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Jalasamvad

A Dialogue on Water

Editors: Dr. Datta Deshkar, Shri Satish Khade

Cover Story:

First Farm-led Company in India Raises capital from Group of European Investors

Famous rivers in the world

(1) Colorado river

(2) Parana River

(3) Seen River

(4) Congo river

Jalsamvad

Mouth Piece of Bharatiya Jala Sanskriti Mandal

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  Shri Satish Khade - 09823030218
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Editorial .....

Vedas and Water

The subject of water has been treated spiritually, philosophically, cosmologically, medically and poetically in Vedas. Nature has given us five important gifts namely earth, air, agni, akasha and water. They are known as Pancha Mahabhutas in Sanskrit. These five bhutas, it is said, constitute the physical Universe. It is recognized that water and fire possess procreative power. Water is considered as Divine by Vedas and is believed to bring peace, happiness, wealth, long life and good health.

Rigveda attributes several Gods to water. Aap is addressed as God of Water. Indra, Varuna and Parjanya are the Gods who are directly or indirectly related to water. Parjanya represents water in the form of rains which sustains life on the earth. It is for this reason Parjanya is deified in Vedas. It is a common practice in India to immerse idols in water. People in our country anoint themselves with water.

As far as earth is concerned, in Vedas, earth was considered as an object of worship and not of exploitation. Earth was bhoomi for Indians and they treated it as their mother. According to Rigveda, it was considered to be the duty of every human being to protect the mother earth. Cutting the trees and disturbing the sky, according the them was encouraging pollution. Vedas wanted tigers to be preserved as they protected the forests.

It is water which gave stability to human life. Human beings settled on the banks of rivers as adequate water was readily available there. Water was associated with every event in human life, right from birth to death. No literature in the world praised water like the Hindu scriptures. In Vedic literature it is observed that people here could curse anybody with water and even bless anybody with water. While describing the earth, in most of the cases, the literature calls it sea clad i.e. it has a water cover. The mighty river Saraswati is praised as ocean like in Indian literature. Astrological research in the world has shown that Saraswati river civilization existed even before Indus valley civilization.

In the consecration ceremony of kings, it is noted in Vedas, seventeen types of water was used in order to infuse different kinds of vigour into the kings. This shows the importance of water in Vedic period. Those seventeen types of water were collected from different rivers in the country. Not only that, sea water, flowing water, water from the whirlpool, water collected while raining, water from ponds , water from wells, water from due drops was used while holding the consecration ceremony. Mantras chanted had the power to enrich the power of water.

Varah Mihir was a Water Man. River and streams, he states are as good as veins which are responsible for proper distribution of water. Some veins are larger and some smaller. On the same lines, he says, rivers work as larger veins and streams , the smaller. The concept of water cycle was known that time. Varaha Mihir has devoted five chapters of his famous work – Dagarkal -to describe the water cycle.

The concepts of efficient use of water, construction of dams and canals, lining the canals, construction of spill ways, protection of river and lakes banks, rules for fixation of rates for water use, measurement of slopes and flow of water, construction of wells, different types of wells, different sizes of wells, step wells, cold and hot water springs, types of trees, distances to be maintained while planting trees, different medicinal values of plants, estimating the ground water levels from the existing plants on the ground, methods to measure the rainfall, collection of statistical information to estimate the quantum of rainfall, classification of clouds, measurement of rainy days, quality of water, methods to maintain the quality of water, all these concepts have been dealt in details in Vedas.

The more you go deep, you learn the beauty of Vedas. There are so many translations of Vedas in English done by Englishmen. But in many cases, those translations distort the basic concepts. It is always better if you go to the original writings if you want to enjoy the reading.

Dr. D. G. Deshkar

Millions of farmers 'replumb' the world's largest delta

by University College London

An electric - powered irrigation well pumping groundwater to dry - season Boro rice fields in Bogra

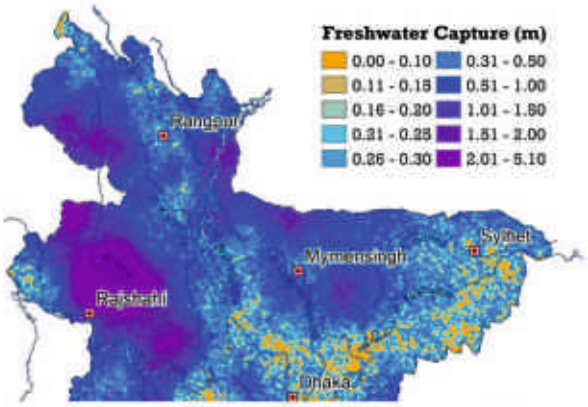
Collective groundwater pumping by millions of farmers in Bangladesh in the dry season each year has created vast natural reservoirs underground that, over a 30-year-period, rival the world's largest dams—these sustain irrigation that has transformed this previously famine-prone country to a food-secure nation, according to a new study led by UCL researchers.

Published in Science, the study explores the combined impact of 16 million smallholder farmers pumping shallow groundwater during the dry season to irrigate rice paddies in the Bengal Basin of Bangladesh between 1988 and 2018.

The study revealed that by lowering groundwater levels through dry season pumping, leakage from rivers, lakes and ponds replenishing groundwater was spurred during the subsequent monsoon. This capture of surface water not only allowed groundwater levels to recover but, in doing so, helped to reduce flooding.

Through this process, which the authors describe as "The Bengal Water Machine", more than 75 cubic kilometers of freshwater was "captured" over 30-years—a volume equivalent to the combined reservoir capacities of China's Three Gorges Dam and the Hoover Dam in the US.

They highlight this intervention as a sustainable alternative to conventional approaches to seasonal river flow storage for irrigation, including dams and reservoirs, which are challenging to construct in densely populated alluvial plains, like the Bengal Basin, that comprise extensive flat landforms of sand, silt and clay laid down by annual floodwaters.



Map showing estimated freshwater capture (meters) accuulated over the period of 1988 to 2018

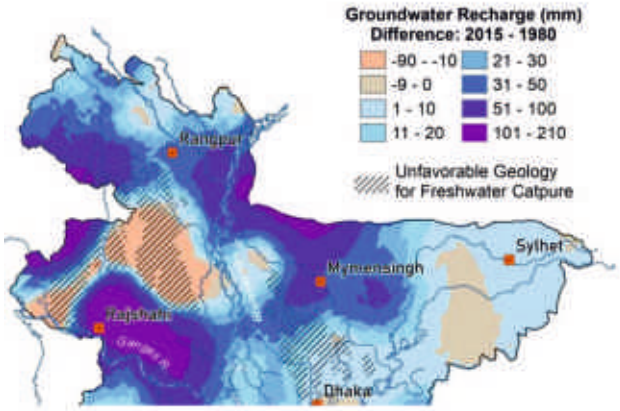
Co-lead author Dr. Mohammad Shamsudduha (UCL Institute for Risk and Disaster Reduction) said: "Despite substantial variations in annual rainfall and an overall decline in basin rainfall, this scalable, decentralized form of freshwater capture has sustained irrigated food

production since the 1990s.

"This novel intervention helps to address seasonal imbalances in rainfall by increasing the capture and storage of seasonal freshwater surpluses and mitigating the monsoonal flood risk without the use of dams."

The study authors argue that this simple intervention has the potential to be replicated across alluvial plains more widely, including other Asian mega-deltas such as the Mekong Delta and Huang He (Yellow) River Delta, which are similarly vulnerable to the impacts of climate change. This Bengal Water Machine could help to enhance global food security and resilience to climate extremes amplified by global warming.

Co-lead author, Professor Richard Taylor (UCL Geography) said: "Our analysis has profound implications for the expansion and optimization of this vital, under-recognized engineering marvel that sustains irrigated food production within alluvial plains of the seasonally humid tropics.



Map showing changes in groundwater recharge (millimeters) between the periods of pre development

"In a warming world, the demonstrated resilience of this conjunctive use of surface water and groundwater to hydrological extremes of the dry and monsoon seasons that are amplified by climate change is of strategic importance to global food security."

To calculate their findings, the researchers analyzed a million, weekly groundwater-level observations from 465 wells across Bangladesh, taken between 1988 and 2018 from a network of 1,250 monitoring stations.

Professor Taylor added: "Whilst previous estimates of the magnitude of freshwater captured have been hypothetical and based on modeled scenarios, this is the first study to quantify the groundwater volume based on observations, revealing its significant potential."

The authors note that their findings highlight the importance of long-term hydrological monitoring to assess the status and trends of a country's groundwater resources, which will become ever more important in the face of our changing climate.

An irrigation well pumping groundwater to dry - season Boro rice fields in Bangladesh Credit - Anwar Zahid

However, the research also highlights limitations to the operation of the Bengal Water Machine in areas of the country where leakage of water during the monsoon season is insufficient to fully replenish groundwater withdrawn during the dry season. In these areas, pumping depletes groundwater resources making these inaccessible to households reliant on shallow wells for drinking-water.

The authors therefore recommend that further research is undertaken to establish where in the Bengal Basin and other Asian mega-deltas

people can benefit from this nature-based solution to storing seasonal freshwater surpluses.

Co-author Professor Kazi Matin Ahmed of Dhaka University added: "It is vital to assess the suitability of locations for the operation of the Bengal Water Machine to maximize benefits to farmers and minimize the risks of groundwater depletion.

"The piloting of the operation in suitable areas is therefore needed before this can be upscaled more widely to address uncertainties in its operation to monsoonal variability under climate change."

More information: Mohammad Shamsudduha, The Bengal Water Machine: Quantified freshwater capture in Bangladesh, Science (2022). DOI: 10.1126/science.abm4730. www.science.org/doi/10.1126/science.abm4730

Aditi Mukherji, The "water machine" of Bengal, Science (2022). DOI: 10.1126/science.ade0393 , www.science.org/doi/10.1126/science.ade0393

Journal information: Science

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Stockholm Water Prize-2007
Prof. Perry L. McCarty, USA
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.)

The recipient of the 2007 Stockholm Water Prize was Prof. Perry L. McCarty of the USA. Sir Perry L. McCarty likes to think outside the box. But even so, he is always polite. Not only does he has a keen interest in septic tank activities, but he also has an unbridled passion for research and endless enthusiasm for constantly sticking behind the microscope to discover new things in the sustainable and healthy reuse of water resources.

Accepting the Stockholm Water Prize in 2007 from the King Carl Gustaf (XVI) of Sweden, he told the audience in his mild humorous style that the passions like his are not common among ordinary people. It should be taken rightly. Because, the pioneering work, that he is known for, in the design and operation of water and wastewater systems, is considered extraordinary.

His journey began at Stanford University nearly half a century ago, in 1962, when he entered the Ivy League that was working to develop environmental engineering and science programs. However, he did not confine his work only to the department of an educational institution, but extended it widely outside. Since starting his work at Stanford, Prof. McCarty's work has helped define the entire field of environmental biotechnology, which has become the basis for small-scale and large-scale pollution control and safe drinking water systems.

Prof. McCarty says of septic tank microbes "It's a community of organisms all working together that we need to study and learn more about. We certainly have a lot to learn about how to live together with each other's co-operation; maybe they can help us learn this better. We also have to adapt to the impending climate change and I am sure we will be able to do that successfully. If we all work together, I'm sure we can achieve it, just as the microbes in the septic tank have learned to do this together."

Author of over 300 publications and textbooks on biological processes used to control and eliminate environmental contaminants such as nitrogen and hazardous chemicals, Prof. McCarty's research has provided key insights into the movement and control of contaminants in groundwater and has opened new opportunities for water recycling and advanced wastewater treatment.

As an icon and active member of the academic and professional community, Prof. McCarty has held many positions in addition to his

roles as a teacher and researcher. He has held various past and present positions, including chair of Stanford's Department of Civil and Environmental Engineering, director of the Western Region Hazardous Materials Research Centre, and stints at the National Academy of Engineering and the American Academy of Arts and Sciences. Before receiving the Stockholm Water Prize, he has been honoured with several other awards. These include the 'John and Alice Tyler' Prize for Environmental Achievement in 1992 and the 'Ashleigh Richardson Irwin Clarke' Award in 1997 for excellence in hydrology and technology.

His entire decorated career in engineering solutions is dedicated to the better use and protection of people and water resources, and it should be a lesson to all that we can't afford to waste water the way we do. Therefore, for this to change we must change our attitude towards these resources of ours which is very necessary.

What we call so-called 'wastewater' is not waste at all, but has great value to society, which we waste on a large scale. Achievements such as reduced pollution of groundwater resources and better application of scientific and natural process understanding, to which Professor McCarthy's work has contributed greatly, provide countries with the ability to clean up and efficiently reuse these precious water resources.

Prof. McCarthy, while in Stockholm to receive the award, offered an advice to nations and scientists seeking sustainable solutions for generations to come. Never straying from his passionate love for the microscopic worlds that reside in sewage and the endless innovations discovered in microscopic organisms, he aspired for all to learn from this tiniest of sources.

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First Farmer-led Company in India raises Capital from Group of European Investors

Sahyadri Farms Post Harvest Care Limited raised Rs.310Crs (almost EUR 40 million) growth capital from a group of impact-focused investors. Incofin, Korys, FMO and Proparco see Sahyadri Farms well-placed to help farmers run their businesses in a more profitable and sustainable way.

India is a country with an aspirational, young population (74% of the population is younger than 45 years) focused on enriching their lives through hard work and entrepreneurship. At the same time, the country faces challenges like inequality (gender, education, family wealth), outdated technology, inefficient supply chains, and lack of access to capital. The country is witnessing a strong movement towards entrepreneurship to help solve these multidimensional problems the country faces.

Sahyadri Farms is a good example of rural entrepreneurship providing end to end solutions to small and marginal farmers.

In 2010 a group of 10 farmers took the initiative to collectively produce and export fresh grapes to Europe. That initiative has grown into the leading fruits and vegetable export and processing company that Sahyadri Farms is today, servicing over 18,000 farmers, covering more than 31,000 acres and 9 crops. The company walks with its farmers from their choice of crops to the farming practices they employ, from the inputs they use to how they harvest and sell their agricultural products. The company for example offers a digital platform that informs farmers on high yield crop varieties, farm inputs, real time climate information and access to the market place.

The economic and social impact of Sahyadri for these farmers is significant. Namdeo Pawar is one of them: "In 2012, I was on the verge of selling my land. Sahyadri supported me, helped me get back up, and I pushed myself to return to work. Through Sahyadri, my income increased. In 2014, I even repaid my bank loan." Also for farmer Anil Dawre working with Sahyadri Farms brought about a turnaround: "I farm on less than one acre, because a part of my land is taken up by my home and an animal shed. Group farming turned out to be a success. My parents never imagined their son's

produce would travel abroad. Their joy knows no bounds."

The capital coming from Korys, FMO, Proparco and Incofin is intended to further grow the farmers' companies. Sahyadri Farms wants to expand its processing capacity for fruits and vegetables-based products, set up a biomass plant to generate electricity from process waste and enhance its infrastructure, like packhouses.

Vilas Shinde, founding farmer and Managing Director of Sahyadri Farms: "The idea of Sahyadri Farms is to unite farmers and make them think like professional entrepreneurs. We are building a sustainable, scalable, and profitable organization for all our stakeholders by making farming profitable and viable activity for each small and marginal farmer."

Michael Jongeneel, CEO of FMO: "We are very happy to have found a long-term partner in Sahyadri Farms to support smallholder farmers in India. We are impressed by Sahyadri Farms' ability to identify and deliver exactly the help farmers need to make their business flourish. We expect this first international equity investment in a farmer-led organization in India to help Sahyadri Farms reach even more farmers and set a blueprint for further growth in the industry.''

Alpen Capital acted as exclusive strategic advisor to Sahyadri Farms for this transaction.

About Incofin Investment Management

Incofin is an independent emerging markets focused impact investment fund manager, focused on financial inclusion, the agri-food value chain and safe drinking water, driven by a purpose to promote inclusive progress. Incofin IM is an AIFM licensed fund manager and has over EUR 1 billion in assets under management. Incofin has a team of more than 80 professionals spread over its headquarters in Belgium and local investment teams in India, Colombia, Kenya and Cambodia.

As a leading impact investment firm, Incofin has invested (via equity and debt financing) over EUR 2.7 billion in more than 320 investees, financial institutions and SMEs in the agri-food value chain, across 65 countries in Asia, Africa, Latin America and the Caribbean and Eastern Europe.

About Proparco

Proparco is the private sector financing arm of Agence Française de Développement Group (AFD Group). It has been promoting sustainable economic, social and environmental development for over 40 years. Proparco provides funding and support to both businesses and financial institutions in Africa, Asia, Latin America and the Middle-East. Its action focuses on the key development sectors: infrastructure, mainly for renewable energies, agribusiness, financial institutions, health and education.

Its operations aim to strengthen the contribution of private players to the achievement of the Sustainable Development Goals (SDGs) adopted by the international community in 2015. To this end, Proparco finances companies, whose activity contributes to creating jobs and decent incomes, providing essential goods and services and combating climate change. For a World in Common.

About Korys

Korys is the investment company of the Colruyt family. Today, it has more than EUR 4.5 billion of assets under management. Besides holding a significant participation in the Colruyt Group, a leading retail company in Belgium and France, it actively manages participations in privately held companies and in private equity funds. Korys has also set up proprietary funds to manage its portfolio of listed investments. Across

its activities, Korys' investment decisions are taken with a long-term perspective and on basis of strict economic (Profit), social (People) and ecological (Planet) criteria. Korys aims to create sustainable value in 3 major ecosystems: Life Sciences, Energy Transition and Conscious Consumer. To do this, Korys can count on a motivated team of 30 professionals based in Belgium and Luxemburg.

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Estimating Land Loss in River Deltas

The famous bird's-foot delta of the Mississippi River is losing land in most areas but gaining in others. Photo credit: NASA/GSFC/METI/ERSDAC/JAROS, and US/Japan ASTER Science Team

This story by Mohammed El-Said originally appeared in EOS and is republished here as part of Covering Climate Now, a global journalism collaboration strengthening coverage of the climate story.

Home to hundreds of millions of people worldwide, coastal deltas are vulnerable to sinking due to multiple factors such as sea level rise, land subsidence, and the decline in sediment supply.

Austin Chadwick, a postdoctoral associate at St. Anthony Falls Laboratory at the University of Minnesota, explained that rivers naturally fight back against land loss by depositing sediment carried from upstream. Engineered features such as dams, as well as natural phenomena like course changes, can reduce the sediment available to river deltas, slowing deposition and hindering the river's ability to counteract land loss.

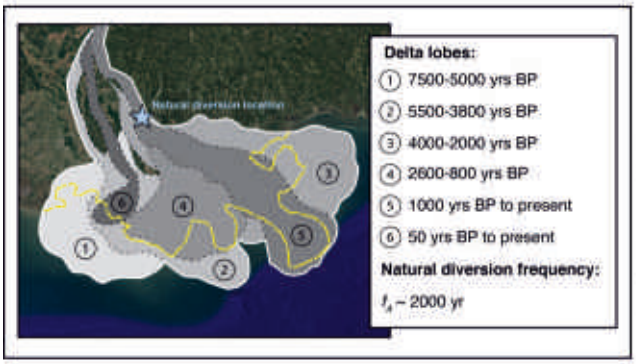
The authors found that the amount of land lost is actually greater than expected. "This is because traditional techniques have not accounted for the fact that rivers change course over time," Chadwick explained. "When rivers change course, they temporarily build land that later drowns after the river changes course again. This process leaves less of the river's sediment resources available to sustain the persistently dry and habitable land, leading to more extensive land loss."

According to the new study, sufficient river sediment is not being delivered to keep delta land dry in the face of sea level rise. The results were published in the Proceedings of the National Academy of Sciences of the United States of America.

Delta Lobes

To estimate deltaic land loss, Chadwick and his colleagues developed a model and conducted an experiment. They built a simulated river delta in the laboratory and captured images of sediment flow each minute over the course of 105 hours and four phases of successive sea level rise.

The researchers focused on delta lobes, wetland formations that perpetually form and disintegrate over time. "It is known that delta plains are built from multiple delta lobes, typically with one active at a time," explained Benjamin Cardenas, an assistant professor of geosciences at the Pennsylvania State University who was not involved in the research. Thus, at any given time deltas are expected to gain land in some areas (the active lobe) and lose land in other areas (the inactive lobes).



The Mississippi River delta plain is composed of multiple lobes. Each lobe was built by a different path of the Mississippi River, which has naturally diverted its course about every 2,000 years (see inset). Photo credit: Austin Chadwick / EOS

Accordingly, the authors modeled sediment deposition to occur on a single active lobe at a time, instead of modeling an even deposition across dry land at delta plains. "This is important because the assumption is more realistic (and agrees with a physical experiment), and it significantly increases the predicted percent of land loss in a number of real delta systems where people live," Cardenas said.

The process of deltaic land loss and land gain takes years and even decades to occur and depends on factors independent of sea level rise, although the authors maintain that phenomenon is the most important.

Changing Course

Another important factor contributing to deltaic land loss and gain is how frequently rivers change course. This frequency varies from delta to delta but is typically between every 10 years and every 1,000 years. Knowing when the river will jump course is very important because after changing course, the delta lobe hot spots of land building and land loss shift.

"We developed a new modeling tool that accounts for rivers changing course during sea level rise. Using this tool, we present improved sediment budgets for deltas across the globe. For a given delta, the budget tells us how much sediment is needed — and how frequently the river must be allowed to change course — in order to keep coastlines stable," said Chadwick.

Vamsi Ganti, an assistant professor of geomorphology and land surface processes at the University of California, Santa Barbara, also noted the tool's ability to isolate the effect of river course changes, which he said had not been dealt with before. "So it is comparing results of land loss to the model that does not account for river jumping." Ganti was not involved in the research.

Additionally, Ganti said that the study's extent of sediment supply required for sustaining deltas when compared to previous estimates "is really surprising."

"For example," he said, "the major deltas across the world, such as the Mississippi, Orinoco, Danube, and the Rhine, need as much as 3 to 10 times more sediment than is currently projected to be available to sustain the current dry land area."

Chadwick and his co-authors said their model can be improved by incorporating additional factors that contribute to deltaic land changes. Such factors include offshore processes such as waves and tides and biological factors such as the presence of mangrove forests. Ultimately, Chadwick said, the tool will help inform coastal management plans, which aim to forecast and mitigate land loss damages with engineered river diversions.

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Organization – International Development and Relief Foundation (IDRF)

Shri Vinod Hande - (M) 9423677795

'International Development and Relief Foundation' (IRDF) is Canadian Non-profit Organization. It is dedicated to link Canadian and Muslim communities with overseas development projects with both humanitarian emergency assistance and long term development projects. Their projects are based on Islamic principles of human dignity, self reliance and social justice. Foundation is working in Asia, Africa, Middle East, Eastern Europe and America.

IRDF was founded in 1984. Dr. Fuad Sahin, Muin Muinuddin and Ebrahim Sayed were founder members of IRDF. Since it's foundation from 1984 IRDF has been supporting those affected by wars and natural disasters, regions affected by grave poverty, injustice, illiteracy, preventable diseases. It is also working to secure long term sustainability for disadvantage people around the world. IRDF began in 1984 as the 'International Refugee and Relief Program' (IRRP) of the Canadian Council of Muslim Communities (CMCC) to address the need of more than ten million people who were displaced around the world as result of war and food scarcity. Around 80 percent of displaced people were Muslims. Dr. Fuad Sahin founder member of IRDF was honored with the Order of Ontario for services he has rendered to the community.

On June 12, 1986 IRDF was formed into a legal organization as International Development and Relief Foundation (IDRF) to tackle the root causes of poverty, food crises and violent conflicts at international level. By including "Development" in the name (initially it was IRRP) it changed the direction and mission of organization. From solely emergency humanitarian agency into an organization that concentrates on helping people at the community level after the natural and man made disaster and long term development to ease poverty, illiteracy and preventable diseases. In 2009 IDRF celebrated it's 25 year of foundation. In these 25 years IRDF implemented development and Relief projects in over 27 countries which helped millions of men, women and children.

Local experts, International NGOs and grassroots organizations are partners of IDRF which helps organizations to increase the effectiveness of project at the same time keeps project cost down. The following is a list of IDRF Canadian and Overseas partners.

Canadian Partners – few from list are American Federation of Muslims of Indian Origin (AFMI), Canadian Auto workers Association (CAW), Canadian feed the Children(CFTC), Canadian International Peace Project, Children of Islamic Nation(COIN), Hphe International, Development In Literacy(DIL), Harbinger Foundation, Islamic Centre of Southwestern Ontario, The Citizens Foundation. Etc.

Overseas Partners- This is also a big list. Few from list are. Action for Relief and Development Assistance (AFREDA)- Tanzania, Al-Islam Foundation- Sri Lanka, Al-Shifa Trust Eye Hospital- Pakistan, Azhar-al-Bekka-Lebanon, Bangladesh Women Chamber of Commerce and Industry (BWCCI), Bihar Viklang Kalyan Parishad (BVKP)– India; BOMU Medical Center (BOMU) – Kenya; Canadian Feed the Children(CFTC)-Canada; Central Islamic Organization of Guyana (CIOG)– Guyana; Community Coordination Initiative (CCI) – India, Modern Educational Social and Cultural Organization (MESCO) – India; Sarvajanik Medical

Trust (SMT)– India, Rural Women's Development Society (RWDS) – Palestine, Zindagi Trust – Pakistan, Village Education Research Center (VERC) – Bangladesh etc..

IDRF gets financial support and guidance from Canadian International Development Agency'(CIDA). Following is the list of some IDRF projects which have been supported by CIDA,

• Burma- Cyclone Nargis Emergency Relief for affected communities.
• Sri Lanka- Kalmunai Tsunami Recovery.
• Sudan- 2006-2008- Assistance to Internally Displaced Persons in Darfur.
• Bangladesh- 2007-2008- Cyclone Sidr Emergency Relief Program.
• Iraq- 2002-2004 Health Provision and clean water. Afghanistan- 2002-2007- Sustainable livelihoods in drought affected area.

Since 1984 IDRF has implemented relief and development projects in South and Southeast Asia, Africa, Eastern Europe and middle east through their ten point program. Zeib Jeeva, is the CEO and Chairman of IDRF.

1) IDRF's Water and sanitation program

This Water And Sanitation Program(WASH) of IDRF provides access to safe drinking water, adequate sanitation facilities (washroom and washing stations) and hygiene education for women, men and children to keep families healthy and break the cycle of poverty.

Impact

• Provided safe drinking water to nearly 20000 Gaza children since 2013.
• Distributed 870 household water filter systems after 2015 earthquake in Nepal.
• Installed 287 hand pumps in Pakistan that provided 13300+ people with clean water.
• Constructed two community water distribution points in Tanzania that serving more than 12000 people.

2) Water wells / Access program

Water is essential for survival. The global water crises is one of the leading causes of death due to water borne diseases. An estimated two million people die every year from diarrhea related diseases. Slogans of IDRF are,
1) Build a well, build a community
2) Build a well, change their future today.
3) No matter how small the amount, contribute to a

well.

In order to ensure clean drinking and cooking water IDRF distribute water to schools, building wells and install hand pumps. IDRF also provides training on the proper use and maintenance of these pumps.

Pakistan- IDRF installing 220 hand pumps in more than thirty villages in drought affected dist of Tharparkar to make water available to 16800 people.

India- IDRF on Indian situation. Water scarcity is an ongoing issue in the villages of India. India faces a serious and persistent water crises due to growing imbalance of supply and demand, poor water resource management and climate change. India to face severe water stress by the year 2050.

IDRF is working in the Thar desert region in Rajasthan. The Thar desert is one of the most arid desert in the world. Due to it's climate frequent droughts causes a major loss in agricultural produce and accessibility to clean drinking water. Organization will serve 10 villages through innovative solutions like rainwater harvesting, purification, vegetation improvements and capacity building. According to IDRF one water well provides water to 75 people.

3) Sanitation facilities program

Having a safe and private place to take care of personal needs is an essential factor of public health. IDRF constructed fully functional sanitation facilities, which include pit latrines, bathrooms and hand washing places. Training also is provided by IDRF for maintenance of these places.

Mali- IDRF constructed 16 household latrine to serve 130 people.

Pakistan- IDRF constructed 36 latrine for 80 houses in Sindh region which will benefit 640 men, women and children. Another additional 80 will be constructed in Tharparkar dist. where open defecation causes serious health concern.

4) Hygiene Education program

Contaminated water is a primary source of poor health so knowledge about keeping water clean is life saving. IDRF provides hygiene education to communities as well as training to sanitation workers and water committee members. These members then pass this message to other society members.

Why to support IDRF's WASH programs

• 750 million people in the world do not have access to safe water and 2.5 billion people do not have adequate sanitation. More than 500000 children die every year from diarrhea caused by unsafe water and poor sanitation.

• Water is essential for survival and for peace. Water scarcity leads to reduced food production, mass displacement, weak livelihood and danger to public health. Water scarcity leads to community conflicts.

• In many communities, women and girls are most affected by water scarcity. Women and children spend an approximately 140 million hours each day collecting water from unsafe sources for their families. Women do not have a safe place for sanitary practices. IDRF WASH consider the needs of all members of the community, make access and educate them through their programs.

5) Health and nutrition program

IDRF provides food security to families in vulnerable regions around the world. They educate communities about nutrition and sustainable food access to tackle hunger and malnutrition and their impact. Because,

• 805 million people do not have enough food to eat.

• 21% of the population in Africa face hunger daily.

• 45% of deaths in children under five are due to poor nutrition.

Impact of IDRF

• More than 400000 people received food aid through IDRF in 2020.

• 2 million meals were delivered in 2020.

• Provided nutrition programs to 20000+ people mainly women and children.

• Ensure healthy breakfast to hundreds of students across South Asia.

6) School Nutrition Programs

In schools also IDRF provides healthy food options as well as education to children and their parents to improve the overall nutrition to young people.

In Pakistan IDRF is providing regular breakfast to 310 kindergarten students. Previously there were reports of children fainting during day due to lack of food. But now they are coming to class with higher energy levels and more prepared to learn.

In India IDRF provides healthy food and potable water to the students registered with their partners school in Surat. Children are learning about the importance of consuming nutrition food.

Why support IDRF's food & nutrition program, because –

Approximately 805 million people do not have enough food to eat. That is one in nine in world. Majority of them live in developing countries.

Global demand for food production is estimated to double due to soil erosion, lack of water, insufficient use of current agriculture land, conversion of forests into farm land. As resources

become scares, competition for access increases. This can result in mass internal displacement, conflict and instability.

7) Economic Development program

Economic development is also an important program of IDRF. Their program assists women, men and youth to come out from poverty to prosperity and self reliance. IDRF's vocational programs allow these people to develop skill to get employment. As per IDRF data,

1) 1.3 billion people live in extreme poverty,
2) 3 billion people live on less than $2.50 per day and
3) 1.3 billion women & children more affected.

IDRF strongly believes that economic development is directly linked to long term financial independence. That's why IDRF is trying to create more economic opportunities for sustainable development of communities. In their development programs they train people in such a way that they can get employment for their sustainable economic development. More than 7000 individuals getting employment every year through IDRF's economic development program.

8) Education program -

In view of IDRF, education plays pivotal role in eliminating poverty. Their education programs provide high quality education to children and youth that makes students employable. Aim of IDRF is to bring children out of poverty and improve their life. Across the world education is a primary right of every child. As per current data,

- 57 million children do not have a school to attend.
- 62 million girls do not attend primary or secondary school.

When a girl gets education she is six times less likely to be married as a child. They are more likely to have healthier children and most important is her children more likely to go to school. Education makes them employable and enhance their life. With the IDRF education programs more than 27000 students received educational in 2020.

9) Zakat

What is Zakat? Throughout the year and most particularly during the month of Ramadan / Ramzan, IDRF receives generous contributions designated as Zakat. Zakat is the Islamic welfare contribution for helpless people. It is obligatory upon the Muslim community not just to collect Zakat but to distribute it according to the guidelines set out in the Quran. Zakat helps world's most vulnerable people who are in need of basic support so that they can live with dignity. Zakat helps save lives and rebuild communities. IDRF's Zakat projects include water, food security and emergency responses around the world. As per IDRF Zakat builds hope, ambition, confidence, opportunities and lives.

10) Sadaqah

Meaning of 'Sadaqah' is charity. The concept in Islam is voluntary giving. It can be done out of compassion, love, friendship or generosity. It can be given to anyone and has no limits or guideline. At IDRF with both your Sadaqah and Zakat, vulnerable people of society get access to food, shelter, water, education, economic development opportunities and ability to live with dignity and to become self dependant. It is said in Islam by Prophet Muhammad that,

"Whoever provides relief to a person in this world, Allah will provide relief to them on the day of judgement".

To run so many programs worldwide and to help needy to lead sustainable life, IDRF needs financial support from society. IDRF accepts donation in dollars program wise fixed amount or recurring. IDRF accept Zakat also. Through the help of their donors and support from partners IDRF could reach 1141594 people in the world by their 108 projects in 27 countries. Impact of IDRF's programs is listed as below,

- 313754 people received health care service.
- 437172 people received food through food parcels and vouchers.
- 350974 people received clean water, hygiene and sanitation facility.
- 37157 people received educational support.
- 2537 people received support to start businesses.

Contact details of IDRF
23 Lesmill Rd., Suite 300,
North York,
ON M3B, Canada

Phone- +1866-4974373 or 416-497-0818
Email- office@idrf.ca
www.idrf.ca

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Pakistan collected $40 million from public to build dam, then spent $63 million on advertising it (News)

(Rs. 9 billion (or $40 million) was raised from the public for the construction of Diamer-Bhasha Dam but much more was spent advertising it.

As Pakistan experiences its worst flodding in years, the spotlight has turned to the country's overwhelmed dams. At the centre of the controversy today is the porposed Diamer-Bhasha Dam on the Indus River. The mega dam that was supposed to serve as the country's future lifeline has been caught in a scandal after it was revealed that Rs. 9 billion (or $40 million) was raised from the public for its construction - but much more was spent advertising it.

According to Pakistan's Parlimentary Accounts Committee (PAC), Rs. 14 billion or $63 million has been spent on advertising the dam, which is nowhere close to being completed.

The backstory :

Now for some context : In July 2018, Saqib Nisar, who was then the chief justice of the Supreme Court of Pakistan, made it his mission to work on the construction of the Diamer-Bhasha Dam on the Indus River. The dam has been proposed in the 1980's, but several issued prevented its constructions.

In 2018, Nisar came up with a plan to raise funds from the public donations that would go towards the construction of the dam. At first, several influential Pakistanis donated generously, reports Vice. The military gave up a portion of soldier's salaries to donate Rs.1 billion, while the

country's cricket team also contributed to the fund

Pakistan's former prime minister Imran Khan assument joint leadership of the fund, making it a joint venture to tackle the country's water scarcity problem.

The criticism and the controversy :

Saqib Nisar's plan to crowdfund the construction of a dam was widely planned. Even ordinary citizens of Pakistan donated their money, several high - profile personalities raised their voices to criticise it.

Rafay Alam, an environmental lawyer, termed the public fundraising campaign as ludicrous, according to Vice. He noted that there was no precedent for a sitting chief justice to start a public crowdfunding initiative.

But things came to a head when it became clear by February 2019 that there was still a gap of %6.3 billion between the amount raised and the amount needed to construct the dam.

A now - retired Nisar then stunned the public by announcing that the fundraising was not done to construct the dam, but rather to raise awareness. We never thought this money would be sufficient to complete the project. We wanted to create awareness and make people understand how important it is, he said, sparking widespread backlash from a stunned public.

After that, several Pakistanis opened up about how they regretted donating for the dam.

So why is the dam in the news today ?

A day before Nisar's shocking statement, Iqbal Ahsan, a member of the national assembly, has claimed that more money has been spent on advertising the dam than on its construction.

These claims now appear to have the backing of the Public Accounts Committee (PAC) of the National Assembly.

The PAC invited Nisar to brief the committee on the Diamer-Bhasha Dam Fund, reports Dawn.

Several members of the parliament have also called for an investigation into how the funds were spent.

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जलसंवाद हे मासिक मालक व प्रकाशक डॉ. दत्ता देशकर यांनी
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e-mail - dgdwater@gmail.com
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Ten famous lakes in the World (1)

Baikal Lake (Soviet Russia)

Dr. D. G. Deshkar, Pune - (M) : 9325203109

Baikal Lake is an ancient lake in the mountainous Russian Region of Siberia. It is on the Northern border of Mangolia. This is supposed to be the deepest lake in whole of the world. It is a fresh water lake in Asia. It is spread over 31722 Square Kilometers. Its average depth is 744 meters with a maximum depth of 1642 meters. Due to severe cold this lake is frozen from January to May every year. Length of this lake 636 kilometers and the breadth is 80 Kilometers. From these dimensions you can imagine how vast the lake is. If we consider the size of the lake from volume, 22 percent of the fresh water in all the lakes is in this lake. This Lake has a huge catchment area i.e. 560,000 Square kilometers. It has a shore length of 2100 kilometers. Total volume of water in this lake is 24,000 Cubic kilometers. Total area of the lake is 88,00,000 hectares.

If we consider from the point of view of age, it is the oldest lake in the world. Estimated life of this lake is 25 to 30 million years. Thousands of species of plants and animals are available in and around the lake. Tribes by name Buryat are settled on the banks of this lake. Raising goats, camels, sheep, cattle and horses is the main activity of the people living here. Temperature in the vicinity ranges between – 14 degrees (winter) centigrade to 19 degrees centigrade (summer). UNESCO has declared Lake Baikal as World Heritage Site. Lake Baikal is in a rift valley where the earth's crust is slowly pulling apart. The rift is young and active and is widening by 2 cm every year. This zone is seismically active. Notable earth quakes take place very often. That gives rise to hot springs. Lake is divided in three basins- viz. North, Central and South. Average depth of these three parts is 900, 1600 and 1400 respectively.

Baikal Lake is surrounded by mountains. All the mountain ranges are protected as National Parks. There are 27 islands in the Lake. Incoming water flow is from 330 long and small rivers. The main are Salenga, Barguzin, Turka, Sarma etc. The main outlet to this lake is that of Angara river. Baikal is one of the cleanest lakes in the World. Water transparency is a sufficient proof of this cleanliness. During winter this transparency is around 30 to 40 meters. However in summer it is reduced to 5 to 8 meters. Water in this lake is very oxygen rich, not only at the surface but also in deep waters. Stormy weather is a very common feature near Baikal lake in summer and autumn which gives rise to high tides rising up to 4.5 meters.

Baikal Lake has rich bio diversity. It hosts more than 1000 species of plants and 2500 species of animals. This is based on just common man's observation. If studied scientifically these groups are believed to be much higher. Large variety of mammals is also found near the lake. More than 236 species of birds are found around the lake. 65 varieties of fish are there in the lake. The lake hosts rich fauna of vertibrates. More than 150 types of snails are located in the lake.

This lake has a long history of human habitation. Earlier, habitants used to call it a huge sea. Very little was known about this lake till Russia invaded in the 17th Century. The first explorer to reach Baikal lake was one Kurbat Ivanov in 1643. In 1631 first ostrog (church) was built at Brask. But in 1634 it was destroyed. It was reconstructed in 1638. Then onwards systematic efforts were

continued to bring the area under control. Siberian Railway was constructed 1896 to 1902. To reach to the south eastern part of Baikal nearly 200 bridges and 33 tunnels were constructed. In 1920 Great Siberian Ice march occurred when the retreating White Russian Army crossed the frozen Baikal lake. The wind on the exposed lake was so cold that number of soldiers died while crossing. In 1956 the famous Irkutsk Dam was constructed on the river Angara which was responsible to increase the level of the lake by 1.4 meters.

Several research works are being carried out on the lake Baikal. Major work is of course by the Government. There is one Baikalian Research Centre - independent research organization - which is carrying out environmental and educational research on the lake. In 2008 Russia sent two submersibles to descend to the bottom of the lake to conduct biological and geological tests of its unique ecosystem. Since 1993 neutrino research is being conducted at this deep water lake. One neutrino telescope is deployed in the lake at a depth of 1.1 kilometer. It consists of 192 optical modules.

This lake is named as the Pearl of Siberia. It has invited several investors from tourist industry. One group of investors has constructed 3 huge hotels near the lake shore. Government of Russia has declared this area as a special economic zone. In 2009 one adventure coastline track is constructed for the sustainable development of the region. In 1996 UNESCO has declared this as the world heritage site. One laboratory is being set up with an investment of 2.5 billion dollars which would give employment to nearly 2000 people near the city of Angarsk. In the lake, there is one island by name Olkhon. One ice road is created every year to reach to that island. It is kept open till the ice condition permits. This ice road is 60 cm thick and is open for the public from 9 am to 6 pm. Length of the road is 12 kilometers.

This lake is very famous for eco tourism. For this, there are two seasons, One is in the winter and the second one is in summer. In winter the ice depth increases up to 140 cm and walking on this surface is possible. Even vehicle driving is possible. Tourists come here. This season is popular for hiking, ice walking, ice skating and bicycle riding. There are various attractive ice formations worth seeing. The second season is summer when deep diving is possible. Some small boats also ply in the lake used by tourists for bird watching, animal watching and fishing. Water in the lake is too cold and that is why the tourists do not take the risk of swimming. Most of the tourists are from the country itself. But in recent years tourists from Europe and China have started pouring in.

Like other lakes in the world, pollution has started playing a major role in Baikal lake also. Environment advocacy began in early 1950s. From 2010 onwards 15000 metric ton waste material has flown in the lake. In 1966 a paper mill was started on the lake shore. The factory is responsible for the

pollution of the lake water as it puts chlorine mixed water in the lake. There was a huge protest from the environmentalists for the construction. But in spite of their opposition this plant came into being. However, later, this plant was shut down as it was not profitable. One company wanted to construct a pipeline which was to pass by 800 meters away from the lake shore. However, due to the public pressure this construction was stopped. In 2006 the Government decided to construct the first international uranium enrichment center at the existing nuclear plan. For this also there was a strong opposition from the people. But in spite of that pressure, the Government constructed this center in 2010. China was interested in erecting a huge water bottling plant at the lake shore. But the protests were so loud that the Government had to stop this activity also. Tourist vehicles are also causing huge pollution in the lake. They dispose nearly 25000 tons of liquid waste in the lake. Efforts are however being made to improve the situation.

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Waste to wealth : Bengalurus trated water holds new promise

For long limited by logistic bottlenecks and unfavourable perceptions, Bengaluru's treated wastewater could find new takers as researchers and civic stakeholders start to look at it as a viable solution to the city's freshwater concerns.

A grey to green project by the Centre for Social and Environmental Innovation (CSEI), in association with the Karnataka State Pollution Control Board (KSPCB), is on cue. The project envisions use of treated wastewater generated in apartment buildings for reening medians and parks. The pilot, done in the Yelahanka zone, involved a survey of around 70 parks.

Shreya Nath who leads CSEI's Green Cities initiative said only 25 % of the surveyed parks have storage facilities, We expect to submit a Detailed Project Report to the BBMP soon. The project, in its initial phase, will focus on the medians, Shreya told DH.

CSEI estimates that the Banglore Water Supply and Sewerage Board's centralised sewage treatment plants (STPs) and decentralised STPs installed in apartments and other buildings together generate 1,265 MLD (million litres per day) of treated wastewater in Bengaluru, of which 720 MLD is unused and discharged into drains and lakes.

Speaking at a workshop on wastewater reuse in Bengaluru last week, KSPCB member - secretary Srinivasulu said the adoption of treated wastewater could help replace substantial amounts of freshwater put to non-potable use.

Supply awaits demand

Tankerwala — the mobile app startup which helps people book freshwater through tankers — has also been supplying treated water to the construction industry for the past three months. The company now delivers about 1 MLD of treated water sourced from apartment STPs to its customers.

It conducts its own tests on the water's quality before it contracts partners for transporting it. The company also runs its won fleet of tankers. Shravanth Donthi, co - founder and CEO of Tankerwala, said an official certification for prescribed standards of treated water is a missing link. While top builders work with treated water generated from their own STPs, there is not enough awareness on its potential.

Contd..... on Page No 29

Scientists Warn Western U.S. Drought Could Be 'New Normal'

The floodgates of the Berenda Reservoir in Chowchilla, California, were completely dry June 21, 2021. Almost three-fourths of the Western U.S. is gripped by drought so severe that it' unlike anything recorded in the 20-year history of the U.S. Drought Monitor. KYLE GRILLOT/BLOOMBERG VIA GETTY IMAGES

By now, you've probably heard about the historic drought gripping the Western United States. Forecasts for wildfires, water shortages and bone-dry riverbeds abound. It's a scary situation, both for those living in the region and for those who don't.

Whether you live in the Southeast or the Northwest, you might have a few questions about this megadrought and its impacts. If so, you're in luck — that's what we'll be breaking down today.

What Is a Drought?

Though it may seem straightforward, it can be difficult to boil down to a simple definition — there's no magic number, be it inches of rainfall or water levels, that signals when a drought begins or ends.

"Drought can mean different things in different places," says Stephanie McAfee, an applied climatologist at the University of Nevada, Reno. "It can actually even mean different things to different people in the same place." But like many in her field, McAfee ascribes to a definition coined by the late climate researcher Kelly Redmond: Drought is "insufficient water to meet needs."

By most accounts, the current drought in the Western United States has been ongoing since the early 2000s. While it might not be the longest drought the region has ever seen (one in the 1200s lasted more than a century), it's one of the most severe. Water levels in the Colorado Basin and Lake Mead have hit new lows; Las Vegas didn't see rain for a record-breaking 240 days between April 20 and Dec. 17, 2020.

"It's really dry," says McAfee.

The tall bleached "bathtub ring" is visible on the rocky banks of Lake Powell at Reflection Canyon June 24, 2021 in Lake Powell, Utah. Lake Powell is currently at 34.56 percent of capacity, a historic low. The lake stands at 138.91 feet below full pool and has dropped 44 feet in the past year. The Colorado River Basin supplies water to 40 million people in seven Western states. JUSTIN SULLIVAN/GETTY IMAGES

The 'New Normal'?

The drought has gone on long enough that climatologists are considering new terminology for it. Some have proposed labeling it a "megadrought" to convey the scope of the situation. Others argue that the megadrought moniker still doesn't do this event justice. "Something that we might be looking at is actually more like aridification," McAfee says.

Aridification occurs when a region becomes permanently dryer. In other words, it marks a shift in the baseline for the amount of water that is considered "normal." As the effects of climate change play out, it seems that less rainfall in the Western U.S. might become the standard.

"I think it's accurate to say that that area, at least statistically speaking, has been drying out," says Curtis Riganti, an atmospheric scientist at the National Drought Mitigation Center at the University of Nebraska. "Connecting that to the dynamics of climate change I think makes sense."

As they become increasingly common, you might be wondering: What are some of the dangers associated with severe drought?

A tributary of the Sacramento River flows through a burn scar from the Carr Fire in Keswick, California. The largest reservoir in the California has plunged 400,000 acre-feet (the volume that would cover 1 acre to a depth of 1 foot) in April and May as the worst drought in decades grips the region, turning the area into a tinderbox.

KYLE GRILLOT/BLOOMBERG VIA GETTY IMAGES

An Empty Lunchbox and a Full Tinderbox

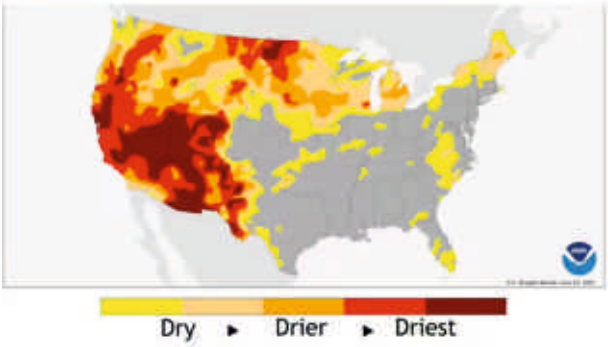
One of the most obvious risks is wildfire. We saw a series of horrific and devastating fires along the West Coast in 2020, particularly in California. This year, some areas of the Golden State have received as little as 11 percent of their typical rainfall to date, which could spark even worse burns than last year as the summer progresses. "We're already starting to see that crop up in some areas in June," Riganti says.

Another concern is food production. Agriculture is incredibly important to the economies of many Western states, including California, Oregon, Washington and Arizona. Common crops in these states — like almonds, wheat, avocados and apples — require lots of water to grow well, which can lead to shortages of those crop in times of drought. That's devastating to those states' economies.

And then there's ranching. With less rainfall in states like New Mexico, Nevada and Arizona, ordinarily lush grazing lands have suffered. "Ranchers have to bring water and food into specific areas for their cattle," says Erinanne Saffell, the assistant state climatologist of Arizona. It's contributed to a worldwide deficit in livestock feed.

But it's important to remember that drought isn't just a West Coast thing, says Riganti. Other areas are in the midst of their own drought. "I've been getting reports of crops struggling in parts of the upper Midwest," he says, "Northern Iowa, Minnesota, parts of Michigan, and then even up into parts of New England are all experiencing various levels of drought right now."

And that means everyone across the U.S. can expect to feel the effects of Western drought as it continues to ripple across rest of the country. For example, last year California wildfire smoke made it as far east as New York City and Boston, and potentially even impacted air quality in the Netherlands. On the economic side, smaller crop yields out West would likely drive up produce prices nationwide.



The colors in the U.S. Drought Monitor map show experts' assessments of conditions related to dryness and drought as of June 22, 2021. The map focuses on broad-scale conditions, so local conditions may vary.
U.S. DROUGHT MONITOR

Drought Mitigation Across the Nation

Despite our best efforts, human beings can't control the weather (yet). But is there anything we can do to help mitigate the effects of drought?

Yes, there is. First, don't waste water.

Water conservation is crucial to easing drought stress. If you live in a drought-prone area, simple things like turning off the water when you brush your teeth, taking a shower instead of a bath, or watering your plants at night to reduce evaporation all help save precious H2O.

Another one of the best ways to save water is to save electricity — it takes 15 of gallons (56 liters) of water in the form of coolant or steam to generate a single kilowatt-hour of power.

Second, pay attention to fire safety. "If there's a campfire ban in national forests, don't light a campfire. And if you're not allowed to shoot off fireworks for the Fourth of July, don't," says Riganti. Stick to cake rather than smoke bombs for your gender reveal party.

Third, switch up your landscaping. Planting drought-tolerant species, like aloe, lavender, artemisia or cacti, can greatly reduce your lawn's water needs. Having a less thirsty lawn means you'll have fewer thirsty people, and it can look beautiful as well. Another trick? "Mulching and composting," says McAfee. These techniques help keep soil wetter for longer, and can even produce a cooling effect on the surrounding environment.

Finally, if you live outside of a drought zone, consider buying less water-intensive foods. That could mean skipping out on almond milk, buying watermelon instead of apples, or opting for chicken instead of burgers at your next summer cookout.

None of these actions will fix the drought, but taken together they can reduce the risk that it poses to many people. "It's kind of like earthquakes," says Saffell, "We can't forecast an earthquake, but we can keep people safe from the impacts of that earth-shaking event."

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From 'open sewer' to 'success story' — how K-100 became Bengaluru's 'model' stormwater drain

SOWMIYA ASHOK

From 'open sewer' to 'success story' — how K-100 became Bengaluru's 'model' stormwater drain

Upgraded along the lines of Seoul's Cheonggyecheon canal, K-100 stormwater drain held up during the recent deluge in Bengaluru due to massive desilting efforts.

SOWMIYA ASHOK

A view of K-100, where the lettering on the wall marks it out as a space to be enjoyed by the public

Bengaluru: When intense rains reduced parts of Bengaluru into a sort of dystopian Venice earlier this month, with drenched people traversing the streets on boats, residents of some parts of the city found it much easier to wring themselves dry, thanks to a "model" stormwater drain.

Originating near the Majestic area and flowing into the Bellandur Lake (which flooded after the deluge) the Koramangala valley stormwater drain — or K-100 — is an outlier in a city known for its silt-filled drainage infrastructure.

Unlike most of its clogged counterparts, the 12 km drain (which is not fully rejuvenated yet) was able to do its job on the intervening night of 4 and 5 September when the city drowned in 131.6 mm of rain.

When ThePrint visited Tuesday, the area around the drain near Shanti Nagar bus station, which is the first phase of the project, looked scenic, with a spacious arena, attractive plants, and writing that read "Citizens Waterway" on the walls. Two men could be seen sauntering across a short bridge and along a walkway before ascending the stairs to the other side.

Just two or so years ago, the drain was not much more than a garbage-clogged sewer, but it got a new lease of life when the Karnataka government — inspired by Seoul's renewal of the 10.9 km concrete-covered Cheonggyecheon stream — decided to upgrade it, under the aegis of the Bruhat Bengaluru Mahanagara Palike (BBMP), the city's civic body.

K-100 before its rejuvenation | By special arrangement

The results have not been just aesthetic.

"The whole drain held up pretty well during last week's rainfall except maybe for one spot where the bund was incomplete," city

architect Naresh Narasimhan from the Mod Foundation, who conceptualised this BBMP project, told ThePrint.

The K-100 drain passes via KR Market, Shanti Nagar, Hosur Road, Ejipura, National Games Village, Koramangala, ST Bed layout and culminates at Bellandur. Its watershed spans 32 sq km, and it carries a twelfth of the city's sewage/runoff.

"The water was flowing nicely even while travelling through the old city. Now all the bridges are in one span, the waterway is clean, there is no silt or solid waste. People are also getting more disciplined and not throwing plastic into the drain since there are more tippers available along the stretch," Narasimhan added.

Today, the K-100 project is being held up as a pilot project that can be scaled up to help protect Bengaluru from floods. Since it flows through different strata of land use under a range of conditions, the project offers inputs on how to adapt it to various conditions in a city with a burgeoning population.

How the project started

In 2016, in a landmark judgment, the National Green Tribunal quashed the environmental clearance and plans sanctioned for a Rs 2,300 crore project on the Bellandur Lake wetland. Apart from staying the construction, the green court asked for 3.10 acres of lake land to be reclaimed and multiple rajakaluves or stormwater drains to be restored.

When the NGT ordered the de-concretisation of the drain's entire length, the civic authorities began mulling over ways to rejuvenate the stretch.

The BBMP took up the project to rejuvenate K-100 with the help of urban designers and architects at Bengaluru-based Mod Foundation.

According to B.S. Prahalad, BBMP engineering chief, Rs 150-160 crore has been spent on the project so far, which is aimed at "bringing back 32 acres of public space worth Rs 1200 crore". But the project was not without its difficulties.

When the team began work on rejuvenating the stormwater drain, it resembled an open sewer. There was lots of indiscriminate dumping of garbage, properties running alongside the drain emptied their waste directly into it, and industrial effluents mixed with sewage and rainwater.

"The biggest challenge which we faced in K-100 was reworking the pipe drainage system from open flow to piped flow. We were able to divert sewage away from the drains and 900 trucks of silt were removed," Prahalad said.

Eventually, he said, the team was able to restore the earlier gradient, which had changed because human waste flowing into stormwater drains had deposited 2 metres of silt. With this extra silt gone, the drainage system was able to flow smoothly.

"Before this, areas along the drain, including Koramangala, were getting flooded every year," he said.

Aerial view of K-100 gateway, towards KH Road in Bengaluru | By special arrangement

Restoring Bengaluru's 'water heritage', with public help

With Bengaluru urbanising at a fast pace, the original rajakaluves or traditional irrigation canals like K-100 have narrowed down and are choked with bottlenecks.

Prahalad believes that replicating the process used for K-100 in these canals could yield great results, but it will also need buy-in from the people.

"[K-100] is definitely a model. But first of all, the public should come forward and say that our rajakaluves should be sewage-free. If sewage is removed from stormwater drains, we can go in for

desilting and have an artificial river. If groundwater enrichment happens it will help in reducing floods and we can bring back the glory of the river system in this city," he said.

Nidhi Bhatnagar, an urban designer from the Mod Foundation, also said that the premise of the project was to connect the city and its people to their "water heritage", but that many are unaware it even exists.

"If you don't know there is a water body flowing in a specific place since it is fenced off, how do you even let people know that this is something that is theirs?" she asked.

For inspiration, the team looked at examples from China, Korea, and the Philippines.

One aspect that stood out was that public participation is a key aspect of the success of waterway renewal projects.

"What was interesting about the [renewal of the] Pasig River in Manila was that it was quite charged with public participation," said Narasimhan.

In the K-100 project, several city and state agencies worked together and collaborated to create awareness amongst people living on either side of the drain.

Now, communities contribute plants to the planters lined along the walls and enjoy the open spaces. In the years the project has been running, the team has seen a significant reduction of sewage and waste going into the stormwater drain.

"Unless you take out the sewage, the solid waste, and the silt out of existing drains, no scheme will work. All you have to do is this, and 80 per cent of the problem will be resolved," said Narasimhan. "Encroachment is one part of it. The real bigger problem is silt, solid waste and sewage and the need to keep widening the width of the channel as you go along."

Narasimhan added that sifting through examples from other countries revealed the importance of natural water systems to remediate drains and the use of artificial wetlands to clean and filter the water.

"This is an important thing we need to bring to India, it is called constructed wetlands," said Narasimhan. "We often assume that the only way to treat wastewater or liquid waste is through expensive membrane-based water treatment plants which need electricity and dosing of chemicals."

"The guiding principle of this project was that we have to move from a grey to a green infrastructure paradigm. We must bring the public into public infrastructure," the architect further said.

(Edited by Asavari Singh)

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From page no 23

With greated awareness, the demand will increase, the supply is already in place. We are building a database on treated water available with the apartments, Donthi said.

The Bangalore Apartments Fedaration (BAF) collaborates with CSEI on the Grey to green project. The cost of compliance makes it tougher (For STP installation in apartments). These apartment associations spend Rs.60 to 70 per litre as treatment costs. Instead of getting incentives for these efforts, they are penalised, Vikram Rai, general secretary, BAF, Said.

He said a lack of clarity in policy - making regarding standards to be followed and inconsistent adoption of technology provided by various service providers are challenges that need to be addressed before treated wastewater finds greater acceptance.

World Water Day-2009

Shri. Gajanan Deshpande, Pune

(M) : 9822754768

Trans-boundary Shared Waters and Shared Opportunities

(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.)

Every year on the occasion of World Water Day on March 22, the international community draws attention to the need for conservation and development of water resources. In the year 2009, the theme "Trans-boundary Shared Waters and Shared Opportunities" was specially chosen. It focused on problems related to lakes and river basins that cross the boundaries of two or more countries in the world.

The world's 263 trans-boundary international lakes and river basins cover 145 countries. They cover almost half of the earth's surface. Freshwater aquifers also flow across international borders through underground aquifers. Of those 263 lakes, nearly one-third are shared by 3 or more countries, while 19 are shared by five or more countries.

Many countries lack adequate facilities and resources for safe drinking water and sanitation. An estimated 880 million people still lack access to water of suitable drinking quality. They are at constant risk from unsanitary-related diseases. Poor quality water and lack of sanitation cause 1.6 million deaths worldwide every year. Most of these deaths occur in children under 5 years of age. It is a great example of the health threat posed by waterborne diseases. Although most deaths are due to these causes, many waterborne diseases are never even reported.

Every country is trying to meet its water needs from the limited water resources near it. However, some people think that in the future, conflicts between countries will flare up over water. But history shows that cooperation, not conflict, is the solution to international trans-boundary water disputes.

Hundreds of trans-boundary international water-sharing agreements have been successful despite the complexity of boundaries inherent in these 263 lakes of the world. Over 200 international water treaties have been signed in the last 60 years and only 37 cases of violence between nations over water have been recorded. There is a need to strengthen and create an enabling environment for cooperation that trans-boundary water management can provide. UNESCO and the United Nations Economic Commission for Europe and other organizations are working to ensure peaceful cooperation in this work.

Shared water is an important resource for many people around the world. Major shared rivers include the Nile, Tigris, Euphrates and Jordan. A number of lesser-known underground aquifers are also shared. Beneficial opportunities for mutual water use are also available to these countries.

There are some general principles of international water law, which have emerged from customary international law. These principles are seen as guiding principles for the commitments required to implement resolutions in international water agreements, negotiations or conventions. The principle of equality states that international law should not be biased in favour of any particular person or country. The principle that gives each country the right to use shared waters is limited by co-basin rights. Accordingly, countries are expected to use the resources of a single water body without significantly harming others. While the principle of equitable distribution provides fair and reasonable rights to countries in each basin, the principle of reciprocity states that when a country acts within its rights, it should expect similar behaviour from other countries in fulfilling its obligations under international law.

The world must learn how to share this precious resource effectively and fairly. This can be achieved through increased cooperation in managing water resources. UNESCO is helping to achieve this by bringing together organizations concerned with surface and aquifer water resources. Their multi-disciplinary meetings propose new legislative agreements, promote awareness campaigns and explore water disputes and alternative ways of resolving them. A number of studies are being conducted to highlight the benefits of trans-boundary cooperation in water resource management. The Blue Nile, Jordan, Mekong, Okavango and Inkomati river basins are examples of successful initiatives that bring benefits to all countries.

The Shared Water Partnership program provides a shared dialogue platform for strengthening trans-boundary water cooperation, through which cross-disciplinary knowledge and tools are acquired. Sustainable management of shared water provides opportunities for countries to prosper despite threats posed by environmental degradation and climate change. Good water management is very important in the current era of increasing water scarcity. This requires mutual cooperation with respect to shared rivers, lakes and aquifers in most parts of the world. This calls for raising awareness among the international community about the shared water partnership and the many benefits of cooperation in shared water resources.

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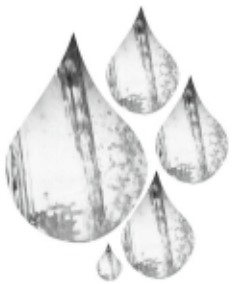
Note : While designing the issue of Jalsamvad - English we find very interesting news, information and articles specially on water and its management. That tempts us to include the same in our issues. Getting formal permission for this inclusion is that way difficult. Therefore our effort is to print 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.



Worldwide Droughts Uncover Ancient Relics, Ruins and Remains

This aerial view of the excavations in Iraq show how expansive the Bronze Age city that was submerged in the Mosul reservoir is. © UNIVERSITIES OF FREIBURG AND TÜBINGEN, KAO

Rising global temperatures fueled by climate change have caused catastrophic droughts from Arizona to Iraq. Lake Mead just outside Las Vegas, for instance, is the reservoir spanning the border between Arizona and Nevada, and the largest by volume in the U.S. According to the U.S. Bureau of Reclamation, Lake Mead was just 28 percent full Sept 5.

Lake Mead has landed in the headlines, not only because it is receding, but also because of what of what's been uncovered since: five sets of human remains.

Experts believe there could be more remains still submerged, most of which are likely innocent drowning victims, but it's almost certain there are a fair number tied to crimes, as well. On a less nefarious note, officials also discovered an unapproved boat ramp in the lake in August.

Lake Mead isn't the only body of water that's dried up and revealed some strange, hidden ruins and relics this summer. Take a look at some of the other surprises that were uncovered around the globe when the heat rose and the water receded.

1. Dinosaur Tracks in Texas

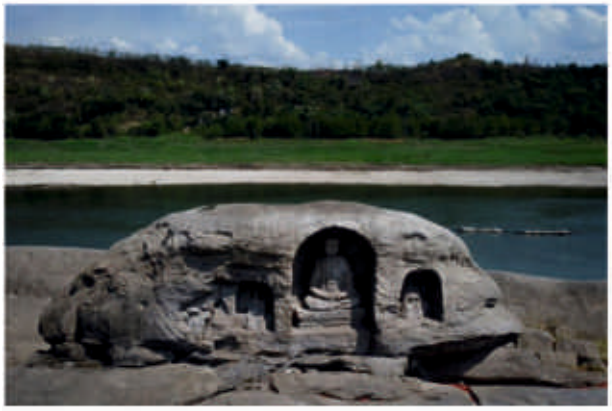
Dinosaur tracks are nothing new to Texas' Dinosaur Valley State Park. In fact, they're very, very old. But severe drought conditions on the Paluxy River uncovered quite a set of massive tracks in mid-August that are usually covered by water and mud. The tracks date back about 113 million years ago and prints likely belonged to Acrocanthosaurus, which was a huge theropod and probably stood 15 feet (4.5 meters) tall and weighed about 7 tons (6.3 metric tons). The tracks are in a limestone sediment that hardened.

Everything really is bigger in Texas, even dinosaur tracks like these that were recently revealed when drought conditions caused the Paluxy River in Dinosaur Valley State Park to dry up.
TEXAS PARKS AND WILDLIFE DEPARTMENT

2. Buddhist Statues in Yangtze River

In August 2022, the drought in China caused water levels to drop across the southwestern part of the country. In the Yangtze

River Basin, in fact, rainfall was 45 percent lower than it was in July, making conditions even worse. The plunging water levels exposed a formerly submerged island known as Foyeliang, which revealed three Buddhist statues estimated to about 600 years old. The statues are on the highest part of the island reef, thought to have been built during the Ming and Qing dynasties. At the time the discovery in mid-August, as many as 66 rivers in the region had dried up, but no other artifacts had made headlines.



meanwhile in china the yangtze river is so low that 600 year old buddhist statues appeared from the riverbed

3. Nero's Ancient Roman Bridge

In July 2022, water levels in the Tiber River in Rome, Italy, dropped low enough to reveal the remains of an ancient stone bridge. The bridge isn't exactly a new discovery; in fact, it's been visible during previous droughts and was already known as the Pons Neronianus, or the Bridge of Nero. Some historians believe the bridge was built by Nero when he was emperor of Rome between 54 C.E. until his death in 68 C.E. However, other experts believe that the bridge may have been built even before then, and that Nero rebuilt it at a later point.

4. Unexploded World War II Bomb in Po River

Another river in Italy, the River Po, also dried up during the summer of 2022. And what it was hiding just beneath its waters was a 1,000-

The remains of the ancient Bridge of Nero, near Ponte Vittorio, resurfaced after the drought-stricken River Tiber all but dried up in Rome, Italy. STEFANO MONTESI/CORBIS VIA GETTY IMAGES

pound (450 kilogram) bomb dropped during World War II. If that's not scary enough that bomb, mercifully, failed to detonate. Fishermen found the bomb on the riverbank near the village of Borgo Virgilio. The discovery prompted officials to shut down nearby air and river traffic until the scene was safely contained. In August, the unexploded bomb — which Italian military officials said had 530 pounds (240 kilograms) of explosives— was safely detonated after about 3,000 nearby residents were evacuated.

This unexploded bomb from World War II was found when waters on the Po River in Italy receded in August 2022

5. Lost City of Zakhikuan

German and Kurdish archaeologists found what they believe is a lost city estimated to be about 3,400 years old. The discovery was made in

Iraq when water levels at the Mosul reservoir in the Kurdistan Region dropped because of extreme drought. The site — described as "an extensive city with several large buildings" — is believed to have been Zakhikuan, an ancient center in the Mittani Empire (ca. 1550-1350 B.C.E.).

The German and Kurdish archaeologist teams excavated, measured and documented large buildings and artifacts from the Mittani period that they believe is the lost city of Zakhikuan.

6. Spanish Stonehenge

Water in the Valdecanas reservoir in Spain's province of Caceres dropped dramatically during one of the country's worst droughts in decades. And that delighted archaeologists because the receding waters exposed what's officially known as the Dolmen of Guadalperal, aka Spanish Stonehenge. The circle made of dozens of megalithic stones was first discovered by German archaeologist Hugo Obermaier in 1926, but the area where the monument is located was flooded in 1963. Since then, it's been visible due to drought just four times. Scholars believe the circle was erected sometime around 5000 B.C.E., though little is known about who built it or why.

The Dolmen of Guadalperal, sometimes also known as Spanish Stonehenge, is seen above at the Valdecanas reservoir, in late July 2022 for just the fourth time ever.

Now That's Interesting

You don't have to wait for a lake to dry up to find weird things; plenty of strange objects lie beneath bodies of water, too. For example, all sorts of weird objects are at the bottom of Lake McDonald in Glacier National Park, including a "graveyard" of yard tools. And at the bottom of Lake Michigan rests a huge marble crucifix that is visible from the surface when it's lit up by lights.

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Famous rivers in the world

(5) Rhine river

(6) Arkansas River

(7) Thames River

(8) Missouri river

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