The DARE-TU project: Co-creation of clean and affordable smallholder pumped irrigation

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Intensification of smallholder production is key for local and global food security. Amongst many challenges smallholders that face, proper water management is one of the most crucial in achieving such objective [1]. One way to enable/improve access and control to irrigation water is by the use of water pumping technologies. Most of these technologies, however, run on grid-electricity or fossil fuels, thus becoming too costly-intensive or even inaccessible for many smallholders. More environmentally sound and at times less expensive alternatives are renewable energy (RE)-based pumping technologies [2]. From these, hydro-powered pumping (HPP) technologies—i.e., those hydro-mechanically driven by the water they lift—pose even further advantages over their other RE counterparts [3]. The Barsha pump, and the novel Integrated Turbine Pump (ITP), developed by the Dutch company aQysta, are amongst these. Nowadays, nevertheless, they are largely ignored/neglected due to technical, social and financial constraints [4].

In this context, a business model that can deal with such limitations is the “Product-Service System” (PSS) [5]. In addition, a PSS co-creation/co-design process [6], especially while identifying and addressing contextual tensions at an early stage—in line with the so-called Context Variation by Design (CVD) approach [7]—will substantially enrich the outputs to meet the user’s needs. However, these have not been studied within the agricultural sector, nor specifically addressed the case of water pumping technologies for smallholder farming.

Methodologies

Several methodologies are carried out:
- Structured questionnaires
- Q-methodology
- Unstructured interviews
- Direct observations

References

[6] Stevinweg 1, 2628 CN Delft
[9] Stevinweg 1, 2628 CN Delft

Stakeholders

- Smallholders from the farming communities
- aQysta, as the private partner
- NGO’s in charge of the service provision
- Governmental organisations / financial institutions