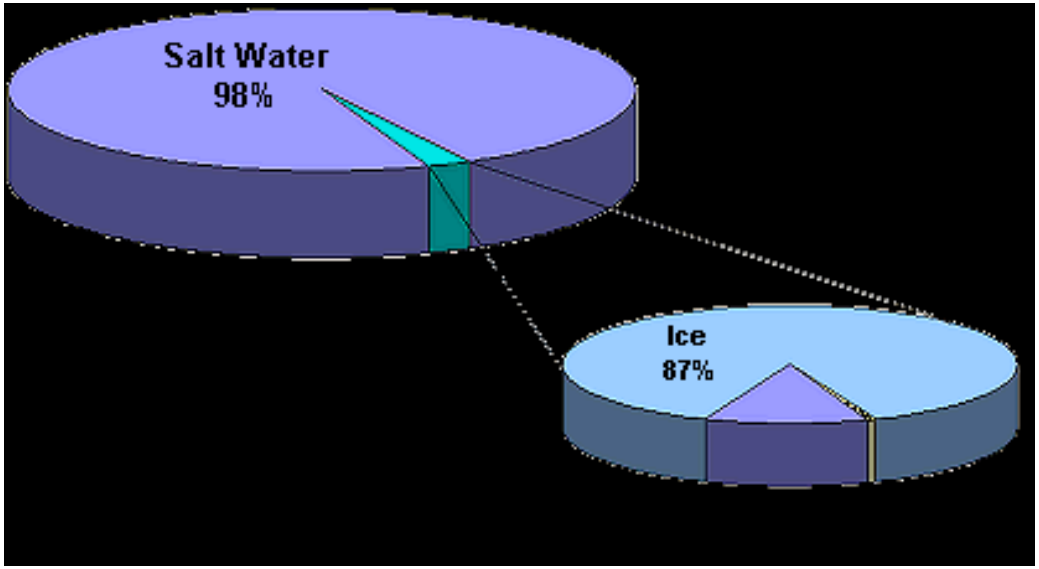
Watershed Organisation Trust &
WOTR Centre for resilience Studies (W-CReS)

World Water Day 2020

Theme: Water and Climate Change

WATER ON OUR BLUE PLANET

Total Water on earth:
326 million cubic miles



Saline water : 98%

Fresh water: 2% of which:

- Locked in Ice: 87%
- In rivers and lakes: 1%
- Groundwater: 12%

India has 4% of the Earth's fresh water for 16% of the globe's population

WATER - INDIA FACTS*

- No access to safe drinking water: **76 million**
- Water related diseases In India: **21%**
- Children (<5 years) deaths due to diarrhoea: **>329, 000** (2015)
- Days women spend fetching & carrying water across India: **150 million work days** equivalent to a national loss of income **of INR 10 billion**
- Potential area to be brought under the micro irrigation (drip and sprinkler): **42.2 million hectare of land**
- Currently under micro irrigation: **3.9 million hectare of land or 9.2% of the potential**

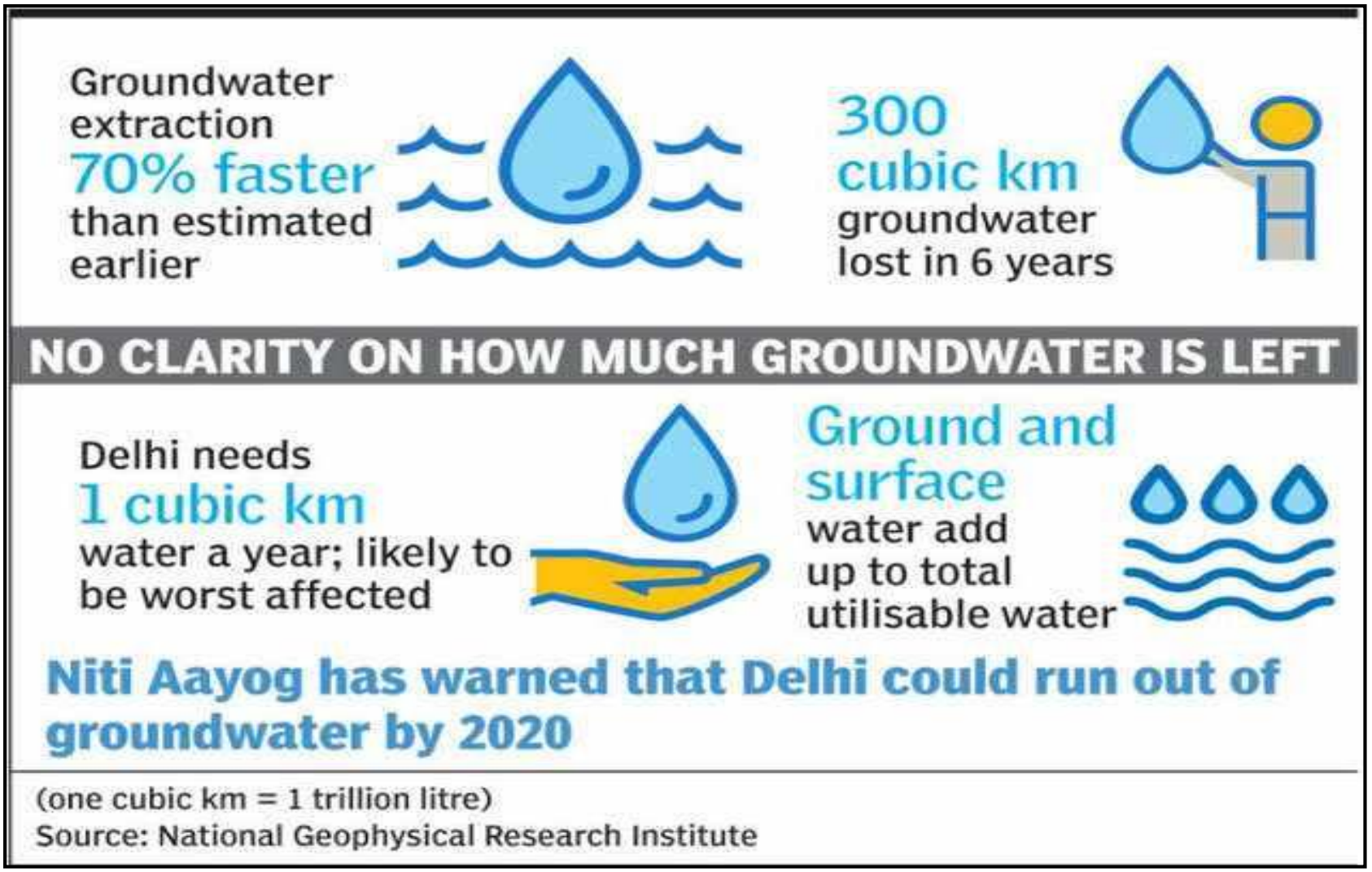
* Source: IDEI Water India facts

The State of North India's Water Resources

- Delhi is the epi-centre of groundwater depletion.
- The northern belt loses 32 km^3 of GW a year which is only partially recovered by the successive monsoons. In a drought year, 100 km^3 is extracted.
- Other related environmental impacts:
  - Soil health and fertility detoriates → cascading impacts
  - Soil Salinization and arsenic contamination →paddy contamination by arsenic.
- Drying of the Indo-Gangetic plain ie 2000 kms*
- 21 major cities of India are likely to run out of water by 2020**
- 600 million Indians living in high to extreme water shortage regions → 200,000 lives lost /year due to inadequate or contaminated water.

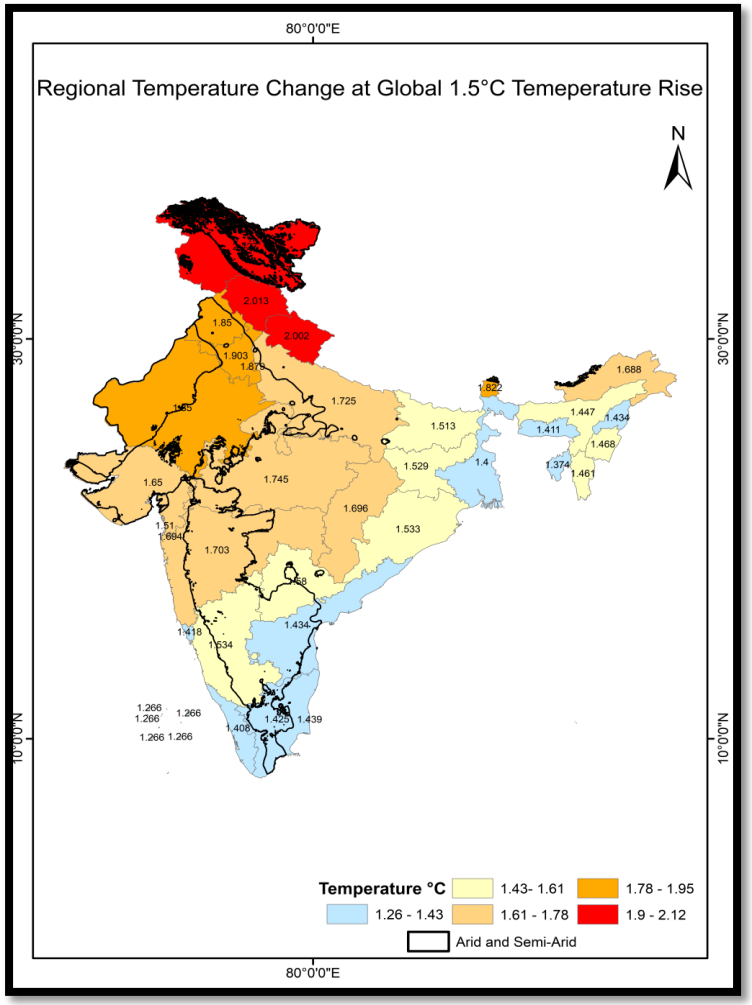
*Source: National Geophysical Research Institute (NGRI)
**Source: NITI Aayog Report

How Much Ground Water is Left ?



Climate Change

What does global 1.5° C temperature rise mean for India?
What does it mean for our water and land resources?



- Most Indian states will experience a temperature rise greater than 1.5°C (compared to pre-Industrial level and in the -RCP 8.5 Scenario)
- This means that the land surface and soil will lose more water.
- Increased water loss from surface bodies by evaporation.
- Increasing droughts, high intensity short duration rains, floods and heat waves.

WOTR Working Paper: Yaduvanshi et al., Impact of 1.5°C global temperature rise on regional rainfall and temperature change of India

Challenges of Semi-arid/Rainfed India

"There is no solution to drought without Participatory Watershed Development"

Fr. Hermann Bacher, co-founder WOTR

Leading causes of desertification in India:

a. Man-made causes:

- Overuse of land: large population, and agriculture dependent,
- Deforestation,
- Cultivation of low potential lands, failure of conservation practices, improper crop rotation, increase use of agro-chemicals and
- Poor water management practices

b. Climatic variability – erratic and reducing precipitation, increasing dry days

Water Status in Maharashtra

- 24.30 lacs abstraction structures (20.55 dug wells and 3.76 bore wells) (GSDA 2014)
- Of the 1531 watersheds, 76 are over exploited*
- 230 of 353 talukas have seen their water levels drop by 1 to 3 meters during the last 5 years
- 26,341 of 43,665 villages faced water crisis in 2018 (lokmat 31/03/18)

* https://timesofindia.indiatimes.com/city/pune/Critical-groundwater-levels-bring-ban-on-wells-deeper-than-60m-in-Maharashtra/articleshow/47494628.cms

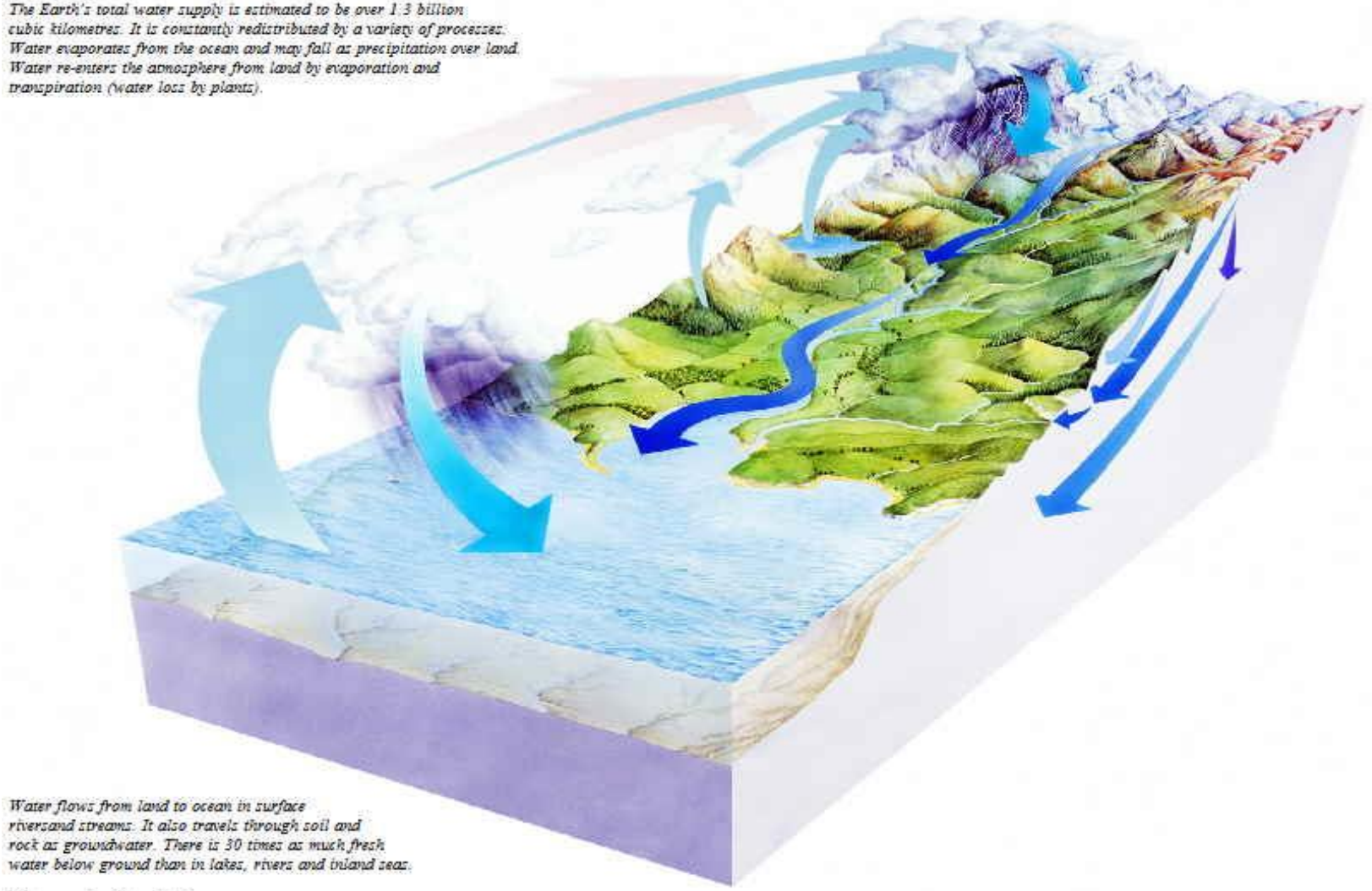
How can we Improve the Water Situation in the Indian Drylands with Climate Change ?

W-CReS
Building Resilient Futures

With an active local community at the centre of the effort:

- Watershed Development to regenerate degraded landscapes to conserve water and reduce soil erosion
- Ground water management through Water Stewardship
- Climate Resilient Agriculture: to enhance agriculture productivity with Water Budgeting and locale specific ‘crop-weather advisories’
- Stakeholder Engagements to pool resources for effective protection and augmentation of water resources
- Transdisciplinary collaborative research for evidence to support good practice and policy

Watersheds, Rain and the Water Cycle



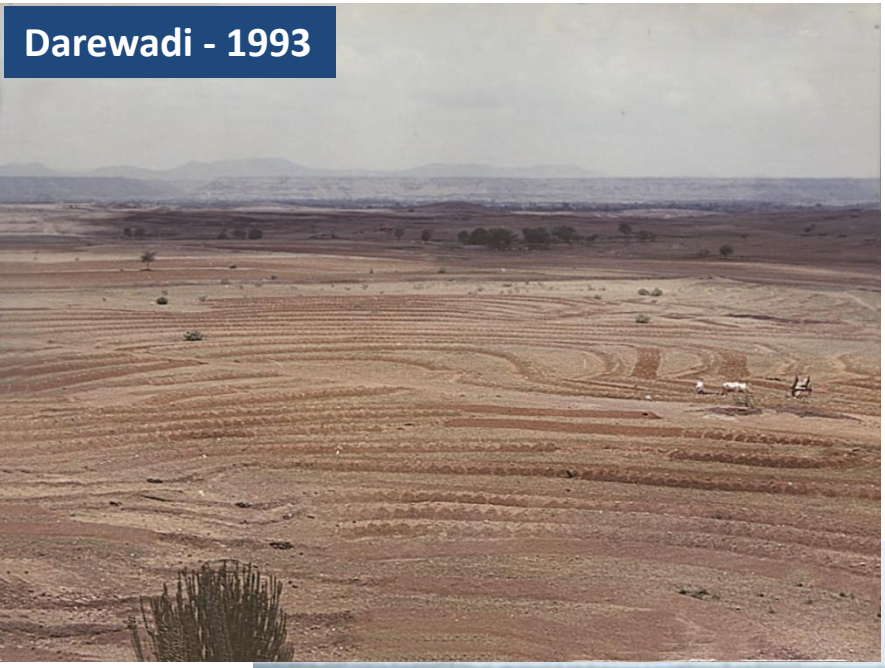
Water Cycle:
The Earth's total water supply is estimated to be over 1.3 billion cubic kilometres. It is constantly redistributed by a variety of processes. Water evaporates from the ocean and may fall as precipitation over land. Water re-enters the atmosphere from land by evaporation and transpiration (water loss by plants).

Water flows from land to ocean in surface rivers and streams. It also travels through soil and rock as groundwater. There is 30 times as much fresh water below ground than in lakes, rivers and inland seas.

Photographer: Gary Hincks
(Science Photo Library)

Watch the transformation through Watershed Development

Darewadi - 1993



Darewadi - 1996

Darewadi - 2009

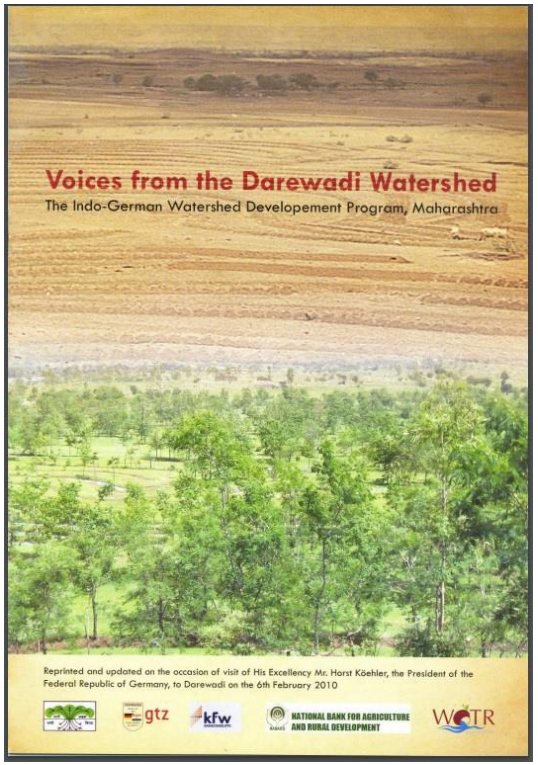
What Watershed Development Does

- Rejuvenates & Diversifies Natural Resources
- Revitalizes Local Economies
- Strengthens Relationships

Voices from the Darewadi Watershed

In 1996, Darewadi, a remote, drought prone village in the rain shadow region of Maharashtra was a picture of despair. Villagers had to migrate to resource-endowed areas working seasonally at sugarcane cutting or in brick kiln of contractors. At this point, some of the villagers approached WOTR to undertake watershed development activities in their village.

Read More: https://bit.ly/3dcQfJP



What made the difference?

Participatory Watershed Management

Village General Body Meeting

Planning

Work Layout

Implementation

What made the difference?

Soil & Water Conservation Measures

What made the difference?

Water Harvesting Structures

Gully Plugs

Gabion

Check Dam

Water storage in wells

Making Drought a Memory

Watch Here: https://bit.ly/2Qyl81z

How do we Sustainably Manage Natural Resources?

"Water Stewardship": Community-led Responsible Water Management

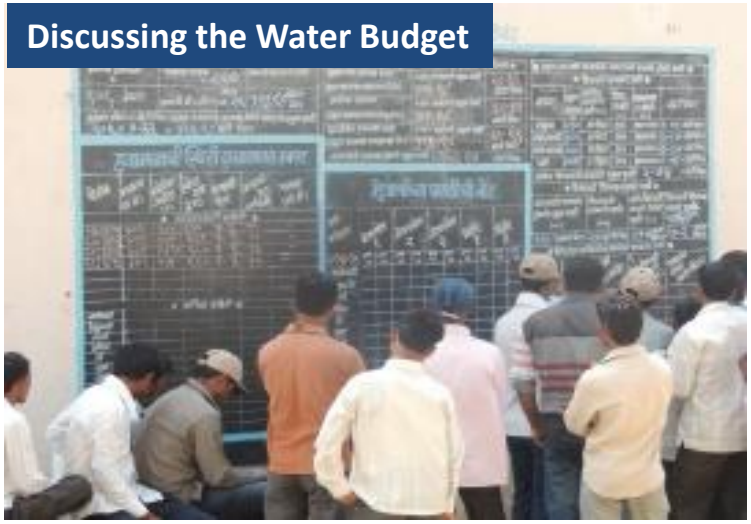
- Enhancing water capture: Water Harvesting through Watershed Development (Supply Side Management)
- Water Budgeting, Crop Planning, Water Governance for both surface and ground water bodies (Demand Side Management)
- Managing water use judiciously and adopting water efficient irrigation technologies (Increasing Water Productivity)
- Setting up of inclusive local bodies to regulate and govern use of local water resources

Community Action

Meetings to plan action

Enhancing Water Storage Potential

Discussing the Water Budget



Measuring Groundwater Levels

See: (i) Water budget: Accounting of water at the time of climate change
(ii) A Step towards Quenching Rural India's Thirst

Small achievements on the Journey…

In 100 villages in 3 districts of Maharashtra:

- Water Stewardship Plans developed and brought into implementation.
- Communities brought under governance annually - 38.39 billion liters of water
- Additional water harvested in a 2.5 years period - approx. 9 billion litres
- Adoption of practices of micro irrigation, mulching , vermi-composting, and organic manures: Over 2000 farmers (54% rise) Saving 3.24 billion litres water
- Maintenance of local data voluntarily -daily rainfall data through 212 rain gauge units - water level data monitored

"Without Income From Agriculture, Water Cannot be Managed"

W-CReS
Building Resilient Futures

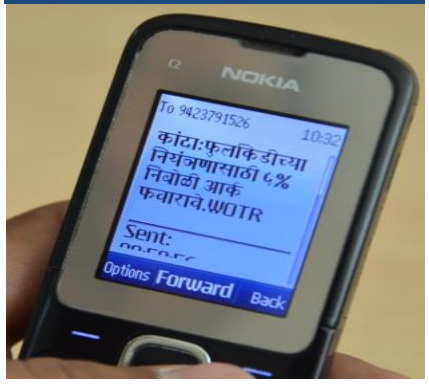
Climate Resilient Sustainable Agriculture

Water Availability→ Cropping Pattern

Farmer Field School – On Site Technical Support

Soil Health and Environmentally Safe Practices

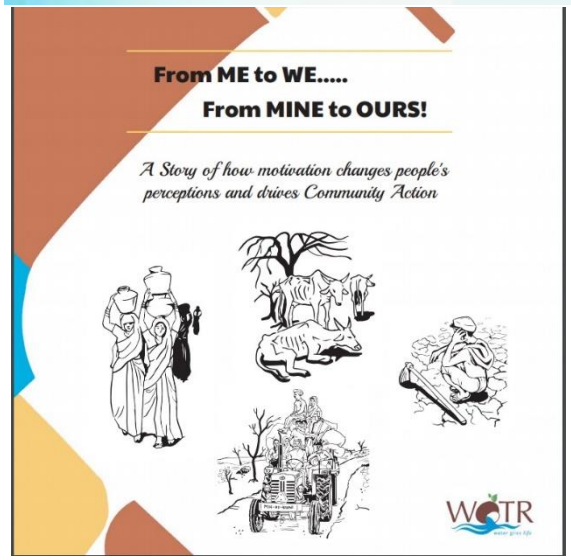
Locale and Weather based Crop, Livestock, Market Advisories



Integrated Water-Nutrient-Pest - Disease Management

Water Conservation Technologies

"Securing Water for Today and Tomorrow, requires Thinking Differently "



From ME to WE, From MINE to OURS

This is a story how motivation changes people's perceptions and drives community action. It focuses on how rural communities can face the challenges posed by climate change, rainfall variability and declining groundwater levels.

Read Here: https://bit.ly/33wK1A1

Water Budget: Accounting for water at the time of climate change

When most of Maharashtra was facing drought in 2016, this tiny village called Kumbharwadi in Ahmednagar district was water sufficient. This was because in 2015 they had started a programme to budget their water resources.

(A film by Down to Earth)

Watch Here: https://bit.ly/393kr6z

Aquifer Management

CO-DRIVE–VI: An Approach to Sustainable Water Management

This is a tool developed by WOTR to help enhance participants understanding and their knowledge regarding the available water resources by demystifying the science of hydrology. CDVI helps villagers' visualize above ground features as well as subsurface aquifers that contain groundwater.

Rea More Here: https://bit.ly/2J0O1iD

Want to mobilize people for water management? Let the "unspoken of" surface!

In order to create joint ownership and make water management the community's responsibility, empowering the people with a factual understanding of the water situation is necessary. A First Step towards this goal is developing a common understanding of the present situation through a participatory assessment of the village water status.

Rea More Here: https://bit.ly/3dg3dGq

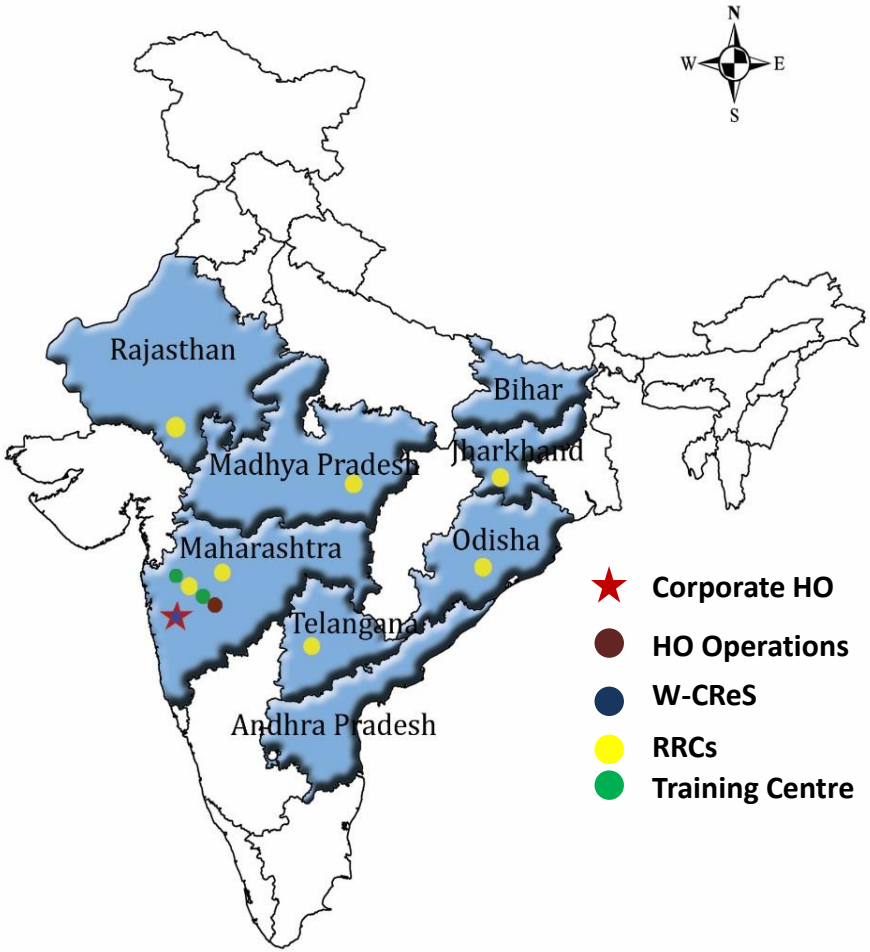
Stakeholder Engagement Events

TSP Jalna FIlm

This is a film made by WOTR on how using **Transformative Scenario Planning** is used to think critically about the future of water in specific locations or geographies.

Watch Here: https://bit.ly/3dcJLud

Organizational Overview



People Impacted: >3.7 million

Project Villages: >4,800 villages

No. of States: 7 ongoing

No. of People Trained : 475,000

International Participants : 63 countries

Area Treated (WSD/NRM): 1.3 million ha

Thematic Areas

1. **Watershed/ Ecosystems Development and NRM**
2. **Climate Change Adaptation**
3. **Integrated Water Resources Management**
4. **Climate Resilient Sustainable Agriculture**
5. **Agro-Meteorology**
6. **Rural Livelihoods and Job Skilling**
7. **Food Security and Nutrition**
8. **Capacity Building and Training**
9. **Transdisciplinary Applied Research**

And YOU ?

What can I do to contribute to Water Security?

If not HERE, then Where? If not NOW, then When? If not YOU, then WHO?

Thank You
for making our country more water secure

If you'd like to know more about our work, visit: www.wotr.org