

Increasing yields of tropical crops by sensor-based water management in India

The FAO estimates that 500 million smallholder families produce over 50% of the food to feed the world's population. A large proportion of them live in the zones of the tropical alternating (wet-dry) climate and depend on rain-fed agriculture. During the long dry season, their fields either remain fallow or are prone to crop failure. Targeted irrigation approaches have the potential to enable resource-conserving and ecological production of fresh produce (e.g. vegetables). This can make significant contribution to improve the living conditions of smallholder families along with fulfilling the growing food demands of the increasing world population. The technology of demand driven irrigation scheduling based on soil moisture measurement has so far been used primarily in mechanized agriculture in industrialized countries. This technology offers great potential of application in tropical and sub-tropical regions of developing countries with limited availability of irrigation water.



This project aims at field implementation and evaluation of moisture-sensor based irrigation scheduling together with a pedal pump in the eastern Indian state of Odisha. On the one hand, the project pursues to develop a locally adoptable technology solution for farmers in Odisha, on the other hand, the project will also serve as a concrete field trial to test this technology and to develop a corresponding requirement profile for future applications.

The Project site

The project will be carried out at the "Maa Mati Campus" , which is a government recognised competence and demonstration centre for agroecology located outside Bhubaneswar, the capital of Odisha state of India. The campus is located 45 minutes from Bhubaneswar and 45 minutes away from the holy city of Puri at the Bay of Bengal.



The field experiment

The project mainly aims at evaluation of different water management strategies to increase the yield of local vegetables species important to the Indian small holders. The experiment will include on-station and on-farm field trials in and around the Maa Mati campus. The student will conduct the actual field trial comparing the improved sensor-based irrigation strategies with prevalent farmers' practices. Regular scientific back stopping and sufficient hands-on support in the field is available. Ideal timeframe is from October 2022 – March 2023.

What's on Offer?

- An excellent opportunity to engage and gain experience in an R4D project with real on-ground impact.
- Fully covered **boarding and lodging** at the Maa Mati Campus, where a campus restaurant and private guest rooms are available.
- Fully covered round trip to India.
- In-between the data collection period, there could be some time available for travelling around.

Project partners

- Supervision and back stopping: Dr. Navreet Bhullar (bhullarn@ethz.ch)
- Agroecological expertise: Prof. Dr. Gurbir Bhullar, BFH-HAFL
- Host organizations: Aqua Alimentaria (NGO in Zurich) and i-Concept Initiatives (NGO in India)

The project is open to the students in agricultural, environmental, biology and plant sciences.

If this topic interests you, send your application to Dr. Navreet Bhullar (bhullarn@ethz.ch)

¹ Video of Maa Mati Campus (2018): <https://www.youtube.com/watch?v=GkBWdhKu7GQ>