

# Promoting Drip Irrigation Innovation System through Effective Institutions: Public and Private Sector Synergies

---

Alicia G Harley

Doctoral Fellow, Sustainability Science Program

Harvard Kennedy School of Government

harley@post.harvard.edu

Sahil Gulati

Consultant, Global Green Growth Institute (GGGI)

sahilgulati4@gmail.com

## Abstract

The innovation system for drip irrigation in the developing world has suffered from low rates of adoption and sustained use. However, recent trends in India are changing this narrative. From 1990 to 2010, area under drip irrigation in India increased by more than 100 times and significant potential for further expansion remains due to India being the most groundwater dependent country in the world. A large fraction of the recent uptake of the technology has been by large farmers, but widespread use will require greater adoption by small and marginal farmers, especially in states where they cultivate a large proportion of the total agricultural land.

The success of drip irrigation was supported by government policy through the Centrally Sponsored Scheme beginning in 2005-06, which provided a 50% subsidy for micro irrigation technologies. Individual states were given the responsibility of subsidy delivery, which led to variation in institutional policies as well as the percentage of subsidy offered to farmers as many states chose to inject additional funds into the program. This resulted in subsidies for micro-irrigation ranging from 50% in some states to 90% (even 100% for some classes of farmers). Yet perhaps surprisingly the percent subsidy in each state is not correlated with adoption rates, suggesting that variables beyond the amount of subsidy provided are driving outcomes.

This paper isolates the innovative institutional design of subsidy delivery as a critical driver of drip irrigation adoption by comparing institutions across four States to understand how differentiated implementation of subsidy program impacts overall adoption as well as adoption by small and marginal farmers. States were purposefully selected for comparison across four categories: 1. States with high overall adoption and high adoption by small and marginal farmers; 2. States with high overall adoption, but low small and marginal farmer adoption; 3. States with low overall adoption, but a high percentage of adoption by small and marginal farmers; and 4. States with both low overall adoption and low adoption by small and marginal farmers. The study's findings focus on: 1. The importance of private sector integration in the institutional design of the subsidy delivery processes; 2. The importance of efficient fund flow between government departments and to the private sector; and 3. Carrot and stick mechanisms to incentivize companies to serve small and marginal farmers. The study concludes with policy relevant recommendations for the design of effective support policies for capital insensitive technology in agriculture.