Piloting Managed Aquifer Recharge (MAR) in the Central Highlands of Vietnam to Sustain Groundwater Supplies for Irrigated Smallholder Coffee Production

STUDY OVERVIEW

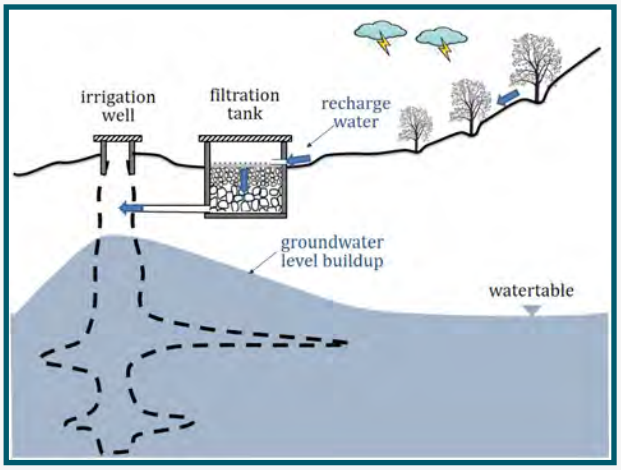
BACKGROUND INFORMATION

- By 2025 a global coffee shortage equivalent to 1.4 times the current production of Vietnam – the world's largest Robusta coffee producer – is expected. On a parallel scale coffee production is under pressure because of the looming effects of climate change causing more profound water scarcity.
- A joint Nestlé/NESCAFÉ-SDC funded project implemented by the Foundation Hanns R. Neumann Stiftung / Embden, Drishaus and Epping Consulting (EDE) in collaboration with the University of Neuchâtel - Centre of Hydrogeology and Geothermics (CHYN), Hanoi University of Science and other partners, is currently underway to "produce more coffee with less water" otherwise expressed as to "reduce the blue water footprint in coffee production". This project receives full support from the Ministry of Agriculture and Rural Development, the People's Committee and the Department of Agriculture and Rural Development in the five Central Highland Provinces.
- The project aims to ensure equitable and sufficient water availability for water users in the Central Highlands and obtain much-needed water savings through improved irrigation demand management in the coffee sector reaching out to benefit 50,000 poorer, more marginalized farmers across the 5 main coffee-producing provinces of Vietnam's Central Highlands.
- The profitability of smallholder coffee farming in the Central Highlands of Vietnam is greatly supported by irrigation, most of which is derived from groundwater.
- Owing to a large increase in groundwater withdrawals for coffee production, critical parts of the basaltic plateau in Dak Lak province have shown dramatic signs of stress expressed as groundwater shortages in the latter stages of the dry season.
- Managed Aquifer Recharge (MAR) has been proposed as a means by which farmers can be pro-active in overcoming seasonal water shortages by converting their irrigation wells for both recharge and pumping and making use of available excess runoff to boost their groundwater storage.
- MAR will complement the approaches based on reducing water use and improving water use efficiency that are being implemented under the current project.

Map: Provinces of major Robusta production are shown in green, while provinces of major Arabica production are shown in Red.

RESEARCH AIMS

- Develop and pilot test farm-level MAR approaches that are pragmatic, low-cost and sustainable and therefore offer scope for adoption by the farmers themselves.
- Assess the performance and tradeoffs of MAR from a wide range of technical (bio-physical) and non-technical (socio-economic) perspectives.



Schematic of Managed Aquifer Recharge (MAR) in Dak Lak Province.

APPROACH

- MAR pilot trials are being setup at multiple sites in close collaboration with the local farmers who will also be the primary beneficiaries of the intervention.
- A rigorous site selection process is followed to identify MAR sites along with sites that would serve as controls.
- The MAR system harvests and collects runoff from the local fields and allows this water to drain via gravity through a sand filter chamber and finally into the farmer's well.
- Each trial is being carefully monitored and evaluated in terms of the volumes of water stored and recovered, groundwater level response, water quality impacts, frequency of site maintenance, cost-benefits, community perceptions and policy dimensions.

INTENDED OUTCOMES

- A sound proof of concept and business case for MAR in Vietnam that would enable more widespread adoption and thus enhance the resilience of smallholder coffee farmers to growing demand and climate change.

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