exciting view can be seen in that place. The fountain depicts water dancing in the movies. And so, the people of Maharashtra need not go far away for that now. That spectacular scenery is now available in the city of Nagpur itself. This fountain has been erected in Futala Lake. Mr. Gadkari says this is the highest-flying fountain in the world. A grand gallery that can seat 10,000 spectators has also been erected to watch this spectacle. It will soon become a major attraction in Nagpur. Due to this, the tourism business in Vidarbha will also get a big boost. Jobs are not only generated by agriculture and industry; when the service industry develops in the country, many times more new jobs are created. There are immense opportunities for employment generation in the tourism business. It is no exaggeration to say that this fountain alone will brighten the future of Nagpur.

6. Gadkari - An Ideal Farmer :

The cultivation of sugarcane has been a practise in western Maharashtra to date. But Gadkari has brought a change to this tradition as well. In western Maharashtra, the production of sugarcane is in a state of decline today. The

production per acre has now come down to an average of 40–50 metric tonnes. Maybe it's because more attention is turned toward politics than sugarcane. This affects the cost of production. Not only does the matter stop here, but due to the high price of sugar, it cannot compete with foreign sugar. Some farmers have found a new way to overcome their personal losses. That is, to pressurise the government and obtain more and more help instead of focusing on agriculture. But now, due to the change in government that was paying more attention to sugarcane, the sugarcane farmer has been caught in trouble.

However, this Vidarbha Kesari (Icon) is growing more than 100 tonnes of sugarcane per acre on his farms. However, those who call themselves agriculturists are getting exposed due to this. The profession of farming will never become affordable unless it goes into efficient hands.

7. A man with a dream that a farmer will become a power provider :

The farmer has become like a big sacred cow. Every day we hear from the farmer that "we are the breadwinners; we are being treated unfairly by society; we are not getting the right price for our products; the government is not paying attention to us, etc." A business that has been running at a loss for years means that the farmer is doing something wrong, and he needs to be guided by knowledgeable people around him who know what sort of mistakes he is making. However, knowledgeable people are keeping away from them. Is it that they don't want the welfare of the farmers? I really can't understand.

India is very weak in terms of natural oil. The number of vehicles is increasing rapidly; however, the fuel has to be imported from abroad. It costs more than 10 lakh crore rupees. This puts a huge burden on foreign exchange. There might be very few eminent people in our country who are aware of the alternative energy resources, that would help save our foreign exchange. We have the resource in our house itself, but we are looking for it somewhere else. This is our situation. (Marathi idiom (**'काखेत कळसाव गावाला वळसा'**). It is really unfortunate that we have alternative fuels in our hands, but don't use them. After realising that ethanol can be produced from sugarcane and food grains, Mr. Gadkari started promoting this resource. When he started putting this before the public more strongly, people started laughing at the idea. But he did not give up. If sugarcane is used for producing sugar, it does not get proper value of it; but he had to sweat a lot while convincing the farmers that ethanol can be produced from the same sugarcane. Now, he has started having success. Ethanol-powered vehicles are getting more popular day by day. By virtue of this, he is having a dream that the farmers will not only be the food providers but also the energy providers as well in future. If this demand increases, money will be plentiful in the farmer's pocket, and then why would the farmer commit suicide?

8. Development of ports and promotion of exports :

Developing the ports and connecting all the country areas to the ports by constructing highways means making huge facilities for the producers; so that their products, especially agricultural produce, can reach abroad quickly. What a great effort! Perhaps, only Mr. Gadkari knows how to do it. Due to the development of roads by him, people are now calling him Roadkari instead of Gadkari. People are now dreaming of smooth roads like those in America.

9. Tamaswada Water Conservation Project :

He realized that the water problem would not be solved by just building dams. Therefore, he conducted an experiment called Purti Irrigation Prosperity Group at Tamaswada in Shelu Taluka of Wardha District. Through this, he paid attention to rainwater harvesting and water conservation. Projects like water storage tanks, increasing the capacity of existing water bodies, and the construction of barrages have been undertaken here. This project has been taken up keeping in mind the objective of getting enough water for agriculture and drinking purposes. Initially, the farmers were against the project. They had a fear in their minds that their land would perhaps be acquired for the project. But they were assured by

the organisation that not a single square foot of land would be taken. The Tamaswada Nallah is about 12 kilometers long. This nallah was deepened and widened from its top to its bottom. The excavated sludge was dumped in the farmers' fields. Work in a total of 28 such compartment bunding was carried out over a stretch of 12 kms. This led to an abundance of water in the surrounding areas. The water retention capacity of the nallah has increased due to deepening. That stopped the flooding. Due to this work, 199 crore liters of additional water were made available. A great change in the standard of living for the people has happened. The NITI Aayog also took note of this work and gave approval for such works under the name 'Tamaswada Project'.

10. Commencement of River-Cruise Service in India :

While travelling abroad, seeing a cruise would make us jealous of the people there, and we felt from within that such cruises should also be started in our country as well. Now this dream has come true because of Mr. Gadkari's efforts. One such long river cruise through the Ganges has now commenced. The immense need for this cause is proved by one thing. You will be pleased to know that the booking for the cruise is full in advance for next two years. People have now become aware of what is going on in the world as they are travelling more and more abroad. Therefore, their expectations are increasing. Whenever Mr. Gadkari goes abroad for work, he keeps his eyes and mind open. The entrepreneur in him wakes up, and when he returns back to India, he has a rough plan in his mind as to how these new ideas be inculcated in India. His ideas would seem exaggerated to people initially. He would also be ridiculed for that. But he is always strong enough to overcome all the odds.

11. Staunch support for new ideas :

I have a friend whose name is Suresh Khanapurkar, an awesome man. The Vidarbha region has quite a large belt that is saline in nature. The groundwater there is salty. It is neither useful for drinking nor for agricultural purposes. The people in this belt have been suffering the the misery for years. Mr. Khanapur has studied this salty water belt in depth and came up with a solution for it. It was decided to undertake a pilot project to see if the experiment for the above solution was successful. It was expected to cost Rs 1 to 2 crore. Shri Khanapurkar and Garkari came together, and the experiment gained momentum. Mr. Gadkari quickly moved the government machinery in that area and immediately sanctioned Rs. 2 crore for the work. If that experiment succeeds, I am sure Mr. Khanapurkar and Gadkariji will be riding on the pinnacle of success. The farmers of that area will celebrate the success by lifting them high in honour. This guy is basically a commerce graduate. But when he opens his mouth, even engineering officials too are astonished by his knowledge. He has been honored with a D.Lit. degree by six universities. All six of these honours are related to the science discipline and not commerce.

I pray that may god bless Mr. Gadkari with good health and long life.

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World Water Day-2015

Water and Energy

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(A new article series has been launched from August 2021 to learn more about the importance of World Water Day and the various water awareness programs implemented every year.)

On the occasion of World Water Day 2015, the theme 'Water and Sustainable Development' was set by the United Nations to enlighten the global community. Through this theme, the concept of promoting the discovery of how water is closely connected with all the sectors needed for creating the secure future that we want and bringing about the development of those sectors has gained momentum.

Water is at the core of sustainable development. It is critical not only for socio-economic development, healthy ecosystems, and human survival but also for reducing the global burden of diseases, improving people's health, and thereby improving their well-being s he productivity. Water is important for providing many benefits to people, like industrial production, the creation of various facilities and services, and their conservation. Water is also at the heart of efforts to adapt to climate change, serving as a vital link between the climate system, human society, and the environment.

Water is a limited and irreplaceable resource fundamental to human well-being. It can be inexhaustible only if managed properly. Water can pose a serious challenge to the world on the path to sustainable development. But it can also play an important role in managing efficiently and equitably the task of strengthening the resilience of social, economic and environmental systems in the face of rapid and unpredictable changes.

Around 750 million people in the world still do not have access to a safe source of drinking water, and 2.5 billion people still do not have access to improved sanitation facilities. Also, over a billion people still defecate in the open. In this regard, the United Nations General Assembly passed a resolution in July 2010 that defined "the right of everyone to safe and clean drinking water and sanitation" as a human right, which is essential for the full enjoyment of life as well as the enjoyment of all human rights.

Water and sustainable development in various sectors

Sustainable development is defined as development that meets the societal needs of the present without compromising the ability to meet the needs of future generations. Briefly discussed below are how to identify and rectify the deficiencies in the methodology adopted to achieve development in various sectors and how to bring about sustainable development.

Agriculture sector :

Globally, agriculture is the thirstiest consumer of water. It accounts for 70% of the world's water consumption. Of course, these figures vary considerably depending on the situation in the country. Rain-fed agriculture is the dominant agricultural production system worldwide, and its current average productivity is more than half of its potential under optimal agricultural management. By 2050, the agricultural sector will need to produce 60% more food globally and 100% more food in developing countries.

Health sector :

Water is essential for human health and survival. The human body can survive weeks without food but only a few days without water. The average human body is made up of 50–65% water. Babies have the highest water content. Newborns have 78% water. The best way to prevent the spread of germs is to avoid getting sick by washing your hands regularly and disinfecting them. One gramme of excrement can contain up to a trillion germs. That means clean hands can save your life.

Every day, every person needs water for drinking, cooking, and personal hygiene. Details of the minimum amount of water required for sanitation facilities without compromising health are available. 7.5

litres of water per capita per day for drinking, as recommended by the World Health Organisation, will meet most people's needs. About 20 litres of water per person per day are required for basic sanitation and food hygiene. Despite impressive achievements in this regard over the last decade, 75 million people do not have adequate access to clean drinking water sources, and 2.5 billion people do not use improved sanitation facilities. It is estimated that Rs. 9000 billion will be spent annually over five years to maintain safe water and sanitation for every person worldwide.

Natural ecosystem :

Water is nature. Natural ecosystems lie at the centre of the global water cycle. Forests, wetlands, and grasslands are at the heart of the global water cycle. All freshwater ultimately depends on the continued healthy functioning of ecosystems, and understanding the water cycle is essential to achieving sustainable water management. Yet, most idealised economic models do not seem to place sufficient emphasis on freshwater among the essential services provided by ecosystems. This leads to the incessant use of water resources and environmental degradation. Pollution from untreated residential and industrial wastewater and agriculture also weakens the ecosystem's ability to provide water-related services.

Perhaps the most important challenge to the sustainable development of ecosystems has arisen in recent decades. That is, the rapidly unfolding global environmental crisis, which is becoming an obstacle to further human development, Attempts at ecologically sustainable development have not yet succeeded. Global environmental degradation has now reached critical levels, and many large ecosystems are on the brink of degradation, which may cause them to shrink drastically. Protecting the systems that support life on Earth requires respecting them. For this, it is necessary to develop an increased understanding of the extent of environmental problems on our planet, which in turn will be the fundamental basis for the future sustainable development of our planet. Adopting 'ecosystem-based management' is important to ensure the long-term sustainability of water.

Cities and water :

More than half the world already lives in urban areas, and by 2050, more than two-thirds of the 9 billion people are expected to live in cities. Moreover, most of this growth will occur in developing countries, which have limited capacity to deal with this rapid change. This increase will also increase the number of people living in slums, whose living conditions are deplorable in terms of water and sanitation facilities. Therefore, the development of water resources for economic growth, social equity, and environmental sustainability will be closely related to the sustainable development of cities. The management of urban areas has become one of the most important development challenges of the 21st century. Our success or failure in creating sustainable cities will be a key factor in the success of the global development agenda.

A network of piped water supply systems spanning thousands of kilometres forms the water infrastructure of every city. Many old tap systems waste more than the fresh water that is delivered through them. Many fast-growing cities (small and medium-sized cities with a population of less than 5 lakh) have non-existent, inadequate, or outdated sewage infrastructure. Industry: Every product requires water for its production. Some industries are more water-intensive than others. 10 litres of water are used to produce one paper sheet, while 91 litres are used to produce 500 grammes of plastic. More water is used to build a car than to fill a swimming pool. Industrialization can lead to growth through increased productivity, jobs, income, gender equality, and youth employment opportunities. Unfortunately, the industry's priority remains how to maximise production rather than water efficiency and conservation.

Global water demand for production is expected to increase by 400% by the year 2050, which is far greater than water demand in other sectors. Major growth will occur in emerging economies and developing countries. Many large industries have made significant progress in reducing their water use and supply chains by evaluating them. However, small and medium-sized enterprises face similar water challenges to a lesser extent.

Technology and smart planning can reduce water use and improve wastewater quality. Some progressive textile industries have introduced such technology that the water coming out of the mill is even cleaner than the drinking water in the city. Major beverage companies are also improving their water use efficiency, and they have significantly reduced the amount of water used in their production plants over the past 10 years.

Industry and power generation together cover 20% of water demand. In developed countries, where agriculture dominates, the industrial use of freshwater is higher than in less-developed countries. Balancing large-

scale industrial needs with sustainable production against the traditional approach poses many challenges for the industry. The real issue is how to spread the benefits of globalisation and industrialization around the world without having uncertain impacts on water and other natural resources.

Energy :

Water and energy are inseparable friends, and they are natural partners with each other. Water is needed to generate energy, and water is also needed to deliver energy. Today, more than 80% of electricity generation is done through thermal power plants. A large amount of steam is required to run its nuclear generator. Water is heated to high temperatures to prepare it. At the same time, billions of litres of water are required to cool down the plants in this process. Therefore, it is necessary to limit the generation and use of less efficient coal-fired thermal power plants. Worldwide, hydropower accounts for 16% of global electricity generation. This hydropower generation capacity can be doubled in the next two decades.

Technologies, such as dry-cooling or highly efficient closed-loop cooling systems that require no water or very little water, should be widely adopted when building new power generation plants. The use of alternative water sources such as seawater or wastewater has great potential to reduce pressure on freshwater resources. Also, renewable energy is a resource that regenerates naturally. e.g., sunlight, wind, rain, tides, waves, and geothermal heat. They do not require large amounts of fresh water. Such projects should now be rolled out on a large scale.

Food :

Water is food. One litre of water is required to produce one calorie of food. However, using 100 litres of water to produce one calorie can be called inefficient water use. Agriculture is the largest user of water globally, accounting for 70% of total withdrawals. In some developing countries, 90% of the water is pumped for irrigation. By 2050, the agricultural sector will need to produce 60% more food globally and 100% more food in developing countries.

As prosperity increases, diets tend to shift more towards starch-based items like meat and dairy products, which require more water. For example, it takes about 3,500 litres of water to produce 1 kg of rice, while it takes about 15,000 litres to produce 1 kg of meat. This change in diet is the biggest change affecting water use in the last 30 years and is likely to continue until the middle of the twenty-first century.

The current rate of agricultural demand for the world's freshwater resources is unsustainable. Inefficient use of water for crop production reduces water storage, reduces river flows, degrades wildlife habitats, and leads to the salinization of 20% of the world's irrigated land area. Increasing water use efficiency can reduce water loss from agriculture and, more importantly, increase crop productivity.

Water is Equality :

Women and girls are responsible for collecting water every day in developing nations. Women in these regions spend an average of 25 percent of their day collecting water for their families. Therefore, they cannot use this time for income-generating work, family care, or schooling. There should be a drastic change in this mindset now, from which it becomes necessary to create gender equality in society today for a sustainable world of tomorrow.

Climate Change :

Climate change has a negative impact on freshwater resources. Current projections show that increasing competition for water among users due to increasing greenhouse gas emissions will affect regional water, energy, and food security, significantly increase the risks associated with freshwater, and create major challenges for water resource management with increasing water demand.

Natural hazards are inevitable. But much can be done to reduce the number of deaths and devastating disasters and to reduce their suffering. Its intensity can be reduced through proper preparation and advance planning. The global community has now committed itself to building coherent disaster prevention and response systems. For this, concrete and significant changes are needed now.

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‘Residents revive their pasturelands of Boojh Village

Aarti Kelkar Khambete

Can digital technologies aid in better decision making and management, governance and distribution of water equitably, transparently and sustainably at the local level? Experiences reveal that technology can often act as double edged sword.

Atpadi, a taluka in Sangli district of southern Maharashtra and situated in the rain-shadow of the Western Ghats, was often called as ‘the land of dushkal (droughts)’ and experienced one of its worst droughts in 2012, followed by those again in 2016 and 2019.

The story of how the region has turned its situation around since then is extraordinary and has its roots in the farmers’ movement – the Samanyayi Pani Vatap Sangharsh Chalwal in the region that started in the 1980s. The Maharashtra government had agreed to sanction funds for the Tembhu Lift Irrigation Scheme (TLIS), which would lift water from the Krishna Basin in five stages and provide water to drought affected regions of Sangli, Satara and Solapur districts with Atpadi being one of them.

The movement negotiated with the government to redistribute water in an equitable manner in Atpadi, ensuring that every home, regardless of land ownership, received at least 5000 m3 of water annually.

Now, water from the TLIS, along with local water in the form of both groundwater and surface water will need to be managed in an integrated and participatory manner by cluster Water Users Associations (WUAs) to ensure sustainable and fair allocation to all households including the landless.

Ensuring water for all

Can digital technology aid in helping WUAs to take better decisions and manage, govern and distribute water equitably, transparently and sustainably in the region?

A pilot action research project undertaken by Society for Promoting Participatory Ecosystem Management (SOPPECOM) and TMG Research in the region explores the extent to which digital tools can enable farmers to improve integrated water management and governance by co-developing and co-piloting a digital application jointly with the WUAs.

What have been the experiences of other organisations who have piloted the use of digital technologies in water and natural resource management? SOPPECOM and TMG Research invited other actors in the water sector to a 1.5 day expert consultation, to share and discuss learnings for developing a collective understanding of digital tools in locally led water governance.

Making the invisible, visible : One of the interesting examples is that of The Water Stewardship initiative by Watershed Organisation Trust (WOTR), an NGO in Pune, which has focused on the use of technologies such as Community-Driven Visual Integrator (CoDriVE-VI or CDVI) to generate an operational 3D map of the local aquifers. This is to help communities in drought prone areas of Maharashtra visualise aquifers in their village, mobilise them to consider water as a common pool resource and manage the demand for water through crop water budgeting.

It has also developed "FarmPrecise"- an android-based mobile application that provides crop-specific weather-based information on up-to-date farming techniques, fertiliser and nutrient management, integrated pest, and disease management, irrigation water management, and market prices of different crops in nearby markets to help village communities take decisions on the selection of crops based on the weather patterns

Democratising data for sustainable management of natural resources

Foundation for Ecological Security (FES) on the other hand has focused on democratising access to socioeconomic and ecological information through spatial and temporal representation for sustainable management of natural resources and supporting local livelihoods for local level decisonmaking..

The India Observatory is a collaborative technology initiative by FES that presents detailed information on India's social, ecological, and economic parameters related to natural resources on a single spatial and temporal platform and brings together data on over 1600+ parameters, ranging from village to national level presented in the form of maps, graphs, tables and infographics.

It also has a set of unique platforms and tools, namely, the Indian Biodiversity Information System (IBIS); the Composite Landscape Assessment and Restoration Tool (CLART), a geographic information system (GIS) tool developed to plan soil and water conservation measures by making location and context-specific data available; the Crop water budgeting tool, a geographic information system (GIS) tool developed to plan soil and water conservation measures by making location and context-specific data available; The Integrated Forest Management Tool (IFMT), the GIS Enabled Entitlement Tracking Tool (GEET) and the The Groundwater monitoring tool (Napo Jal Bachao Kal)

Mapping surface and groundwater resources, to aid decision making

Arid Communities and Technologies (ACT) works in the Kutch region where conserving water through recharging aquifers becomes crucial.

For this, information presented in the form of water resource, aquifer and watershed maps is made available by using data collected by people on the ground level related to surface and groundwater sources, aquifer-wide groundwater level and quality, local weather data, and water and soil quality and moisture data. The maps are used to make informed farm-level decisions to become water secure.

The technology used for monitoring data is gradually or stagewise introduced and includes data collected and stored in digital form using equipment and manually collected data. Static data such as farm geometry, location, soil type, hydrogeology, geomorphology, and water resources is combined with variable data that is regularly monitored by people at the ground level and water security plans are made.

ACT plans to develop comprehensive mobile applications to monitor data, train Bhujal Jankars to use this data, and develop laboratories for the maintenance of technical equipments.

Water passbook, to measure water balance : Gram Vikas, Odisha uses mWATER, an open-source

tool used to estimate groundwater availability in a given area and can be compared to a Bank Passbook, which makes it easier for the community to understand the concept and use it to plan for water use and allocation.

Information on water levels is collected using a tool called Transect walk and recharge and discharge areas are demarcated and aquifers identified. After aquifer mapping, aquifer area and aquifer thickness can be estimated using GIS platforms and the storativity of the aquifer is calculated. which gets fed into the water passbook tool to estimate groundwater availability on any given day.

Jaltol for rural water security

Centre for Social and Environmental Innovation (CSEI) has developed Jaltol, a free and open source digital tool for water budget estimation. Since most agencies working in water sector are in need of water budget assessment and estimation of water balance and as most of them are small and do not have the inhouse capacity , the tool is an attempt to fill that gap where the CSOs with minimum inputs can get water budget estimation of their watersheds.

Understanding aquifers, through digital tools

Advanced Centre for Groundwater Resources and Development (ACWADAM) is using the mWaterapp for assessing the ground water potential in various villages of Atpadi Taluka in Sangli District and working along with SOPPECOM and Peoples movement for equitable water distribution and Irrigation Department, Govt of Maharashtra in Atpadi to aid in equitable distribution of irrigation water through integration of various sources.

Watershed development, using digital data

Bharat Rural Livelihoods Foundation (BRLF) is implementing Jivi Daah Hasa means Life (JDH) , a watershed project with the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) Cell, Rural Development Department, Government of Jharkhand in collaboration with civil society organisations to build planning capacities in MGNREGA to support livelihoods. The project aims at enhancing the incomes of marginal farmers while securing livelihoods and climate resilience through regenerating agroecology.

BRLF has been using the Open Data Kit (ODK) tool to prepare village DPRs for watershed treatment that collects data using android-based mobile devices which is submitted to an online server and A report is generated in the JDH web portal through ODK data BRLF plans to integrate this data with the MGNREGA in the future.

Technologies can empower

The above examples reveal that digital technologies can have varied applications and can be very useful in empowering people at the ground level with information that they can use to take decisions and manage their water resources sustainably. However,

Training and capacity building for making information understandable and usable is needed

Capacity building and facilitation is the key to encourage use

Handholding is essential to encourage communities to use technologies. Making monitoring systems farmer-led is very challenging, if not unrealistic. It requires tremendous support and facilitation by the project staff.

A lot of background work and capacity building is needed to make farmers/ communities feel comfortable to use digital tools for gathering, entering, collating, analysing and drawing inferences from the data.

Making information simple and easy to understand is important

Digital is not only about collecting and collating information. It is also about how this information is converted to meaningful data that is presentable and understandable at the community level.

Translation and adaptation of the information collected to convert it into meaningful data is a complex process and needs support and training.

Larger and contextual realities need to be factored in

Adapting the tools to suit specific contexts

is crucial

While a number of tools are available, adapting the tools to make them suitable for local contexts is important. The correct selection of tools is also important taking into consideration the scale at which data is needed.

Use of technology might not automatically lead to decision-making and produce results on the ground

Mere access to information does not guarantee that this information will be used by people at the ground level to produce the desired results.

Making the effort sustainable beyond the completion of the project can be challenging and depends on the understanding and motivation of the community to bring about the desired change.

What happens after the projects are completed? To what extent does the farmer own the technology, what is the value of the technology for the farmer is an aspect that needs to be explored. How to incentivise farmers to keep monitoring and reporting data is a challenge that also needs to be addressed in the future.

While technologies have made the invisible, visible and helped to create awareness among people, has this awareness translated into changes in water use practices among people, has it led the community to formulate rules to use water sustainably and improve water governance? Do external factors such as market dynamics affect water use practices? Do digital tools bring transparency and how do local institutions cope with it are larger questions that need to be addressed in the future.

Gaps between micro and macro level data sets can make drawing inferences difficult

There is a huge gap between data sets that are available at the governmental level and that are collected at the ground level by people. Bridging this gap between micro and macro level data sets in terms of granularity and aiding the integration of data is important.

Hierarchies among communities can impact technology outreach : Access to digital technologies may not be uniform among communities. The sociocultural contexts and village-level hierarchies often determine who has access to information and can participate in decision-making.

There is data and information asymmetry in

our communities. For example, women, poor, marginalised, and tribal populations continue to have poor access to resources and technologies. Including them in the mainstream will require efforts that expand beyond the adaptation of technologies to bring about social changes at the ground level.

Who needs, controls and owns the data and technology can affect outcomes

Technologies do not function in a vacuum and their uses can be influenced determined/controlled by the sociocultural and political contexts where they are used.

Thus power relations at the village level can influence who has access to data and can influence decision-making and equitable distribution of resources. How far technology can lead to democratic decision-making and equitable distribution of resources remains to be seen.

Technology can act as a double edged sword

While technology can play an important role in empowering communities with information and aiding them in taking decisions on the ground level, it can also act as a double-edged sword.

One needs to be wary of using technology as a solution to all evils. Questions such as who needs and controls technology, who uses it and what is it used for need to be placed at the centre of all discourses on the use of technology for the last mile.

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Famous rivers in the world

(5) Jurua river

(6) Rio Negro River

(7) Xingu River

(8) Mackenzie river

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