Building Capacity of Smallholder Farmers for Enhanced Adoption of Drip Irrigation: Lessons from Karnataka, India

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• Bhoosamrudhi Program in the state of Karnataka, India
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Bhoosamrudhi Program
• “Improving Rural Livelihoods through Innovative Scaling-up of Science-led Participatory Research for Development program (Bhoosamrudhi) in the state of Karnataka
• The Program commenced in 2014
• ICRISAT led Consortium of CG Centres

Objectives:
• To work in a partnership mode to increase crop yields by 20% and small and marginal farmers’ income by 25% in four years
• To develop the capacity of agriculture related development agencies and researchers in the state to enhance the impact of the development programs through science-led support systems.

Per Drop More Crop – Micro irrigation in PMKSY
Prime Minister Irrigation Scheme (Har Khet Ko Paani)
• Increase area and crop cafeteria under micro irrigation
• Increase productivity of crops
• Promote micro irrigation in water intensive/consuming crops
• Promote micro irrigation in water scarce/stressed and critical areas
• Promote fertigation.
Area coverage under Micro Irrigation

- Task force on MI (2001) estimated potential of 69.5 M ha.
- All India Coverage under micro irrigation is about 9.4 M ha.
- Gap 60 M ha

<table>
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<th>Year</th>
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<td>Area (Lakh ha)</td>
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<td>4.31</td>
<td>4.25</td>
<td>5.72</td>
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</tbody>
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Achieved

Study sites

- Tumkur
- Chikkamagalur
- Raichur
- Vijaypur

Area under Micro irrigation 954,000 ha 9.5% of the Net Sown Area
Potential for MI 2.2 to 2.7 M ha

IWMI COMPONENT – DRIP IRRIGATION

- Objective:
  - Promote micro-irrigation systems within four districts to increase agriculture productivity and income generation of farmers
  - Offer on-farm and off-farm capacity building to farmers

- Activities:
  - District-wise baseline assessments - types of crops under drip irrigation, status of coverage and associated subsidy programs
  - Assessment of needs, challenges and perceptions of farmers
  - Understanding the government and non-government support providers

Capacity building plan

- Joint action plans for the districts Phase 1 - Tumkur, Chikmagalur, Raichur, Vijayapura
- Needs assessment and collection of data of drip users
- Understanding of the current drip system promotions and programs
- Guidance and facilitation on purchasing drip systems
- Irrigation and fertigation scheduling for crops (vegetables and fruits) - Crop-based drip systems
- Trainings in individual farmer plots and clusters (continuous hand holding and expert visits) On farm individual trainings on irrigation and fertigation scheduling with and without solar powered systems
Results

- A move from low water intensive crops to high – sugarcane and vegetables
- Farmers trained:
  - Drip irrigation adoption was 20-30% on average
  - Drip irrigation was used for a variety of crops, ranging from oil palms, coconut, arecanut, sugarcane to cereal crops and fruits and vegetables
  - The private large-scale enterprises were managing their systems more efficiently than the smallholder farmers
  - Not all farmers were aware of the different subsidy programs

Survey results: Field observations (Drip Users = 150)

- Not familiar with the component parts of the drip systems
- Design layouts were not explained by vendors
- Dependent on vendors for trouble shooting
- Many did not install a filter systems
- Poor quality material was used for installation, partly linked to farmer requests on cutting costs.
- Hand holding after installation was minimal or non-existent
- Promotional programs were conducted in the state, however this was not reflected in the farmer knowledge
- Irrigation scheduling was not adopted properly. This was linked to electricity scheduling
- Fertilization was not popular, as farmers experienced clogging or considered it as an additional burden

Challenges encountered

- Difficulty in tracing farmers through subsidy and registration lists – these are prepared annually
- A large number of non-subsidy installations – substandard installations
- Farmers attitude – still project mode and preferring flood irrigation, where water is still available
- Complaints on drip systems - frequent clogging – not following guidelines, timed releases not adhered to, leave them on overnight for slow trickling.
- Poor electricity supply – no motivation for further adoption
- Despite training, farmers are not monitoring the drip systems for trouble shooting adequately
- Lack of time and engagement in other livelihood activities
- Knowledge on the pressure systems and filter systems for micro-irrigation poor
- Grappling with variable water availability in bore wells.
- The equipment providers do not support with follow-up advice. Overall the installation is a slow process.
- Unwilling to change crops to suit the climatic conditions that are changing

Lessons learned

- Effective technology adoption requires planning at a cluster level in a watershed/village
- Advice should be based on a sound understanding of the available water resources, water quality, and types of crops
- Handholding is a must at least during initial period.
- Organize regular trainings
- Emphasis on drip maintenance - cleaning of filters, acid treatment of dippers to remove clogging
- Develop an App for trouble shooting and data collection for providing real time solutions
- Forming microfinance-based cooperatives for drip farmers is one way to enhance the technology adoption and mutual learning
The way forward

• Adoption of MI is still slow, hope through PMKSY it is being expedited
• Increasing technical know how and capacity building at farm and cluster levels on maintenance, irrigation scheduling, choice of crops
• Benchmarking, water budgeting planning
• Mechanism for facilitation with experts, Vendors, farmers
• Continued technical support to departments
• Training manuals in local language
• Effective and transparent subsidy disbursement
• Innovative arrangements for Solar-Microirrigation
• Monitoring, microfinancing & enabling microirrigation policy

Thank you

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