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Jalasamvad

A Dialogue on Water
Editor: Dr. Datta Deshkar

Cover Story

Do we really need ground water for survival ?

Shri Ulhas Paranjape










Chilka Lake

Jalsamvad

Mouth Piece of Bharatiya Jala Sanskriti Mandal

■ **November 2023**

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Editorial .....

Who is responsible for farmer's suicide ?

In spite of several efforts, in last 20 years, farmer's suicides are increasing year by year. Central and State Governments are taking several measures to bring them in their control but their efforts are proving inadequate. Nature is also partly responsible for this. Climate change is responsible for the changes in the rainfall pattern and the cultivators are confused as how to adjust with these changes. Previously, both the crops, Kharip and Rabbi, could help the cultivators to maintain their livelihood. But now, due to the vagaries of Nature, there is no guarantee that cultivators would get reasonable income to maintain themselves and their farming activity.

Besides Nature, farmers also are responsible for this debacle. When there is a change in the climatic conditions, is it not necessary that the farmers should also adapt themselves to these changes? If they continue with the same age old practices of cultivation, failure of crops is bound to be there. Shed net technology helps the cultivators to maintain definite temperature and humidity. It is not expected from the famer to cover his entire land by shed nets. But a small portion of his land can be used for this practice enabling him to get at least that much income to maintain himself and his family. There are several farmers around Pune who have started following new practices where they earn nearly seven to eight lakhs of rupees from one acre of land. They are small farmers but only because they have changed their cultivation and marketing practices, they are reaping these benefits.

Few years before, cropping pattern followed by the cultivators was a multiple cropping pattern. There was an in built insurance facility. Of all the crops cultivated, at least some were successful guaranteeing definite income to the farmers. Now, the cultivators have resorted to a single crop pattern and if that crop fails, the entire farming activity miserably fails. This, I think, is the root cause of resulting frustration tending towards suicide.

Water is a very important input for the success of agriculture. Our cultivator pays too much of attention to procuring of good seeds, fertilizers, pesticides but pays very little attention to collect rain water. In fact, every farm itself is a water shed. If the rainfall is 700 mm, the total water available on the farm is 28,00,000 liters per acre. If efforts are made to store this water, that can be used as a buffer by the cultivator when there is a gap in the rainfall. You should not entirely depend on the Government for this. You have to build your own water resources if you want stability in cultivation.

Cultivation without understanding the market trends is landing the farmers in trouble. In case of tomatoes, when he gets one rupee per kilo, the consumer pays rupees 25 in the retail market. Can he not put his efforts to reach the customer directly and take the benefit? Is he under the impression he will get better price without any effort from his side? For getting better price, all the cultivators should form organizations so that they could have better control over the supply in the market. Prices are determined by price mechanism where demand and supply forces work. You are the looser if you do not have any control over supply. That control can be had only when the farmers come together.

Size of the farm also has become a major issue. Year after year, size of the farms is continuously decreasing as it is being distributed amongst the male and female children. If this continues, a time will come when each piece will be less than 10 square feet. Almost all the farms have become uneconomic holdings and sustenance on this small piece is not possible. In spite of this, the division is taking place every year. There are no efforts on the part of the Government and the farmer himself to stop this practice.

Some radical steps are necessary to save the farmer and also the agriculture.

Dr. D.G.Deshkar

Editor

Organization - Arghyam

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Safe, sustainable water for all is the slogan of Arghyam. Arghyam is an Indian public charitable foundation set up by Rohini Nilekani. Rohini Nilekani is one of the India's leading philanthropists and advocates on environmental issues. She is the wife of Infosys Technologies co founder Nandan Nilekani. Sunita Nadhamuni is the president of Arghyam. Arghyam Trust was founded in 2001 and is working actively in water sector since 2005. Arghyam is a Sanskrit word and it's meaning is 'offering'. They describe their mission as "Enough water, safe water always and for all".

Arghyam was appointed to manage Indian Water Portal by National Knowledge Commission of Government of India from 2005. The portal is an open web based platform for sharing knowledge, information and data on the water sector in India. Indian water Portal is available in regional languages for making water information and knowledge available in Indian languages. Arghyam offers project grants to innovative projects in the field of wastewater treatment & management in a rural and peri-urban area, groundwater management and novel solutions for improving sanitation. Organization seeks to support strategic and sustainable efforts in the water sector that improves fairness in access to water for all citizens. Arghyam is working with various partners that includes NGOs, research institutions and government agencies. Current project area of organization includes Integrated Domestic Water Management, Rainwater Harvesting, Groundwater Management and Water Quality.

Arghyam is working as a funding agency through partnerships with government, non governmental organizations and various types of institutions for projects issues of quantity, quality and access to domestic water in communities. It also started Indian water Portal an online forum through which information and best practices can be shared. Since it's foundation Arghyam is working in 22 Indian states on water security issues for vulnerable communities through 83 projects. Total direct beneficiary are 14.9 lakhs. Arghyam is based at Bangalore in Karnataka.

Why water and sanitation- Most of us take water for granted. It is available to us so easily that we forget that there are millions of people who do not have access to it despite the government's best efforts. India is the most populous country in the world according to recent report. 162 million do not have access to safe water. It is stated that India will become water stressed by 2025 and will fully utilize its water resources by 2050. Water management is a complex issue. For Arghyam bringing long term changes is the main goal.

Rohini Nilekani founder of Arghyam was talking about the foundation, she set up to address the problem of water in India at meet of "Joy of

Giving" over the challenges for managing water in India. Water is a such a key resources in ecology and economy. It is a renewable resource but used badly. Technically Delhi could be self sufficient in water, but our cities do not contain demand or reuse , we have high cost schemes to bring water from far away. We use it, pollute it and send it away. Water is a political issue in many part of our country. The NITI Aayog has set up several committees to rework the law and regulation and financing the water. So far Arghyam financed 85 projects across 22 states. We have contaminated our supplies so focus of Arghyam is from quantity to quality. As projects are financed by organization they should be of low cost because Arghyam looking for low cost innovations solutions to grow. At gram panchayats level there are very little means to solve their water issues more over corruption is a big issue. Villagers do not understand the connection between sanitation and public health.

Arghyam is having partnership with people and bodies who are driven by same vision of water for all. They work with individuals, government, non government organizations , research institutes and academic organization. This list is very big. All can't be mentioned here, even though few are listed below,

1) University of Agriculture Science- Bangalore, 2) Accountability Initiative, 3)ACWADAM (Advanced Centre for Water Resources development And management), 4) Aga Khan Rural Support Programme- India, 5) Institute for Rural Development-karnataka, 6) Biome Environmental Solution Pvt. Ltd., 7) Centre for Rural studies Manipal University, 8) Citizen Forum for Mangalore Development –Mangalore, 9) Environmental Law Research Society, 10) FXB India, Gandhigram Trust, 11) Gramalay- Tiruchirappali, 12)Indian Institute of Science, 13) Janasahayog- Karnataka d many more.

Resources – Arghyam's work in water and sanitation is rich in learning and deep in understanding. They have compiled a list of publications, annual reports, videos and presentations to share their vast knowledge bank.

Grants- They provide grants to NGO, Civil society organization, research institutions and govt. agencies at local, regional and national levels. Their grants cover activities such as development or restoration of water supply and sanitation infrastructure, capacity building in communities research, advocacy, events and communication. Aim of Arghyam is to strengthen the ability of ecosystem to enable water security for 100 million people by 2023.

Water Securities

Water security involves the protection of water sources and capacity building among communities on the sustainable use of water. Arghyam encourages sustainable and equitable access by implementing effective scientific principals. Arghyam support initiatives that prevent over extraction of groundwater, encourage water management method that includes , use of water sources and preserve traditional water conservation system.

PGWM (Participatory Groundwater Management)

PGWM is a collaborative program between Arghyam and their partner NGO to built a suitable model for groundwater management. PGWM is an aquifer based, community – centric approach that has emerged as an alternative for managing groundwater as a CPR. By definition groundwater is a common pool resource (CPR) but its management seldom reflects CPR principals. Arghyam launched PGWM in jan.2011 with ACWADAM, ACT, WASSAN and PSI. MPA also a partner of PGWM but they joined after 2011.

Internship program for Rural Youth and Student on groundwater management was conducted in Kutch dist. of Gujarat. ACT created an internship to train people from local communities to understand geohydrology better and plan water management on that. This program helped them to plan for management of groundwater on the basis of mapping and identification of aquifers with practical training in Mundra Taluka. Total 15 para engineer graduates were trained. Training program was of 45 days.

Another program was in Maharashtra that evolved water self Reliance through surface and Groundwater Sharing and management. Groundwater overexploitation is a major problem in many parts of India , specially in groundwater dependent dry region like Maharashtra. Villages with unexplored groundwater resources fall within dark zone category and therefore are not allowed to access to groundwater resources. The project was taken up by two partners of Arghyam in one village in Pune dist.. Partners were ACWADAM and GGP (Generation & Gender Program). ACWADAM with its good understanding of geohydrology and GGP motivated the people of the village to harness their water resources for common cause. The project illustrated the potential of participatory watershed management to address water security issues. Measure such as optimum usage of pumps, modified cropping pattern which could match water availability adopted. and raise productivity were adopted. Out come of project,

- ACWADAM conducted geohydrological studies over a period of 6 months on existing water sources, rainfall pattern, water quality.
- The Paani Panchayat model was adopted. Sustainable method of water utilization with priority to drinking water were developed.
- Over 10 Water User Groups (WUGs) with around 275 members were formed.
- Over 10 community lift irrigation schemes were completed.
- Over 10 self-help groups were formed.
- Around 6 old wells were deepened and over 12 wells were dug.
- Demonstrated to the govt. and groundwater agencies that aquifer boundaries do not match administrative boundaries and that water status needs to be based on mare detailed data so that villages which have not developed their groundwater potential do not get penalised because they are located in a dark zone.

Uttarakhand- Promoting Participatory Groundwater Management Principals in Himalayan Region. The Himalayan state of India of steep slopes and highly broken and fractured rocks which is not beneficial to the formation of large underground aquifers. Groundwater occurs in disconnected localized bodies in joint fractured zones. In this project to give unique groundwater situation in Himalaya PSI worked in collaboration with other NGOs, govt. departments and other academic. Villagers were taught to adopt PGWM to reduce water conflicts. The project covered three districts i.e. Sirmour, Pauri and Almora. This project also aims to incorporate aquifer management into watershed and drinking water projects.

Sikkim- Provision of safe Domestic Water through sustainable Development and management of water Sources in Rural areas of East and South Sikkim. Challenges of water scarcity have been recurring in Sikkim. Many springs/ ponds are drying or becoming seasonable. Discharge also declines during demand season. The aim of proposed project was to reduce drinking and domestic water scarcity in remote rain shadow (precipitation is blocked) areas of Sikkim. Out come of project,

- Hydro-geological assessment of water sources.
- Identifying important water sources and their type of land use.
- Documentation of traditional ecological knowledge.
- Spring shed development
- Civil works on development of water sources.
- Survey and preparation of a status report on drinking water and sanitation.
- Capacity building activities.

Springshed Water Management - Springs are the main source of water for about 200 million people in India. 80 percent of them are in Himalayan state and rest in Eastern and Western Ghats. Springs feed streams and rivers are critical mountain ecosystems. Throughout our country condition of these streams are sharply declining in terms of flow and quality. Arghyam started taking initiative in spring shed management work in 2007-08. They use scientific methods to recharge springs, moderate flood peaks and to enhance rainfall infiltration into the ground.

Water conflicts – In view of Arghyam Water conflicts in India are at bad state due to frame work of rules, policies and mechanisms to resolve and prevent them. In association with SOPPECOM, Arghyam has funded the forum for policy dialogue on water conflicts in India. The forum is of 250 individuals and organizations and working since 2008. The forum has completed two phases which involved conflict documentation, resolution and prevention in Chhatisgarh and karnakata states. Currently they are working to prevent conflicts.

Water Quality- Surface and groundwater can become unfit for human consumption due to different kind of contamination. Human activity and climate change can be a reason for water contamination. Arghyam proposes to go deep into the issue of water quality. They also support their partners in the creation of low cost, effective water purification system which provides safe drinking water for communities. Further they want to tackle the issue of arsenic, fluoride, iron and bacterial contamination in groundwater. Arghyam has funded formation of two knowledge and experience sharing network to tackle fluoride and arsenic contamination in groundwater. The water quality project improved water quality by tackling the fluoride problem in a Chitoor village in Andhra Pradesh.

Water quality is also a issue in North Bihar where livelihood of millions of people affected due to floods caused by heavy rain. During floods there is lack of safe drinking water, sanitation and shelter that causes diseases and malnutrition. Similar type of water quality were taken up by Arghyam in three districts of Karnataka, Odisha, West Bengal and Uttar Pradesh for tackling groundwater contamination. One such project was taken up in 2011-13 in 10 villages of two dist. Bihar, where 58000 people were directly benefited. During project period,

- Awareness building workshop and trainings conducted for community and local government to explain the ill effects of high fluoride in drinking water.
- Villagers trained to use field test kits to test quality of water.
- Rooftop rainwater harvesting system set up to provide safe water to around 15 households.
- Village tank renovated to increase surface water storage.
- Three rounds of water quality testing of about 50 drinking water sources was done per panchayat.
- Over 330 community rainwater harvesting structure constructed.
- Over 850 individual rainwater harvesting structure constructed.
- More than 60 dugwells cleaned.
- A primary survey conducted in the project village to understand the level of arsenic contamination and its effect on health.
- Meeting with community, gram panchayat, schools, doctors etc. to inform them about presence of arsenic and seek their support on the project work. And many more.

Rural sanitation- Access to clean water and a good sanitation plays a crucial role in keeping people out of poverty. This relates to unclean water and poor sanitation. Arghyam's sanitation programs concentrate on knowledge building and capacity of different stakeholders.

One such project was implemented in a village in Manipur with a focus on making village open defecation free. Intensive education and awareness building activities were carried out and access to sanitation facilities increased. Ecosan technology was promoted . Manure from Ecosan toilet was used as fertilizer. Use of toilet reduced disease burden and helped women and girls. Similar projects were taken up in Gujarat, Tamil Nadu. During the project period,

- Training and awareness building workshops were conducted for local govt. .
- More than 55 families were motivated in Manipur and 350 families in Gujarat.
- Around 134 families were motivated to construct bathroom cum toilet.
- Over 100 soak pits constructed to manage waste water.

Arghyam current projects. Following is the list of Arghyam current projects, details of which can be had from their web site.

- Using digital information to leverage MGNREGA at scale across Karnataka.
- A systematic approach to manage India's

largest groundwater program

- Participatory and frontline centred approach for Bihar water supply scheme.
- Democratising knowledge and data on water quality in India.
- Impacting Natural Resource management at scale in Meghalaya.

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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 - 2020

Water and Climate Change

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.)

We have been hearing a lot about global climate change and its effects for the last two decades, and it is evidenced by our first-hand experience of erratic rainfall patterns, shrinking ice sheets, rising sea levels, floods and droughts. It is becoming clear how water and climate change are inextricably linked and how climate change is adversely affecting the world's water. With this important topic at the centre, World Water Day-2020 was focused on the theme 'Water and Climate Change and how they are Interrelated'.

Climate is the condition of heat, wind, rain and cold in a certain place for many years. Climate change is causing changes in this average climate and resulting in an increase in the Earth's temperature. This is seeing the effects of extreme changes in climate and it is posing serious problems to human life, and so, many lives and livelihoods are in danger.

This is mainly due to various human activities. Due to increasing human activities, the amount of carbon-dioxide emission is increasing and as a result the temperature is also increasing. The use of oil, gas and coal by humans at home, in factories and for transportation is causing rapid climate change. Methane, another greenhouse gas released into our atmosphere, is also exacerbating climate change. Greenhouse gases are emitted when bio-fuels are burned. It is high in carbon dioxide. These gases trap the heat from the sun in the atmosphere and thereby increase the temperature of the earth.

Water balances our climate. It drives the primary cycle of performing the delicate balancing act between water and climate, evaporation and precipitation. As our climate changes, so do the processes of droughts, floods, melting glaciers, rising sea levels and intensifying storms.

Since the 1980s, the world's water use has been increasing by about one percent per year, and the same rate of growth in water use is projected to continue until 2050. Experts say that due to the increasing demand for water and the effects of climate change, the pressure on water resources will increase tremendously.

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

In 2007, the International Committee for the Study of Climate Change (IPCC) prepared a report. In this report, it has been opened that the water cycle will continue to intensify in the twenty-first century, based on science. Compared to the 19th century, the global temperature has increased by 1.2 Celsius. The amount of carbon dioxide in the atmosphere has increased by 50 percent. Scientists say that if the adverse effects of climate change arising from this are to be avoided, it is necessary to prevent the global temperature from rising.

Today, nearly two billion people worldwide do not have access to safe drinking water, and

approximately half of the world's population experiences severe water scarcity at least part of the year. This number is likely to increase due to climate change and population growth.

As temperatures rise, polar ice and glaciers are melting faster. As a result, the risk of flooding in low-lying coastal areas has increased due to rising sea levels. It will also create more favourable weather conditions for forest fires and wildfires.

The retreat of glaciers is also an example of a changing water cycle. Warming will reduce the century-long supply of melt water from glacier-capped peaks and mountain ranges, reducing the availability of water during hot and dry periods in the supply regions, where more than one-sixth of the world's population currently lives.

In subtropical regions, which are relatively more arid, precipitation will decrease in the twenty-first century (eg, Tropic of Cancer and Tropic of Capricorn). This will increase the probability of drought. This aridity will be greater in the polar regions of the subtropics. (eg, the Mediterranean Basin, South Africa, South Australia, and Southwestern America), which are currently known as the monsoon regions. In such equatorial and high latitude areas the annual rainfall trend will continue to increase.

Between 1950 and 2000 the salinity of the surface oceans was studied. This research confirms the hypothesis that the intensifying water cycle will cause saline areas to become more saline and saline areas to become more desalinized in the future. Also, some other studies show that as temperatures increase, arid areas will become drier and wetter areas will become wetter. Sea-level rise will increase salinization of groundwater, reduce the availability of freshwater for humans, and have adverse effects on coastal areas.

Rising global temperature increases atmospheric moisture. This results in more storms and heavy rains. But, paradoxically, as water evaporates from the soil and global climate changes, more severe droughts occur.

Climate change is also affecting the environment. Frequent and severe climate-related events such as sea-level rise, hurricanes, floods, and droughts in some areas and forest fires are occurring, which is causing biodiversity loss and environmental change. This can have far-reaching effects on the availability of water and food resources. Also, the amount of carbon-dioxide in the atmosphere is increasing.

Climate change can have many effects on nature as well. Some species will migrate to new favorable locations. Climate change is also having detrimental effects on biodiversity. Many plant and animal species are becoming extinct, which can have far-reaching ecological and economic consequences. Oceans are becoming more acidic, harming marine life and ecosystems.

Climate change has many potential health impacts. Heat-related disorders, respiratory problems, infectious diseases and malnutrition may increase. An increase in the range of infectious disease-carrying insects can also increase the spread of diseases such as malaria and dengue fever.

Climate change can cause significant economic losses. Especially in low-lying areas, where flooding is more likely. It also affects agriculture, fisheries and forestry, thereby impacting food security and livelihoods.

Climate change damages many types of infrastructure. This can have several significant economic consequences, including a reduction in agricultural productivity. In particular, conflicts over resources such as water and food can escalate, leading to issues such as political instability and migration.

Climate change can change the lifestyle of humans. Fertile soil can turn into sandy soil. Lack of water can also make growing crops and food difficult. Extreme changes in weather can occur. Heat waves, heavy rains, storms increase in frequency and can become dangerous to human life, resulting in social problems such as displacement and migration, resulting in increased inequality.

In short, climate change is likely to have far-reaching and severe impacts on many aspects of life, including the environment, human health, economy, security and society.

Efforts to mitigate climate change:

The United Nations has decided to take various measures to deal with climate change at the global level. Some of the salient points are given below.

Setting emission reduction targets: Greenhouse gas emission reduction targets have been set globally to limit global temperature rise. Under the Paris Agreement, all countries have committed to keeping the rise in global average temperature below 2 degrees Celsius above pre-industrial levels.

Implementing carbon pricing: Many countries have implemented carbon pricing mechanisms such as carbon taxes or cap-and-trade systems to reduce their greenhouse gas emissions and incentivize businesses.

Promotion of renewable energy: Development and use of renewable energy sources such as wind and solar power are being encouraged to reduce dependence on fossil fuels.

Promotion of renewable energy: Development and use of renewable energy sources such as wind and solar power are being encouraged to reduce dependence on fossil fuels.

Supporting research and development: The government is supporting research and development in new clean technologies to help reduce greenhouse gas emissions.

International Cooperation: Countries around the world have agreed that the challenge of climate change can be tackled together. A landmark agreement reached in Paris in 2015 set a goal of limiting global temperature rise to 1.5 Celsius by 2100. Experts say that this growth is safe. However, the effectiveness of actions on climate change varies widely from country to country, and more ambitious and coordinated efforts are needed to address the global challenge of climate change.

Healthy aquatic ecosystems and improved water management can reduce greenhouse gas emissions and provide protection against climate hazards.

Climate-smart agriculture can help reduce demand on freshwater supplies by using drip irrigation and other means of more efficient water use.

Nature is a tool we can use to repair our broken planet.

Adapting to climate change impacts on water will protect health and save lives.

Action plans from different sectors need to be integrated and coordinated across borders to combat climate change, and one thing they should have in common is safe and sustainable water management.

Using water more efficiently will reduce greenhouse gases. Reducing greenhouse gas emissions is essential to reduce the effects of climate change.

Only 2% of all funds used to deal with climate disruption go to natural climate solutions. The functions of nature and natural solutions can help countries build climate resilience.

If urgent steps are not taken in this regard, it will pose a threat to both man and nature. Terrible droughts will occur, sea levels will rise, and many species of birds and animals will die out. By the end of this century, the temperature of the earth is feared to increase by 2 degrees Celsius. If nothing is done and inaction is shown, the Earth's temperature will rise by 4 degrees Celsius, resulting in catastrophic heat waves, rising sea levels, displacing millions of people, and irreparable damage to planet Earth and its biodiversity.

The biggest challenge is the changed lifestyle and principles of life. The new entrenched principle, more consumption - more development, is causing the overall balance of nature to deteriorate. Water is our most precious resource. We should use it more responsibly. We must balance the water needs of all communities while ensuring that the poorest are not left behind. It is time to decide whether to use natural resources to provide basic comforts to those who do not have them, or to feed those who do have. But who will tie a bell around a cat's neck?

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3 Million Indians at risk of Sikkim - like disaster : Study

Vishwa Mohan

New Delhi : The Glacial Lake Outburst Flood (GLOF) that led to disaster in Sikkim may just be an indication of the danger such an event poses to the lives of three million Indians living in vulnerable areas of the six Himalayan states / Uts - J & K, Ladakh, Himachal Pradesh, Sikkim, Assam and Arunachal Pradesh.

The first global assessment of such areas, done by an international team led by scientists at Uk's Newcastle University flagged in February that India and Pakistan together make up one - third of the total number of people globally exposed to such GLOFs. The study, published in the journal Nature Communications, also underlined that the population exposed to GLOFs increases with distance from the glacial lake.

GLOFs occur when either a natural dam containing a glacial lake bursts or when the lake's level suddenly increases and overflows its banks downstream destruction.

The Himalayan ranges are host to 7500 glacial lakes. Of these, Sikkim has about 10 % of which nearly 25 are assessed to be at risk. India's Glacial basin Atlas of Ganga river basin shows a total of 4707 glacial lakes have been mapped from their origin to foothills of Himalayas covering a catchment areas of nearly 2.5 sq.kms.

These figures show the vulnerability of the people living downstream, specifically when climate change due to increasing global average temperatures make the glacial lakes prone to outburst. Flash floods in the Himalayas are increasingly linked to climate change. Rising temperatures lead to the melting of glaciers, which store vast amounts of water. When these glaciers melt rapidly, it results in glacial lake outbursts and heavy rainfall, exacerbating the risk of flash floods in the region, as seen in Sikkim, said Anjal Prakash, clinical associate professor at Bharti Institute of Public Policy, ISB, Hyderabad.

He said the Un's Intergovernmental Panel on Climate Change (IPCC) reports have consistently warned of the Himalayan regions vulnerability to climate change impacts, including the heightened risk of flash floods due to glacier melt and changing rainfall patterns. These reports emphasise the urgent need for climate action to mitigate these risks and protect vulnerable communities in the region, said Prakash who as a scientist also contributed to the IPCC reports.

Dam, bridge washed away at hydro project :

The dam of India's second biggest run-of-the-river hydropower project - the 1200 MW Sikkim Urja or Teesta Urja - and a connecting bridge were swept away by flash floods caused by a breach in Lhonak lake in north west Sikkim on the intervening night. Sikkims biggest project on the Teesta, was built in the Chungthang area of Mangan district at a staggering cost of Rs. 25000 crore.

Kirloskar - Rotary come together to restore Ramnadi

Pune : Kirloskar Vasundhara and Rotary District 3131 have joined hands to take forward their work under the Ramnadi Restoration Mission for the next five years.

Their collaborative work focusses on restoring the water body to its former state of continuous flow using an ecological approach. They aim to do this by engaging all the stakeholders for creating awareness on ecological sanitation and sustainable toxic free lifestyle among those who live near the river.

Our collaborative five year plan includes river cleaning, treatment of point and non point waste water sources, river front eco - development, creation of a clean and green society through awareness campaigns and workshops, ground water recharging, restoration of heritage structures and programmes for schools students, Virendra Chirtav, festival director of Kirloskar Vasundhara said.

Kirloskar Vasundhara will take up the responsibility of creating reed beds, dredging of river, aerating river water for enhancing natural purification conducting tree plantations for developing green cover, promoting rain water harvesting and restoring Khatpewadi and Manas lakes along with organising various campaigns.

On the other hand, Rotary District 3131 will undertake screening and building of reed beds, setting up stations for renewable energy for electrically driven equipment, constructing strom water collection and storage in wetlands, setting up water tanks for wildlife, providing bee hives, and promoting rainwater harvesting, waste segregation, energy saving and urban farming, They will also look after green initiatives through workshops and awareness drives, construct clean toilets, libraries and laboratories in schools and help needy students

Climate change causing infra sectors of $ 850 bn a year globally : Report

70 % of Loss tied to climate - related Disasters like Cyclones, Floods, Storms

New Delhi : Climate change has led to an annual average global loss in infrastructure sector to the tune of $850 billion, implying that 14 % of the 2021-22 GDP growth is at risk, according to a report released by New Delhi based Coalition for Disaster Resilient Infrastructure (CDRI).

The first of its kind report released puts in perspective problems faced by the Global South and its poor infrastructure governance.

The biennial report has estimated that about 67 % of the global value of infrastructure assets is concentrated in high income countries. The upper and lower middle income countries account for 25 % and 7% respectively while they carry the highest relative risk with an average annual loss estimated at 0.4% compared to 0.1% in high income countries.

The report has come out with the first - ever publicly available fully probabilistic risk model - Global Infrastructure Risk Model and Resilience Index (GIRI) - quantifying the average annual losses due to disasters.

The report has analysed nine infrastructure sectors and says to achieve the sustainable development goals (SDGs), nations

need to invest $9.2 trillion annually in resilient infrastructure till 2050, of which $2.9 trillion is required in developing countries alone, including India.

Amit Prothi, the Director general of CDRI said, The report puts CDRI on the global map with 20 global partners bringing together a unique body of evidence to unpack age the resilience dividend making compelling economic, political and financial case to radically upscale investment in infrastructure.

This is the first Global South - driven report that will influence national policies and infrastructure governance, said Kamal Kishore, member of the National Disaster Management Authority and co chair of the executive committee of CDRI.

The report says high income countries could witness an increase in annual loss by 11% due to climate change but this figure could increase to 22% in middle income and 33% in low income countries.

Andrew Maskrey , coordinating author of the report who had been associated with the Un's Global Assessment Reports on DRR brought out by the UN Office for Disaster Risk Reduction has emphasised on nature - based infrastructure salutions (NbIS) as a novel and pragmatic approach for infrastructure resilience and strategies that effectively transform risk into resilience.

Governments can use this report to understand the risk they face, and to realise that it is critical to ensure that all future infrastructure is fully resilient, Maskrey said.

While average annual infrastructure loss of 30% is associated with hazards like earthquakes & tsunamis, around 70 % is associated with climate related disasters like cyclones, floods, storms etc.

It has been estimated that about 80% of the risk is concentrated in the power, transport and telecommunications sectors where asset building only accounts for 15 - 30 % of overall expenditure over its design lifecycle while up to 70-85% is attributable to operation and management..

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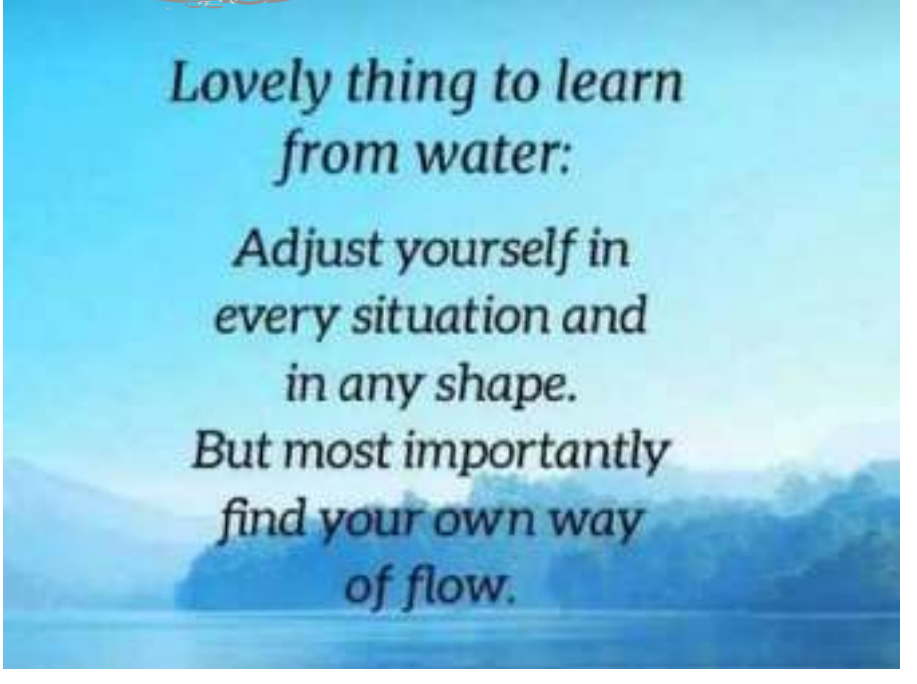

Waterbody encroachers are traitors :

Madras HC

News

CHENNAI: A person who encroaches on a waterbody is a traitor of the nation, the Madras high court has said, adding that it will not hesitate to use even military to remove encroachments.

"They (encroachers) must not be provided with alternate accommodations at the cost of the exchequer, as it would amount to perpetrating an illegality by the government," a division bench of Justice S Vaidyanathan and Justice K Rajasekar said on Tuesday.

"We make it very clear that if encroachments on waterbodies are not removed, this court will be constrained to pass appropriate orders to use military force to remove such encroachments," the bench said.

The court made the observations on a contempt plea moved against the Tamil Nadu government for failing to implement a court order and remove encroachers from the Pallikaranai

marshland. When the plea came up for hearing on Tuesday, the state filed a report dated September 12 prepared by the member-secretary of the Tamil Nadu State Wetland Authority.

The court was informed that the government had sanctioned 5 crore through Tamil Nadu Pollution Control Board (TNPCB) to evict 1,087 families from Pallikaranai marshland and they are being accommodated in alternate 9/27/23, 7:44 AM Waterbody encroachers are traitors: Madras HC - Times of India tenements provided by Tamil Nadu Urban Development Board (TNUDB). So far, allotment orders have been issued for 149 households, the report said.

Recording the submissions, the bench said: "It is really a sad state of affairs that in Tamil Nadu, instead of buying land, any person can encroach upon a land and the government is willing to give an alternative site."

"If this is going to be allowed, then the taxpayers' money will be wasted. The government should not provide alternate accommodations to any encroacher, particularly to those who occupy waterbodies. It would amount to perpetrating illegality by the state," the court added

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Stockholm Water Prize-2018

Prof. Bruce Rittmann, USA and Mark Van Loosdrecht, Netherlands

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.)

Prof. Bruce Rittman, USA and Marc van Loosdrecht, Netherlands were awarded the 2018 Stockholm Water Prize for revolutionizing water and wastewater processes. Their pioneering microbiology-based technology has led to a new class of energy-efficient water treatment technologies that are being implemented worldwide.

Their innovative microbiological water treatment not only removes harmful contaminants from wastewater, it also reduces treatment costs and energy consumption, while also recovering its chemicals and nutrients for reuse.

Mark van Loosdrecht is Professor of Environmental Biotechnology at Delft University of Technology, The Netherlands. Bruce Rittman is Regents Professor of Environmental Engineering and Director of the Biodesign Sweat Center for Environmental Biotechnology at the Biodesign Institute, Arizona State University, USA.

In their citation, the Stockholm Water Awards Nomination Committee Prof. Rittman and van Loosdrecht have been honored for "pioneering the development of environmental biotechnology-based processes for water and wastewater treatment. They have revolutionized the safe treatment of drinking water and developed minimal electricity consumption techniques for treatment processes that involve the release or reuse of polluted water".

Prof. Loosdrecht says the award recognizes not only his work but also the contribution of microbiological engineering to the water sector. He adds that he actually only thought of doing something to get rid of the pollutants. But now they are looking at them as potential resources, which are misplaced.

Prof. Rittman has an intensive study of how microorganisms can transform organic pollutants into valuable products for humans and the environment, and is increasingly focusing on how microbial systems can be used to generate resources.

Prof. Van Loosdrecht's work is responsive and consistent with Prof. Rittman's studies. His research has led to the widespread adoption of wastewater treatment processes that are less expensive and more energy efficient than traditional methods. "There is an overall trend towards energy neutrality with current technology. There is a lot of research on how to be energy positive. It is important to note that especially in developing countries where electricity supply is unstable and funding availability is limited. If we want to be self-sufficient with energy generation, if we can build sewage plants, it will be possible to start such sewage plants in many places", says Prof. Loosdrecht.

Together Professor Rittman and van Loosdrecht are leading work on the path to providing clean and safe water for humans, industry and ecosystems, bringing to light important aspects of one of the most challenging human activities on Earth.

Prof. Bruce Rittman and Mark van Loosdrecht say that we are currently in the middle of all these changes and are increasingly focusing on how to generate resources using microbial water treatment systems.

Prof. Rittman has written over 650 rigorously peer-reviewed scientific research papers. He has also co-authored textbooks on Environmental Biotechnology with Stockholm Water Prize winner Prof. Perry McCarty. He is the inventor of the membrane biofilm reactor, a commercially available technology that uses naturally occurring microorganisms to remove contaminants such as perchlorate and trichloroethene from water.

Prof. Rittman has received many awards during his career. These include being elected as a Fellow of the International Water Association, the National Academy of Inventors, and the American Association for the Advancement of Science. He is a distinguished member of the National Academy of Engineering and the American Society of Civil Engineers.

Prof. van Loosdrecht's research has been instrumental in developing the Anammox and Nereda technologies for wastewater treatment. The anammox process is a resource-efficient way to remove nitrogen from wastewater, leading to an energy-generating process.

Nereda technology is based on bacterial granulation, thereby providing a cheap and simple urban wastewater treatment. The Nereda plant is significantly smaller and energy efficient (up to 50%) than conventional plants. In addition, the recovery of high-performance biopolymers from sewage sludge can further contribute to the circular economy.

Prof. van Loosdrecht has received several awards including the 2014 Spinoza Prize and the 2012 Lee Kuan Yew Award. He is the Editor-in-Chief of the scientific journal 'Water Research' and a member of the Royal Netherlands Academy of Arts and Sciences and the Dutch and USA National Academies of Sciences.

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Climate change is causing more frequent, intense cyclones on India's western coast

Sethu Pradeep

Cyclone Biparjoy maintaining its peak intensity while approaching the India-Pakistan border region on June 12, 2023. (NOAA/NASA)

Human-induced climate change is causing more frequent and intense cyclones on India's west coast, finds a new study.

Changes in the patterns of ocean and atmosphere warming are causing more frequent and severe tropical cyclones in the Eastern Arabian Sea, next to India's west coast, according to a new study.

Typically, tropical cyclones usually happen in the Arabian Sea at the start of the southwestern monsoon between March and June, as well as after the season, between October and December.

"In 2019, the Arabian Sea witnessed five cyclones as compared to its normal count of three, and the year 2019 corresponds to a positive IOD (Indian Ocean dipole) phase. Hence, under favourable natural climate modes, warming of Arabian Sea can increase the frequency and intensity of tropical cyclones in the North Indian Ocean," said S Abhilash, co-author of the study published in Scientific Reports, to indianexpress.com. He is an associate professor in the Department of Atmospheric Science at the Cochin University of Science and Technology. (CUSAT)

The Indian Ocean Dipole and its effect on cyclones
The IOD is similar to the El Nino, where one part of the ocean gets warmer than the other. During its positive phase, sea surface temperatures get warmer, and there is more precipitation (rain) in the western Indian Ocean region. This corresponds to more rain in the eastern Indian Ocean.
"The recent increasing frequency of extremely severe cyclonic storms over the ARB during the post-monsoon season is due to anthropogenic influence rather than natural variability," explained Abhilash, emphasising that human-caused climate change is responsible for the intensification and increase in the frequency of cyclones.
Cyclones could affect the entire western coast of India from Gujarat to Thiruvananthapuram
As the eastern Arabian Sea changes, the coastlines of western India are increasingly at risk. As the intensity of cyclones increase, so does their potential to cause high wind, storm surges, severe rainfall, and more. This means that cyclones could pose more and more of a threat to all densely populated coastal regions along the western coast, from Thiruvananthapuram to the coast of Gujarat.

"This is something we have never seen before in the Arabian Sea. We need more studies about these trends. This is especially going to affect the lives and livelihood of the indigenous coastal communities and artisanal fishers," added Abhilash.
ccording to co-author Mrutyunjay Mohapatra, this report calls for changes to development strategies to account for the dangers posed by more intense and frequent cyclones. There is also a need to develop new policy and technology initiatives in the areas of storm warning, impact-based local weather services and reliable localised weather services. Mohapatra is the Director General of Meteorology at the Indian Meteorological Department (IMD).

'Forecasting with Fishers'

This research is part of the Forecasting with Fishers project that the Advanced Centre for Atmospheric Radar Research (ACARR) at CUSAT has been leading over the past five years.

The project brings together a multi-disciplinary research team that includes social scientists, physical geographers, atmospheric and marine scientists, and communication and media experts from CUSAT and the University of Sussex. The project aims to improve safety at sea for small-scale traditional fishers by producing and communicating localised weather forecasts.

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Do We Really Need Ground Water for Survival ?

Shri Ulhas Paranjape

News

Population rise, development of new townships, industrialization, change in the boundaries of village / towns and better life style are resulting in continuous increase in water demand. On the other hand, water scarcity is increasing due to limited availability of fresh water sources. For many urban / rural areas, water is fetched from long distant sources due to centralized water systems, which requires major capital investment to convey the water. The Indian economy is growing and people have higher expectations on lifestyle, increased use of home equipments and higher water requirements. Hence, judicious planning of water system and management of the assets created is required to meet the expectations of citizens, manage the resources, operations and maintenance aspects considering higher delivery standards. The availability of fresh water sources are limited and that plays a major role in providing better services and consumer satisfaction.

People normally use water from tap, open well, bore well, river or pond/ talab for their day-to-day requirements. Rain water is the main source of all the storages mentioned above. Rain water as a source has huge potential but remains unutilized even as on today. Ground water is mostly used when piped water system is not available or to support the piped water system. If rain water is used as a source of water for all activities, then the issues related to water availability can be handled better and ground water may not have to be used.

If treated wastewater is used after treatment, then the daily water requirement would be reduced further.

It is said that Money and Water can be best used if they are Stored. Money, everyone collects but very few are collecting/ storing Rainwater.

Case studies of rural areas of Beed District and Karjat Taluka in Raigad District of Maharashtra are discussed in detail.

Beed District

In Beed District, three types of Farm Pond are found: a) Below Ground b) Half above and half below ground, and c) Below ground, with inlet and out let arrangements.

The Geographical area of Beed District is 10,693 sq.km. The Administrative Divisions (as on 31-03-2011) were 11 Talukas, namely Beed, Georai, Ashti, Patoda, Shirur (Kasar), Wadwani, Ambajogai,

Majalgaon, Kaij, Dharur and Parli. There are 1,360 Villages with a Population of 21,61,000 (2011 Census). The average annual rainfall is 666 mm.

Beed District has many Farm Ponds but most of them are Half below Ground and Half above Ground. For all these water storage tanks, the water is brought from outside.

A different approach to solve the water problem of District Beed is proposed below.

A visit was made to Ambajogai and Beed from 9th to 14th July 2021, to conduct training for masons and farmers. The intent was to train the masons in "Water Conservation with Natural Fibre Cement Technology". During the training they learned and constructed 2 types of tanks, one below ground and other above ground. During discussions, everyone was mentioning about water shortage and depleting ground water table or low water level. It was suggested to them to use rainwater with a better approach.

The annual water potential that was estimated was explained and shared with them, is given below.

Beed District Rainfall Potential for Water Collection & Storage

Area of Beed District – 10,693 sqkm = 10,69,300 hectare

1 sq.km. = 100 hectare = 100 x 10,000 = 10,00,000 sqm.

Area of Crop under Kharif Crop: 7,78,207 hectare (72.78 %) in 2022

Area of Crop under Rabbi Crop: 4,19,816 hectare (39.26 %) in 2022

Forest Land = about 2 %

Annual Average Rainfall = 666 mm = 0.666 m

One sq.km of land area has potential of catching rainwater = 6,66,000 cum

Assuming only 25% can be effectively collected then per one sq.km, one can store or collect only 666000/ 4 = 165500 say 1,65,000 cum or 1,650 cu.m. per hectare.

At 55 LPCD, the quantum of water required per person = 55 x 365 = 20,075 litre, say 21 cum Hence 1,65,000 cum will be sufficient for 1,65,000 / 21 = 7857.14, say 7800 persons.

The population as per 2011 Census was 21.61 lakhs. It is assumed that in 2023 it would be 30 lakhs. Hence, water required would be 30,00,000 / 7800 = 384 .61 sq.km or say 400 sq.km. which is only 400/10693 = 3.7 % of total area of the District.

Which means that 25 % of annual average rainfall over 400 sq. km of land, if stored, would be sufficient for a population of 30 lakhs for one year.

Technologies Taught

Two different innovative technologies were taught to the masons, farmer, students, and others for the storage of rain water.

Drinking Water

For drinking water, use of Rooftop rain water was suggested. The collection could be in a 10,000 litre Ferrocement Tank. During the period 2000-2002 the "PAGOLI VIHIR YOJANA" was available in Maharashtra. Some people from Taluka Pen are still using water collected during the monsoon in a storage tank for entire year for drinking purpose.

Use of Natural Fibres in Water Retaining Structures

The use of Natural Fibres such as i) Coconut Coir, ii) Banana Fibre, and iii) Ambadi fibre in construction of water storage tanks below ground has been recommended and constructed accordingly. A study on the use of these natural fibres was done by the Indian Institute of Technology Bombay which has replaced Chicken mesh by Natural Fibres in Ferrocement Tank above Ground. It is an Innovative product which is being spread to many locations.

Mason, farmers, and students were taught how to construct the Water Storage Tank.

10 % Model for Water Conservation

Knowing the total rural and urban area and its annual average rainfall, it is possible to estimate the potential and the quantity of water that can be stored. If the rain water is stored, then the urban or rural problem can be either solved or eased. The total land required may not be more than 10% of the total land either in the rural or the urban areas.

10,000 litre Ferrocement Tank at More wadi, Taluka Karjat Dist. Raigad

Coconut coir Cement Tank

Ferro - Natural – Fibre Cement Tank

Some examples of the 10% model are given below.

10 % Model - Field Study by Prof. S. N. Panda and others from the Indian Institute of Technology Kharagpur during 2002-2003 in the rainfed area of Kharagpur, situated in the District of West Madinapur in West Bengal.

PRADAN (Professional Assistance for Development Action), a Bihar NGO has the core idea of the 5% model of in-situ water harvesting is which every plot should have its own water- body, which should be able to hold rainwater which otherwise flows out of the plot.

Kokkarni from Kerala - is a traditional water body – they are small farm ponds, that provide water for one or two protective irrigations.

Pokhris in the North Eastern states are small ponds in each house hold.

Chauka system in Rajasthan was initiated by Laxman Singh — of Gram Vikas Navyuvak Mandal, Laporia - GVNML). Chaukas are constructed across the slope at a predetermined spacing for intercepting the runoff and retaining it on the greater part of the field till it is absorbed into the ground.

Bodi and Phad system in Vidarbha, Maharashtra are similar rainwater conservation models.

Raigad District

A different approach has been proposed to solve rural level water problem for Taluka Karjat Dist. Raigad, State Maharashtra.

Normally watershed development is a solution for rural water problem. Instead of watershed development, if the village or pada or cluster of houses is considered as a unit then on the basis of the annual average rainfall and the land holding of that unit, it is possible to fulfil the water requirement of that unit.

6 Lac Litre Pond at Kalhe, Taluka Panvel Dist. Raigad

In addition, attention must be given to all other sources of water such as well, bore well, pond, lake, stream, river, etc, using rain water as a source of water.

Taluka Karjat, Dist. Raigad from Konkan Region (State Maharashtra) is taken as a representative case. The detailed calculations are given below.

1. Total area of Taluka Karjat	65,117 Hectare
2. Population (2001)	1,84,420
3. Animals/ Cattle	25,832
4. Land holding with people (Khatedar)	36,713 Hectare (56.38%)
Out of above land holding	
(i) Land under crop	17,168 Hectare (26.36%)
(ii) Padik (Varkas) land	14,093 Hectare (21.64%)
(iii) Pot kharaba	5,452 Hectare (8.37%)
5. Forest land	18,140 Hectare (27.86%)
6. Gavathan, Kurane, Devarai Government land, N. A. land, etc.	14,264 Hectare (21.91%)
7. Annual Average Rainfall	3,316 mm (3.316 meter)

A. Water Required for Daily Needs of the People

For the total population of 1,84,420 in the city, water is provided at a rate of 135 liters per person per day (LPCD).

Yearly water required = 1,84,420 x 135 x 365 = 90,87,295.50 cum. = 908.73 Hectare meter.

B. Water Required for Domestic Animals (Cow, Buffalo, etc.)

For the 25,832 animal population water is provided at a rate of 100 liters per animal per day.

Yearly water required = 25,832 x 100 x 365 = 9,42,868 cum. =94.29 Hectare meter.

C. Water required for Agriculture i.e., for Kharif crop (Rice)

Normally monsoon Rice is grown and that is followed by wal, chawali like crop grown on the same land after the rice is harvested.

Assuming water requirement for Rice as 1600 mm (1.6m), the total water required will be = 17, 168 x 1.6 = 27,468.80 hectare meter.

15 Million Litre Pond at Talasari, Palghar

2 lac litre Pond at Panve Dist. Raigad

Water required for cultivation on Varkas land (Horticultural development) i.e., for tree plantation such as mango, cashew, etc.

Assuming around 200 trees are planted on one Hectare of land Water required for non-raining season i.e., for 240 days

Assuming water requirement as 5 litre per day tree, (initially the trees require about 1 litre per day if water is given by diffuser, etc.) the requirement will be =

14,093 x 200 x 5 x 240

= 33,82,320 cum = 338.23 Hectare meter.

Hence total annual requirement of water is:

1. For residential population Taluka Karjat	908.72 Hectare meter
2. For animals	94.28 Hectare meter
3. Agricultural purpose	27,468.80 Hectare meter
4. Horticultural Dep	338.23 Hectare meter
Total	28,810.05 Hectare meter, say 29,000 Hectare meter

In short, if about 29,000 Hectare meter water is available then it will satisfy the water need of Taluka Karjat.

Total available water considering Annual Average Rain fall as 3316 mm is = 65,117 x 3.316 = 2,15,927.97 Hectare meter, say 2,15,928 Hectare meter.

Whereas requirement is about 29,000 Hector meter, hence it is about

= 29000 / 2,15,928 = 1343 or 13.43 % say 14% of the total available water

Thus, about 14 % of the total available water from rain would be sufficient to provide water of Taluka Karjat.

Out of the 29,000 Hectare meter, 2,15,928 Hectare meter water is required for Kharif crop. Again, out of 27468 only part of water is required to be stored for dry spell during monsoon. Hence, there is a need to store water even for Kharif crop to get better yield.

That means 27468/29000 = 94.72 % say 95% of water is required for agricultural purpose.

Hence, arrangements need to be made to store only 5% of 29,000 Hectare meter only or 1450 Hector meter for other than agricultural use.

= (29,000-27,468)/ (2,15,928)

= 0.00709, i.e., 0.71 %

Thus, only 0.71 % Rainfall needs to be properly stored.

It is therefore evident that Rain Water Managements can solve the problem of local water requirement. The example of Taluka Karjat makes it very evident that if water is managed at individual level, or at a pada or village level then the problem can be successfully addressed.

Conclusions :

The large schemes with centralized approach need high investments, manpower, expertise, and more time for making the benefits available to the people. Even after completion of the large projects, their maintenance needs to be ensured in terms of resources, energy, and manpower with a permanent establishment.

Addressing the solutions at a Local level and capturing the rainfall and storing it for various uses will improve the water supply situation for the consumers, and reduce their dependency on centralized schemes. All the habitants need to be responsible and responsive citizens and use the water carefully.

The examples of Taluka Karjat, and District. Beed make it very clear that the solution lies in managing the Rain Water at an individual level, or at a pada or a village.

Jalvardhini Pratishthan

Jalvardhini Pratishthan, set up by the author, aims at supporting the rural and tribal population in Rain Water Harvesting and Management. The team at Jalvardhini Pratishthan has constructed with the participatory approach, Storage Tanks of up to 30,000 litres capacity, with donations from donors and provide technical support for Tanks/ ponds of up to 15 million litres capacity.

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IBEF

INDIA BRAND EQUITY FOUNDATION

Indian Economy News

Prime Minister Mr. Narendra Modi launches PM Vishwakarma Scheme at New Delhi

Press Information Bureau September 18, 2023

Prime Minister Mr. Narendra Modi has unveiled the 'PM Vishwakarma' scheme, with an allocation of Rs. 13,000 crore (US$ 1.56 billion) to support traditional artisans. The event was held in Dwarka, New Delhi, at the recently opened India International Convention & Expo Centre.

The newly launched scheme will provide skill enhancement through both basic and advanced training, a toolkit incentive of Rs. 15,000 (US$ 180.48), collateral-free credit support of up to Rs. 1 lakh (US$ 1,203.19) (first tranche) and Rs. 2 lakh (US$ 2,405.37) (second tranche) at a 5% concessional interest rate, incentives for digital transactions, and marketing support.

PM Mr. Modi said "Under PM Vishwakarma scheme, govt has focussed on providing special training to the Vishwakarma partners and Rs. 500 (US$ 6.02) will be provided to you while the training is underway. You will also get a Toolkit voucher worth Rs. 1,500 (US$ 18.05). The government will also help you in branding, packaging, and marketing the products you make. In return, the Government wants you to purchase Toolkits from shops that are GST registered only".

The plan will register 'Vishwakarmas', who create with their hands and tools, at no cost through Common Services Centres, utilising the biometric based 'PM Vishwakarma' platform. These artisans and craftspeople will be recognised with a certificate and ID card from PM Vishwakarma.

It will aid artisans and craftspeople in both rural and urban India. It includes eighteen traditional crafts, such as carpenter, boat maker, armourer, blacksmith, hammer and tool kit maker, locksmith, goldsmith, potter, sculptor, stone breaker, cobbler (shoesmith/footwear artisan), mason (rajmistri), basket, mat, broom maker, coir weaver, doll and toy maker (traditional), barber, garland maker, washerman, tailor, and fishing net maker.

The fundamental goal of PM Vishwakarma Scheme is to improve the quality and reach of products and services created by artists and craftspeople, ensuring their inclusion in both domestic and global value chains.

Source: https://www.ibef.org/news/prime-minister-mr-narendra-modi-launches-pm-vishwakarma-scheme-at-new-delhi

Scientist's Soilometer helps farmers check the health of soil

Dipanita Nath

What does it say about our country's agriculture when the Kerla High Court stops the powerful Sabarimala Temple from distributing aravana prasadam because the cardamom being used contains a high level of pesticide ? This happened in January 2023. In 2021, Nepal destroyed fruits and vegetables imported from India due to high pesticide levels. Says Ahmednagar - based scientist and startup leader Prafulla Gadge.

After researching the problem Gadge has developed a kit that enables farmers to test the health of the soil and the quality of bio fertilisers and bio pesticides in three hours and at the farm itself. The kit was launched by Union Agriculture Minister Narendra Singh Tomar in February. Last week, Jaipur's National Institute of Agriculture Marketing granted Gadge's firm, Biome Technologies, funding of Rs. 18 lakh. The paperwork is underway for further funding Rs. 50 lakh, for 10 per cent equity, from private incubators.

The money will be used for a Lab at Farm, initiative by which farmers can check soil microbial health and manage the farm accordingly, and also access the quality of bio products they are buying. We also plan to deliver handy kits to farmers that will tell them what kind of pathogens are present in the soil so that they can accordingly treat their soil,

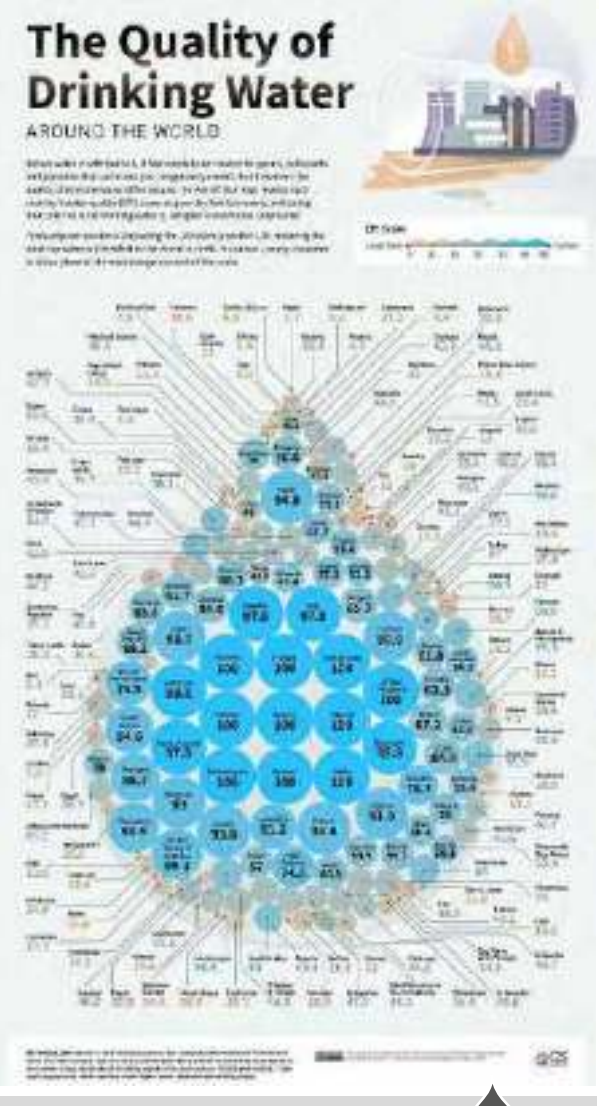
says Gadge.

Till now, the kit, priced at Rs. 310, has been deployed by 7000 farmers across India. Which includes the bio fertiliser industry that wants to demonstrate the quality of soil to farmers. Biome is also in talks with government authorities for using Soilmeter as a standard kit fo for natural and organic farming that the country is promoting. Earlier farmers used one or two bags of fertilisers and got good yields. Now, they are using a number of bags but failing to get a good harvest and their losses continue. This has been a cause of farmer suicides or debt, he says.

Gadge traces the decline in the country's soil health to companies that have been selling farmers products that contain fungicide like molecules or antibiotics, among others, that disturb the nature of the soil and the biodiversity. The biodiversity of the micro organisms present in the soil is the life of the soil as it helps plats to take in the nutrients in a proper way, protects them from climate change and environmental changes and most importantly, protects them from pathogns and pets, says Gadge.

Before Soilometer, the scientist - cum - entrepreneur has created a growth promoting bio stimulant in a laboratory on his terrace, and formulations for roots developments, proper flowering and branching and nitrogen fixation, among others, for almost 200 agrochemical based industries. I began to conduct skill training for farmer groups and industry because there was a high degree of agrochemical illiteracy among farmers, he says.

Gadge adds that soil health is worsening in the country and farmers have no alternative but to go for soil rejuvenation. This is a growing market that is attracting several companies. But, farmers should be able to analyse the soil microbial health before deciding what is suitable for them, he says.



Faster disaster: Climate change fuels 'flash droughts', intense downpours and storms

By Andrew King, Andrew Dowdy

Faster disaster: Climate change fuels 'flash droughts', intense downpours and storms
As we continue to warm the planet, we'll see more flash droughts and more intense ones

The run of extreme weather events around the world seems to be never-ending. After the northern summer of extreme heat and disastrous fires, we've seen more exceptional autumn weather over Europe with record-breaking heat in the UK.

Meanwhile, record-breaking rain and intense flash floods struck Greece before the same storm devastated Libya, with thousands dead.

Almost 20 per cent of Africa is estimated to be in drought, and drought conditions are returning to parts of Australia. To top it off, we've seen several hurricanes intensify unusually quickly in the Atlantic.

We know climate change underpins some of the more extreme weather we're seeing. But is it also pushing these extreme events to happen faster?

The answer? Generally, yes. Here's how.

Flash droughts
We usually think of droughts as slowly evolving extreme events which take months to form.

But that's no longer a given. We've seen some recent droughts develop unexpectedly quickly, giving rise to the phrase "flash drought".

How does this happen? It's when a lack of rainfall in a region combines with high temperatures and sunny conditions with low humidity. When these conditions are in place, it increases how much moisture the atmosphere is trying to pull from the land through evaporation. The end result: faster drying-out of the ground.

Flash droughts tend to be short, so they don't tend to cause the major water shortages or dry river beds we've seen during long droughts in parts of Australia and South Africa, for example. But they can cause real problems for farmers. Farmers in parts of eastern Australia are already grappling with the sudden return of drought after three years of rainy La Niña conditions.

As we continue to warm the planet, we'll see more flash droughts and more intense ones. That's because dry conditions will more often coincide with higher temperatures as relative humidity falls across many land regions.

Flash floods and extreme rainfall
Climate change can cause increased rainfall variability. Some parts of the world will get a lot wetter, on average, while others will get drier, increasing the variation in rainfall between different regions. For Australia, most locations are generally expected to have intensified downpours of rain, as well as intensified droughts. So we might be saying more often "it doesn't rain, it pours!".

We're seeing exceptionally extreme rainfall in many recent events. The recent floods that submerged villages in Greece came from a sudden

downpour of over 500 millimetres in a single day. Hong Kong was hit last week by the heaviest rains in 140 years, flooding subway stations and turning streets into rivers.

But why does it happen so quickly?

Sudden extreme rains fall when we have very moist air coupled with a weather system that forces air to rise.

We've long known human-caused climate change is increasing how much moisture the air can hold generally, rising by about 7 per cent per degree of global warming. That means storms now have the potential to hold and dump more water.

Notably, the impact of climate change on rain-bearing weather systems can vary by region, which makes the picture more complicated. That means, for instance, climate change may lead to more extreme rain in some places, while other places may only see an intensification in really short extreme rain events and not for longer timescales.

We can safely say, though, that in most parts of the world, we're seeing more intense storms and sudden extreme rainfall. Sudden dumps of rain drive flash floods.

More moisture in the air helps fuel more intense convection, where warm air masses rise and form clouds. In turn, this can trigger efficient, quick and intense dumps of rain from thunderstorms.

These short-duration rain events can be much larger than you'd expect from the 7 per cent increase in moisture per degree of warming.

Flash cyclones? Hurricanes are intensifying faster
Last month, Hurricane Idalia caused major flooding in Florida. As we write, Hurricane Lee is approaching the US.

Both tropical storms had something odd about them – unusually rapid intensification. That is, they got much stronger in a short period of time.

Usually, this process might increase wind speeds by about 50 kilometres per hour over a 24-hour period for a hurricane – also known as tropical cyclones and typhoons. But Lee's wind speeds increased by 129km/h over that period. US meteorological expert Marshall Shepherd has dubbed the phenomenon "hyperintensification", which could put major population centres at risk.

Rapidly intensifying tropical cyclones are strong and can be very hazardous, but they aren't very common. To trigger them, you need a combination of very high sea surface temperatures, moist air and wind speeds that don't change much with height.

While still uncommon, rapid intensification is potentially getting more frequent as we heat the planet. This is because oceans have taken up so much of the heat and there's more moisture in the

air. There's much more still to learn here.

Australia's El Nino summer in a warming world Spring and summer in Australia are likely to be warmer and drier than usual. This is due to the El Nino climate cycle predicted for the Pacific Ocean. If, as predicted, we also get a positive Indian Ocean Dipole event, this can heighten the hotter, drier weather brought by El Nino. After three wet La Nina years, this is likely to be a marked shift.

If it arrives as expected, El Nino would lower the risk of tropical cyclones for northern Australia and reduce chances of heavy rain across most of the continent.

But for farmers, it may help trigger flash droughts. Prevailing warm and dry conditions may rapidly dry the land and reduce crop yields and slow livestock growth.

Drier surfaces coupled with grass growth from the wet years could worsen fire risk. Grass can dry out much faster than shrubs or trees, and grass fires can start and spread very rapidly.

Climate change loads the dice for extreme weather. And as we're now seeing, these extremes aren't just more intense – they can happen remarkably fast. The Conversation

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