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Jalasamvad

A Dialogue on Water

Editors: Dr. Datta Deshkar, Shri Satish Khade

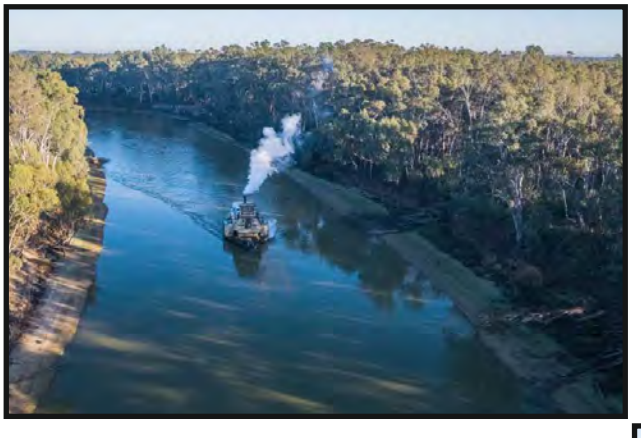
Cover Story: **Ferro Cement Museum And Jalbodh Kendra Karjat (Dist. Raigarh)**

Famous rivers in the world

(1) Danube river

(2) Oricono River

(3) Murray River



(4) Salween river

Jalsamvad

Mouth Piece of Bharatiya Jala Sanskriti Mandal

■ **March 2023**

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Contents

Editorial .....

For last several years, one common thing is observed that the prices of onions are never stable. They rise so high that the consumers start shouting or fall so low that the farmers start complaining. Since the consumers are in large number (in crores) than the farmers (in lakhs), the Government generally takes the side of the consumers so that consumer agitations do not start. But that leaves the farmers in a precarious condition.

In international markets prices of onions, at present, are very high and after seeing that the farmers get wild for the reason that they are not allowed to export onions to other world markets. There is always a failure in striking a happy balance in the demand and supply and also the exports. Required elasticity is not observed in the policies of the Government as to when and how much quantity should be exported.

In fact, efforts should be made to see that storage systems for storage of onions are properly designed so that life of the product increases. How many farmers have designed the storage racks is the main question which needs consideration. More subsidies should be given to erect such racks so that the stocks could be maintained till the time better price is available in the market. Rushing to the market immediately after the crop is in hand should be discouraged. The supply in the market increases so fast that the prices are bound to collapse.

Main problem is related to the marketing tactics. When the prices in the wholesale markets fall, the same day the consumer is required pay five to ten times more price in the market nearer to him. It naturally means that the distribution system is faulty. Recent trends in this situation are very encouraging. I observe that a van moves in our locality loaded with onions where direct contact with the customers is established. Thereby the farmers get better price so also the customers. Middlemen are no doubt essential in the chain of distribution but if they take undue advantage of the market conditions, mechanism should be developed to restrict their malpractices.

If the farmers convert their product in powder form, I think, they would be benefited more. Customers, now days, have changed their habits. Ginger paste, garlic paste are readily available in the market. But that is not the case with onion paste. In developing such paste there is a lot of value addition. Selling the onions as they are may not prove to be beneficial. Farmers also should change their attitudes. Adaptation to the market situation is very necessary.

The agricultural universities and colleges should come forward to develop new seeds which will increase the life of onions. These universities and colleges have developed ivory towers around them and the extension work is not taken care of. The link between the research organizations and the cultivators has gone very weak. One foreign researcher by name Benour had developed one technique popularly known as training and visit method. Efforts were made to introduce that technique in our country but that scheme miserably failed due to the poor interest shown by the concerned people.

Government, now a days, talks of doubling the farm income. But the promise still remains to be unfulfilled. This problem should be solved on war footing so that the goods are delivered at the earliest.

Dr. D. G. Deshkar
Editor.

Water And Irrigation Panorama of India - 3

Dr. Suresh A. Kulkarni

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TRANSBOUNDARY RIVER WATER SHARING

Some important river systems originate in upstream countries of India, flow through various states of the country and finally terminate in to other countries. The Indus river originates in China and flows to Pakistan; the Ganges-Brahmaputra river system originates partly in China, Nepal and Bhutan, and flows to Bangladesh; some minor rivers drain into Myanmar and Bangladesh. However, no official records are available regarding the annual flows into or our of the country. Ministry of Jalshkti has signed Memorandum of Understanding (MoUs) with neighbouring and other countries on cooperation in trans-boundary river water / data sharing as well as in the field of water resources management and development. This part of the article provides a brief information about these water sharing treaty/ cooperation.

Indus Waters Treaty

The Indus river system comprises of main stem of Indus river along with its three eastern rivers (Sutlej, Beas and Ravi) and three western rivers (Indus, Jhelum and Chenab), Figure 1(a & b). The basin is mainly shared by India and Pakistan with a small share in China and Afghanistan. The catchment area of Indus basin in India is 317,708 km2 which is about 28 percent of the entire catchment area of the basin. Within India, the Indus basin lies in Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana and Rajasthan.

The Indus Waters Treaty was signed between India and Pakistan in 1960 in Karachi.

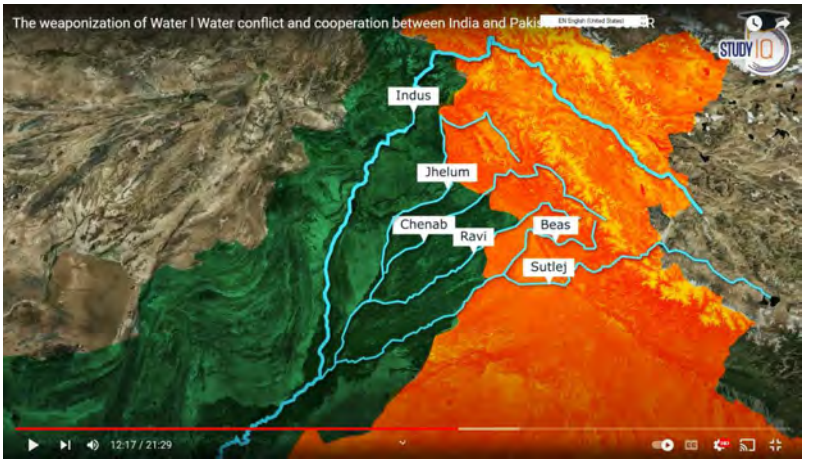

Figure 1(a). The Indus River System

The Treaty provides India an absolute control of all the waters of eastern Rivers while Pakistan shall receive for unrestricted use of all those waters of the western Rivers which India is under obligation to let flow beyond the permitted uses. India is permitted to use the waters of western rivers for domestic, hydropower generation and other non-consumptive uses and also for agricultural uses as provided in the treaty. India is also permitted to construct storage of water on western rivers upto 3.6 million acre feet (MAF) (4.44 BCM) for various purposes as provided in the Treaty. The Treaty permits India to build run-of-the-river hydro-power plants with unrestricted use but there are design and operational restrictions on the plants. The waters of the 'eastern rivers' was used for the Rajasthan canal and the Bhakra Dam.

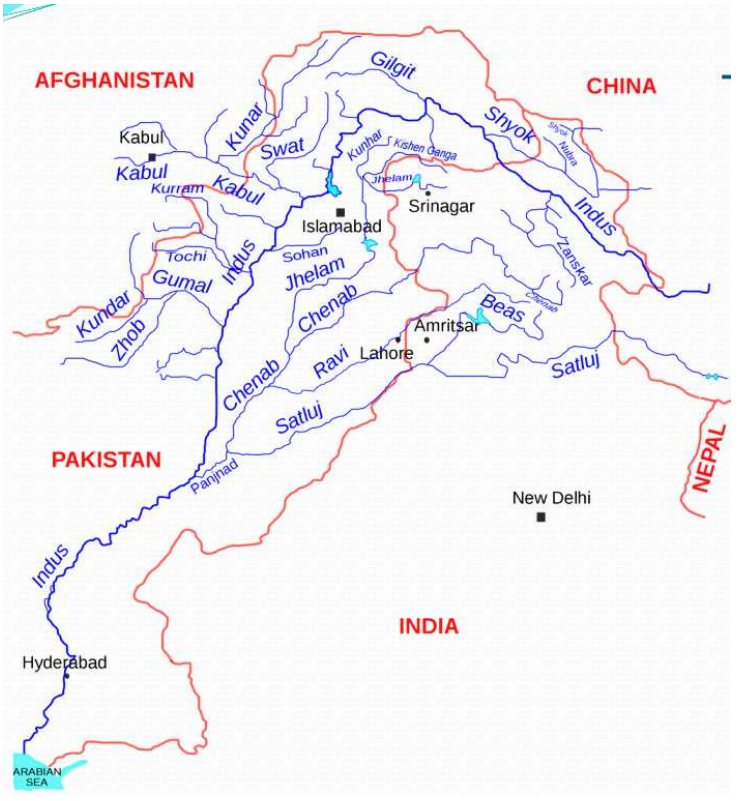

Figure 1 (b). Indus River and its tributaries

The Treaty provides for the institutional mechanism for implementation through Permanent Indus Commission (PIC) comprising of one Indus Commissioner each from both the countries. The purpose and functions of the Commission inter alia are to: (a) establish and promote cooperative arrangements for the Treaty implementation; (b) furnishing or exchange of information or data provided for in the Treaty; (c) promote cooperation between the Parties in the development of the waters of the Indus system; (d) examine and resolve by agreement any question that may arise between the Parties concerning interpretation or implementation of the Treaty. The Commission is required to meet regularly at least once a year, alternately in India and Pakistan and also when requested by either Commissioner. The Commission is also required to undertake tours of inspection of the Rivers and Works for ascertaining the facts connected with various developments. India has also been providing the daily gauge and discharge data of hydrological sites fixed on all the six rivers to Pakistan.

The Indus Water Treaty between India and Pakistan has helped to resolve the issues between two countries; although during the last few years Pakistan has objected to India's development of Kishenganga and Ratle hydropower projects on the western rivers, Chenab and Jhelum. Indus treaty is regarded as one of the best examples of trans-boundary river basin water cooperation. Although, seemingly the treaty claims it as the equitable distribution of water, but the fact remained that India conceded 80 percent of the aggregate water flows in the Indus system to Pakistan. India has been woefully wanting in not utilising the 3.6 million acre feet (MAF) of "permissible storage capacity" granted by the IWT on the western rivers. Poor water development projects have allowed 2-3 MAF of water to easily flow into Pakistan which needs to be urgently utilised. Further, out of the total estimated capacity of 11406 MW electricity that can be harnessed from the three western rivers in Kashmir, only 3034 MW has been tapped so far. While the treaty may have served some purpose at the time it was signed, now with a new set of hydrological realities, advanced engineering methods in dam construction and desiltation, there is an urgent need to look at it afresh and as such there is a growing debate to modify the existing IWT.

India-China Cooperation

The Brahmaputra (aka Yaluzangbo or Tsangpo in China) river originates in the high glaciers of the Tibetan Himalaya. After flowing for 400 kilometres, the river twists around the mountains, dropping more than 2,000 metres in altitude and giving up huge energy potential. The river after entering through to the northeastern

corner of India, river descends into the Assam valley of India and then the vast deltaic lowlands of Bangladesh to rendezvous with the Ganga, before reaching its final destination in the Bay of Bengal (Figure 2). The trans-border rivers flowing from China to India fall into two main groups. 1) the Brahmaputra River system on the eastern side, which consist of the main stream of river Brahmaputra and its tributaries, namely Subansiri and Lohit, and 2) the Indus River system on the western side consisting of rivers Indus and Sutlej ee Figure 1 (b)].

Figure 2. Brahmaputra and ganga river system

In the year 2002, the Government of India had entered into a Memorandum of Understanding (MoU) with China upon provision of hydrological information on Brahmaputra River during flood season by China. In accordance with the provisions contained in the MoU, the Chinese side has been providing hydrological information (water level, discharge and rainfall) to Indian authorities on regular basis. A need for trans-border cooperation for early warning system was also felt for Sutlej River in the year 2004. Accordingly, an MoU with China was also mooted on Sutlej River and signed in 2005. Under this MoU, Chinese side provides hydrological information of Tsada station located on river Sutlej (aka Langqen Zangbo). A Joint Expert-Level Mechanism has been set up to discuss and cooperate on provision of flood season hydrological data, emergency management and other issues regarding trans-border rivers as agreed.

Indo-Bangladesh Cooperation

India controls the flow of the river Ganga at the Farakka barrage which is low diversion structure built at 18 km upstream from the border with Bangladesh. An Indo-Bangladesh Joint Rivers Commission is functioning since 1972 as a liaising mechanism between the two countries. A treaty was signed in 1996 and provides for sharing by mutual agreement the waters of the international rivers flowing through the territories of the two countries and of making the optimum utilization of the water resources of their region in the fields of flood management, irrigation, river basin development and generation of hydro-power for the mutual benefit of the two countries. In the event flow at Farakka falls below 50,000 cusecs in any 10-day period, the two Governments will enter into immediate consultations to make adjustments on an emergency basis. For monitoring the implementation of the Treaty, a Joint Committee has been set up. There exists a system of transmission of flood forecasting data on major rivers like Ganga, Teesta, Brahmaputra and Barak during the monsoon season from India to Bangladesh. This has enabled the civil and military authorities in Bangladesh to shift the population affected by floods to safer places.

India-Nepal Cooperation

There are memorandums of understanding and arrangements between Nepal and India for the exploitation of the Kosi River (1954, 1966) and the Gandak river (1959) (see Figure 2). This includes Pancheshwar multipurpose project, Sapta-Kosi high dam Project, Sun Kosi storage cum diversion scheme, Kamla and Bagmati multipurpose projects and Karnali multipurpose project. Pancheshwar project is a bi-national multipurpose project, primarily aimed at energy production and augmenting irrigation in India and Nepal. A Treaty known as 'Mahakali Treaty' concerning the integrated development of the Mahakali River, which included Sarada barrage, Tanakpur barrage and Pancheshwar Dam Project was signed between the Government of Nepal and the Government of India in 1996. Following which in the year 2009 the Pancheshwar Development Authority was set up for development, execution and operation of the Pancheshwar Multipurpose Project.

India-Bhutan Cooperation

A scheme titled 'Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on Rivers Common to India and Bhutan' is in operation. The network consists of 32 hydro-meteorological/ meteorological stations located in Bhutan and being maintained by the Royal Government of Bhutan with funding from India. The data received from these stations are utilized in India for formulating flood forecasts. A Joint Experts Team (JET) consisting of officials from the Government of India and Royal Government of Bhutan (RGoB) meets twice in a year to review the progress and other requirements of the Scheme. A Joint Group of Expert (JGE) on flood management has been constituted between the two countries to discuss and assess the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining plains in India and recommend to both the governments appropriate and mutually acceptable remedial measures.

Reference:

Central Water Commission. 2019. Reassessment of Water Availability in India Using Space Inputs, Basin Planning & Management Organization, CWC, New Deli.

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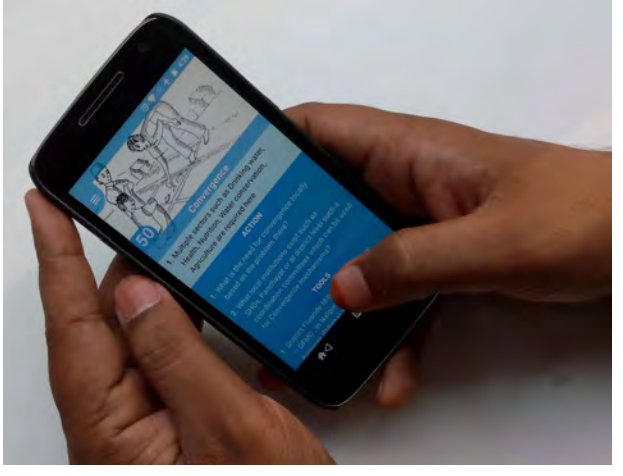
Building content on water quality for scale

Kiran Kumar Sen, Sarmila Kakoti

M : 9820158353

Innovative training and learning methods developed by INREM Foundation not only ensure that learner's needs are prioritised, but also help in adapting content to suit different contexts.



Use of safe water cards in online training (Image Source: INREM Foundation)

Our drinking water is fraught with quality issues like chemicals, microplastics, excessive minerals, bacteria, and other contaminants, which tend to be local in nature, and require mitigation action at the local level. Frontline workers in these localities require an understanding of how to assess the local water quality and what steps to take to address issues that are discovered in water. This requires capacity building and availability of simplified information on water quality problems and solutions.

INREM Foundation works to empower field functionaries from government and non-government institutions with knowledge and capacities to enable them to find solutions to water quality problems in their area. Doing this has meant exploring innovations in training and learning methods. We will explain some of them in this article.

Reusable Learning Objects

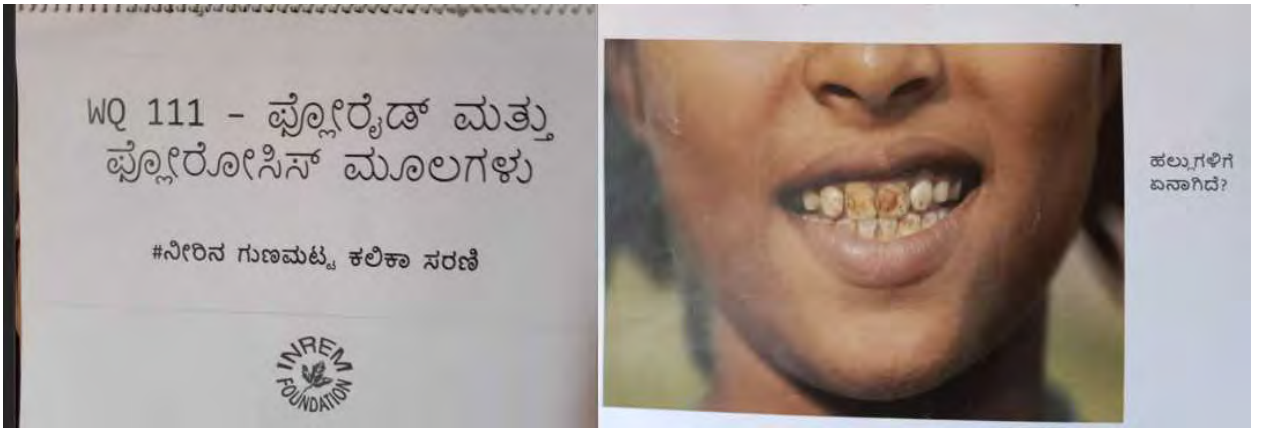
Water quality is a vast subject and can often be complex in nature. Hence, simplifying the information and breaking it down into the smallest bits possible is critical to the knowledge dissemination process. This ensures that learners' needs are prioritised and they are not overwhelmed in the learning process.

To achieve this, INREM follows a concept of reusable learning objects (RLO) to design its content. We focus on understanding the audience and their needs when creating content for them. The safe water learning cards, which have found immense popularity in water quality training across the country, have been developed using this approach.

Characteristics of RLOs

The different characteristics of RLOs in the context of training of frontline workers on water quality are described below.

1. Learner-centric: Frontline workers working on water management have different skills and learning needs in different places. Hence, the content designed for them must take into account their existing knowledge, local context, and the medium of comfort for the learners. For instance, for the watermen in Karnataka i.e. Jalagara, the training material on basics of water quality and field testing was made in the form of flipcharts in Kannada language.



2. Atomised: Complex topics need to be broken down into simple concepts and practicable solutions to make it easier for the frontline workers to understand. Each content piece must be bite-sized to ensure that learners can grasp the concepts one at a time without getting overwhelmed. The safe water learning cards targeted at frontline workers are a good example of how to build foundational knowledge on water quality management with bite-sized small units of learning.

3. Flexible and customisable: Just like how we customise vanilla ice cream with different toppings to suit our preferences, content created should allow for easy customisation. This enhances reusability of the training content and saves time and resources. For example, the training material used for building capacities of health workers under the National Program for Prevention and Control of Fluorosis (NPPCF) was adapted and reused in different districts. Three modules developed on Integrated Fluorosis Management (IFM) for one district in Rajasthan were adapted to the local context and data so they could be used in different districts. You can check the content for IFM here. Some slides about fluorosis mitigation were retained while the rest modified depending on the districts and their issues.

4. Modular:- Making training content modular provides the flexibility to fit parts together depending on the learner and their learning needs without having to re-create content from the start. For the water quality management course, we built the content on basics of water quality and field-based water quality testing using Safe Water

Learning Cards and existing modules from the frontline workers' training material. The content was re-used and incorporated into a larger learning module. Sample content can be seen here.

5. Interactive: Elements like teaser questions, quizzes, assessments, polls are an integral part in designing the online training modules. The training content is designed in a way that stimulates participant's thinking and allows for introspection of their field observations and experiences. We used several of these in all water quality training sessions to make them interactive for the participants.

6. Accessible and shareable at scale: Content created in digital formats allow for easy sharing to any number of users. When participants are trained in cohorts from different districts of India, the content pieces are made accessible to all the participants at once using digital platforms like Participatory Digital Attestation (PDA) or through the water quality network portal. They can further share the pieces with their peers and others through applications like Whatsapp. This creates a fluidity of knowledge even beyond the training cohorts. The table below shows the number of times participants have viewed and downloaded content from the training modules for a period of 1.5 years.

Number of modules	9
Number of training sessions	257
Content views	2900
Content downloads	4760
Content shared outside the app	299

Based on our experiences, here is a summary of tips for making online content for training of frontline workers:

- Create modular and customizable content that can be used anywhere in the country
- Use virtual field demos, videos, case studies depending on the learners' needs
- Publish the content online and make it available to everyone
- Use photos with creative commons license
- Acknowledge and give credit to people who contribute content, photos, videos, etc.

By simplifying information it can be used to explain complex, interconnected topics related to water quality such as climate change. Further, innovative approaches like gamification, graphic novels and newer technologies are being explored to make virtual learning not only engaging but also scalable.

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'Deep Trouble': Water Levels at California's Reservoirs Leaving Towns Dry

Parts of California could be in "deep trouble" in the coming years if more reservoirs are not built to meet the demand for water, with some towns already suffering from major shortages as a result of the megadrought that has gripped the state for decades.

Record rainfall has hit the state since the end of December, which has pulled most of California out of extreme drought.

However, despite increased water levels in many of California's major reservoirs, a lot more rainfall is needed to completely replenish not only the surface reservoirs but the groundwater stores as well.

If the water stores cannot be refilled, many towns may suffer from shortages.

"It really depends on where in California you're talking about in terms of trouble. Certainly, some smaller communities are already in deep trouble," Jacob Petersen-Perlman, a water resources geography expert and assistant professor at East Carolina University in Greenville, North Carolina, told Newsweek. "A couple of Northern California communities ran out of water to supply citizens this fall.

Lake Isabella in California has had large drops in its water levels, hitting 7 percent capacity on November 14, 2022. Despite improvements in the state's drought conditions and increased water levels in many of California's major reservoirs, a lot more rainfall is needed.
GEORGE ROSE/GETTY IMAGES

"Other wells are going dry in the Central Valley. Farming is also another dimension where some growers are facing very difficult times, with dropping groundwater levels and not enough water to satisfy their water rights."

Lack of water is already impacting parts of the state. Coalinga in Northern California was forecast to run out of water by the end of last year, with city officials having to purchase additional supplies at a huge cost.

Our community can't rely just on precipitation amounts or atmospheric moisture demand alone to understand how severe a drought is," Daniella Rempe, a hydrologist and geomorphologist at the Jackson School of Geosciences, University of Texas in Austin, told Newsweek.

"We have to look underground to see how much water has been depleted from storage belowground in soils and rock. This is where the water that supplies streams and trees during [California's] long dry season comes from."

Rempe previously told Newsweek that long periods of low rainfall also remove moisture from plants, increasing the risk of fires. Groundwater levels are also impacted.

"This groundwater is absolutely crucial to supplying streams in [California's] long, dry summers every year, not just during drought," she said. "But what happens during drought is that the rains that would refill this groundwater end up just refilling the dry root zone and either delaying or preventing recharging of the groundwater system that supplies streams and reservoirs."

While the start of 2023 has been a wet one, the rest of the year may not see the same degree of rain for months, putting the reservoirs and groundwater levels at risk of drying out again.

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China to build a major dam on Brahmaputra river in Tibet

China to build a major dam on Brahmaputra river in Tibet: Report

China will build a major hydropower project on Brahmaputra river in Tibet and a proposal for this has been put forward, an official said.

According to the report, the mainstream of the Yarlung Zangbo River has the richest water resources in Tibet Autonomous Region. (Representational Image)

By Press Trust of India :

China will build a major hydropower project on Brahmaputra river in Tibet and a proposal for this has been clearly put forward in the 14th Five-Year Plan to be implemented from next year, the official media on Sunday quoted the head of a Chinese company tasked to build the dam as saying.

Yan Zhiyong, chairman of the Power Construction Corp of China, said China will "implement hydropower exploitation in the downstream of the Yarlung Zangbo River" (the Tibetan name for Brahmaputra) and the project could serve to maintain water resources and domestic security, the Global Times reported.

Speaking at a conference on Thursday, Yan said the project was clearly put forward in the proposals for formulating the country's 14th Five-Year Plan (2021-25) and its long-term goals through 2035 made by the Central Committee of the ruling Communist Party of China (CPC), it quoted an article on the WeChat account of the Central Committee of the Communist Youth League of China on Sunday.

"There is no parallel in history it will be a historic opportunity for the Chinese hydropower industry," Yan told the conference organised to celebrate the 40th anniversary of the founding of the China Society for Hydropower Engineering.

The 14th Five-Year Plan (2021-2025) and National Economic and Social Development and the Long-Range Objectives Through the Year 2035 were adopted by Plenum - a key policy body of the CPC - last month.

Details of the plan were expected to be released after the formal ratification by National People's Congress (NPC) early next year.

Proposals for dams on the Brahmaputra have evoked concerns in India and Bangladesh, the riparian states, and China has downplayed such anxieties saying it would keep their interests in mind.

As a lower riparian State with considerable established user rights to the waters of the trans-border rivers, the Indian government has consistently conveyed its views and concerns to the

Chinese authorities and has urged them to ensure that the interests of downstream States are not harmed by any activities in upstream areas.

China has already operationalised the $1.5 billion Zam Hydropower Station, the largest in Tibet in 2015.

About the new dam, the Global Times report said that speculation about China planning to build a "super hydropower station" in Medog county, where the Yarlung Zangbo Grand Canyon is located, have circulated for years.

Medog is the last county in Tibet which borders Arunachal Pradesh.

In his address, Yan said that the hydropower exploitation of the Yarlung Zangbo River downstream is more than a hydropower project. It is also meaningful for the environment, national security, living standards, energy and international cooperation.

According to the report, the mainstream of the Yarlung Zangbo River has the richest water resources in Tibet Autonomous Region, about 80 million kilowatt hours (kWh), while the 50-kilometer section of the Yarlung Zangbo Grand Canyon has 70 million kWh that could be developed with a 2,000-meter drop, which equals more than three Three Gorges power stations in Hubei province.

Tibet has about 200 million kWh of water resources, accounting for 30 per cent of the total in China.

The 60 million kWh hydropower exploitation at the downstream of the Yarlung Zangbo River could provide 300 billion kWh of clean, renewable and zero-carbon electricity annually. The project will play a significant role in realising China's goal of reaching a carbon emissions peak before 2030 and carbon neutrality in 2060, he said.

"It is a project for national security, including water resources and domestic security," he said, noting that the project will also smooth cooperation with South Asia.

The hydropower station could generate income of 20 billion yuan (USD three billion) annually for the Tibet Autonomous Region, he said.

India and China established Expert Level Mechanism (ELM) in 2006 to discuss various issues related to trans-border rivers.

Under existing bilateral Memorandums of Understanding, China provides hydrological information of Brahmaputra River and Sutlej River to India during the flood seasons.

Under the arrangement, China provides flood season data of the Brahmaputra river between May 15 and October 15 every year.

Edited By:
Snigdha Choudhury

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Organization - National water Academy

Shri Vinod Hande

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National Water Academy (NWA) earlier it was known as Central Training Unit. It was set up in Central Water Commission by the Ministry of Water Resources, River Development and Ganga Rejuvenation. It was established in 1988 to impart training to the in-service engineers of various Central and state organizations involved in the development and management of water resources. It was established from the assistance from US aid and then from World Bank. The National Water Academy is aimed to function as a 'Center of Excellence' in training water resources personnel. It is providing the wider range of training to water resources engineers of States and Central Agencies working in the fields of planning, designing, evaluation, construction, operation and maintenance of water resources projects. The National Water Academy is playing a national role for conducting training in specialized and in emerging areas, where State govt. or other institutions are not adequately equipped to meet the requirements. It is conducting induction and refresher courses in the relevant areas of water sector. The training programmes are open to participants from recognized academic institutions, NGOs, central and state PSUs , private companies, individuals and foreign nations. All these programs are on payment basis. The NWA is headed by a Chief Engineer.

Role and objectives of NWA

• To organize specialized courses for Group 'A' and 'B' officers of Central and State agencies.

• To arrange National / Regional Seminars and Workshops on key issues of water resources development / subject areas for the benefit of Senior level officers (CE's / Secretary) of State / Central agencies.

• To provide assistance to Central and State Government organizations and their training institutes on their specific training needs.

• To develop and maintain linkages with leading institutions in India and abroad dealing with training related activities in water resources sector for sharing the expertise.

• To conduct training in advanced methods of structural analysis and design.

• To develop training modules / case studies on new emerging technology like GIS(Geographic Information System) applications in water resources.

• To organize Induction Training for newly appointed Assistant Directors / Assistant Executive Engineers of Central Water Engineering (Group 'A') Services.

• To organize induction / orientation training to newly appointed / promoted Group 'B' engineering officers of CWC.

• To organize Re-orientation Courses for

officers promoted from Group 'B' to Group 'A' of Central Water Engineering Services.

• To undertake Induction Training of newly appointed Group 'B' / Group 'A' officers of state water resources department / Central agencies on their request, where such training facilities are not available.

The vision of NWA is to provide quality training for building water resources professionals and responsive engineers to deliver effective engineering services. After training one will learn new skill and knowledge, build confidence, gain hand-on experience to prepare for real professional career. Faculty members train participants with skills, resources, techniques to face challenges with knowledge and open mind.

The mission of NWA is to seek solutions to

important water resource problems and educate central and state engineers who in return make the country at better place by using the power of engineering principals.

NWA has leadership in bringing about changes to enhance the capacity building of water professionals in the country. The core faculty at NWA is selectively chosen by CWC and Central Water Engineering Services(CWES) –Group 'A' officers. These officers should have excellent academic record, long practical experience in water resources development and management. They should also have good communication skills with talent for imparting training. The core faculty is headed by a Chief Engineer and eight other faculty members with specialized subjects such as hydrology and water resources, irrigation, hydropower, socioeconomic & environmental aspects and system engineering. In short core faculty of NWA are Group 'A' officers of CWES and are having adequate and professional knowledge and field experience in water sector. In addition to core faculty the courses are supported by guest faculty invited by NWA.

Shri Shushil Kumar is a Chief Engineer at NWA. He did his B.Tech. in Civil Engineering from IIT Delhi in 1986. NWA campus is very beautiful and is located in the green and clean environment of Khadakwasla dam (Pune). It is on the right bank of Mutha river. The campus is 10 km from main Pune city. Khadakwasla dam is just 2 km. from NWA. Central Water and Power Research Station (CW&PRS) is adjacent to NWA campus. National Defense Academy is on opposite side of river Mutha. NWA is self contained campus having hostel for participants, guest house for visiting faculty, class rooms, computer facilities, labs and recreational facilities which include indoor outdoor games and swimming pool. Etc. Programs at NWA are fully residential. It has a hostel capacity of 55 rooms with twin sharing accommodation. Family accommodation is not available for the officers attending the training. The MWA mess provides full boarding at affordable rates.

Then

Now

The academic area has four lecture halls, a seminar hall and office area. Lecture halls and seminar hall are air-conditioned. They also provide LCD projector with PC. The computer center is equipped with local area networking, scanners, digitizers, plotters, printers, CD writer etc.

The NWA has its own library with good collection of books and journals on all aspects of Water Resources Planning and Development, River basin Planning and related topics. Participants can also have access to the CW&PRS library which has a larger collection. The NWA provides course material, computer facility, library, accommodation, boarding and transportation within the campus area to the participants.

Training courses at NWA :

NWA conducts training courses on all aspects of water resources development and management. Following areas are covered in NWA ,

• Integrated Water Resources Development & Management (IWRDM)

• Investigations, planning and formulation of river valley projects.

• Designs - FEM, designs of various structures, softwares for designs, dam safety

• Irrigation - Command Area Development, Watershed management, Participatory Irrigation Management, Benchmarking of irrigation systems

• Hydrology

• Flood Management, Flood Forecasting

• Remote Sensing and GIS techniques

• Hydrometry and data processing

• Environmental, social and human aspects of river valley projects.

• Construction and economic aspects of river valley Projects

• Water Law, and river valley disputes

• Management Development program for senior officers

Above programs are further divided in following categories,

• Exposure Program- These programs are for senior technical officers to know what is new. These are not training programs. Here participants expected to learn “how to” do it. These short duration programs are of 3 days that cover 4-6 topics.

• Operational Level training Programs- This program is designed for JE and AE level. Programs are separate for JEs and AEs. These are 5 to 15 days duration program where focus is given on only one topic.

• Refresher Programs – This is also a separate designed program for JEs and AEs level. Aim of this program is to bring participants up-to date in latest development in the given topic and brush up forgotten concept. These are short term programmes of 3 days duration which cover more than one topic.

• Brain storming Sessions- These sessions are for senior level officers in the rank of SE and CE. These are short duration programs of 3 days. In this duration no ‘faculty’ and no ‘teaching’. The purpose of session is for officers to “take the thinking forward” and create a “think tank”. In these 3 days period 4-6 topics are discussed.

One to two weeks training programs are arranged at NWA on various subjects. Mentioning all subjects is not possible here. Even though few are listed below for readers,

• Integrated Water Resources Development & Management.

• River basin Planning

• DSS(Decision Support System) Planning for Integrated Water Resources Development & Management of River basin.

• Preparation of Detailed Project Report of Water resources Projects.
• Sedimentation planning of reservoir.
• Project Planning.
• Analysis and design of Dams.
• Design of Hydro power structures.
• Dams safety Instrumentation.
• Design Flood Estimation.
• Dam safety concerns and awareness.
• Irrigation Planning. Etc.

Further another 6 topics are covered under Hydrology and 3 under Flood Management, 5 under Remote Sensing. In all 82 topics are covered and taught related to water at NWA.

The above list indicates programs which have already been conducted ant NWA. In addition NWA also takes up custom made training programs as per the requirement of client organization on any topic related to water resources development and management. Detailed training program calendar for the year is announced in April and circulated.

Arrival at NWA campus is very difficult part to attending a program. Management of NWA is trying for to make transport available , but presently it is not possible for them.

Leadership in training :

NWA has always shown leadership in bringing about changes to enhance the capacity building of water professionals in the country. The academy is hoping to influence number of institutes to join them. NWA arranged training of irrigation and water management to the state organization and govt. committees throughout the year. NWA also continued to contribute to transfer of technology to various state Water Resource Department through pilot training in advanced technologies in water resources .

NWA is established to function as a 'Centre of Excellence' in training water resources personnel. It is providing the wide training needs, of water resources engineers of states and Central Agencies in the field f planning, design, evaluation, construction, operation and management & monitoring of water resources projects. In its national role NWA is concentrating on conducting training courses for all water sector personnel, in the specialized and emerging area for which state govt.s and other institutions do not have adequate equipment to meet the needs.

Quality training of water at NWA always influences other institutions and hoping to join number of institutions to achieve integrity. The NWA is helping other institutes to join them to achieve integrity in water related areas across the country. To talk about the achievement of NWA , so far NWA has organized more than 430 programs and trained 10500 people in water resources .

Many people may visit NWA for the first time, for them some useful information available on their site to make familiar with the procedure at NWA. It is located on the western side of the Pune city on Pune –Sinhghad road near Khadakwasla village. It is 12 km from Swargate, 18 km. from Pune rly. Station and 29 km. from Pune Airport.

During Swachha Bharat Mission Survey in 2018 Rooftop Rainwater Harvesting system restored inside the NWA campus to recharge ground water and improve ground water quality and not letting naturally purified rain water to drain and get polluted. Recharged ground water is used in swimming pool of NWA round the year.

In 2016 a training cum workshop was arranged at NWA to create awareness about water conservation and recharge among youth in India. For this program special instructions were issued from PM Office to tap youth potential. This program was highly appreciated at the highest level. This was one day program and was attended by 66 youth organizations from across Maharashtra and Goa.
Similarly in 2016 NWA organized a 'Training–cum-workshop on Scenario of Water Resources Sector in India'. Target population for this workshop was school teachers, as teacher plays a major role in nation building. 56 teachers from 25 schools of Maharashtra attended the workshop. This workshop was also organized as per the guidelines issued by MoWR, RD and GR for 'Jal Kranti Abhiyan'.
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जलसंवाद हे मासिक मालक व प्रकाशक डॉ. दत्ता देशकर यांनी
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Ancient Mauryan technology brings water, hope to dry Magadh in Bihar

Shri. Subhash Pathak

Inspired by a college professor, villagers in the south-central part of Bihar donated money, built traditional channels and embankments to irrigate fields and ease farm woes.

Ancient Mauryan engineering has brought water back to the undulating and rocky terrain of Magadh, the grain bowl of Bihar that had turned almost entirely arid because of abortive modern irrigation policies.

The Magadh region, comprising 10 districts in south-central Bihar, was reeling from its worst water crisis over a decade ago, forcing farmers to board trains to distant cities such as New Delhi and Chandigarh and work there as migrant labourers. Rainfall was scanty, people had long abandoned traditional reservoirs that caught and stored rainwater run-off, the water table in aquifers had depleted from overuse, and modern irrigation canals covered only a small area.

Gaya itself was a modern nightmare as most of its ponds overflowed with garbage. The water table had dipped below 200 feet, and taps and tube wells had gone dry. The water crisis was so acute that people sold their houses in posh localities at throwaway prices. The government promised to build a 100km canal from the Ganga,

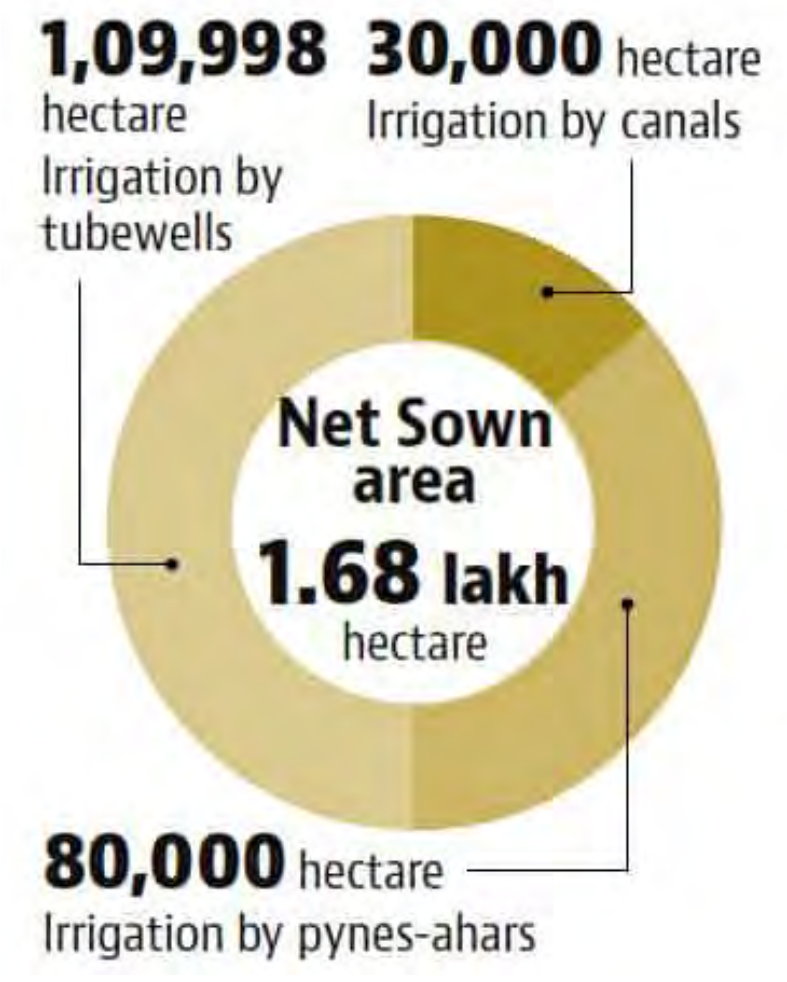
A check dam built by villagers along with Maghadh Jal Jamaat near Sijuaghati in Imamganj-Dumaria area.

but the project failed.

The crisis looked irreversible but Rabindra Pathak, who taught Pali and Sanskrit at a college in Arwal, was certain that the answer lay in the long-forgotten and crumbling aqueducts and water reservoirs that irrigated the fields and fed ancient India's most glorious empire.

He pored through old books and scriptures, and found that reviving the dilapidated network of pynes and ahars was the lone solution.

Pynes are channels carrying water from rivers. Ahars are low-lying fields with embankments that act as water reservoirs. This combined



irrigation and water conservation system dates back to the Mauryan era that flourished in Magadh 2,000 years ago.

Pathak founded the Magadh Jal Jamaat (MJJ) in 2006, a network of individuals working to revive the neglected pynes and ahars. "There was no other way to solve the recurring water crisis threatening to turn the region arid. Reckless use of tube wells for irrigation without adequate recharge complicated the scenario," he said.

Convincing people to participate was not easy in a fragmented society, where nobody was willing to part with an inch of land.

"Villagers shrugged off the idea of collective participation initially, as they couldn't fathom its impact," said Kanchan Mistri at Khaneta-Pali village. "When the government with all its resources failed, how could a group (like ours) do it? That was the common refrain."

Besides, the local mafia interested in contracts for government projects posed a big threat to the voluntary initiative. A years before MJJ's formation, in 2004, social activists Sarita and Mahesh, working on an irrigation system in Gaya, were murdered by the mafia.

But Pathak was determined to do the unthinkable — bring water to the area. He got ample help from his professor-wife, Pramila, and trader Prabhat Pandey.

They persuaded villagers to form committees and donate anywhere between Rs 100 and Rs 1,000, depending on the size of agricultural plots they owned, and revived the 125-km Jamune Dasain pyne and 159-km Barki pyne. These two complex channels, rebuilt with help from social worker Chandra Bhushan, brought water from Falgu, a tributary of the Ganga.

The impact was instantaneous and miraculous. About 150 villages along the Jamune-Dasain pyne and around 250 villages along the Barki canal have been able to irrigate their fields for the kharif and rabi (monsoon and winter) crops, and grow vegetables, pulses and

oilseeds as well.

The farm distress eased significantly. Life changed for marginal farmer Jairam Bhagat, who wanted to kill himself when his paddy crop failed in 2007, after he met volunteers of the Magadh Jal Jamaat. He joined the group, discarded plans to return to Chandigarh where he worked as a plumber, and contributed his mite for the irrigation system.

Bhagat, 45, from Shabaazpur village in Gaya was among thousands of people from about 700 villages who used to migrate for work — not by choice, but by compulsion. He now stays home and reaps a good harvest from his amply irrigated farm.

People began to say the water system's revival was the second-best thing to have happened to Gaya after the Buddha's enlightenment. In Gaya, residents, officials, military and police personnel joined the mission to build check dams and clear ponds of encroachment and debris.

"Recurring protests over water crises are now a thing of past in the district. Hand pumps and wells that were abandoned are now working," said Rajesh Kshitij, a lawyer in Gaya.

The social organisation's initiative drew accolades from environmentalists Anupam Mishra and Magsaysay winner Rajendra Singh.

In 2011, chief minister Nitish Kumar asked the irrigation, public health and engineering, and the revenue and land reforms departments to replicate the Magadh Jal Jamaat model.

The Magadh region has four medium and major irrigation projects, including the Sone canal. But these irrigate only 30,000 hectares in parts of Gaya, Arwal, Jehanabad, Aurangabad, Nalanda and Nawada districts.

The North Koel reservoir scheme in Jharkhand's Palamau and Punpun barrage in Gaya were launched in 1972 and 2006 respectively. But they never took off.

The Gaya circle irrigation department's executive engineer, Ashok Kumar Choudhary, said the existing canal system works only for the kharif season, or monsoon crop.

But the restored pyne-ahar system helps farmers grow paddy in 150,000 hectares, wheat in 100,000 hectares and pulses and oilseeds in about 30,000 hectares in Gaya alone.

The Mauryan network brings water to the remote countryside, which seldom got any help from government agencies because of Maoist insurgents active in those areas.

The Magadh Jal Jamaat responded positively when at least seven villages in the Maoist heartland of Imamganj- Dumaria requested for a check dam to be built to conserve rainwater. The area is about 22km off GT Road, but barely accessible.

"Our volunteers worked two months, built a check dam and rejuvenated a pyne, which is now irrigating farms of over a dozen of villages and recharging ahars and ponds," said 60-year-old Kameshwar Yadav of Pachman, ploughing his field after a decade.

The move encouraged a farm turnaround and migrant youth working in Delhi returned home to sow oilseeds.

"We built the dam with Rs 44,000 in 2014 when the state would have spent Rs 50 lakh and taken a year. This year, we hope to grow fish and reap a bumper rabi crop," said Niranjan Yadav, a 30-year-old who worked at a retail shop in Delhi.

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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.

World Water Day-2012

Water for Food Security

Shri. Gajanan Deshpande, Pune -(M) : 9822754768

(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.)

Due to the increasing population and improved lifestyles, the demand for food is continuously increasing, not only in India but also all over the world. The agricultural sector has to meet this increasing demand through the modernization of cultivation methods, research into improved varieties of seeds, pest control, and the adoption of appropriate water management. Accordingly, on the occasion of World Water Day 2012, the international community drew attention to how every drop of water can be converted into more grain production through the judicious use of water so that food security can be achieved.

The natural resource for agriculture, which is mainly in the form of "water," generally has limited average availability and is uncertain from year to year. Therefore, large-scale water management skills must be acquired to ensure a sufficient and consistent water supply throughout the years.

A society can ensure food availability by either stockpiling food grain reserves from a good year's agricultural production or by importing food grains at a high cost. For the country to be self-reliant and economically strong, food grain production should be sustainable even in adverse weather conditions. For this reason, skill in water management plays an important role.

There is an extreme variation in annual rainfall in different parts of India. Similar differences can be seen elsewhere in the world. If we consider Rajasthan, this deviation will be up to 60 percent. In Maharashtra, the drought-prone area, which covers more than 40 percent of the state, has a deviation of 35 percent. Therefore, dry land cultivation suffers a lot in a year of low rainfall. There are often consecutive years of low rainfall. Moreover, in the year when the drought is spread over a large area, there is obviously a great strain on the food grain management in the country.

Since India has at least one year of drought deficit every 10 years, one should always be prepared for such a flexible arrangement. During drought years, the natural process of water recharge in the soil is disrupted. If the agricultural sector wants to get assured water, one way is to plan to reserve sufficient water reserves for the next year in the reservoirs built on the rivers at the end of the year. Planning to retain such reserves will help to at least partially cover the water availability deficit in the coming years.

Possible changes in climate will add to the problem in the future by extending the period of consecutive dry days during the rainy season. Due to this, measures such as laying protective foliage on the agricultural land while irrigating and preparing the additional base of the farms for water supply will be necessary. When the roots of the crops get stressed due to a lack of water, the farmers will get help from the farms to supply water exactly when needed. The frequency of such climate changes is likely to increase in the coming years. In order to minimize their adverse effects, water management strategies have to be designed with foresight.

The successful retention of maximum rainfall within the watershed is an important

principle of watershed development programs. The greatest enemy of hot and dry regions is evaporation loss. 4 to 6 mm of rain evaporates not only during the rainy season but also while it is raining. There is a loss of 400 to 500 mm through evapotranspiration if the whole monsoon season is taken into consideration. It costs so much. Mulching techniques can play a significant role in mitigating this.

The state of self-sufficiency in various types of food grains is not uniform in India at present. In some grains, we are doing well. Wheat and rice are two examples. We are also getting a good grip on maize. However, a lot remains to be done on Jowar and millet. For water-intensive crops like fruits and sugarcane, special attention needs to be given in the coming years to making drip irrigation widely adopted to achieve water savings.

There is currently a huge gap in the production and demand of oilseeds and pulses. Oilseed crops are also vulnerable. Because most of these crops are dependent only on rainfall, Therefore, along with other measures, provision for improved water availability has to be made for them. Vegetable production is responding well to frost, drip irrigation, and the use of greenhouses. Henceforth, all such measures have to be an integral part of water management systems.

If the food basket of India is considered as a whole, it must contain all the items like grains, oilseeds, pulses, milk, and fish. However, grains play a more important primary role in food security. Grain, oilseed, and pulse proportions are expected to be 410 grams for grains, 82 grams for oilseeds, and 68 grams for pulses, respectively. We have not yet been able to maintain such a balance in the country.

Dairy and fish production are also important sources of food. Dependable inclusion of these sources in food planning is easily possible through careful management of catchment grasslands for livestock and poultry, as well as small surface water storage tanks and ponds.

Urbanization and industrialization are spreading to rural areas. As a result, first-class lands near such centers are frequently going out of agriculture. Due to this, the availability of water for agriculture is also decreasing. The "agriculture" business has to lose its resource base in a dual way, such as land and water. Therefore, the resulting deficit will have to be met by increasing productivity.

In the agricultural sector too, water available for agriculture is preferentially diverted to higher-value crops such as cotton and sugarcane, as well as fruits such as dates and bananas. This causes a reduction in the amount of water available for food grains. Therefore, the challenge before us is to have the ability to produce more food grains with less water. This requires management skills to resist evaporation, improved irrigation techniques for food crops resulting from modern research, and the adoption of new high-yielding crop varieties.

At least 80 percent of urban wastewater and 90 percent of industrial water should be returned to natural watersheds. Such water returns are a valuable addition to water deficit basins and sub-basins.

Excessive and unscientific use of pesticides, fertilizers, and irrigation water has resulted in the degradation of soil texture and a decline in productivity. Irrigation water should be used in controlled quantities.

Drainage of surface and subsurface water is as important as proper agricultural irrigation practices.

The importance of water management for food security has been formally recognized at the United Nations level. That is why the theme "Water for Food Security" was specially chosen for universal awareness on the occasion of World Water Day-2012.

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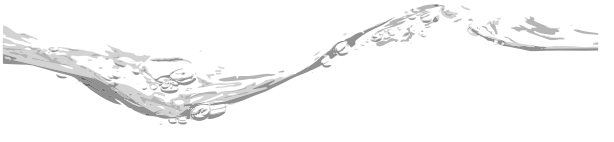

SUSTAINABLE SEPTEMBER CHALLENGE

GREEN CALENDAR

DAY 1 I WILL NOT RUN THE TAP WHILE BRUSHING MY TEETH ☐	**DAY 2** I WILL NOT WASTE FOOD ON MY PLATE ☐	**DAY 3** I WILL USE BOTH SIDES OF PAPER WHILE TAKING PRINT OUT ☐	**DAY 4** I WILL NOT LITTER ANYWHERE AT ANY TIME ☐	**DAY 5** I WILL CARRY A HANDKERCHIEF AND NOT USE THE TISSUE PAPER ☐
DAY 6 I WILL SHIFT TO AN INKPEN ☐	**DAY 7** I WILL NOT HONK TODAY ☐	**DAY 8** I WILL REDUCE MY SHOWER TIME BY 50% ☐	**DAY 9** I WILL NOT CHARGE MY PHONE OVERNIGHT ☐	**DAY 10** I WILL PLANT SOME MICROGREENS ☐
DAY 11 I WILL REUSE WASTE WATER ☐	**DAY 12** I WILL SWITCH OFF ALL DEVICES, CHARGERS AT WALL WHILE NOT IN USE ☐	**DAY 13** I WILL START CARRYING A CLOTH BAG EVERY TIME I STEP OUT ☐	**DAY 14** I WILL REDUCE MY INTERNET USAGE BY 1 HOUR TODAY ☐	**DAY 15** I WILL HAVE ONE MILLET BASED MEAL ☐
DAY 16 I WILL AVOID ANY SNACK THAT IS PACKAGED IN PLASTIC ☐	**DAY 17** I WILL OPEN WINDOWS AT HOME/OFFICE TO MINIMISE FAN AND LIGHT USE ☐	**DAY 18** I WILL BUY GROCERY FROM SMALL SCALE/LOCAL VENDORS ☐	**DAY 19** I WILL LEARN THE BASICS OF WASTE SEGREGATION ☐	**DAY 20** I WILL KEEP A BOWL OF WATER OUTSIDE MY HOUSE FOR BIRDS ☐
DAY 21 I WILL EAT LOCAL FRUITS, GRAINS & VEGETABLES ☐	**DAY 22** I WILL CHOOSE PAPERLESS OPTIONS FOR BILLS ☐	**DAY 23** I WILL WALK FOR AT LEAST 1 KM OF THE TOTAL TRAVEL PLANNED FOR TODAY ☐	**DAY 24** I WILL SWITCH OFF UNNECCESSARY LIGHTS/FANS AT HOME/OFFICE ☐	**DAY 25** I WILL KEEP MY MOBILE DATA AND WIFI OFF AT NIGHT ☐
DAY 26 I WILL BE MINDFUL OF WASTE SEGREGATION ☐	**DAY 27** I WILL FINISH LEFTOVERS IN MY FRIDGE AND WASTE NO FOOD ☐	**DAY 28** I WILL MINIMIZE USAGE OF AC AND KEEP IT BETWEEN 24-26 DEGREE C ☐	**DAY 29** I WILL CARRY A REUSABLE WATER BOTTLE WHENEVER I STEP OUT ☐	**DAY 30** I WILL HANG DRY MY CLOTHES ☐

MY SCORE: ...../30

Haryana becomes 'Har Ghar Jal' state

Amita Bhaduri

The central government on February 9 informed the Rajya Sabha that Haryana has become a 'Har Ghar Jal state' as all the 30.41 lakh rural households in the state have tap water supply in their homes. Out of 19.39 crore rural households in the country, 11.12 crore (57.36 per cent) households are reported to have tap water supply in their homes.

The minister also mentioned that the Government of India is implementing Jal Jeevan Mission (JJM) – Har Ghar Jal, since August 2019, in partnership with states, to make provision for potable tap water supply in adequate quantity, of prescribed quality and on regular and long-term basis to every rural household by 2024.

"Under Jal Jeevan Mission, as per existing guidelines, Bureau of Indian Standards' IS:10500 standard is to be adopted for ensuring safe drinking water supply. Under JJM, while allocating the funds to states and UTs, 10 per cent weightage is given to the population residing in habitations affected by chemical contaminants.

"States and UTs have been advised to plan and implement piped water supply schemes of bulk water transfer based on safe water sources such as surface water sources or alternative safe groundwater sources for the villages with water quality," the Minister said.

"Since, planning, implementation and commissioning of piped water supply scheme based on a safe water source may take time, purely as an interim measure, states and UTs have been advised to install community water purification plants (CWPPs), especially in Arsenic and Fluoride affected habitations to provide potable water to every household at the rate of 8-10 litre per capita per day (lpcd) to meet their drinking and cooking requirements."

States and UTs have been advised to undertake testing of water quality on a periodic basis such as once in a year for chemical and physical parameters, and twice a year for bacteriological parameters and take remedial action wherever necessary, to ensure that the water supplied to households is of prescribed quality, said the MoS.

"To enable states and UTs to test water samples for water quality, and for sample collection, reporting, monitoring and surveillance of drinking water sources, an online JJM – Water Quality Management Information System (WQMIS) portal has been developed. (ANI news service, The Print)

India announces $4.3 billion investment in clean energy

The Indian government has pledged to invest $4.3 billion (350 billion rupees) in green technology to clean up the country's economy and create jobs. In the announcement, Indian authorities included a focus on solar power from the Himalayan region of Ladakh and green hydrogen production.

Despite its low per-person emissions, India's huge population makes it the third-biggest emitter in the world. The country has pledged to reach net zero by 2070. "We are implementing many programmes for green fuel, green energy, green farming, green mobility, green buildings, and green equipment, and policies for efficient use of energy" said finance minister Nirmala Sitharaman presenting her government's annual budget recently.

The government promised to invest towards the country's energy transition and its net zero target. The petroleum and natural gas ministry will oversee investments. The government will subsidise private-sector projects for battery energy storage. This technology can store electricity from intermittent power sources like renewables so that it can be used when the sun isn't shining or the wind isn't blowing.

The government said it will also look into pumped storage, a way to store energy using hydropower. When electricity is abundant, it is used to pump water up into a dam. When demand surges, the water can be released, producing hydro-electricity.

The budget also touted the recently-launched national green hydrogen mission. The government will spend 197bn rupees ($2.4 bn) developing the carbon-free-fuel, which can replace fossil fuels in the manufacture of steel and in shipping and aviation. Most of the money will be spent on incentives to produce hydrogen with renewable electricity and to build Indian electrolysers, the machines which turn water into hydrogen.

India aims to produce five million metric tons by 2030. The International Energy Agency (IEA) has said that, for the world to limit global warming to 1.5C, it should produce about 100m metric tons of green hydrogen by 2030. (Climate Change News)

NGT directs Chennai Corporation to take measures against dumping of sewage in water bodies

The National Green Tribunal's (NGT) Southern Bench has directed the Greater Chennai Corporation (GCC), Chennai Metrowater authority and other local bodies to take stringent action against dumping of sewage in open water sources.

The NGT directed these bodies to stick to the guidelines framed by the Tribunal for sewage treatment plants in Chennai on removal of septage from unsewered areas. It also directed the local bodies to regulate the movement of sewage tankers under local body limits.

The guidelines of the NGT were framed by Judicial member, Justice Pushpa Satyanarayanan and expert member, Dr Sathyagopal Korlapati under the Municipal corporation, Municipalities and the Chennai Metropolitan Water Supply and Sewage Act of 1978 along with the GO of January 2, 2023.

The issue of private tankers dumping sewage into open water sources comes under the purview of the guidelines formulated by the NGT. In its study, it also looked into whether the infrastructural development matched with the expansion of the city.

Talking to IANS social activist R. Ashok Kumar said: "NGT is doing a great job in curtailing the menace of

trucks dumping sewage in water bodies and untreated sewage being dumped by companies into water bodies. However, it has to be seen whether the Greater Chennai Corporation and other local bodies conduct stringent monitoring. Ultimately at the execution level, it is the local bodies which have to act."

The NGT had earlier constituted a joint committee comprising of District Collector, TNPCB Chairman, PWD's Superintending engineer and a GCC official to look into possibilities of tracking vehicles licensed to transport sewage. (The Times of India, Daiji World)

NGT forms 9-member panel led by chief secretary to resolve environmental issues in Sundarbans

The National Green Tribunal (NGT) has constituted a nine-member Committee headed by the chief secretary for remedial action against the environmental degradation of the Sundarbans in West Bengal.

The bench headed by Justice Adarsh Kumar Goel in an order passed on February 7, 2023, stated, "we accordingly direct monitoring by a nine-member Committee headed by the Chief Secretary, West Bengal with Regional Officer, MoEF&CC Integrated Regional Office at Kolkata, Chairman State PCB, Member Secretary, State Coastal Zone Management Authority and District Magistrates of Purba Medinipur, North 24 Parganas and South 24 Parganas, Director, Sundarban Tiger Reserve and the State Wetland Authority."

NGT said the state authorities must ensure that activities, which are not permissible in the delta as per Coastal Zone Management Plan (CZMP), including hotels operating in 'no construction zone', are duly identified and prompt remedial action taken in a time-bound manner, which may be monitored at the highest level in the state. Similarly, SOP for the operation of vessels may be strictly enforced, the green tribunal noted.

It further stated that "in view of neglect by the state of sensitive matters, resulting in continuous and irreversible damage to the environment, wildlife and biodiversity, as found in the earlier order of this Tribunal, and since the matter is pending at least since 2014 without satisfactory and adequate action, there is need for monitoring at a higher level in the state administration".

The tribunal's direction came during the hearing on a plea against the inadequacy of remedial action against the environmental degradation of the Sundarbans.

Such degradation is inter alia on account of illegal constructions, operation of sea vessels, unscientific waste management, and delay in finalising Coastal Zone Management Plan, stated the plea.

The tribunal noted that the main grievance of the applicant is that there's been a huge delay in finalising the CZMP and no adequate action has been taken against unauthorised hotels, unregulated operation of vessels and brick kilns, as well as protection of mangroves, a tiger reserve and solid waste management. (ANI, The Print)

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Stockholm Water Prize-2010

Dr. Rita Colwell, America, USA

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.)

Dr. Rita Colwell, 76, is recognised as one of the most influential figures in water and health science and technology of this century. She has made an exceptional contribution to controlling the spread of cholera, a waterborne disease that infects 3 to 5 million people and causes about 1,20,000 deaths every year. Through her groundbreaking research, innovation, and decades of scientific pioneering work, she has defined our current understanding of the ecology of infectious diseases and developed the use of advanced technologies to prevent their spread. Their work has established the basis for environmental and infectious disease risk assessment that is widely used worldwide.

The Stockholm Water Prize Nomination Committee has mentioned in its citation that Dr. Rita Colwell's seminal contributions to solving water and water-related public health problems, particularly the work to prevent the spread of cholera, are of great global importance. Through research on physiology, ecology, and metabolism, Dr. Colwell further advanced the fields of mathematics, genetics, and remote sensing technology and is concerned not only with these bacteria but also with the prevention of other diseases in many developing countries.

In the 1960s, Dr. Colwell's research found that Vibrio cholerae, the causative agent of cholera, can survive in association with zooplankton. This led to the surprising discovery that some bacteria, including Vibrio species, can enter a dormant state and return to an infectious state when the nutrient conditions are favorable. This means that even when there is no disease outbreak, rivers, lakes and oceans can serve as breeding grounds for these bacteria. These findings overturned conventional wisdom and belief that cholera could only be transmitted from person to person, through the mixing of sewage with food or drinking water. As a result of their work, scientists are now able to examine whether there is an underlying relationship between changes in the natural environment and the spread of disease.

Defining the new climate of disease prevention:

Dr. Colwell has shown how climate change, extreme weather events, changes in ocean circulation, and other environmental processes can create conditions conducive to the spread of infectious diseases, and in doing so, she has created the potential for early strategies to reduce outbreaks. Her research in the Bay of Bengal, Bangladesh, demonstrated that warmer sea surface temperatures promote the growth of cholera-infected zooplankton and thus increase the number of cholera cases. She was the first to lead research experiments in the US on the effects of El Nino on human health and the aquatic environment. In the 1990s, Dr. Colwell was the first scientist to research the spread of infectious diseases and the effects of climate change. She also serves as a senior government health advisor to the World Health Organization and dozens of other international organizations, as well as developing policies on climate change adaptation.

Saving lives with low-cost and high-tech innovations:

Throughout her career, Dr. Colwell has worked at the forefront of science and technology, dedicating her life to creating practical solutions to

provide clean drinking water and protect human and environmental health. She has been instrumental in developing and leading the curriculum in bioinformatics, which combines biology, computer science, and information technology. This has led to rapid advances in the understanding, diagnosis, treatment, and prevention of many genetic diseases. She has also pioneered the adoption of remote sensing technology to track the spread of diseases globally. Dr. Colwell developed the first remote satellite imaging model to track and predict cholera outbreaks before they occur. This model has become a model for infectious disease surveillance and prevention used worldwide.

Lifelong Scientific Leadership:

Dr. Colwell was born in 1934 in Beverly, Massachusetts, USA. She has authored 17 books and covered 700 scientific topics. Dr. Colwell has worked extensively for many years in communities across South Asia and Africa, promoting community-based water security education and the dissemination of viable and cost-effective technological innovations. In the 1990s, during the cholera epidemic in Latin and South America, Dr. Colwell served as a national advisor to several countries. Her research into Vibrio cholera in hospitals and the shrimp industry in Ecuador saved countless lives. She was honoured by the national government of Peru for her work in developing drinking water standards and helping to formulate guidelines to prevent the spread of disease.

Dr. Colwell has held a number of advisory positions at US non-profit science-policy organizations, private organizations, and international scientific research communities. From 1998 to 2004, she was appointed by President Bill Clinton as the first woman to serve as director of the National Science Institute. She was inducted into the United States National Academy of Sciences in the year 2000. A passionate teacher, Dr. Colwell has special interests in elementary and high school science, mathematics, graduate science, and engineering education, as well as increasing the participation of women and minorities in science and engineering.

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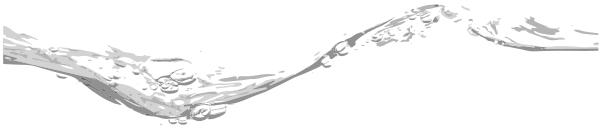

What Is Regenerative Agriculture And How Does It Work?

Regenerative agriculture is an approach to conservative rehabilitation of food and farming ecosystem. This approach focuses on increasing biodiversity, topsoil regeneration, improving the water cycle, supporting biosequestration, enhancing ecosystem services, increasing resilience to climate change, and strengthening the vitality and health of farm soil.

To simply understand, Regenerative agriculture is a system of farming practices that tries to enhance and maintain the entire ecosystem by giving attention to soil health, water management, use of fertilizer, etc. It is a farming method that focuses on agro-ecosystem and improves the resources used while farming. It is not any specific practice of agriculture. Instead, it is a combination of a variety of sustainable agricultural techniques. Recycling resources used in farms as much as possible is a practice. It also includes the use of compost.

Origin of Regenerative Agriculture :

The term 'Regenerative Agriculture' came into use by Rodale Institute in the early 1980s. Rodale publishing started publishing regenerative agriculture books in 1987 and 1988. Robert Rodale said,"By marching forward under the banner of sustainability we are, in effect, continuing to hamper ourselves by not accepting a challenging enough goal. I am not against the word sustainable, rather I favor regenerative agriculture." The term was not used by the institute in the late 1980s. It reappeared after the institute released a white paper in 2014 titled "Regenerative Organic Agricultural and Climate Change". This paper explains agricultural practices involving crop rotation, compost application, various organic

agricultural methods, etc.

Current scenario of Regenerative Agriculture :

With the expansion of the term, various books have been published on it, and several organizations have started promoting it.

Allan Savory launched the Savory institute to educate people about large farms and different land management methods.

A non-profit, Kiss, the Ground organization runs a series of media, education, farmland, and policy programs to make people aware of soil health and also helps and supports farmers interested in using regenerative farming methods rather than conventional ones.

The Union and State Government of India are also promoting regenerative agriculture. They aim to reduce the chemical fertilizers and pesticides in farmlands and to lower the input costs.

India's steps to promote regenerative agriculture

The National Project on Organic Farming

Systematic rice intensification

Zero-budget natural farming, which is now known as the Subhash Palekar Natural Farming

What are the different activities taking place under regenerative agriculture?

Dry sowing

Change in cropping pattern

Drip irrigation

Soil fertility inventions

Change in crop variety

System of wheat intensification, Line sowing

Sprinkler

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Sustainability award for restored Bansilalpet stepwell in Hyderabad

The restored stepwell at Bansilalpet in Hyderabad won the prestigious Big 5 Construction Impact Award in Dubai

Hours after the Minister for Municipal Administration and Urban Development K.T. Rama Rao threw open the restored stepwell at Bansilalpet

in Hyderabad, the project won the prestigious Big 5 Construction Impact Award in Dubai. "The award is dedicated to the skilled persons, craftsmen and the people who worked for the cause. The award is for the community of the area who accepted the positive change," said Surya Narayana Murthy of Kshetra after receiving the award.

The Award for the JV between architectural firm Kshetra which carried out the restoration work and the Rain Water Project which executed it was announced at a dinner gala at Dubai World Trade Centre late on Monday night. The stepwell project was named the winner of the Sustainable Initiative of Year Award. The Hyderabad team was picked from among 14 other projects in the category including some from China and Saudi Arabia in the Middle East Africa South Asia (MEASA) region.

The stepwell at Bansilalpet was disused and turned into a dumpyard in the area. The Rain Water Project led by Kalpana Ramesh stepped in and with the sustained involvement of workers of Greater Hyderabad Municipal Corporation and Hyderabad Metropolitan Development Authority, the team cleaned up the well. The architectural conservation firm Kshetra worked on the restoration of the project including the reconstruction of portions which had collapsed.

In addition to excavating and removing tonnes of trash over months, the small park has been incorporated into the well area to create a cultural space for the neighbourhood.

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Visit to Ferro cement Museum and Jalbodh Kendra at Karjat . Dist Raigad

Shri Ulhas Paranjpe - (M) 9820788061

Visit to Ferrocement Museum by 20 M.Tech Students [18 from Construction Management + 2 Structural Engineering] and 5 Staff of S.P.C.E.Civil Dept [Dr P.G.Gaikwad + Dr A. N Ghatge + Other 3 staff members] Andheri. on 8th February 2023

Er. Kulkarni explained about Ferrocement and it's applications.

I explained the purpose of Ferrocement Museum.

Lunch at Jalbodh Kendra at Mauli Hall Karjat

Post Lunch discussion

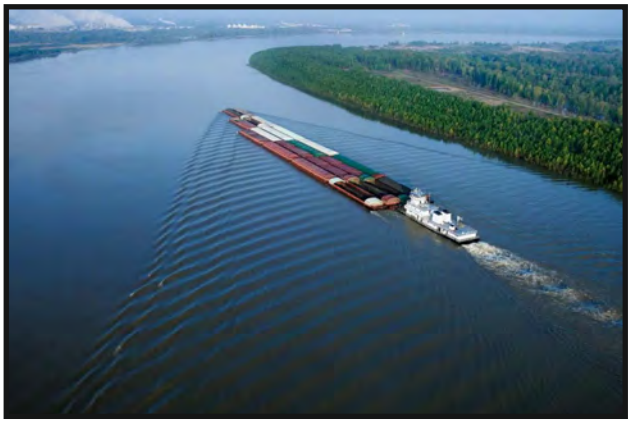
I explained Students and staff about Jalbodh Kendra and how we as a Engineer can give assured Water to Farmers with appropriate , cost effective & easy to replicate Ferrocement & Natural fibres Cement Technology after Lunch on 8th February 2023

Famous rivers in the world

(5) Nile river

(6) Mekong River

(7) Mississippi River



(8) Volga river

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