SESSION 3: AGRICULTURAL TECHNOLOGY FOR RESILIENCE: GOVERNANCE FRAMEWORK AND PRACTICE

Simple Soil water monitoring tools and Agriculture Innovation Platforms (AIPs) for small scale irrigation schemes in Iringa District, Tanzania: Adoption process, outcome and resilience elements

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Introduction

1. Increasing irrigation water productivity in Mozambique, Tanzania and Zimbabwe through on-farm monitoring, adaptive management and Agricultural Innovation Platforms- Phase I (2013-2017)
   i. Develop, test and deploy innovative water and solute monitoring systems to stimulate farmer learning towards great water productivity;
   ii. Evaluate whether AIPs, based on existing community organizations can identify and overcome institutional and market barriers to greater Water Productivity;

2. Transforming smallholder irrigation into profitable and self-sustaining systems in southern Africa (TISA)-Phase II (2017-2021/23)
   i. Determine how the package of AIPs and simple tools for water and land management can best be scaled out and up;
Simple Soil water monitoring tools and AIPs

1st sensor & reader installed in Kiwere: May 2014

Sensors & WFD installed to 20 farm plots: July 2014

About 40 plots with the tools after launching VIA in 2016: 2017

Lipuli, Igomelo, Igingilanyi, Nyamahana, Mafuruto: 2017 - 2022

About 40 plots with the tools after launching VIA in 2016
Number of tools installed and stakeholders received training and awareness

- Others trained or received awareness
- Staff from Government Departments and Agencies
- Number of farmers
- Participants (all events)
- Number of farmers on VIA by June 2021
- Sensors installed
- Target of sensors for installation

![Bar chart showing the distribution of various categories of training and awareness]
Establishment and operationalization of AIPs

• Existing context of the irrigation schemes (analysis): infrastructures, irrigation water, farm inputs and output markets, physical accessibility, social service infrastructures and facilities

• Vision exercise: Desires to achieve within short, medium and long term. Irrigation potential, improved infrastructures, access to storage facilities and markets, improved social conditions and livelihoods

• Identification and detailed analysis of the barriers along the production value chain: Farm inputs, on farm production, outputs markets

• Preparation of Action plan to implement solution to the barriers: include stakeholders identified to implement solutions of the barriers.

• Continuous learning, sharing of knowledge, new innovation and technologies, monitoring, scaling out/up
Operationalizing Innovation platforms

Figure 1. The innovation platform process. Once established, the multi-stakeholder forum convenes to identify challenges and opportunities, and test and evaluate new strategies as well as technical, institutional and policy interventions in order to work towards the desired state. Stakeholders engage in a participatory monitoring and evaluation (M&E) process to measure progress.
Changes the farmers have made through adaptive learning of the tools and AIPs intervention

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Kiwere</th>
<th>Magozi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Changes in irrigation water use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction of number of irrigation intervals (%)</td>
<td>39</td>
<td>n/a</td>
</tr>
<tr>
<td>Reduction of number of irrigation events (%)</td>
<td>40</td>
<td>n/a</td>
</tr>
<tr>
<td>Reduction of duration of irrigation (%)</td>
<td>42</td>
<td>n/a</td>
</tr>
<tr>
<td>Reduction of total time of irrigating (%)</td>
<td>65</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Changes in farming activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced amount of chemical fertilizer (%)</td>
<td>74</td>
<td>n/a</td>
</tr>
<tr>
<td>farming previously unfarmed irrigated land (%)</td>
<td>91</td>
<td>86</td>
</tr>
<tr>
<td><strong>Changes in spending</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More spending on irrigation/farm inputs (%)</td>
<td>73</td>
<td>65</td>
</tr>
<tr>
<td>More spending on farm implements (%)</td>
<td>66</td>
<td>65</td>
</tr>
</tbody>
</table>

Changes in conflict over water (% of households)

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Kiwere</th>
<th>Magozi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased within the household</td>
<td>89</td>
<td>88</td>
</tr>
<tr>
<td>Decreased between farmers on the same canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased between head-end and tail-end users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased between the scheme and other water users</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Changes in income sources in the last four years (% yes)

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Kiwere</th>
<th>Magozi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in income sources in the last four years (% yes)</td>
<td>66</td>
<td>63</td>
</tr>
<tr>
<td>Farm income is same &amp; better compared to four years ago (% of respondents)</td>
<td>85</td>
<td>77</td>
</tr>
</tbody>
</table>

Systemic changes by the tools and AIPs

Building absorptive and adaptive capacity, addressing systemic challenges and creating feedbacks from markets to build human livelihoods, dignity and pride

**Innovation systems:**
Inclusive system analysis & innovation

**Interventions and learning:**
Building adaptive capacity

**Inputs and production:**
Profitable & resilient cropping systems

**Market development:**
Accessible and functional markets

Building analytical capacity to identify and act on strong leverage points

Interventions with farmer friendly technologies

Developing diverse and integrated sustainable production systems

Generating income, stimulating rural economies and the capacity to reinvest.

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Governance frameworks

<table>
<thead>
<tr>
<th>Policies/Development Strategies</th>
<th>Implicit emphasis on tools for efficient irrigation management on smallholders</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Third National Five Year Development Plan (NFYDP, 2021)</td>
<td>• Expand sustainable water &amp; land use management through integrated land use planning and <strong>improvement of irrigation systems</strong></td>
<td>no specific mention</td>
</tr>
</tbody>
</table>
| Agriculture Policy 2013 | • Enhance crop productivity and profitability in irrigated agriculture  
  • Promote **water use efficiency** and drainage (incl. productivity and reduce salinity)  
  • Promote **high value horticultural crops** | no specific mention |
| National Irrigation Policy 2009 | • Promote **efficient water use irrigation systems** (one of the policy’s specific objectives) | no specific mention |
| Agriculture Sector Development Programme II (ASDP II, 2017) | • Promote **climate smart agriculture technologies and practices**  
  • Promote **soil and water management systems and efficient use of irrigation systems** | • Knowledge-based precision irrigation that provides reliable and flexible water application and wastewater reuse will be a major platform for sustainable intensification  
  • Developing climate smart technologies |
| Irrigation Master Plan (2018) | • Rural Finance and Credit systems-**significant and indispensable for improved technology use/access**  
  • Recognize importance of **water management tools to improve efficiency of water use and productivity** | no specific mention |
Summary

• Use of tools and AIPs in smallholder schemes have demonstrated to contribute to self-sustaining irrigation systems, food security and improved viability for rural households. Can simultaneously achieve the development goals of governments and investors.

• The evidence suggests outcomes are greater when both interventions are introduced together.

• Emphasis on actionable interventions in policies, sector strategies and development programmes to support availability, distribution and access to simple and farmer friendly tools/technologies.
Thank you!

https://youtu.be/MVs139ZZhcc