Co-creation of affordable irrigation technology
The DARE-TU project
Intriago Zambrano, Juan Carlo; Ertsen, Maurits; Diehl, Jan-Carel; Michavilla, Jaime; Arenas, Eva

Publication date
2018
Document Version
Final published version

Citation (APA)

Important note
To cite this publication, please use the final published version (if applicable). Please check the document version above.
Co-creation of affordable irrigation technology: the DARE-TU project

Abstract submitted to the International Conference Water Science for Impact

October 16–18 2018
Wageningen University & Research (WUR)
Wageningen, the Netherlands

Juan Carlo Intriaigo – Delft University of Technology, the Netherlands
Maurits W. Ertsen – Delft University of Technology (corresponding author for the moment)
Jan-Carel Diehl – Delft University of Technology
Jaime Michavila – aQysta, the Netherlands
Eva Arenas - Universidad Pontificia de Comillas, Spain

Global food production needs to increase. Such an increase can come from intensified irrigated agriculture. Many current irrigation technologies are energy- and cost-intensive. Providing irrigation services instead of selling hardware addresses the (financial) reality of smallholder farmers and builds a sustainable business model rather than relying on charity. Besides the scarcity of financial resources, a multi-dimensional view of sustainability becomes possible, including sustained and guaranteed operation over time and more environmentally friendly processes (including longer life of technologies). DARE-TU improves livelihoods of rural communities by design and management of appropriate Integrated Turbine Pump (ITP)-based irrigation infrastructures through sustainable product-service systems. Accessible and affordable water services technologies enable high-value irrigated agriculture (in terms of income and nutrients), providing opportunities for the rural poor and improving food security. With users and supporting organizations, DARE-TU translates general design principles into functional prototypes providing ‘irrigation as a service’ to communities, based on sustainable business models that are cost-effective for smallholders and profit-effective for organizations and/or businesses.

DARE-TU is based upon / has as core / is developed around the ITP, an innovative hydraulic device, operating simultaneously as pump and turbine: the turbine provides energy to drive the pump. As ITP-hardware combines higher initial costs with much lower running costs compared to conventional fuel-based pumps, it is likely that ITP-systems are less affordable by individual farmers. As such, ITP business models are envisioned to be based on community appropriation and/or a model providing irrigation services. The DARE-TU project links knowledge institutions, private companies and NGOs in building/creating/constructing an iterative design process with inputs from users (co-creation) rather than setting technical parameters as given. In close cooperation with prospective users and support organizations, socio-economic contexts plus user preferences and challenges are translated into specifications and prototypes for users in different regions. DARE-TU’s innovative approach of Context Variation by Design (CVD) intentionally and systematically combines insights from different contexts early on in the process to develop solution directions.