Users Centred Aquifer Level Groundwater Management-
A Case Study From Water Stressed Fluorosis Endemic Area
(Nalgonda Dist-Telangana)

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WATER STATISTICS (INDIA)

❖India constitutes 18 % of Worlds population but only 4 % renewable water resources.

❖Receives avg. annual precipitation of 3880 Billion cubic meter (BCM) (of which 50 % takes place within 15 days & in <100 hrs). After evaporations 2000 BCM is left.

❖Utilizable water resources: 1122 BCM (SW:61% & GW: 39 %).

❖Present Utilization:700 BCM (SW:450 and GW:250).

❖Projected requirement by Year 2025:843 BCM and by 2050:1180 BCM.

❖Present water utilization (Agriculture:78 %, Domestic and other purposes : 8 % each & Industries:6 %) in Telangana, Agriculture:90%, Domestic:6 % and Industries:4%.

❖Per capita availability of water reduced from 1816 m^3/yr during 2001 to 1545 m^3/yr by 2011 by 2025 it will be 1340 m^3/yr.

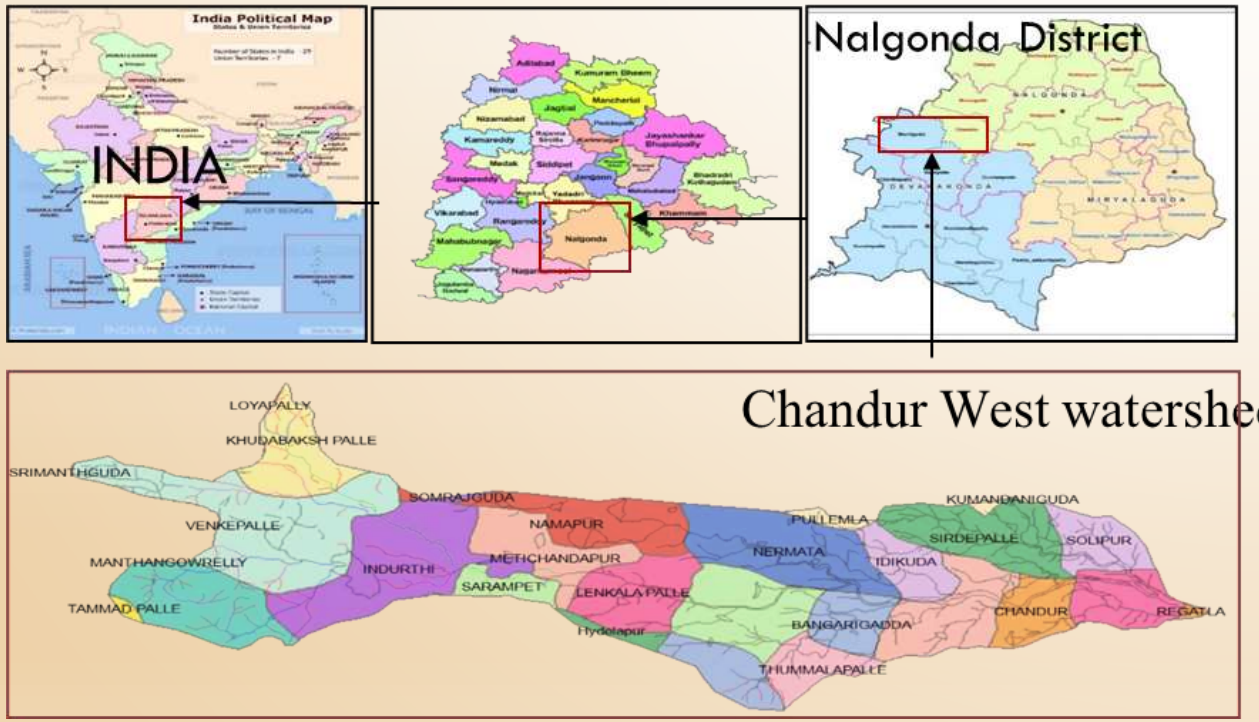
❖Availability of water <1700 m^3/yr/person is called water stressed country.

Objective:

To develop an institutional model

To test the processes & procedures for sustainable use and management at aquifer level.

To test its viability as well as acceptability by the community at village level.



Salient Features

Basin	:	Krishna River
Watershed	:	Chandur West
Mandals/District	:	Chandur and Marrigudda)/Nalgonda
Area	:	165 Km2
Villages	:	23
Geology	:	Granite and Gneisses
GW Extractions	:	98 %

METHODOLOGY

1.Technical baseline survey of pilot area

2. Implementation arrangements

- Constitution of state level pilot unit (SPU) at Directorate of Ground Water Dept.
- District pilot unit at District office with technical and support staff.
- Constitution of Technical Support Group (TSG).
- Hiring of NGOs for community mobilisation, social assessment and IEC activities.

3. Social assessment survey

4. IEC activities to create awareness on importance of GW and necessity for its management.

5. Development of Institutional Model

- Formation of Gram Panchayat Level Committees (GPLC)
- Formation of Groundwater Management Association
- Creation of infrastructure to monitor groundwater levels and rainfall.

6.Capacity building of community to enable them to manage GW resource at village level.

7.Preparation of community based groundwater management action plan and its implementation by them.

Implementation Arrangements

SPECIAL CHIEF SECRETARY TO GOVERNMENT

I & CAD DEPARTMENT

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PROJECT DIRECTOR, (CADA) PPMU

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STATE PROJECT UNIT (SPU) IN O/o THE DIRECTOR, GWD

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TECHNICAL SUPPORT GROUP WITH REPRESENTATIVES FROM REVENUE, RURAL DEVELOPMENT, AGRICULTURE,GROUNDWATER,SOCIAL WELFARE AND COOPERATIVE

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PILOT TEAM LEADER (PTL)
DISTRICT PILOT UNIT (DPU)

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GROUNDWATER MANGEMENT ASSOCIATION (PILOT LEVEL)

NGO CONSULTANT

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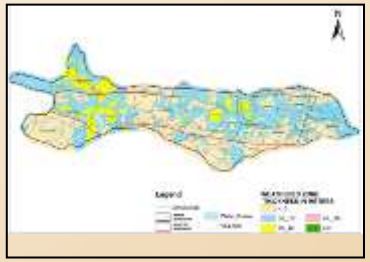
GRAM PANCHAYAT LEVEL COMMITTEES (GPLCs)

Purpose:

- To provide technical guidance to the pilot team leader/ community/ NGOs in implementation of the pilot activities.
- Appraise the groundwater management action plans prepared by the gplcs and GWMA.
- Ensure appropriateness, design and cost of recharge structures

STUDIES

- Mapping of structural controls like dykes & lineaments.
- Delineation of aquifer boundary.
- Geophysical investigations (1041nos) to assess subsurface lithology.
- 100 % well inventory.
- Aquifer tests (11 nos) to assess aquifer properties.
- Collection of water bodies and recharge structures data.
- Collection of cropping pattern data (long terms).
- Assessment of groundwater resource availability, usage and balance



SOCIAL ASSESSMENT SURVEY & FORMATION OF GW MANAGEMENT ASSOCIATION

- Covered 100% households to know socio-economic status through NGOs.
- Findings of Social Assessment survey formed the basis for designing IEC to involve community in Groundwater management.
- IEC activities on conservation & management of GWR and to identify problems in mobilising community for community based groundwater management.
- Ground Water Management Association (GWMA) formed at GP level and registered under societies act.
- The members of GWMA elected its Chairman, Secretary and Treasurer and prepared its own by laws.

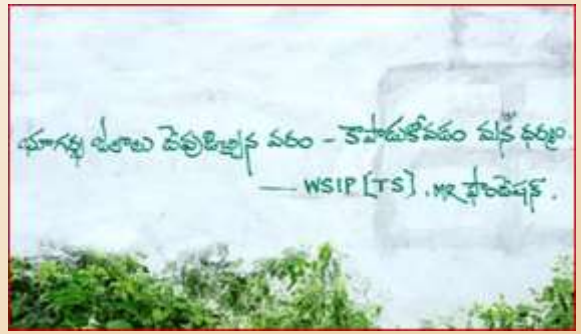
FIELD ACTIVITIES

- Installed 6 Raingauge stations and trained GP members to record daily measurements and display on GP building/other prominent places.

- Constructed 14 Pzs and fitted with DWLRs.

INFORMATION EDUCATION & COMMUNICATION (IEC) ACTIVITIES

- Creation of IEC activities through interactive meetings, Kalajatha (folk art), Posters/Door Stickers, Rallies, Exposure Visits etc.



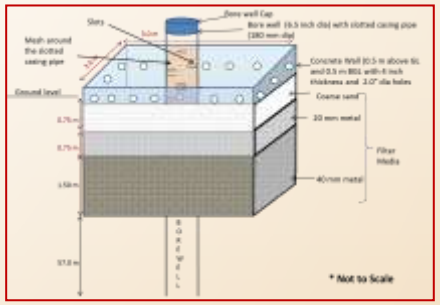
CAPACITY BUILDING

Community was imparted training on

- Groundwater level monitoring.
- Rainfall recording.
- Estimation of groundwater.
- Crop water budgeting.
- Preparation of community based groundwater management action plan.
- Book Keeping-Maintenance of registers for Accounts, Crop statistics , Bore wells/Wells , Rainfall Groundwater.

Preparation of GW Management Action Plan

- All 13 GPLCs have prepared Groundwater Management Action Plans, encompassing various demand side and supply side interventions for their respective village.
- Technical Support Group appraised these action plan.
- State Level Technical Review Committee reviewed and approved these action plan.



Salient features of the Action Plan:

Demand side Interventions

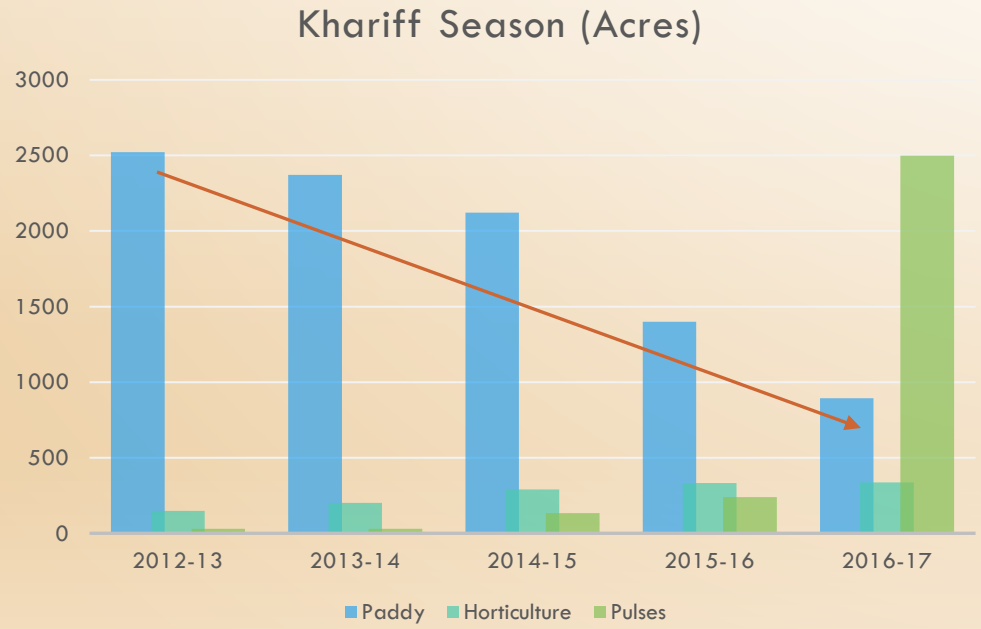
- Reducing area under paddy cultivation.
- Increasing the area under pulses, ID crops and horticultural crops.
- Use of micro irrigation.

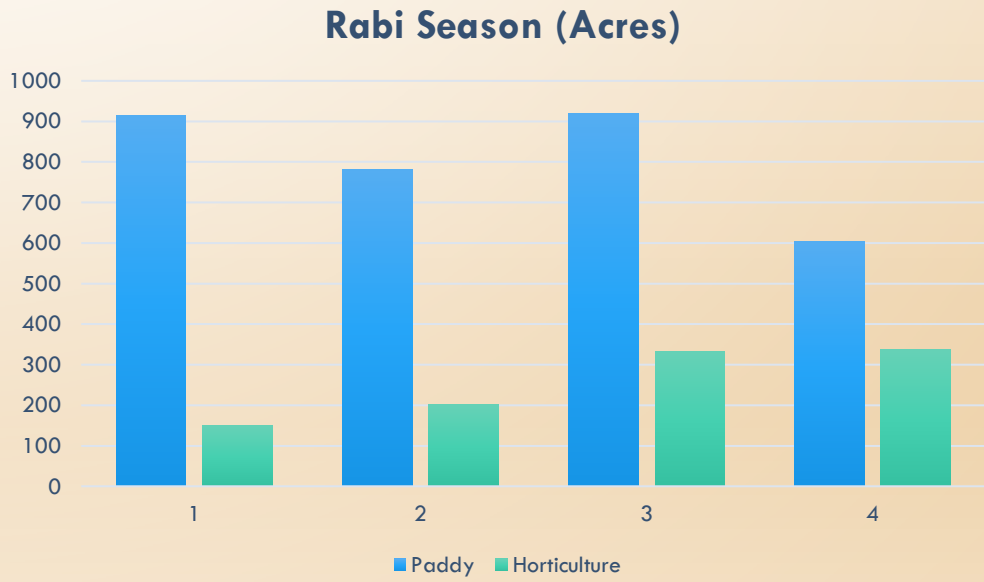
Supply Side Interventions

- Construction of 23 check dams with recharge shafts (2.78 Cr).
- GPLC opened bank account and contributed 15% contribution as there shares.

Groundwater Demand Control Measures

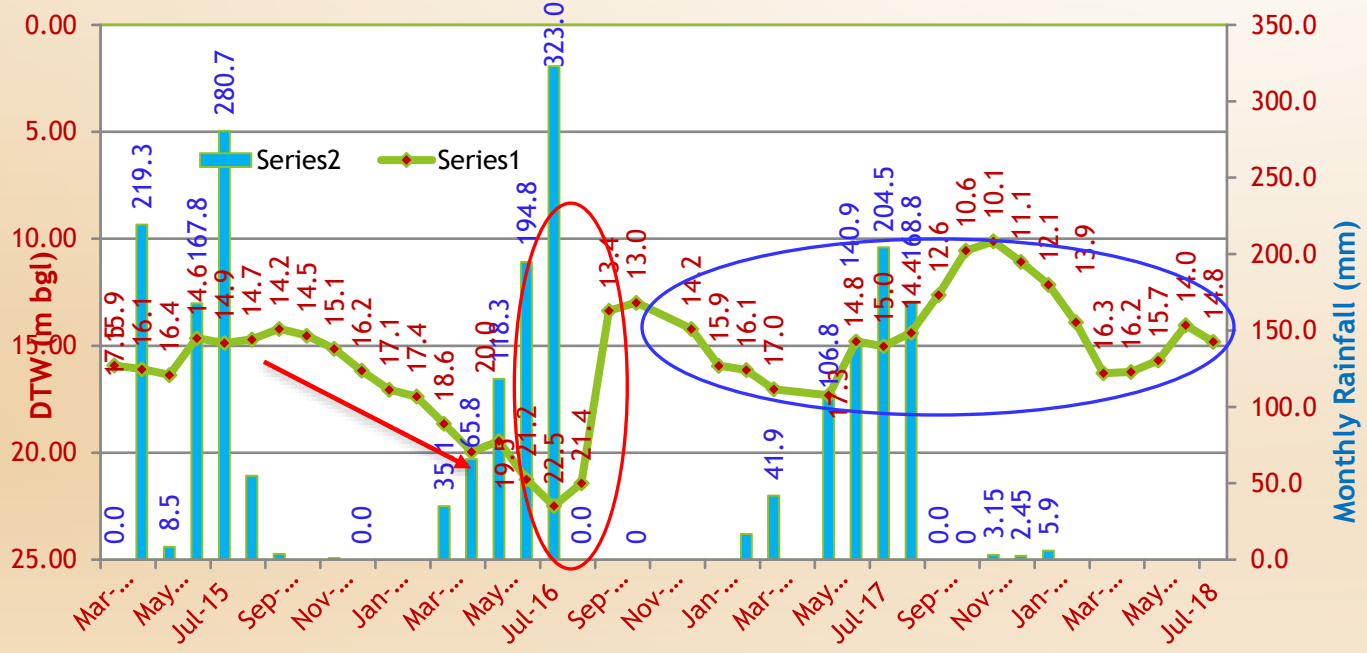
- Farmers diversified from water intensive paddy to ID and horticultural crops.
- Area under paddy reduced to 893 acres from 2521 acres in 5 years (by 65%).
- Area under pulses increased from 30 acres to 2499 acres.
- Area under and Horticultural crops increased from 149 acres to 338 acres.
- Not much changes in Cotton crop cultivation is observed (around 20000 Acres).





End Results:

- GW risen by 9.5 m observed (post period) and hovers around 15 m.
- Whereas during same period (pre-period) rise was only 2.05 m (with similar rainfall).
- Groundwater extraction reduced from 98 % to 76% (2023).
- **Project received 3rd Prize under NWM from Govt of India.**



Thank You