



Co-managing Floods and Droughts through Innovative Underground Storage: Cases from India and Vietnam

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ASIA Focus - Natural Alternatives to Water Storage

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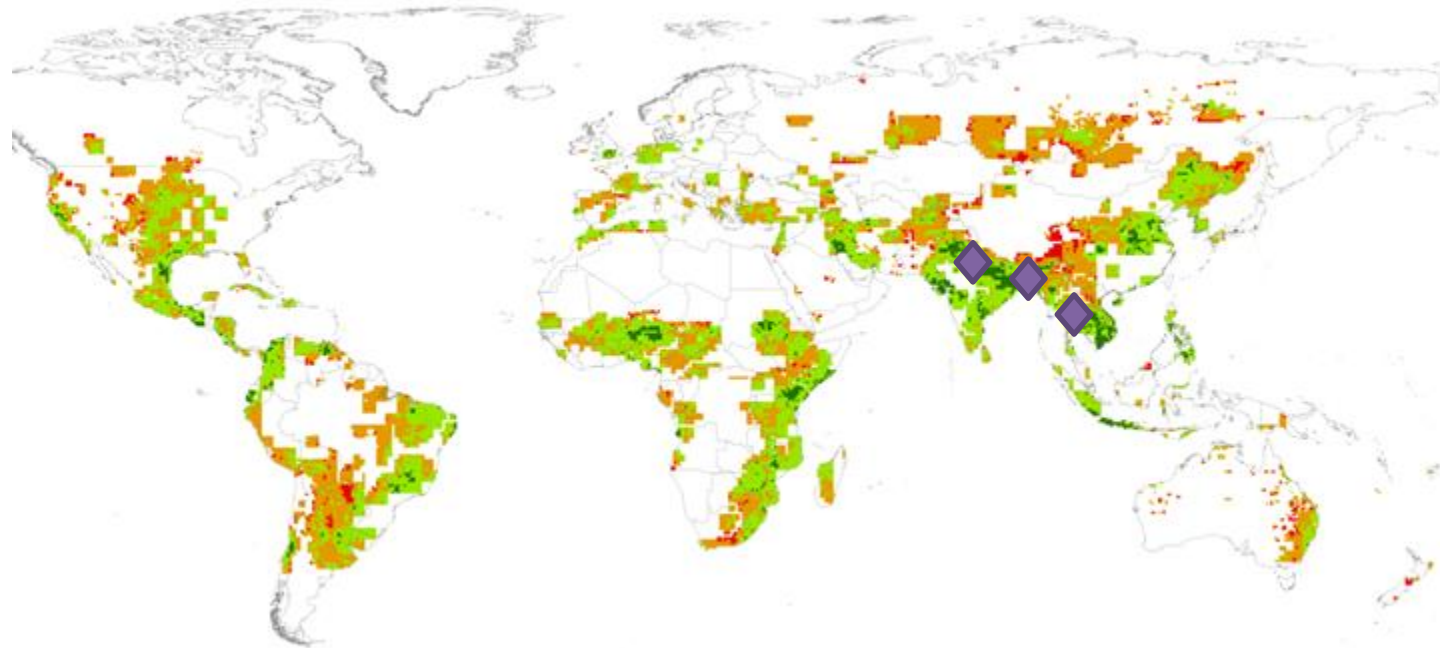


A water-secure world

www.iwmi.org

UTFI CONCEPT AND BROADSCALE PROSPECTS

Global Prospects

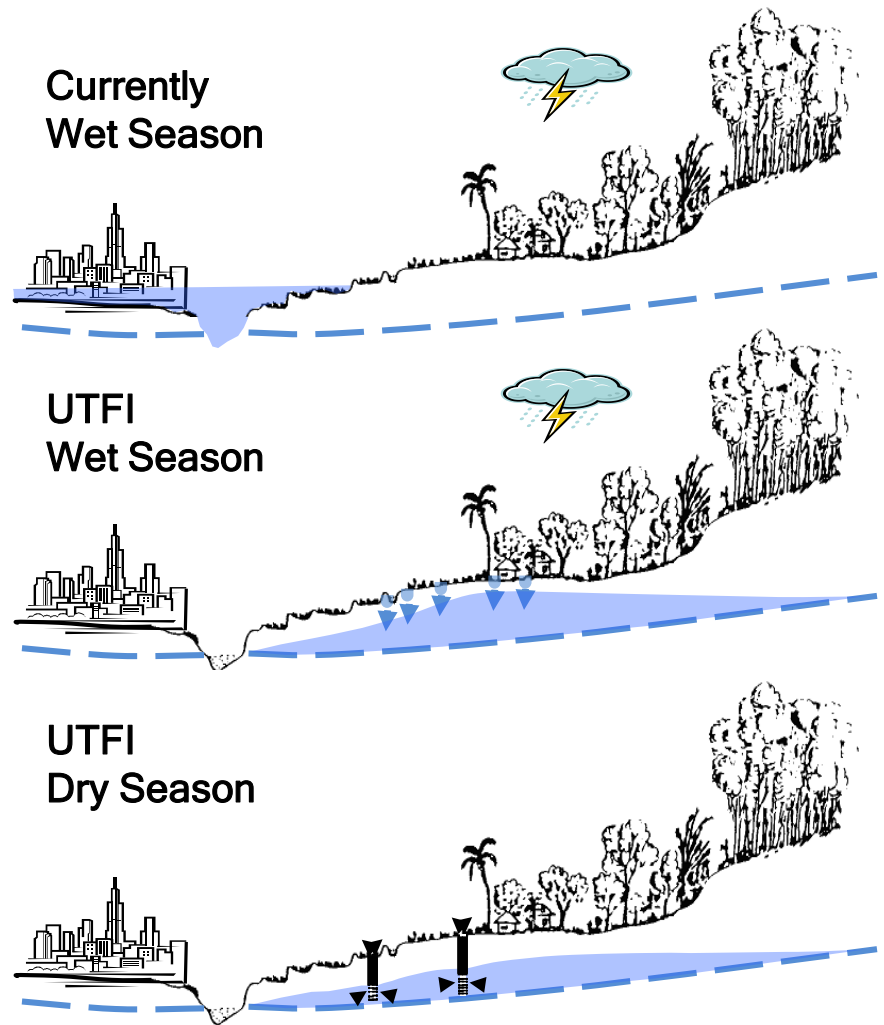


Source: IWMI

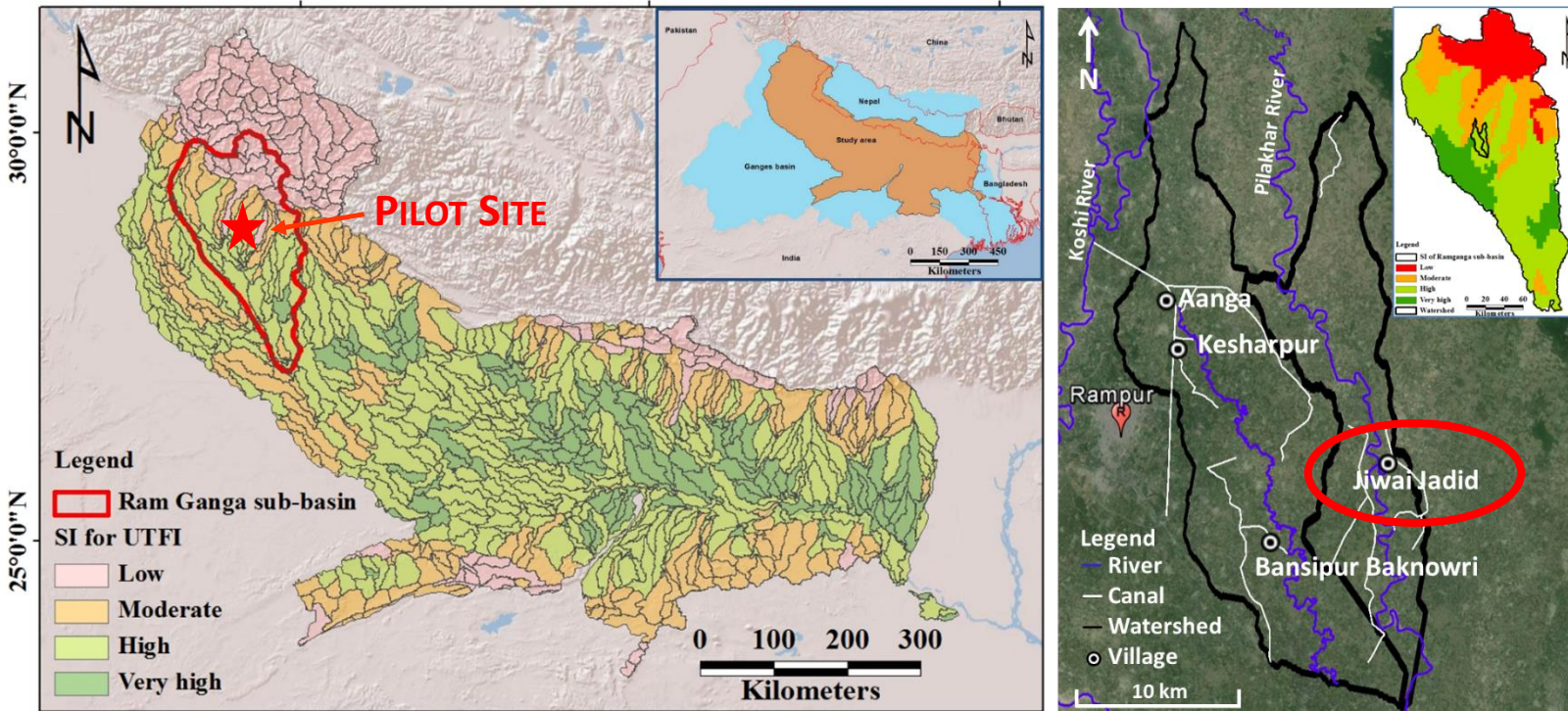
Green shaded areas highlight where the scope for UTFI is promising. These areas account for 50% of the global population and 40% of the crop area.

Areas where research has taken place are highlighted by the diamonds (◆) above.

UTFI in Concept



UTFI IMPLEMENTATION IN THE GANGGES BASIN, INDIA



Objectives

- 1) Develop a sound evidence-based case for UTFI at pilot scale
- 2) Facilitate opportunities for scaling up in prospective parts of the Ganges

Interdisciplinary Approach

Research - mapping, hydrologic/hydraulic modelling, pilot testing (technical, social/gender, economic, institutional, environmental analysis)

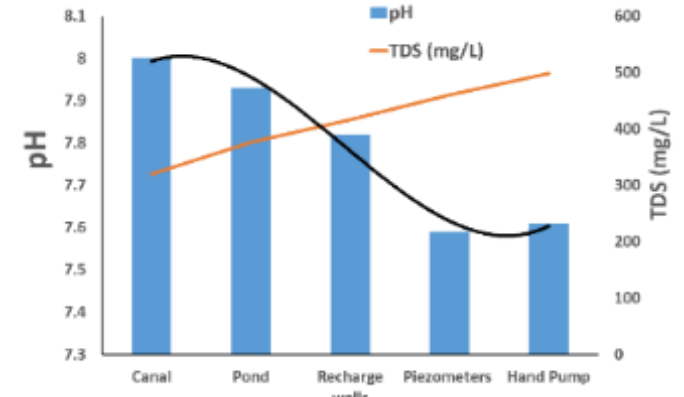
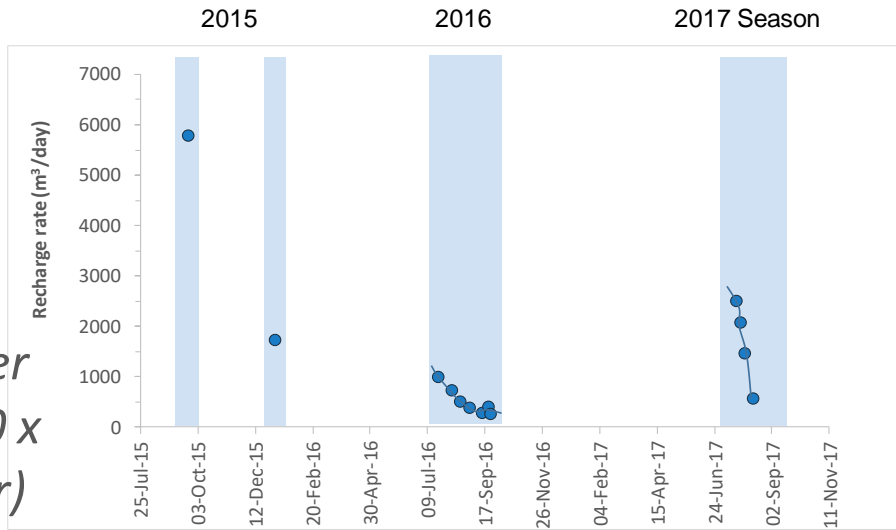
Engagement - workshops, open days, dialogue, trainings



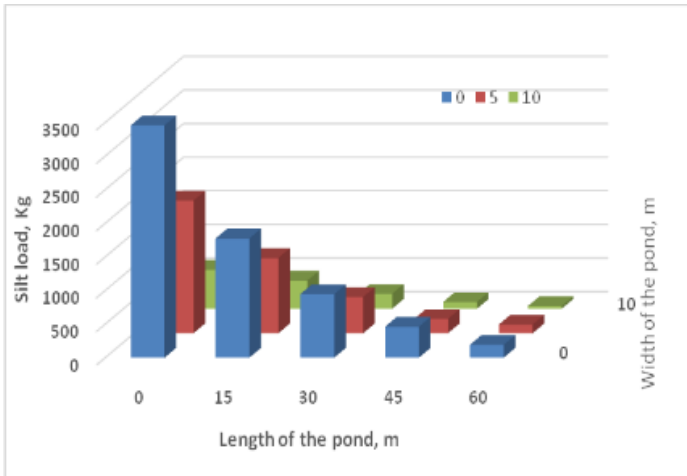
Community pond converted for UTFI in Jiwai Jadid village. The village is periodically flooded and groundwater levels have been falling, which impact on domestic water supplies and agricultural livelihoods.

Scientific Knowledge

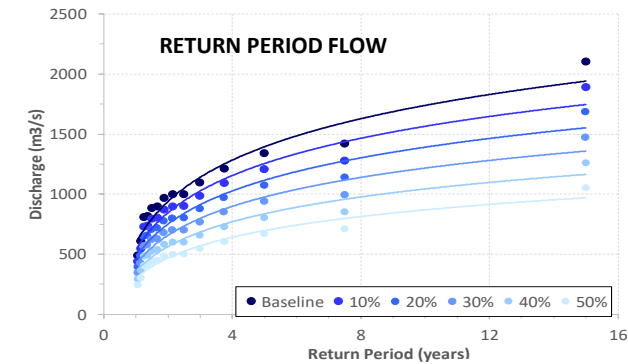
Volumes of excess flow stored in aquifer are high (40-70 x 10³ m³ per year)



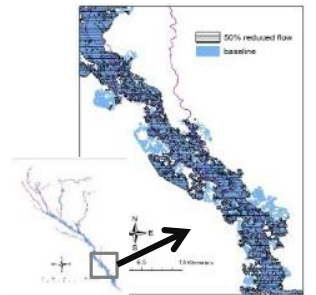
Water quality data collected at 10 stations. Risks have not increased due to UTFI.



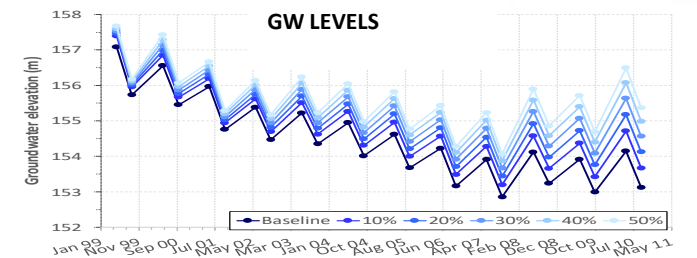
Silt fluxes and removal efficiencies at the pond-base and in the filters are being determined.



FLOOD INUNDATION



Potential to scale up to basin scale established through hydro-economic modelling



Engagement & Impact

VILLAGE LEVEL

- Acceptance of UTFI by the local community, especially women
- Site maintenance formalized through MGNREGA with community participation



Consultation with villagers

DISTRICT LEVEL

- Support from the highest level decision makers in Rampur district
- Site being formally handed over to district government



Meeting CDO, Rampur

STATE LEVEL

- Uptake by UP Govt by inclusion of UTFI in District Irrigation Plan PMKSY (Prime Ministers Irrigation Program) for two districts



DIP Doc.

NATIONAL LEVEL

- Growing support from Ministry of Water Resources



MWR site visit



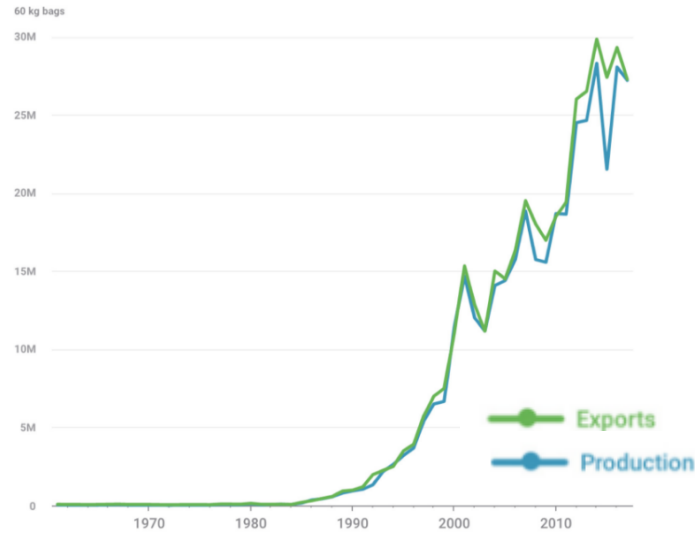
Further Information:
<http://utfi.iwmi.org/>

Piloting MAR in Vietnam to Increase Resilience of Smallholder Farmers



The Central Highlands is Vietnam's foremost coffee production region

Coffee Production



Source: USDA data

Coffee production has boomed, and robusta coffee is one of VN's largest export commodities

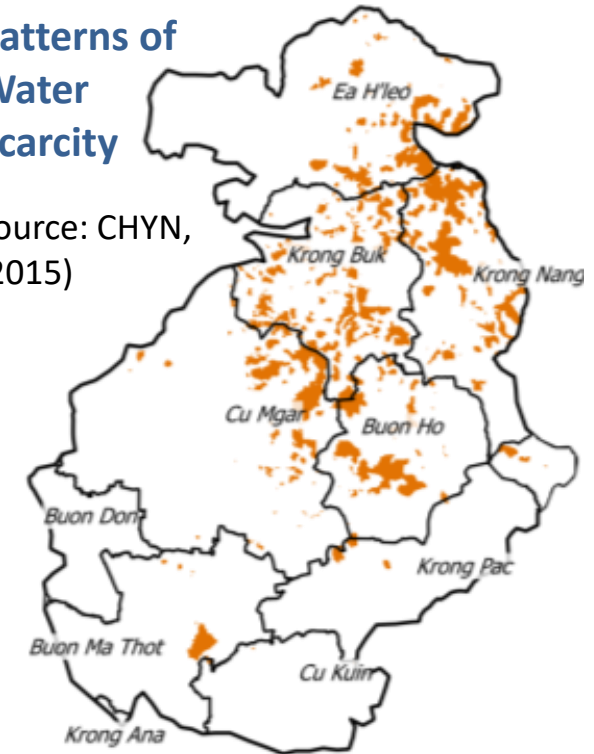
GW for Irrigation



GW use has boomed, and deep well drilling is common due to seasonal depletion of shallow basaltic aquifers

Patterns of Water Scarcity

Source: CHYN, (2015)



Smallholder farmers in the Central Highlands face seasonal groundwater shortfalls, exacerbated by drought



Aims and Approach

Aims

- Develop robust proof of concept for implementing MAR
- Explore trade-offs and outlook for broader adoption

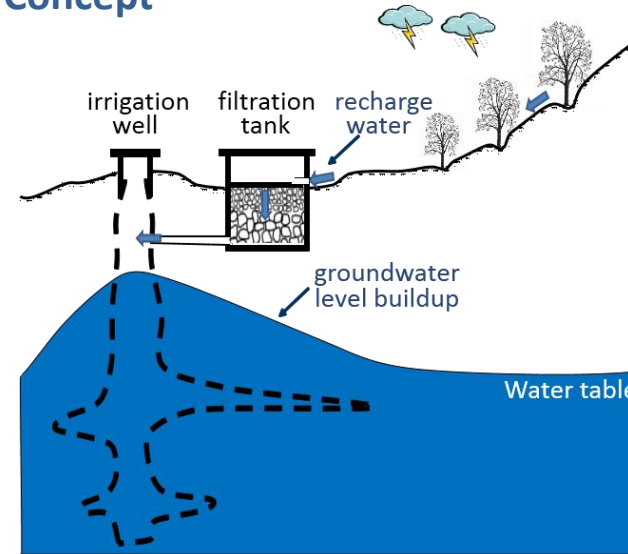
Approach

- Setup trials at multiple sites
- Use simple methods that may be replicated by farmers

Measurements

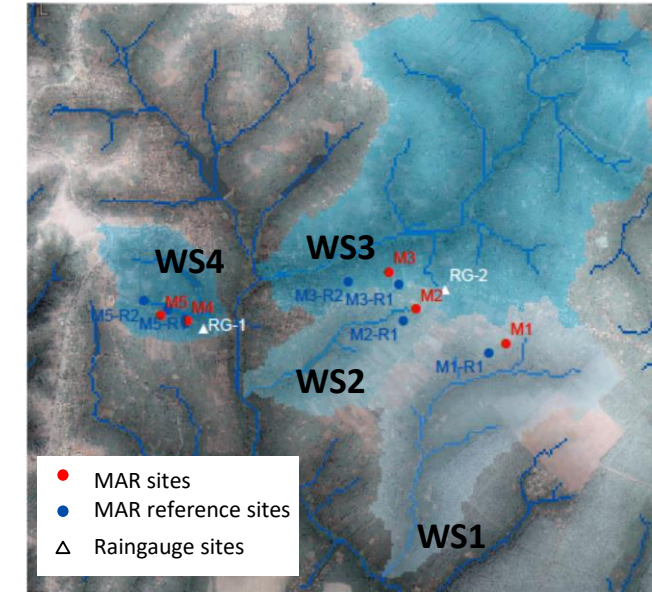
- Water volumes stored & recovered
- Groundwater level response
- Water quality
- Frequency of site maintenance
- Cost-benefits
- Community perceptions

Concept



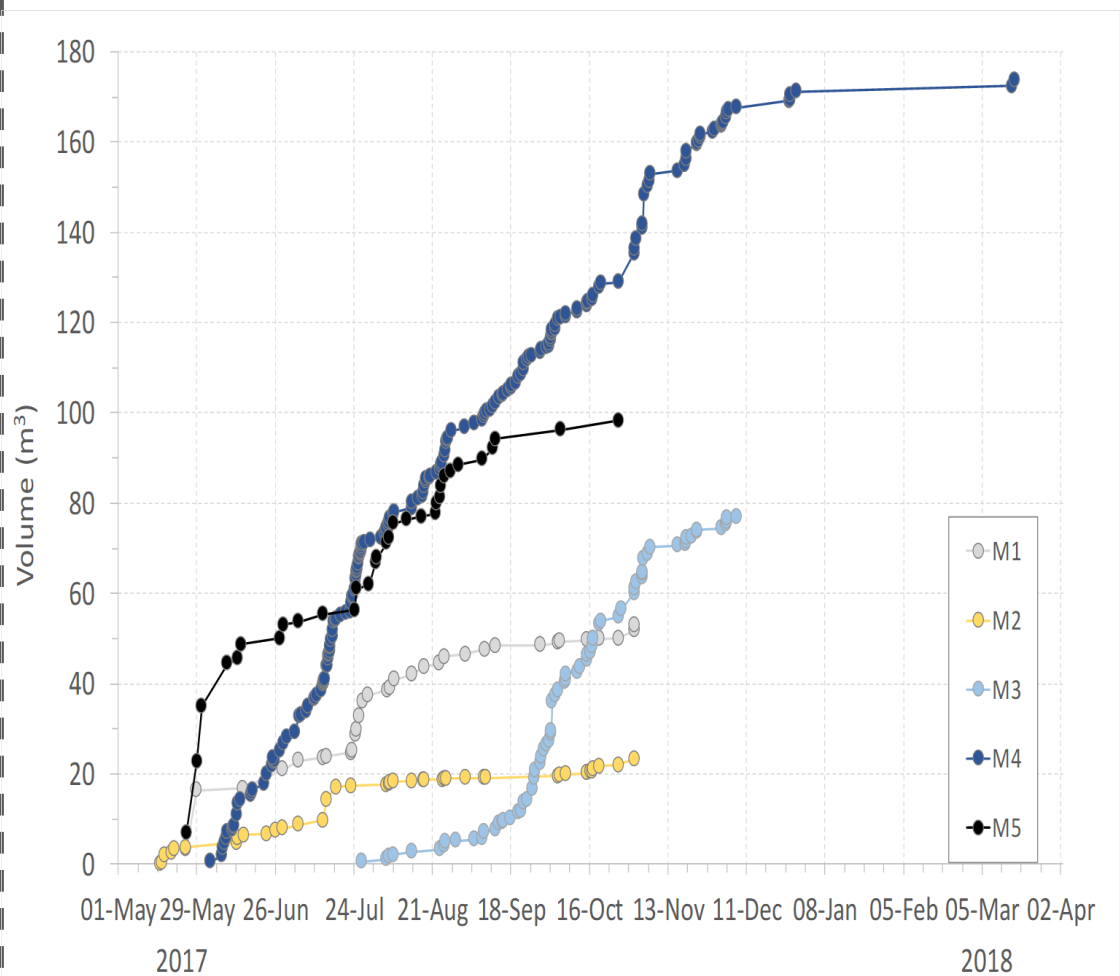
M5 Site

MAR & Control Sites

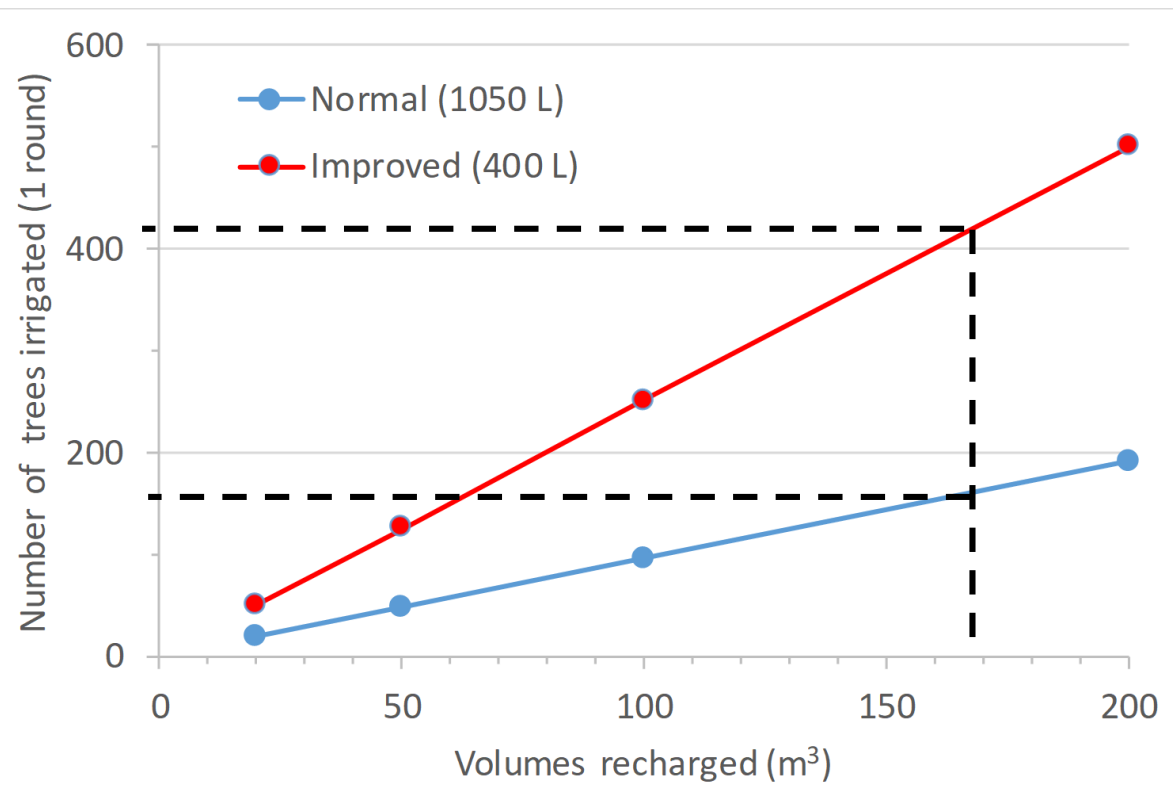


Some Initial Results

Cumulative Recharge Volumes



Water Availability – M4 Site



Traditional Irrigation:

- 190 extra trees can be irrigated (theoretically)

Improved Irrigation:

- 450 extra trees can be irrigated (theoretically)

Key Messages Overall

1. New solutions developed and tested that convert water-related disasters/hazards into opportunities to enhance livelihood opportunities;
2. Strengthening links between natural infrastructure (aquifers) with private or community infrastructure (ponds/canals) helps build climate resilience;
3. UTFI piloting in India has successfully influenced policy with plans for next-level scaling;
4. MAR piloting in Vietnam is less advanced, and is being fine-tuned further; and
5. Policy makers should consider UTFI/MAR in relation to relevant development challenges (SDGs, CCA etc).



Photo credit: HNRS