THE ART OF LIVING

Revive Rivers, Revive Life

How Art of Living is solving India's Water Crisis

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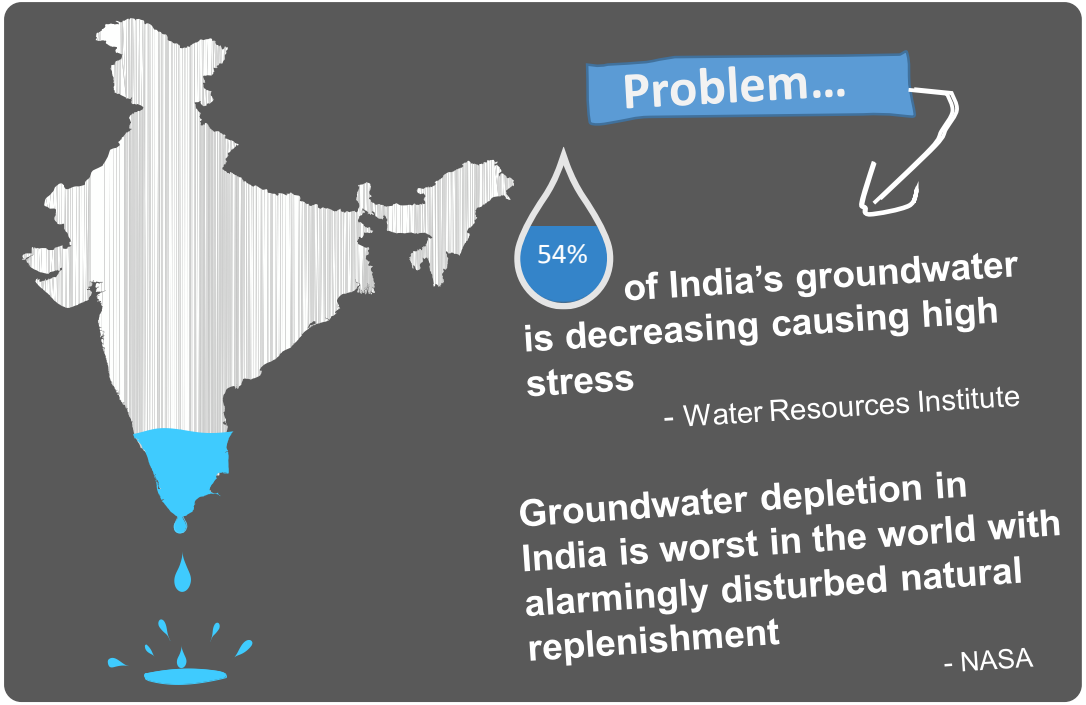
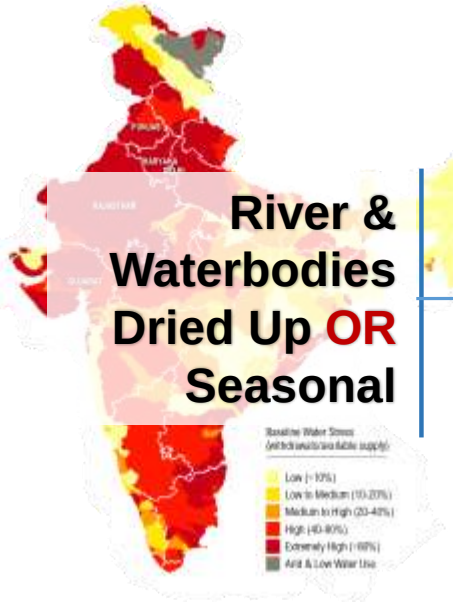
THE PROBLEM…


Problem…
54%
of India's groundwater is decreasing causing high stress
- Water Resources Institute
Groundwater depletion in India is worst in the world with alarmingly disturbed natural replenishment
- NASA

33cr people in 2.55 lakh villages of India are short of water
TIMES of INDIA
Over 25%
drought
4 to 6 FARMERS
Commit Suicide per day in India
NATIONAL CRIME RECORDS BUREAU

THE CAUSE

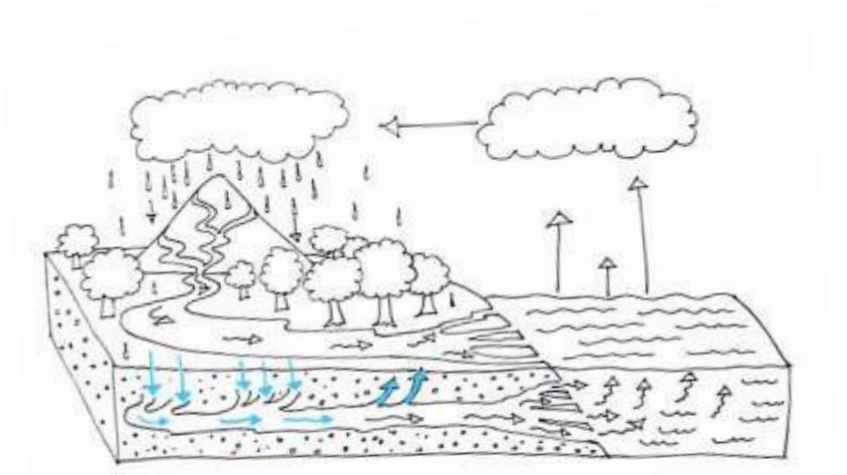


River & Waterbodies Dried Up OR Seasonal

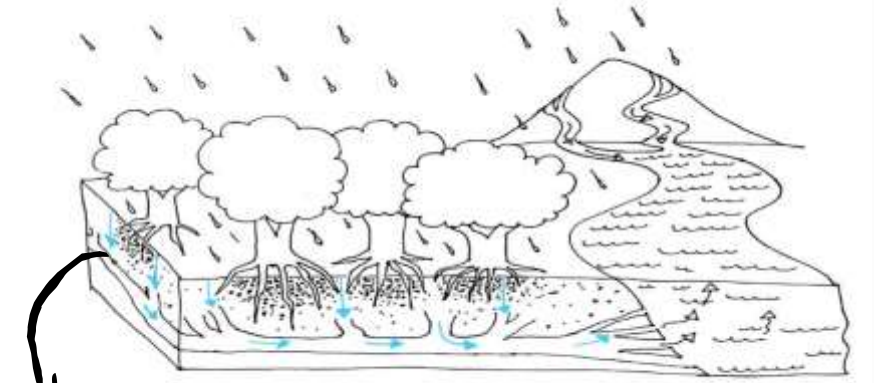
Causative Factors

- **Over Exploitation**
  - 1 Drastic **Land Use Changes**
  - 2 **Degradation** of Natural **Vegetation**
  - 3 Soil **Erosion** & **Siltation** of Waterbodies
  - 4 **Dried** up **Waterbodies**, Shallow & Deep **Aquifers**
- **Environmental Degradation**
  - 5 **Change** in **Rainfall Patterns**
- **Policies / Laws**
  - 6 **Archaic Laws** allowing mindless GROUNDWATER mining

NATURAL HYDROLOGICAL CYCLE

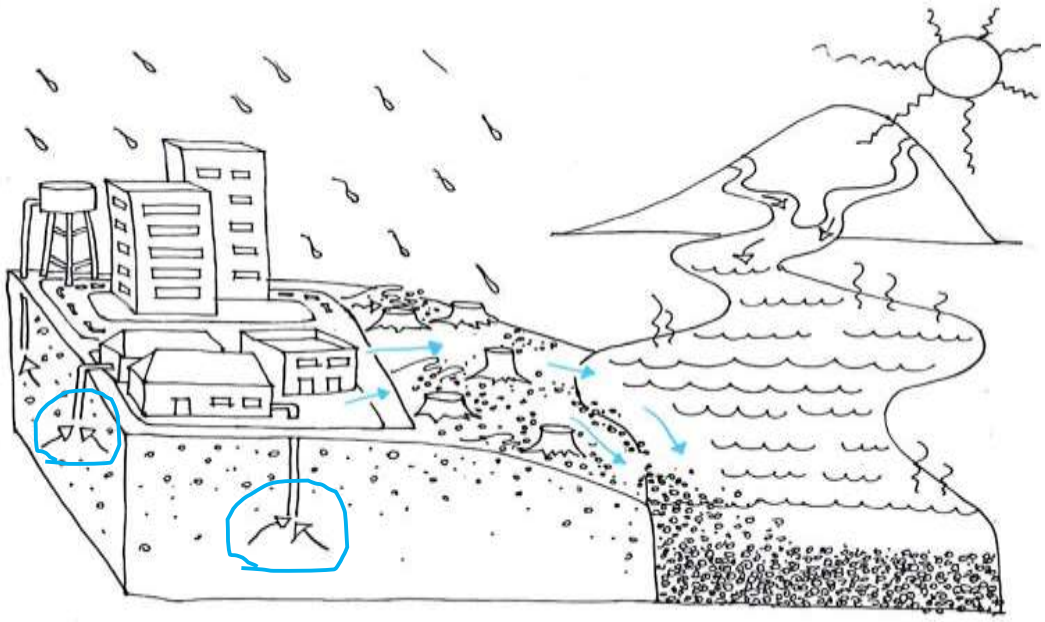


Many know about the hydrological cycle, but the **RELATIONSHIP between GROUNDWATER & SURFACE WATER** is often **unnoticed**



The ROOTS of the TREES absorb the **water molecules** and recharge the underground water.

DISRUPTED HYDROLOGICAL CYCLE



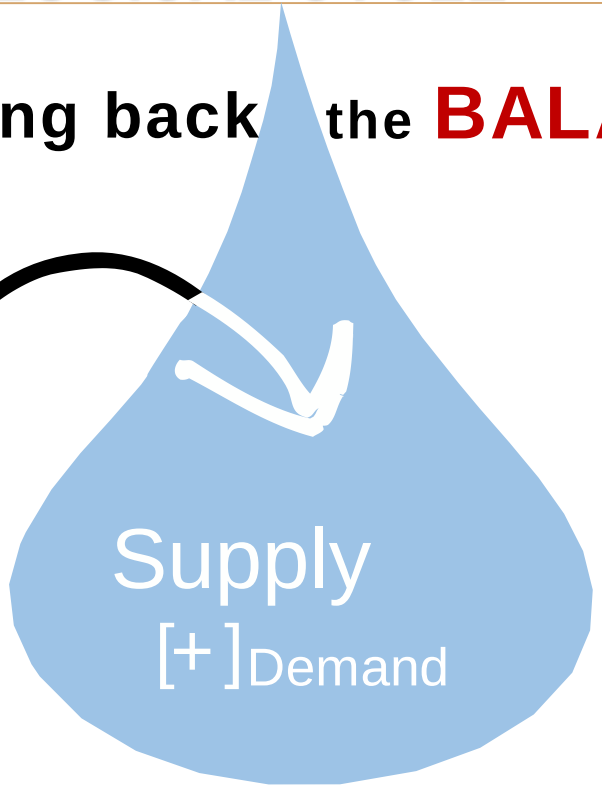
Because of

1. Deforestation
2. Soil Erosion
3. Siltation
4. Overexploitation of underground water

BALANCE?
HYDROLOGICAL CYCLE

How can we bring back the BALANCE ?

Demand
[-] Supply



THE ART OF LIVING

OUR INNOVATIVE SOLUTION

A Holistic Approach

RIVER REJUVENATION with "MANAGED AQUIFER RECHARGE (MAR)"

Solution Approach

PREMISE

1. **IWSM - SDG & DUBLIN** Principles

METHODOLOGY & FRAMEWORK

2. Satellite Imageries, Reconnaissance, **Action Plan** thru **GIS**
3. Community **Mobilization**, **Capacity Building** (Village Job Card Holders, Staff)
4. **Execution, Continuous M & E** with Mobile Apps for effectivetracking
5. **Demand-side Planning**
   - PRA Assessment
   - Doubling Farmers Income
   - Watershed Mgmt.

IMPACT STUDY DATA

6. Baseline and Periodic **data Collections**
7. Data Analytics – **Impact Study**

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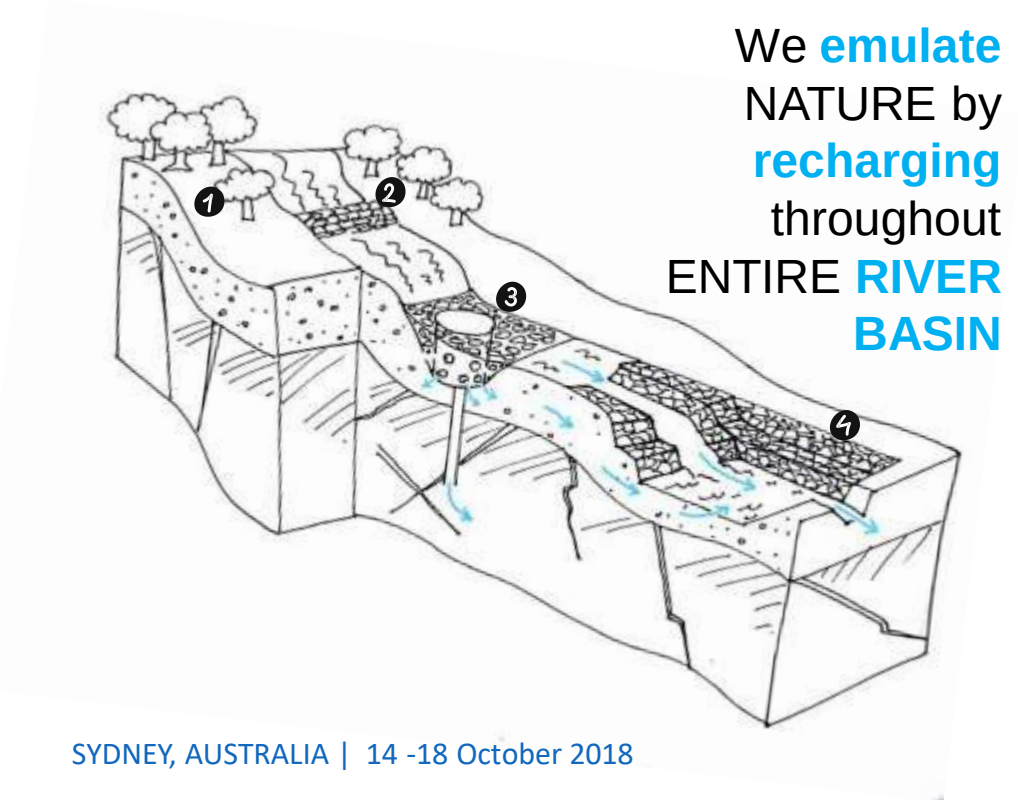
RIVER REJUVENATION



We **emulate** NATURE by **recharging** throughout ENTIRE **RIVER BASIN** >>

TREE PLANTATION
reduces soil erosion and recharges ground water
01

BOULDER CHECK DAM
slows down speed of water, reduces soil erosion.
02

RECHARGE & INJECTION WELLS
recharges groundwater (Shallow and Deep Aquifer)
03

WATER POOLS
revives lakes and larger water bodies
04

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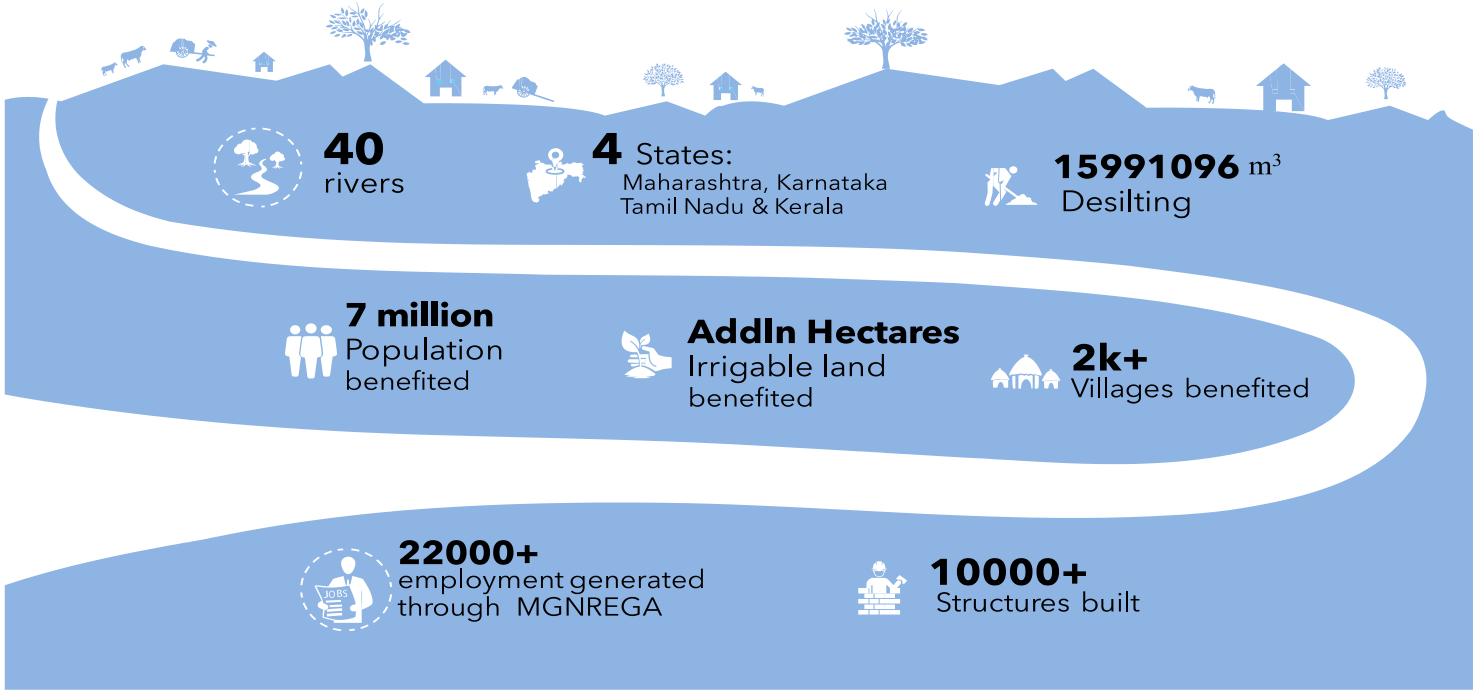
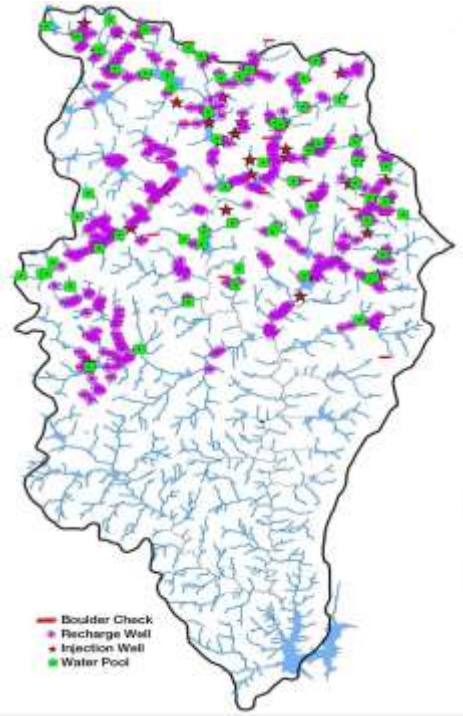
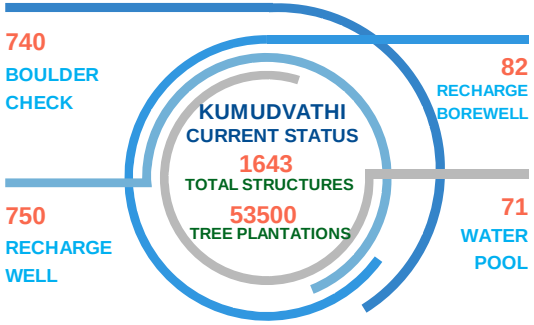
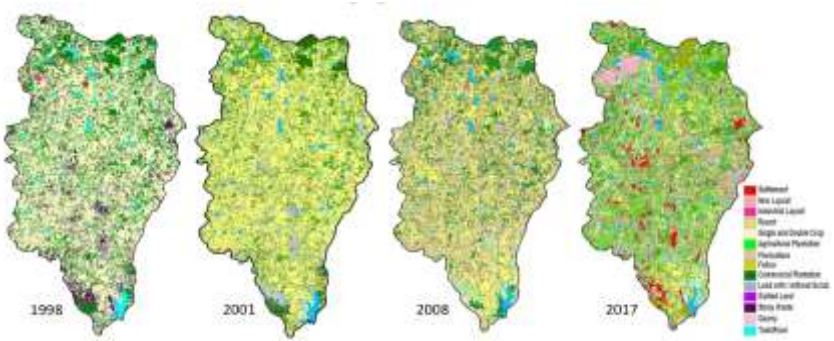
OUR WORK SO FAR



MANAGED AQUIFER RECHARGE (MAR) IN KUMUDVATHI BASIN







Natural seasonal flow in the Kumudvathi River has been affected in the recent years mainly due to

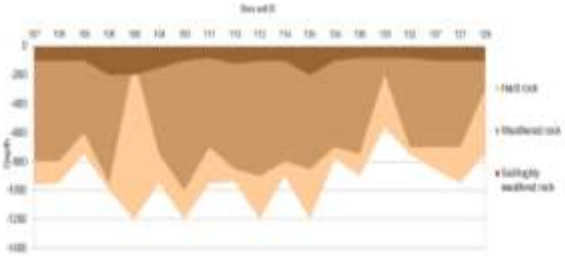
- Vagaries of rainfall
- Pressure of increased production
- Competing demands
- Uncontrolled exploitation of groundwater
- Change in land use

MAR IN KUMUDVATHI BASIN

MAR Objective : to **augment** the **natural recharge** through artificial means & **increase** the **natural vegetation**

MAR activities aimed at :

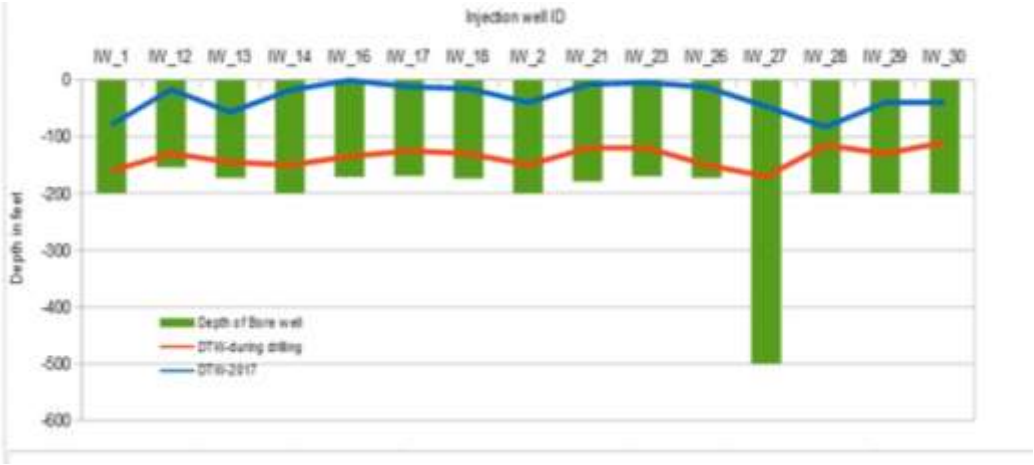
- Increasing soil moisture
- Recharging phreatic aquifer
- Injection to semiconfined aquifers



Site Selection – Basin composed of granitic rocks (Hard Rocks) & groundwater movement is controlled by the depth of weathering and the fractures

Adequacy of Source *for Augmented Recharge made through* detailed hydrological studies understanding the changing land use over the years (2001 to 2017)

MAR RESULTS IN KUMUDVATHI BASIN

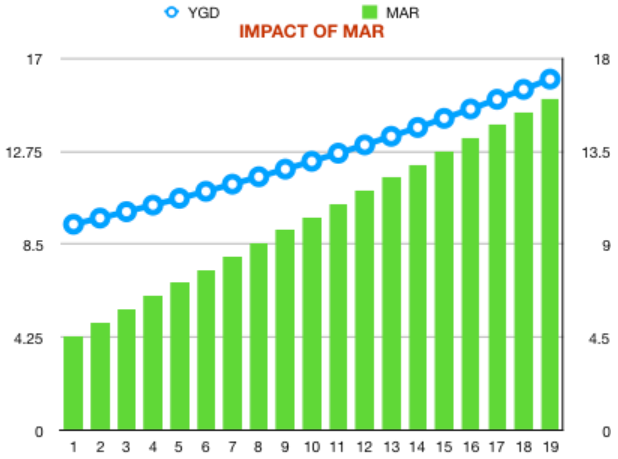


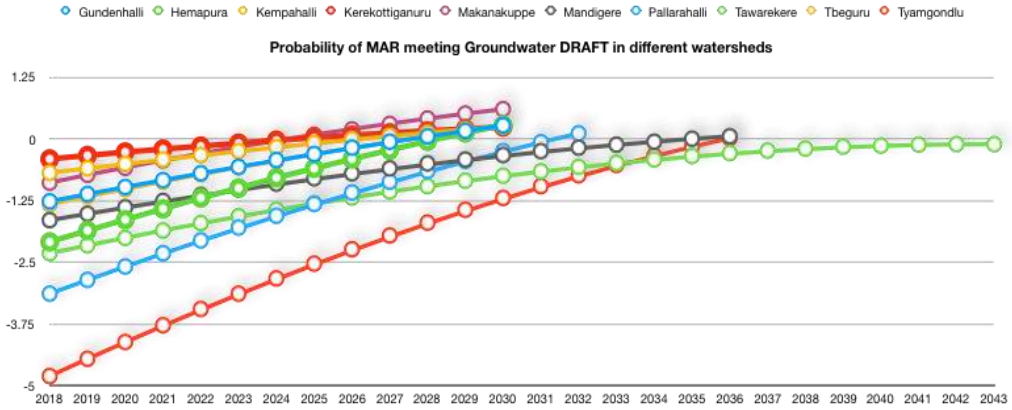
1. **Increase in water table** has been observed in all the injection wells (**from 20 feet to 137 feet**)

2. Interim observations from the injection wells, extent of **augmented recharge** has been **estimated as 1.625%**

3. Augmented recharge at 1.625% of the available runoff for harvesting **amounts to 701025000 litres** (during one rainy season) i.e., **140205 water tankers**

MAR RESULTS IN KUMUDVATHI BASIN





Basin is an agriculture landscape, intermittent urban & industrial pockets. Archaic laws won't HELP control groundwater extraction, assumptions are made & probable period for resuming the normalcy of groundwater regime was simulated

Considering the Annual Normal Recharge, and Expected Incremental Groundwater Draft, required **rate of Recharge Augmentation was simulated**. The simulation has provided insights for increasing the intensity of MAR activities

CONCLUSIONS
IMPACT ASSESSMENT

Based on the data generated and study of the different sites of MAR structures following conclusions are drawn

- MAR is one of the best strategies that IAHV has adopted for quantitative and qualitative watershed Management
- Increase in water table has been observed. The magnitude of increase is from 20 feet to 137 feet.
- Augmented recharge at 1.625% of the available runoff for harvesting amounts to 701025000 litres
- Time taken at the suggested rate of augmented recharge thru intensification varies from 7 to 22 years
- Augmented recharge is estimated approximately at 1.625%. Recharge wells are effective recharging aquifers

DEMAND SIDE
OUR MULTIPRONGED STRATGEY

NATURAL FARMING

- Reducing farming input cost through Sustainable, low cost, non chemical, indigenous farming methods.
- Increasing Yield / acre by 20 percent.
- Developing desi / Native seed bank.
- Improving Seed replacement rate.
- Giving due emphasis to non-wheat, non-paddy and less water intensive crops.

DAIRY DEVELOPMENT

- Gir Cow Raring and Milking
- Production of Ghee, Butter and other dairy bi-products from excess milk.
- Selling food supplements for cattles; Cotton Seeds & Groundnut Hindi.
- Selling Bio-Fertilizers.

MICRO INDUSTRIES

- Setting up Micro Industries at village level.
- Oil Extraction & Processing units.
- Cattle Feeds Production Units
- Manufacturing and Processing of Agro based products in respective villages.

DEMAND SIDE
CONTRIBUTORS & STAKEHOLDERS

THE ART OF LIVING

PROMOTING INSTITUTION FOR FARMER PRODUCER ORGANIZATION (FPO)

(Guiding, Mentoring & Facilitation)

A THINK TANK

- **IDEATES MARKETPLACE CREATION**
- **KEY INTEGRATORS (Buyers + Sellers)**
- **AGGREGATORS (Demand - Supply)**

AN MSME SUPPORTING FPO WITH VALUE ADDITION

(FOOD PROCESSING UNITS & MILK CHILLING UNITS)

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DEMAND SIDE
MAJOR EMPHASIS to FARMERS

THINK TANK WILL FOCUS ON FIVE MAJOR ASPECTS OF VILLAGE SUSTAINABILITY

HEALTH & WELLNESS

Will work on overall wellness of a village through supplies of authentic food, Ayurveda Medical Camps, etc.

SKILL DEVELOPMENT

Will provide technical training to Coordinators, train the villagers to make best use of technology.

RETAIL OUTLETS

Will open retail outlets with robust tech support in every village to enable easy accessability to essential foods daily needs & basic services.

DIGITAL ECONOMY

Will introduce digital means of day-to-day money transaction system. Transactions with our retail outlets will be made digital

FINANCIAL STABILITY

Village coordinators who engage full-time in the FPO activities will also be engaged in operating the retail outlets and hence, earn a livelihood.

MORE PARTICIPATION FOR IMPROVED WATERSHED MANAGEMENT