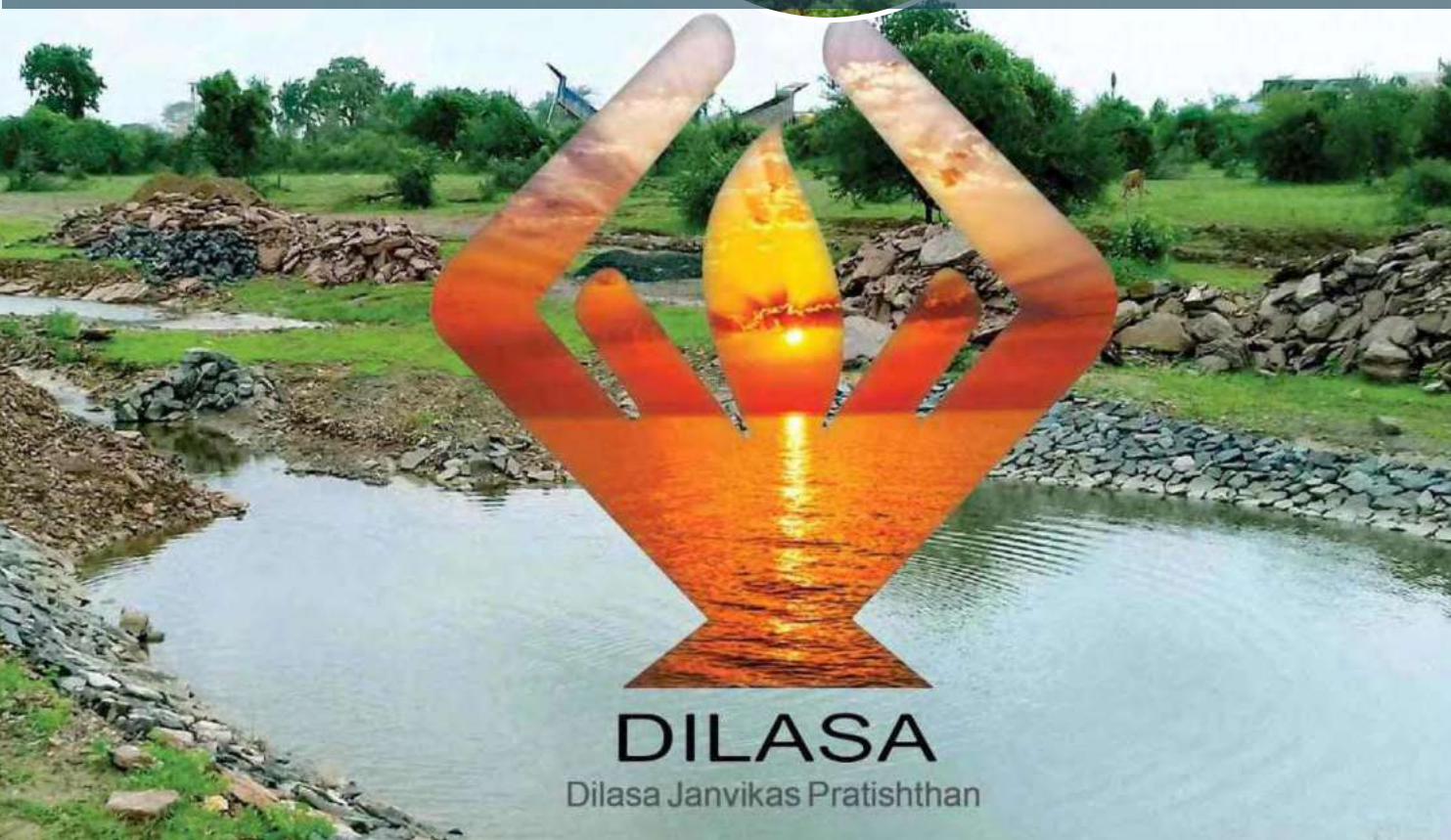




## Cover Story

Dilasa Sansthan - Shri Vinod Hande



# DILASA

Dilasa Janvikas Pratishthan

# जलसंवाद



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- (१) मी एक जलप्रेमी : डॉ. दत्ता देशकर
- (२) जाणून घ्या आपले पाणी : डॉ. दत्ता देशकर
- (३) जल-सुसंस्कृततेच्या दिशेने : श्री. गजानन देशपांडे (आगामी)
- (४) Towards Excellence in Water and Culture :  
Shri Gajanan Deshpande (आगामी)
- (५) उद्योजकता : (स्वतःचे भविष्य स्वतःचे हाती) : डॉ. दत्ता देशकर (आगामी)
- (६) जलक्षेत्रातील यशोगाथा : संपादन : डॉ. दत्ता देशकर (आगामी)
- (७) जलक्षेत्रात काम करणाऱ्या संस्थांचा परिचय : श्री. विनोद हांडे (आगामी)
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■ **Founder Editors**

Dr. Datta Deshkar

Late. Shri. Pradeep Chitgopekar

■ **Present Editors**

Dr. Datta Deshkar - 09325203109

■ **Cover Design**

Ajay Deshkar

■ **DTP & Page Setting**

Aarti Kulkarni

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You must have heard the name of Shri Suresh Khanapurkar who owns the idea of Shirpur Pattern. He has totally transformed Shirpur Taluka of Dhule District. This area gets scanty rainfall. In spite of this, he could achieve this success. There are 28 districts in Maharashtra which are trying to replicate his pattern in their own area. In Maharashtra the total irrigated land is hardly 20 percent whereas in Shirpur Taluka more than 85 percent of land is enjoying irrigation facility. Once, in personal discussion with him, I just asked him the secret of his success there. He gave me a slogan – Collect rainwater greedily, but use it judiciously. He said, we miserably fail in collecting and storing rain water and on the other hand we do not use water judiciously. Thus we are burning the candle from both the ends.

Nature blesses us with rainfall every year. Show me any year when there was no rainfall. There may be variations in quantum but it has never failed. The tragedy is, even when we know that we need water badly, we do not collect it, we do not store it. Is storing a very difficult job? No. Not at all. But we are careless and remember water only when run short of it.

Is it the duty of the Government to make water available to each and every person? Yes. It is. But Government, of its own, has its own limitations. It needs support. Each and every person should come forward and contribute to solve the water problem. Every year we spend crores of rupees to solve the problem but there does not seem to be any end to it. It appears as if we are not interested in solving this problem.

In our country there are more than 2,50,000 grampanchayats. If every grampanchayat decides to be self sufficient, the desired solution can be achieved. It should prepare a water budget where total water availability and water use can be estimated. Efforts should be made to increase the availability and reduce the use. I know, it is not an easy task but at the same time it can be said that this is achievable. Of course, the panchayat will be required to exert.

What are the sources of availability? Rainfall is the main. There is a saying, Catch the rain where it falls. Every drop has to be collected and stored properly. Main enemy is the Sun. Nature gives by one hand and takes away by another. Yesterday I was reading one article in the local news paper. It was stated there that out of the water stored in the dams in Maharashtra, evaporation takes away that much water which is enough for nine years water consumption of Pune city. That much water may prove to be enough to irrigate 8.25 lakh hectares of land. Why has the rate of evaporation increased in recent years? That is because we are cutting trees. Do you remember what our Sadguru says? He wants to develop plantation of trees on both sides of all the rivers up to one kilometer throughout the country. If such a scheme is undertaken, temperature level would come down and the rate of evaporation would also fall.

To avoid evaporation we can store water under the ground. By what ever way, every person should take resort to rain water harvesting. Once water is deposited under the ground there would be no evaporation.

Merely increase in the supply of water would not solve the problem. Whatever water we have collected has to be judiciously used. If that is not done, all our efforts would go in vain. Government should reserve one five year plan exclusively for making all the grampanchayats self sufficient in water and solve the problem once for all.

**Dr. D. G. Deshkar, Editor**

## Organization - Dilasa Janvikas Pratishthan

Shri Vinod Hande

(M) 9423677795



“Dilasa Janvikas Pratishthan” is an organization working in natural resource management since last 30 years with a mission to give support to the villages by improving the condition of water, soil and vegetation. Along with these programs they are working for the empowerment of women. They have a team of qualified and experienced Civil Engineers, Water Resources Engineers, Agriculture Experts, Social Mobilizers. The first watershed Kaccheghati was developed as a showcase and NABARD considered it as the textbook of watershed. Dilasa is the first NGO to introduce Hot Water Chulla a different low cost structures in watershed. Dilasa is promoting Self Help Groups since last more than a decade. They have promoted more than 1500 women groups as of date. “Dilasa Janvikas Pratishthan” is established in 1993. Today they have 101 full time staff and 20 full time volunteers. Their head office is at Aurangabad, in Maharashtra.

History of organization- During year 1990-91 Mr. Sanjeev Unhale and Dr. Anagha Patil were trying to help farmers through soil conservation works in nearby villages. The farmers were organized by the efforts of them for collective farming and better farm practice. Their cooperation in community took shape and it was told by the rural community that they should go for Civil Society Organization and keep the name as “Dilasa”. This event gave birth to the organization “Dilasa’. Mr. Unhale visited one of the old watersheds where he observed the transformation of the village through proper natural resource management. He was concerned with the fact that watershed development is the key for rural development. To uplift the environmental, socio-economical status

of rural people by implementation of sustainable natural resource management programs is the mission of “Dilasa”. Similarly to restore agriculture economy through natural resource management, agriculture better productivity through soil health improvement and market development is also a part of mission of ‘Dilasa’. To develop climate smart village which will be resistant to extreme weather events through adaption, mitigation and technological interventions is the vision of “Dilasa”.

Mr. Sanjeev Unhale is the Secretary of “Dilasa Janvikas Pratishthan”. He is journalist turned activist. He is having 35 years of experience in the field of journalism. He was assistant Programme Executive in All India Radio, Lecturer in English and finally joined Horniman Collage of Journalism. He was Principal there for short period. He is good in English and Marathi. He wrote hundreds of article



on the development issues of backward region of Marathwada. With out standing communication skill and debate he established “Dilasa” with a mission to work in Water and Women sector. Dilasa



is having network in 1365 villages. With the experience of Journalism he has started “Gaongatha” which covers only rural development news with 5000 circulation. Mr. Unhale is M.A. in English, Master of Mass Communication and Journalism, Master of Philosophy and Diploma in Higher Education. Dr. Anagha Patil is the president of Organization.

“Dilasa” is now working in 60+ districts of ten states of India and they are Maharashtra, Gujarat, Rajasthan, Haryana, Madhya Pradesh, Karnataka, Tamilnadu, Bihar, Delhi and Goa. Total beneficiaries are 2302628+ from 7284+ villages.

“Dilasa” had implemented watershed program on 6 lakh ha of land with great performance in micro irrigation, women development and livelihood enrichment. “Dilasa” is having five sister concerns and they are,

- Dilasa Janvikas Foundation
- Dilasa Agro Processor Pvt. Ltd.
- Dilasa Baliraja Krishi Utpadak Producer Company ltd.

- Dilasa centre for Sustainable Liveihood
- Udayan Foundation.

“Dilasa Janvikas Pratishthan’s” activities are listed as below,

- CSR Programme
- Watershed Development
- Water supply and Sanitation
- Women Development
- WADI projects

- Soil and Water testing laboratory
- Loan administration and monitoring

### **CSR Programme**

Corporate Social Responsibility (CSR) means the responsibility of the corporates that extends towards society. There are number of companies that help “Dilasa” in completing their projects like SBI Foundation, United Breweries Chennai and Patna, Oracle and CAF India, L&T Financial Services, ACC Coimbatore, Edelgive Foundation, Mahindra & Mahindra , Coca Cola Foundation ACC cement ect. All CSR work can’t be considered here for lack of time and space problem so light will be thrown on few of them.

### **United Breweries Chennai**

It is a CSR initiative by United Breweries Limited Chennai. Motive is to support villagers by increasing water availability in village surrounding by using water conservation techniques. Under this project 4 villages are covered. Water conservation techniques awareness program is also conducted in villages to aware them about water conservation practice.

### **L&T Financial Services**

With L&T Financial Services “Dilasa” is implementing IWRM( Integrated Water Resources Management) in 72 villages of Maharashtra with the name ‘Jal Vaibhav Prakalp’ for creating climate resilient agriculture community. As climate change is showing erratic and unpredictable weather which is drastically reducing the yield of the farm and there by reducing the income of farmers. Agriculture was getting severely affected because of water scarcity and non availability of irrigational water. Improving agriculture productivity is necessary to meet the needs of people. Sustainable increase in production can be achieved by making sustainable use of water. Hence L&T came forward to implement IWRM projects to increase agriculture income of farmers through NRM (Natural Resource Management) activities and efficient use of water. Project started in 2017 with 12 villages of Dharur block of Beed district and expanded it in 60 villages from Aurangabad, Jalana, and Buldhana district of Maharashtra in 2019. The

objective of project was to create water potential, awareness generation among community on modern agriculture techniques to be adopted, demonstration activities for increasing crop yield. Establishment of farmer field, exposure visit, development of dense forest were also the part of project. A good result was shown in very short time says 'Dilasa'.



### Watershed Development

Watershed Development Fund (WDF) is an integrated programme for rehabilitation of watershed for generation of natural resources. It is initiated under the bilateral agreement between the federal republic of Germany and the Govt. of India and managed by NABARD and "Dilasa" as implementing agency. "Dilasa" implemented this watershed development projects in Jalkotwadi, Aliyabad and Manmodi watersheds in Tuljapur block of Osmanabad dist. In this WDF program 3318 ha area covered under watershed treatment. The main objective of project is to increase the

agriculture productivity through watershed development. Another 5502 ha area also covered in this program in 4 blocks of Ahmednagar dist. and 5 blocks of Nanded dist. NABARD also funded for watershed development program for Jalana Dist. DHFL Mumbai also funded for watershed development project in 5 villages of Phulambri block of Aurangabad dist.

### Water supply and Sanitation

With a concept of "Supply Driven to Demand Driven" approach "Dilasa" played a vital role in Water Supply and Sanitation sector. "Dilasa" has successfully completed eight water supply schemes under 'Apale Pani project'. This project was financed by kfw bank of Germany. 'Dilasa' also worked as Capacity Building Consortium for 'Jalswarajya Project' funded by World bank in Jalana and Beed simultaneously. With the efforts of 'Dilasa' both districts stood first in performance. With well trained and qualified and experienced staff 'Dilasa' implemented more than 266 schemes. The organization has given technical, social and financial process monitoring of 'Jalswarajya Project' in whole state of Maharashtra.

Jalyukta Shivar Abhiyan of Maharashtra govt. to provide long term sustainable solution was also undertaken by 'Dilasa'. This program was developed to address drinking water and irrigation water demand of communities. This program was implemented by Agriculture Department. 'Dilasa' is working for impact assessment in 330 villages of Buldhana dist., 72 villages in Nandurbaar dist., 229 villages in Nasik dist. and 60 villages in Jalgaon dist..

'Dilasa' and Rural Development Organization implemented total sanitation campaign under "swacha Bharat Mossion" in Phulambri block of Aurangabad dist.. 'Dilasa' is responsible for securing finance for construction of sanitation system and promotion of its usage.

### Women Development

'Dilasa' is the only organization in Marathavada Region for conducting MAVIM (Mahila Arthik Vikas Mahamandal) 'Sahayogini's program in Marathavada Region. Under this training programme Aurangabad, Jalana, Parbhani,





participation in agriculture development in order to enhance agriculture productivity. Under this scheme 'Dilasa' made 24 SHGs in 24 villages.

**WADI projects**

'Dilasa' successfully implemented tribal development program in 12 villages of Igatpuri block of Nasik dist. and 14 villages of Patur block of Akola dist.. The main object of this project is to undertake integrated development of 2000 tribal families by establishing Wadi and livelihood support to 200 landless tribal families. Horticulture plantation & maintenance,

Hingoli, Beed and Latur districts are covered. The main focus of the training was on livelihood activity. MAVIM 'Sahayogini's have formed SHG's under Ramai Mahila Sakashmikaran, NABARD and SJSY(Swarnjayanti Gram Swarozgar Yojana) programme. Different skills were provided to participants so that they can start income generating activities. Required production skills were told them through demonstrations. 'Dilasa' has also tried to give marketing and communication skill to the Sahayogini. Under this training programme about 180 Sahayogini's are covered from 6 districts of Marathavada. 'Dilasa' and MAVIM also worked in four districts of Vidarbha region of Maharashtra: Akola, Amaravati, Chandrapur and Gadchiroli with support from IFAD (International Fund for Agricultural Development). 'Dilasa' is the only organization in Marathavada region for executing women oriented agriculture project in Sillod block of Aurangabad dist.. Women participation in agriculture development is the major scheme in Krishi Saptak Programme. The main object of this project is to utilize women



Soil conservation and water development are the main works of this programme. Similarly health & sanitation, Training and capacity building are also part of this program. 'Dilasa' has successfully established 1000 WADIs in both locations i.e. Igatpuri and Nasik in phase manner. It provided additional income generation and creation of assets. This project not only helped to the





Laboratory is at Waladgaon, Aurangabaad.



participating farmers but also increased secondary employment opportunities in the villages which definitely reduced migration of people to the nearby town. The main objective of this project is to uplift socio-economic condition of tribal families through integrated approach. 'Dilasa' has started wadi program for 1000 tribal families in Nasik dist. and 1000 families in Akola dist.. This program is being sponsored by NABARD.

#### **Soil and Water testing laboratory**

'Dilasa' has established a soil testing laboratory in the premises of Dilasa Agro Processor Pvt. Ltd.. This lab. is approved and subsidized by Govt. of Maharashtra. Currently this lab. is receiving soil samples from the Aurangabad dist. This lab. is well equipped with modern instruments such as Atomic Absorption Spectrophotometer, Flame Photometer Spectrophotometer, pH meter, EC meter, Automatic Nitrogen Distillation Unit, Horizontal shaker, Rotary shaker etc. having a capacity of testing 15000 soil samples and 1000 water samples per year.

Soil health card report card is prepared containing 12 parameters of soil: pH, Electrical conductivity, Organic Carbon, Sulphur Micro nutrients like Zink, Ferrous, Copper, Manganese, Boron and micro nutrients like Nitrogen, Phosphorous, Potash. Soil testing gives an idea to farmers about lacking nutrients in soil and required fertilizer. Farmers receive a well maintained soil health record by which they can study the soil management practices. This way they can plan the future of their crops and land for optimum yield.



#### **Loan administration and monitoring**

'Dilasa' was appointed as a loan administration and monitoring agency by various financial institutions. 'Dilasa' has created awareness among the farmers for utilization of loan and regular return of loan for the welfare of the farmers and their families. This helped farmers in getting finance for agriculture activities at the right time and main reduction in the suicides of farmers.

Name of Financial Institution	No. of Beneficiary
NABARD UPNRM-I	1058
NABARD UPNRM-II	188
Nabkisan Limited	31 FPO's (Follow on Public Offer)
DHFL	Creation of medical infrastructure facilities

'Dilasa' is partnering with number of partners for financial and technical support in completing their activities successfully in their working area. Of the big list few are named as below.

- Syngenta
- ACC limited
- Anandana- Coca Cola India Foundation.
- CAF- Charities Aid Foundation
- CII- Confederation of Indian Industry
- DHLF
- IFAD
- L&T Financial services
- SBI Foundation etc.
- UNICEF

In addition to above 'Dilasa' accepts financial help from individuals with Tax benefit to them under section 80G of Income Tax.

'Dilasa' was honoured with many national and international awards for their contribution in water storage and ground water harvesting. Few of them are listed as below.

- 'Best Water NGO-Revival of Rural Water Resources' for outstanding contribution in the field of water in India.
- Indian Water Works Association (IWWA) award at Hyderabad for the remarkable contribution in the field of water supply.
- Bhoomijal Sanvardhan 2007 – A National Award by Ministry of Water Resources for remarkable work in water sector.
- Complimentary Award for best model of ideal watershed 2006.
- Sinchan Mitra award 2004 for completion of 25000 ha. soil and water conservation.
- National Award for Innovations in Watershed in 2001
- Mahatma Award for Social Good 2020 in

Rural Development.

- Durga Award 2023 by Loksatta for its contribution in the field of water. Etc.

For further details of 'Dilasa Janvikas Pratishthan' interested readers may contact on their postal address or on their web site given below.

Address

B-3, Sudarshan park, Vedant Nagar,  
Near MIDC Regional Office, Station Road,  
Aurangabad-431005

Phone-0240- 2320444/2363741

Email-dilasango@gmail.com

www.dilasango.org



## Water Sensations Will Provide Water Protection

Waterman Rajendra Singh

( M ) : 9414066765



Location- NCRT, Delhi

Water Yatra reached Delhi on 9th May 2024 Jalpurush Rajendra Singh ji was invited as the keynote speaker in NCRT's dialogue program here. Here waterman Rajendra Singh ji said, today the whole world is getting ruined due to climate change. Due to climate change in India, farmers now do not know when the clouds will come and when will they settle. There was a time when the farmer knew the clouds and used to cultivate from the drops falling from the clouds. We must understand that the climate change problem is worldwide, but the solution to this problem is local. The way Tabhasan adapted and abolished climate change in Rajasthan's Thanagazi Tehsil should be in the whole world.

Further said, our education only teaches our brain to drive around and stops looking at our environmental environment. For this reason, the relationships with which we were teachers of the world, have forgotten those relationships. We were the teachers of the world in that time when we recognized our God. Our God was earth, sky, air, fire and water. By the time we knew this God, we were all one. We believed that, it could only be possible to consider the world a family, when the creator of us

is one. Then Panchmahabhoot was going to make us one.

God had created the sacrament of considered water, women and river as Narayan. That's why the people of India are going to give life to water, mother to women and river is going to give life flow. Education only makes us big for profit, looking for 14'-16 hours night and day to find a job, which makes us selfish. While Vidya teaches and inspires to do good for the world.

Today we have to know that, now in this 21st century, if India wants to make the teacher of the world, it cannot make education. Education snatches the joy of our life and breaks it into pieces. That's why we need to make a relationship of education with Vidya.

Further said that 72 percent of India's underground water reserves are empty today. When our groundwater reserves are empty, will we have water? Will our lives go on? Will our farming be there? Will our industries run? So today the world should learn from the way the people of Rajasthan worked to make our lives happy, prosperous and peaceful.

Further said, today water market has become all over the world. The situation is such that bottle water is sold in the village also and our governments talk about water in the tap and tap in every house. Because the water market increases, when the water crisis. When the world remains watery in its place, the market is not built. By managing community decentralized water, awakening water sensitivity, and catching water drops to make India water water water water protection; then our senses will provide water protection.





# Climate Finance & The Net Zero Transition in India

Anjanalakshmi G



Anjanalakshmi G  
Senior Research Analyst, Centre for Environmental Research & Education (CERE)

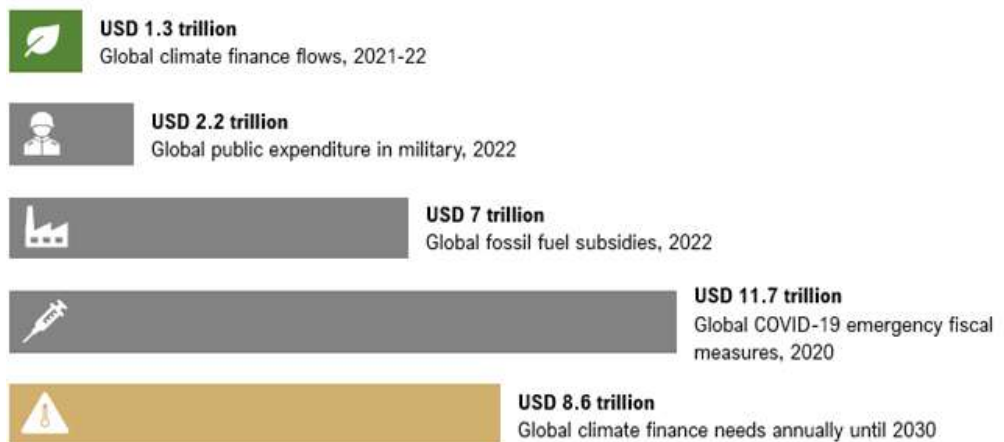
Anjana handles projects at CERE involving carbon foot-printing, environmental sustainability assessments and climate-related disclosures. With a background in environmental economics, her interest areas include green finance, ESG assessments and sustainable business strategies. Climate Finance for a Warming World

We live in a world where natural disasters, extreme weather events, and threats to food and water security are increasing with rising global temperatures. The climate crisis is real. Unless nations, institutions, the private sector and individuals collaborate to protect nature and reduce emissions, we are looking at a bleak future. Climate finance is a mechanism through which climate change mitigation and adaptation activities are supported financially. This generally involves funding projects related to renewable energy, sustainable agriculture, water management, low-carbon transport and other priority areas related to the environment. Mitigation activities involve projects which reduce greenhouse gas (GHG) emissions released into the atmosphere.

Adaptation involves projects geared towards adjusting systems to cope with current and future climate impacts. Global climate finance is currently leaning more towards mitigation projects. As per an analysis by the Climate Policy Initiative, mitigation projects in the energy and transport sectors were responsible for two-thirds of total climate finance flows in 2021-22.

Investing for a sustainable future calls for looking beyond traditional sources of finance. Innovative instruments such as green bonds, sustainability-linked bonds and debt-for-nature swaps have been introduced to mobilise climate finance. Blended finance which promotes collaboration between public, private and philanthropic capital is also gaining popularity.

**Figure 1: Climate finance in the context of other global expenditures**



Source: Adapted from Global Landscape of Climate

**Is the Current State of Climate Finance Enough?**

A core theme of the COP28 which concluded on 12 December 2023 was to develop a framework for accessible and affordable climate finance. This is in light of global bodies including the United Nations recognising substantial gaps in climate funding relative to the requirements for transitioning to a world with net zero carbon emissions – a state where carbon emissions and removals balance each other. In fact, the State of Finance for Nature report released at the COP28 revealed that finance flows to activities harming nature were 30 times larger than investments in nature-based solutions.

As Figure 1 shows, the estimated financial need to mitigate and adapt to climate change is \$ 8.6 trillion annually till 2030. The current state of finance (\$ 1.27 trillion) falls way short of the mark. This calls for a redistribution and reallocation of funds towards meeting climate goals.

**Taking Stock of India’s Commitments**

Since the Paris Agreement in 2016, India has announced commitments in the form of Nationally Determined Contributions (NDC) to reduce GHG emissions. These include targets to reduce the emissions intensity of India’s GDP, increase the share of renewables in electricity generation and enhance carbon sinks. India also pledged to achieve net zero emissions by 2070.

There has been some progress towards achieving these targets with key outcomes highlighted below:

- The installed non-fossil fuel capacity increased by 396% in the last 8.5 years. In 2022, India ranked 4th globally in renewable energy installed capacity.
- The same year also saw the highest year-on-year growth in renewable energy additions of 9.83%. India updated its NDC in 2022 to account for the progress in renewables and released India’s Long-Term Low-Carbon Development Strategy, a document outlining the commitments and planned initiatives.

- Earlier this year, the government approved the National Green Hydrogen Mission aimed at supporting indigenous, affordable and sustainable production of hydrogen.

**Figure 2: India’s progress towards updated commitments**

2022 NDC Target	Key Progress Indicator
Achieve 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.	As of June 2023, non-fossil fuel generation capacity is 43% of total installed capacity.
Reduce emissions intensity of the economy by at least 45% by 2030 relative to 2005 levels.	India has already achieved a 24% reduction in emissions intensity between 2005 and 2016.
Create an additional carbon sink of 2.5 billion to 3 billion metric tonnes of carbon dioxide through forestry by 2030	The carbon stock in Indian forests (including plantation/trees outside forests) increased by 79.4 million metric tonnes between 2019 and 2021.

Source: Adapted from Deb and Roy (2023)

However, while the initiatives look promising, achieving the set targets may not be enough to limit global temperature rise to 1.5°C by the end of this century. The global average temperature already rose to 1.1°C above the pre-industrial baseline in 2021. Extrapolations by the Climate Action Tracker reveal that if all countries were to follow India’s approach, then global warming could reach up to 3°C. Furthermore, it appears that the net zero target has not been clearly defined in terms of scope and other technicalities. Much more effort seems to be required to achieve the carbon sink target as well. The baseline for calculating additional carbon sink is unclear. While

total forest and tree cover may have increased between 2019 and 2021 (by 2,261 sq. km), regions such as the North East actually recorded forest cover loss of 1,020 sq. km.

As per a report by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), India may face climate change-related losses reaching 35% of its GDP by 2100. The report stresses that institutions must prioritise bridging the sustainable finance gap. The estimated funding required for India to achieve the NDCs by 2030 is \$1.04 trillion as per UNESCAP. The International Finance Corporation estimates that \$10.1 trillion would be required to achieve the net zero target by 2070 and a major chunk of the investments would need to come from the private sector. This presents a huge opportunity for the financial sector in India.

### Aligning to Net Zero Pathways

Achieving net zero emissions requires collaborative efforts from the government, corporations, regulatory authorities, institutions, academia and individuals. A nationwide target

emissions to building a system of checks and balances.

CERE's Carbon Map & Cap™ program offers companies a suite of GHG accounting services including assessing organisation-wide emissions, charting mitigation roadmaps, setting targets and monitoring progress. Along with carbon assessments and reporting, CERE also supports CSR projects involving afforestation, solar installations, rainwater harvesting and other nature-based solutions.

For financial institutions, CERE also helps assess the portfolio impact by calculating financed emissions. These are absolute emissions that banks and investors finance through their loans and investments. Positive portfolio impact can be enhanced through climate finance instruments. Climate-friendly retail banking such as offering loans for solar installations, purchasing electric vehicles, green homes, etc. can facilitate climate action.

**Figure 3: Benefits to organisations through CERE's Carbon Map & Cap™ program**



must also trickle down to the grassroots to ensure effective implementation. This means while India is on the path to net zero by 2070, corporations must also work to align their climate goals and develop a roadmap to transition to net zero.

Some of India's big corporations such as Reliance Industries, HDFC Bank, Mahindra & Mahindra, and Dalmia Cement have announced targets to reach carbon neutrality. However, it can be quite a challenging task to navigate through the entire process right from measurement of baseline

Inaction is not an option anymore. Widespread funding towards climate mitigation and adaptation, and a transition towards carbon-neutral pathways are the need of the hour. As an emerging economy, India may face formidable challenges. However, with the right tools, partnerships and strategies, it is possible to attain and sustain climate goals.



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*Lovely thing to learn  
from water:*

*Adjust yourself in  
every situation and  
in any shape.*

*But most importantly  
find your own way  
of flow.*

## **Pune's Water Crisis to Be Like Bengaluru's As**

### **Water Sources Deplete Rapidly**

**By Ishika Kumar**

The grim situation is fuelled by the unchecked discharge of massive untreated sewage directly into rivers and water bodies, signalling a dire lack of concern for precious water resources among governmental bodies, elected officials, politicians and even the citizens.

The expansive city of Pune is facing a crisis as its water sources rapidly dwindle, driven by a combination of factors including rampant urbanisation, water pollution and unbridled extraction of groundwater. The grim situation is fuelled by the unchecked discharge of massive untreated sewage directly into rivers and water bodies, signalling a dire lack of concern for precious water resources among governmental bodies, elected officials, politicians and even the citizens.

Non-governmental organisations (NGOs) specialising in water-related issues have raised this red flag, warning that unless urgent action is taken to rectify the current practices, Pune could soon find itself in a water crisis akin to the one that has plagued Bangalore in recent years. In response to this pressing predicament, concerned organisations have hooped in together to craft a comprehensive water manifesto, aimed at compelling political parties and electoral candidates to prioritise water management efforts and adopt them in their agendas.

Prominent among the NGOs commanding this initiative are Gram Gaurav Pratishtan, Vanarai Organisation and the Gokhale Institute of Politics and Economics. The pivotal moment came during a recent conference convened on Tuesday, 23rd April, where leading figures in water management, including esteemed water expert Pradeep

Purandare, Trustee of Gram Gaurav Pratishtan Kalpana Salunkhe, Executive Trustee Dr Sonali Shinde, Prasad Sevekari and Coordinator Amit Wadekar, came together to address the issue at hand.

Pradeep Purandare, renowned for his expertise in water matters, reasoned the critical importance of effective planning, regulation and enforcement of water laws. He drew attention to the alarming neglect of dam maintenance and repair, stressing the urgent need for regular upkeep to ensure their continued functionality. Furthermore, Purandare emphasised the imperative of equitable water distribution and the need for a collective effort to ensure access to water for all individuals.

Kalpana Salunkhe, Trustee of Gram Gaurav Pratishtan, lamented and indicated that the persistent water crisis stems from decades of neglect, tracing its roots back to as early as 1972. She highlighted the failure of authorities to effectively manage available water resources, noting a severe departure from past policies that once advocated robustly for water-related issues. Salunkhe called for a renewed commitment from today's representatives to address this existential challenge head-on.

Amit Wadekar amplified these sentiments, emphasising the need for elected officials to prioritise discussions on water-related matters, and also the critical essence of effective water resource management and regulation to cut the tide of depletion.

The manifesto put forth by these concerned organisations outlines a series of key recommendations aimed at tackling various facets

of water management and ensuring sustainable usage for the future.

· Firstly, the baseline availability of water should dictate future urban planning and outlining of the city-development plans. Efforts should ensure that development is in harmony with the available water resources only. This approach can help prevent over-exploitation and ensure the long-term viability of water sources.

Secondly, the implementation of water recharge initiatives in urban settings is essential to replenish groundwater levels. These initiatives can include rainwater harvesting, the creation of artificial recharge structures and the preservation of natural water bodies.

Thirdly, combatting water leakage and water theft is crucial for conserving water resources. Measures such as the installation of water meters, regular maintenance of water distribution systems and the imposition of penalties for water theft can help reduce wastage and ensure equitable distribution.

Fourthly, the regular maintenance and repair of dams are paramount to their continued functionality. The '3D' scheme proposed by the manifesto aims to address this by focusing on timely dam desilting, desilting of canals and desalination of reservoirs.

Fifthly, the manifesto proposes the dissolution of the Irrigation Department and the establishment of a River Basin Authority to streamline water management efforts and ensure integrated planning at the basin level.

Sixthly, allocating funds for the repair and revitalization of minor irrigation projects can help enhance water availability for agricultural purposes, thereby supporting rural livelihoods.

Seventhly, planning on a watershed and river basin basis is essential for holistic water management, as it allows for the consideration of interconnected water systems and ecosystems.

Eighthly, prioritising water conservation initiatives and promoting schemes such as farm-to-demand can help reduce water usage in agriculture, which is a significant consumer of water resources; so is construction, as cement needs immense amounts of water for mixing.

Lastly, the establishment of punitive measures against those illegally discharging sewage, industrial waste and chemical pollutants into rivers is crucial for safeguarding water quality and public health. Heavy fines and punishment like those under cognizable offences should be levied for such outrageous harm during a water shortage in the city.

These recommendations, if implemented with diligence and urgency, hold the promise of mitigating Pune's water woes and ensuring a sustainable future for generations to come. As the clock ticks ominously, the onus rests on policymakers and citizens alike to heed the cry for help and take action before it is too late.





## **Southern India faces water crisis as reservoir**

**levels plunge to just 17 pc capacity :**

**Central Water Commission**

The reduced storage levels in the southern region are indicative of worsening water scarcity and potential challenges for irrigation, drinking water supply and hydroelectric power generation in these states.

The southern region, encompassing states of Andhra Pradesh, Telangana, Karnataka, Kerala and Tamil Nadu, has significantly reduced water storage compared to historical averages at just 17 per cent of reservoir capacity, according to the recent bulletin of the Central Water Commission.

In the bulletin released by the CWC late Thursday concerning reservoir storage levels across various regions of India, it was reported that 42 reservoirs under CWC monitoring in the southern region have a total live storage capacity of

53.334 BCM (billion cubic meters).

As per the latest report, the total live storage available in these reservoirs stands at 8.865 BCM, representing only 17 per cent of their total capacity.

This figure is considerably lower compared to the storage levels during the same period last year (29 per cent) and the ten-year average for the corresponding period (23 per cent).

The reduced storage levels in the southern region are indicative of worsening water scarcity and potential challenges for irrigation, drinking water supply and hydroelectric power generation in these states.

In contrast, the eastern region, comprising states like Assam, Odisha and West Bengal, has



shown a positive improvement in water storage levels compared to last year and the ten-year average.

The bulletin highlighted that in this region, 23 monitored reservoirs with a total live storage capacity of 20.430 BCM currently hold 7.889 BCM of water, representing 39 per cent of their total capacity.

This marks an improvement over the storage levels from the same period last year (34 per cent) and the ten-year average (34 per cent).

The situation is less optimistic in other regions.

The western region, consisting of Gujarat and Maharashtra, reports storage levels of 11.771 BCM, which is 31.7 per cent of the total capacity of 49 monitored reservoirs.

This is notably lower compared to the storage levels of the previous year (38 per cent) and the ten-year average (32.1 per cent).

Similarly, the northern and central regions also show declines in water storage levels compared to historical averages.

The broader analysis provided in the bulletin categorizes reservoir storage across various river basins as “better than normal,” “close to normal,” “deficient,” or “highly deficient”.

Notably, river basins like Brahmaputra, Narmada and Tapi are marked as having better-than-normal storage levels, whereas basins like Cauvery and east flowing rivers between Mahanadi and Pennar are classified as highly deficient.

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**Water Management solution biz expected to reach Rs. 1 k cr in FY 25 : Thermax**

Pune : Thermax’s water management solutions deployed by the company have enabled commercial and residential complexes reduce their dependence on external sources such as water tankers by 80 %. The company has deployed its water management solutions to over 140 residential and commercial sites in the country and is in talks with developers to implement its

solutions, MD and CEO Ashish Bhandari said.

The volume of water required for consumption is going to spike significantly on coming years and with no new sources of water being available, management solutions will play a key role, he said at the launch of the company’s water and wastewater solutions unit in the city.

The company has set up water and wastewater facility by making an investment of Rs. 45 crore for providing solutions such as zero liquid discharge, reverse osmosis and sewage treatment plant for residential and industrial projects. In addition, the plant will also implement and cater to new technologies such as softener and filter vessels, tubular membrane modules, and capacitive deionisation solution. The business is expected to grow by three fold and the company is looking at an orderbook of Rs. 1000 crore for FY 25. Thermax started water management vertical almost 40 year ago but it has increased its focus on the business on account of increased demand from across sectors such as food and beverage, textiles, Bhandari said. Some of the process such as zero liquid discharge is a significant cost to companies and the challenge is to reduce the operating costs for such enterprises.

Despite the demand from the private sector, the company may not entered into the municipal and government projects as these are larger projects, he added.

**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.

## 7 most beautiful forests in India

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abundant water sources and lush greenery, along with a diverse ecosystem.

Named after the Sundari Mangrove trees, the Sundarbans ranks among the world's largest active deltas, spanning across India and Bangladesh. Encompassing 40,000 square kilometers, it boasts renowned coastal mangrove forests and serves as a habitat for over 260 bird species and the majestic Royal Bengal tiger. With 102 islands, 54 of them inhabited, it holds status as a distinctive and vital natural sanctuary.

Namdapha National Park, Arunachal

India is one of the top 10 countries with rich forest cover, which is an achievement in itself. While this achievement is noteworthy, it's tempered by the loss of resources due to historical transgressions, such as forest burning and wildlife hunting. Nevertheless, for enthusiasts of nature, India remains a veritable paradise, teeming with biosphere reserves and biodiversity hotspots. Here, we bring to you a curated list of India's 7 most notable forests, promising visitors an unparalleled and exclusive experience.

Saranda Forest, Jharkhand This forest once served as the private hunting grounds for the Singh Deo royal family of Saraikela in the West Singhbhum district of Jharkhand. Saranda Forest spans across an area of 820 square kilometers and is inhabited by the Ho people. Rich in iron ore, minerals, sal trees, and a variety of wildlife including leopards, the forest derives its name, 'Saranda,' from its



Pradesh Ranked as the fourth largest national park in India, Namdapha covers an area of 1,985 sq km and is a hotspot for biodiversity in the Eastern Himalayas. Featuring extensive bamboo forests, a rich variety of flora and fauna, and evergreen rainforests, the park was initially a wildlife



sanctuary before being designated as a Tiger

### **Pichavaram Mangrove Forest, Tamil Nadu**



Ranked as the second largest mangrove forest globally, Pichavaram offers a serene getaway with its 50 islands, 4,400 canals, and diverse bird species. Despite serving as a buffer zone during the 2004 tsunami, protecting inland territories, the forest has faced challenges due to its complex waterways, attracting smugglers. Nonetheless, it remains an offbeat destination ideal for a peaceful weekend retreat.

Often referred to as the 'Scotland of the East,' the Khasi Hills feature low mountain formations on the Shillong plateau and are inhabited by the Khasi people, known for their unique matrilineal system and chieftainships. This region, including Cherrapunjee, one of the wettest places on Earth, showcases a

Reserve in 1983.

### **Nilgiri Biosphere Reserve**

Translating to 'Blue Mountains,' Nilgiri serves as the meeting point of the Western and Eastern Ghats, and is famed for its seasonal rainforests, tropical forests, and moist deciduous forests. With more than 3,500 species of flowering plants, the reserve spans across Kerala, Karnataka, and Tamil Nadu and is inhabited by various tribes with distinct rituals and customs, making it a revered hotspot for biodiversity.

### **Mawphlang Sacred Forest, Meghalaya**

Spread across 192 acres, the Mawphlang Sacred Forest is considered the holy dwelling place of the local deity, Labasa, who takes the form of a leopard or tiger to protect the locals and preserve their society. Enforcing a strict rule of prohibiting anything from being taken out of the premises, the forest features monoliths depicting local traditions of animal sacrifices and houses a variety of fauna with medicinal properties.



distinct culture and breathtaking landscapes, making it a visual treat for visitors.





## Raj 1st state to launch dashboard on water

### resources info system

Jaipur : To forecast drought and to enable better water management based on water availability, water resources department (WRD) minister Suresh Singh Rawat inaugurated the State Water Resources Information System Dashboard at Sinchan Bhawan. Rajasthan is the first state in the country to launch this portal.

A press release from the department stated, this portal will only help in forecasting drought and drought but will also enable better water management based on water availability. This system has been developed buy the Department of water Resources under the National Hydrology Project.



This portal will prove to be a milestone in the direction of water management in rain deficient state like Rajasthan. Farmers will get the most benefit from getting real - time information

about water availability. By continuous monitoring of rainfall, waterlogging, temperature, ground water status and availability of surface water, better and sustainable management of the water resources of the state can be done, said Rawat.

At present, complete data of 805 dams and daily data of 242 dams and live data of 88 dams will be available on the portal. Also, in the rainfall module, the analyzed data of 326 rain gauge stations from 1957 till now can also be views or downloaded through graphs. Information about canal network will be available in the Canal module.

This network has also been mapped on GIS. Data of Ganga and Bhakra canal system, Bisalpur, Jawai, Gudha, Jawahar Sagar dams will be available live through SCADA.

In addition, real time data of rainfall, waterlogging, temperature etc, of 322 places will be available every hour through Real Time Data Ambition System (RTDAS|). Besides, old records, maps, DPR etc. of WRD will also be available on the portal within some time. Pre and post monsoon data of 9022 piezometers / dig wells / observation wells from the year 2011 will also be available in the ground water module.

In the present times data is emerging as a valuable resource. With the help of technologies like Artificial Intelligence, data can be used in the interest of the general public. HE said that by working in coordination with other departments in this regard, this system will be made more strong and effective, said Abhay Kumar secretary of water resources department (WRD).

## Groundwater level down in all 13 tehsils of

### Pune in March, finds GSDA study



Pune : Groundwater level declined in all 13 tehsils of the district in March , with Purandar, Shirur and Baramati showing maximum depletion of up to one metre, a study has found after comparing with the average figures recorded in the last five years for the month.

#### Rain, hail damage crops over 36k ha in Vidarbha :

This is probably the most depleted groundwater level in the last four - five years. Measures like rainwater harvesting should be made mandatory to check this rapid decline. Defunct borewells and wells should be modified and used as recharge systems. Diwakar Dhote, a senior geologist with Groundwater Surveys and Development Agency (GSDA), which carried out the survey said.

In Purandar, the average water table stood at 5.92 m recorded for the period in the last five years. In Shirur, it was 7.09 m against 6.14 m and in Baramati it was 6.44 m compared to the five year average of 5.58 m.

#### Deficient rainfall could affect level of groundwater :

Shashank Deshpande a retired GSDA geologist, said a 20% rainfall deficiency usually shows a groundwater depletion of more than 30%.

Purandar is a drought - prone block and the groundwater depletion could be the cumulative effect of deficient rainfall. This is alarming, and these blocks should be taken up on priority under the state water conservation schemes, he said.

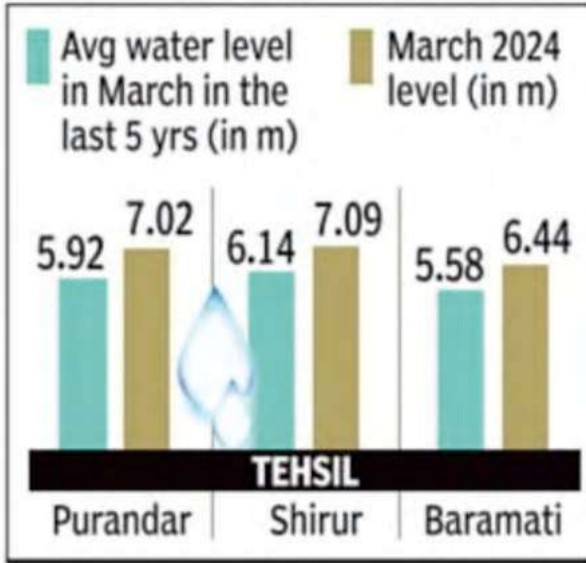
Groundwater experts said around 30-40 % of the rainwater is naturally percolated into the soil and the depletion occurs when the input is less than the output.

Colonel Shashikant Dalvi (retd), who has helped make 106 villages tanker - free through rainwater harvesting systems, said Tehsils depend on groundwater for agriculture, animal husbandry and daily domestic use. There is a need to set up groundwater recharge systems , with the help of CSR funds, in villages to make them self sufficient .

Dalvi, founder of Parjanya, is now working to help 30 villages in Marthawada set up rainwater harvesting systems.

Dr. Himanshu Kulkarni, founder and director of Advanced Center for Water Resources Development and Management, a not for profit knowledge institution and think tank on groundwater level as a standalone indicator of

anything. It has to be seen as a factor of rainfall in the year, the kind of extraction that is taking place etc. Preparedness for water shortage is the biggest gap in our programmes and policies.



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# Water crisis looms as dams across Maharashtra in critical condition

By Siddharth Gadkari

A senior official of the state water resources department said, "As compared to last year, this summer seems to be hotter, further exacerbating the water shortage

A water crisis is looming large in Maharashtra as water levels in dams across the state have dropped to 32.72% of their total storage capacity. And Pune is no exception with its four dams namely Khadakwasla, Temghar, Panshet and Varasgaon holding only 10.31 TMC (thousand million cubic feet) of water as against 12.91 TMC on the corresponding day last year.

A senior official of the state water resources department said, "As compared to last year, this summer seems to be hotter, further exacerbating the water shortage. Less rainfall this year has contributed to the decline in dam water levels. Currently, 138 major dams across the state hold only 32.72% of their total storage capacity (a more than 7.1% decrease from last year)."

## Water tankers to the rescue

With rising mercury levels, water scarcity is only becoming more severe. The demand for water tankers is increasing as villages struggle to access water. In Pune city, the Pune Municipal Corporation (PMC) has increased water tanker trips in the 34 merged villages due to complaints of inadequate water supply. Presently, the PMC is sending 300 water tankers to 11 out of the 34 merged villages and 800 water tankers to the remaining 23 villages to address the demand for water in areas such as Sus, Mahalunge, Pisoli, Holkar Wadi, Phursungi,

Uruli and Catari Bu. However, water continues to be in short supply in these areas despite the efforts. So much so that the PMC has increased tanker trips by 10%.

A majority of the 1,799 villages in the Pune division now depend on tanker water supply. Similarly, 33 villages in the Konkan division; 1,179 villages in the Nashik division; 697 villages in the Chhatrapati Sambhajnagar division; and 26 villages in the Amravati division depend on tanker water supply. Whereas the Nagpur division has not still resorted to tanker water. As per the water supply and sanitation department statistics, 1,417 tankers are presently delivering water to 1,153 villages and 2,583 settlements across Maharashtra. Every week, around 100 to 150 new villages are being added to the list.

## Dwindling water reserves

The water storage in various divisions of the state is certainly a cause for concern. The Marathwada division has the lowest water storage at 19.36%; followed by the Pune division at 36.34%; Nagpur division at 48.84%; Amravati division at 49.62%; Nashik division at 38.17%; and Konkan division at 50.50%. Given the limited water storage in dams and the increasing demand for drinking water, there is a possibility of restrictions on irrigation, especially in Pune, Nashik, and some parts of Marathwada.



### Critical dam water levels

Out of 138 major dams in Maharashtra, 17 are completely dry; 23 have less than 10% water storage; 20 have more than 50% water storage; while the rest have 20 to 40% water storage. This suggests that the state may face severe water scarcity this year.

### Chances of loadshedding

The Koyna dam for instance, has only 47.52% usable water storage as against 50.92% during the corresponding period last year. This could lead to

limitations on power generation as the demand for water increases during the monsoon. Consequently, there may be discussions about diverting water from electricity generation to other purposes, potentially leading to load regulation, particularly in rural areas. Koyna generates 1,920-megawatt of hydraulic power. If the water level goes down, it affects power generation.



## Rice, wheat today has less nutritional quality, more toxic elements than 50 years ago: Study



Rice, wheat today has less nutritional quality, more toxic elements than 50 years ago: Study

The production of high quantities of food grains have compromised the nutritional quality of these products, noted the study.

Rice and wheat form the cornerstone of food security and nutrition for people in India, providing over 50 percent of their daily energy needs. (Creative Commons)

Rice and wheat form the cornerstone of food security and nutrition for people in India, providing over 50 percent of their daily energy needs.

Over the past 50 years, since the Green Revolution

in India, numerous high-yielding varieties of rice and wheat have been introduced, with only a select few recognised as landmark cultivars — the different varieties of a food grain.

These particular cultivars demonstrated broad adaptability and resistance to various pests and environmental challenges within different agricultural regions, making them highly popular among farmers.

These landmark cultivars significantly improved the fortunes of cereal growers and played a pivotal role in the success of the Green Revolution, ensuring the country's food sufficiency, significantly increasing food production, and thus alleviating hunger and food shortages.

## Higher quantities, lower quality

But, a new study — titled “Historical shifting in grain mineral density of landmark rice and wheat cultivars released over the past 50 years in India” — by Hyderabad-based ICMR-National Institute of Nutrition (NIN) along with institutes of the Indian Council of Agricultural Research (ICAR) found that the production of high quantities of food grains have compromised the nutritional quality of these products while the toxic elements have increased in the grains.

The results of the study suggested that “the modern breeding agenda for genetic gains in the yield of rice and wheat in India have tended to reduce the concentration of essential and beneficial elements, but to enhance toxic elements concentration in grains”.

It added, “Consequently, it dented the dietary value of the major staples (rice and wheat) to the Indian population in the past 50 years or so.”

The study further highlighted the worsening of grain mineral diet quality for both rice and wheat up to 2040.

“This necessitates the urgency of efforts to improve the grain mineral density, at least, essential nutrients, of these staples through genetic interventions for sustenance of nutrition and human health in the years to come. The favourable alleles that were ‘left behind’ during the modern breeding process may be bred back into the cultivars, and grain nutrient profile should mandatorily be evaluated before release of a cultivar in near future,” said the study.

Despite achieving food sufficiency, it remains surprising that India still faces a significant issue of undernutrition, which imposes a substantial economic burden on its society.

Out of the 768 million undernourished individuals

worldwide (9.8 percent of the total population), India is home to 224.3 million (2.9 percent).

The core of this problem lies in the food systems that prioritise maximising yields and economic worth without enough attention to the nutritional value, specifically the overall mineral content known as the ionome and its effects on human health.

### The study

The study reported altered grain nutrient profile of modern-bred rice — developed through modern breeding techniques — and wheat cultivars — different varieties or strains of wheat that have been selectively bred or developed for specific traits or purposes — diminishing their mineral dietary significance to the Indian population.

The researchers evaluated grain-nutrient profiles of historical landmark high-yielding cultivars of rice and wheat released in succeeding decades since the Green Revolution in the mid-1970s and their impacts on mineral diet quality and human health, with a prediction for decades ahead.

Analysis of grain-nutrient profiles showed a downward trend in concentrations of essential and beneficial elements, but an upward trend in toxic elements in the past 50 years in both rice and wheat.

For example, zinc and iron concentration in grains of rice decreased by 33 percent and 27 percent, respectively. For wheat, they decreased by 30 percent and 19 percent, respectively, for more than 50 years.

A proposed mineral-diet quality index (M-DQI) significantly decreased by 57 percent and 36 percent in the reported period (1960–2010) in rice and wheat, respectively.

“The impoverished M-DQI could impose hostile effects on non-communicable diseases (NCDs) like

iron-deficiency anaemia, respiratory, cardiovascular, and musculoskeletal diseases among the Indian population by 2040. Our research calls for an urgency of grain nutrient profiling before releasing a cultivar of staples like rice and wheat in the future,” said the researchers.

### Essential elements

Over the decades, there has been a decrease in the concentrations of calcium (Ca), zinc (Zn), iron (Fe), and copper (Cu) in both newer varieties of rice and wheat compared to their older counterparts.

In contrast, there has been an increase in sulphur (S) concentrations observed in the newer varieties of both rice and wheat.

For instance, the concentrations of Ca, Zn, and Fe in the grains of rice and wheat cultivars released in the 1960s were 337.0, 19.9, and 33.6, and 492.3, 24.3, and 57.6 mg per kg, respectively.

These concentrations significantly dropped to 186.3 (a 45 percent decrease), 13.4 (a 33 percent decrease), and 23.5 (a 30 percent decrease), and 344.2 (a 30 percent decrease), 17.6 (a 27 percent decrease), and 46.4 (a 19 percent decrease) mg per kg in cultivars released in the 2000s and 2010s, respectively.

Conversely, sulphur concentration in grains of rice and wheat cultivars released in the 1960s was 472.7 and 518.3 mg per kg, which significantly rose to 653.6 (a 38 percent increase) and 1,744.3 (a 236 percent increase) mg per kg in cultivars of the 2000s and 2010s, respectively.

### Beneficial elements

Over time, the levels of beneficial elements decreased in newly developed cultivars compared to their older counterparts in both rice and wheat grains.

For instance, silicon (Si) concentration in grains of rice and wheat cultivars released in the 1960s was 521.9 and 456.6 mg per kg, respectively.

These concentrations significantly decreased to 304.7 (a 42 percent decrease) and 251.4 (a 45 percent decrease) mg per kg in cultivars released in the 2000s and 2010s, respectively.

Apart from gallium (Ga) concentration in wheat grain, there was an upward trend observed for silver (Ag) concentrations in grains of newly released rice and wheat cultivars.

### Toxic elements

Over the years, there has been an increasing trend in the concentrations of toxic elements, except for lead (Pb), in newly developed rice cultivars compared to older ones.

However, a reverse downward trend was observed for the concentrations of lead (Pb), chromium (Cr), and arsenic (As) in grains of newly developed wheat cultivars.

For instance, the concentration of As in rice cultivars released in the 1960s was 0.05 mg per kg, which increased significantly to 0.80 (a 1,493 percent rise) mg per kg in cultivars of the 2000s.

In contrast, the concentration decreased from 0.032 mg per kg in wheat cultivars released in the 1960s to 0.015 mg per kg (a 53 percent decrease) in cultivars of the 2010s.

Aluminum (Al) concentration in grains of rice cultivars significantly increased from 29.3 mg per kg in the 1960s to 52.1 (a 78 percent rise) mg per kg in the 2000s.

Meanwhile, its concentration in wheat cultivars rose from 32.6 mg per kg in the 1960s to 44.6 mg per kg (a 37 percent rise) in cultivars of the 2010s.

In contrast, the concentration of Pb significantly decreased from 0.051 to 0.037 mg per kg (a 27 percent decrease) in rice and from 0.045 to 0.012 mg per kg (a 72 percent decrease) in wheat cultivars released over the past 50 years.



### The significance of these nutrients

The researcher found that consuming rice might have more harmful impacts on human health compared to its beneficial effects, largely due to the ingestion of higher levels of toxic substances.

Recently, this issue has become critical due to the widespread contamination of essential soil resources with toxic elements, a consequence of rapid industrialization and urbanisation in India.

“There is strong evidence that oral ingestion of metal toxicants like Arsenic (As), Chromium (Cr), Barium (Ba), and Strontium (Sr) imposes toxic effects like lung cancers or chronic respiratory diseases, cardiovascular diseases, hyperkeratosis, renal toxicity and impaired bone calcification. As a fallout of the above phenomena, a naturally high reliance on rice diet could put the Indian population at higher risks of having non-communicable diseases (NCDs) like dermal, respiratory, renal, cardiovascular, or musculoskeletal ones, which would worsen the country’s already high disease burden,” said the researchers.

Conversely, a significant decline in the positive impact of the Mineral-Diet Quality Index (M-DQI) in wheat cultivars until the 2000s indicates a diminishing nutritional benefit for human health due to reduced intake of essential elements, alongside a decrease in wheat consumption.

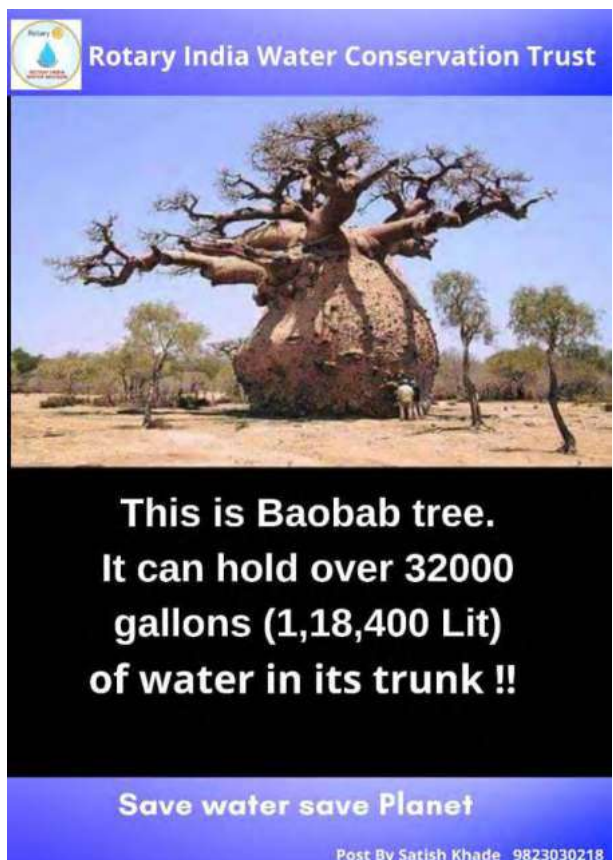
Essential elements such as phosphorus, calcium, silicon, and vanadium are crucial for bone formation, while zinc is vital for immunity, reproduction, and neurological development, and iron is essential for haemoglobin production.

“Therefore, the depleted constructive effect of M-DQI could result in higher prevalence of NCDs related to neurological, reproductive, iron deficiency anaemia, and musculoskeletal system among the Indians relying on wheat diet,” said the study.

It further added that the claim for higher risks of NCDs corroborated with a report published by the Indian Council of Medical Research (ICMR) indicating a 25 percent rise in it from 1990 to 2016 among the Indian population.

“It assumes a grieving concern considering the fact that rice and wheat together provides more than 50 percent of daily energy requirements for the Indian population,” reads the study.

<https://thesouthfirst.com/health/rice-wheat-has-less-nutritional-quality-more-toxic-elements-than-50-years-ago/>



## Chand Bavri - World's largest stepwell

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## Chand Bavri - World's largest stepwell

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### Who constructed this?

An engineer, an architect, a mathematician, or a devotee? Without knowledge of geometry, mathematics, physics, and engineering, how is it possible?

Chand Baori: World's Largest and Most Visually Striking Stepwell.

Chand Baori stepwell was built during the 8th and 9th centuries and has 3,500 narrow steps arranged in perfect symmetry, which descend 20m to the bottom of the well.

In the northern Indian states of Rajasthan and Gujarat, the problem of water is profound. Centuries ago, stepwells were built in these areas to provide water throughout the year. These wells acted as reservoirs or storage tanks that could store a large amount of water and keep it cool as well.

Known variously as baoris, baolis, and vavs, stepwells have steps built into the sides that can be descended to reach the water at the bottom. Stepwells are generally larger than common wells and are often of architectural significance, just like Chand Baori – one of the oldest and most famous stepwells in India.

Chand Baori is a deep four-sided structure with an immense temple on one face. This incredible square structure is 13 stories deep, and lined along the walls on three sides are double flights of steps. 3,500 narrow steps arranged in perfect symmetry descend to the bottom of the well 20 meters deep to a murky green puddle of water. One side of the well has a pavilion and a resting room for the royals. While there is no documentation about its construction, it is commonly believed to have been commissioned under the rule of King Chanda of the Nikumbha dynasty, between the 8th and 9th

centuries.

Considered one of the best-kept hidden gems of India, Chand Baori is not easy to find since it's slightly removed from the usual travel circuit of Rajasthan. But it deserves all the praise heaped on it. Chand Baori is located in a small town by the name of Abhaneri, about 93 kilometers from Jaipur, the capital city of Rajasthan. The place was called Abha Nagri (City of Brightness), but with time Abha Nagri became Abhaneri.

The steps and the whole surrounding area are fine examples of the architectural expertise of the great Indian architects. It also displays the geometrical intelligence of the architects of the bygone era. The steps form a magical maze, and the consequent play of light and shadow on the structure gives it a captivating look.

In addition to conserving water, Chand Baori also became a community gathering place for the Abhaneri locals. The townsfolk used to sit around the stepwell and cool off during the summer days. At the bottom of the well, the air is always about 5-6 degrees cooler than at the top.

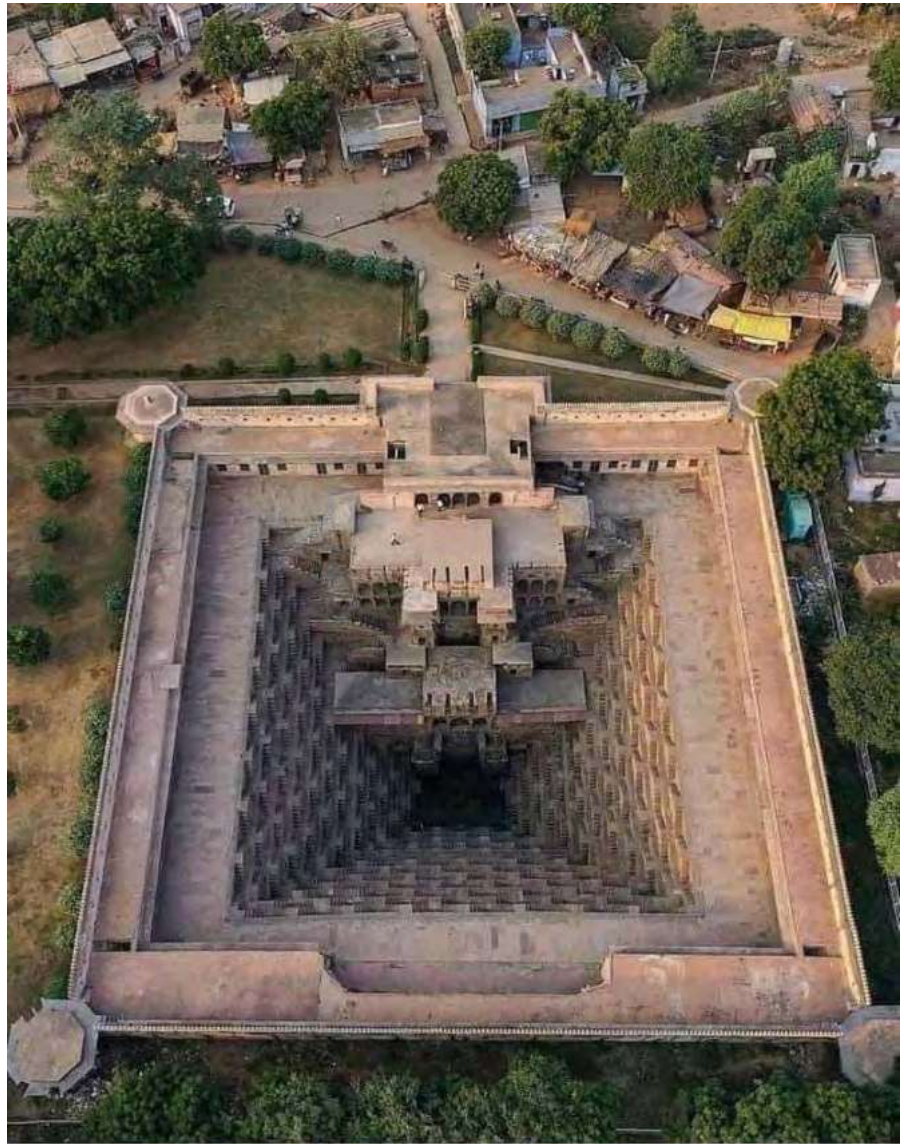
Adjoining the baori are the ruins of the Harshat Mata temple, built in the 9th century shortly after Chand Baori was built. It was a ritual for pilgrims to wash their hands and feet at the well before entering the temple. This temple was destroyed during the 10th century by Mahmud Ghazni. Its many pillars, columns, and statues now lie scattered in the temple courtyard.

Chand Baori is no longer an active well and is maintained by the Archaeological Survey of India. Chand Baori was featured in the movie *The Fall* and also made a small appearance in Christopher Nolan's blockbuster *The Dark Knight Rises*.

Chand Baori Stepwell looks like an inverted pyramid, Abhaneri, Rajasthan, India Chand Baori looks like an inverted pyramid in this aerial view;

Stepwells in ancient India  
The earliest stepwells date to around 550 A.D., but the most famous of them were built in medieval times. There are suggestions that they may have originated much earlier, and precursors to them can be seen in the Indus Valley civilization. It is estimated that more than 3,000 stepwells were built in northern Indian states. Although many have fallen into disrepair and have been filled in with trash in the modern era, hundreds of wells still exist.

Chand Baori stepwell, one of the most intricate, deepest, and largest stepwells in India, called Chand Baori (or Baoli/Baodi meaning stepwell), is located in the village of Abhaneri near Bandikui, Rajasthan.





## Rivers Carry Only 2.5% Of All Water

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### On Earth: NASA

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The research, conducted by NASA and published in *Nature Geoscience*, involved the analysis of nearly 3 million river segments worldwide. The study revealed that rivers contain only 2.5 per cent of the world's water.

Water, the most abundant resource on Earth, makes up a major part of all living organisms and covers nearly three-quarters of the planet's surface. However, rivers are lifelines for freshwater

ecosystems for humans and nature to survive. But have you ever wondered how much water is in the world's rivers? Recently, the National Aeronautics and Space Administration (NASA) conducted a study that explored the flow and storage of water in the Earth's rivers, highlighting areas facing significant water stress.

This research, published in *Nature Geoscience*, involved the analysis of nearly 3 million

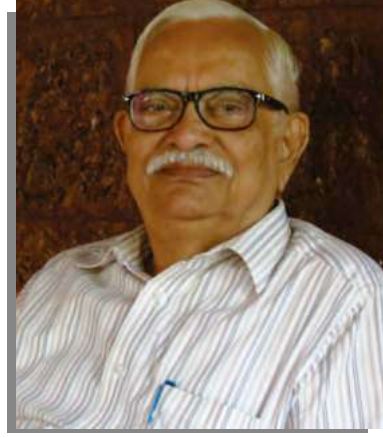






## डॉ. दत्ता देशकर यांनी लिहिलेल्या विविध पुस्तिका

- (१) चला, जलसाक्षर होवू या.
- (२) संकल्पना शाश्वत शेतीची.
- (३) चला , जलपुनर्भरण करू या.
- (४) पाण्याचे गणित.
- (५) बळीराजा सावध हो, दुष्काळ भेडसावतोय.
- (६) वनशेती. (\* )
- (७) शेततळी. (\* )
- (८) पाणी वापरा, पण जरा जपून. (\* )
- (९) हिसाब, किताब, पानीका.
- (१०) चला, जलसाक्षर होवू या (चित्रमय पुस्तिका)



(\* ) ही पुस्तके महाराष्ट्र सरकारच्या प्रौढ शिक्षण संस्थेने प्रकाशित केली आहेत.

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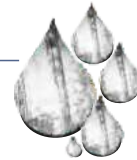
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