FANRPAN
Food, Agriculture & Natural Resources Policy Analysis Network



POLICY BRIEF SERIES 01/2019 January 2019

Smart Water Governance – Agriculture Innovation Platforms (AIPs)

INTRODUCTION

Conventional irrigation scheme development has focused on 'hard' technologies to improve the functionality and efficiency of infrastructure and/or irrigation application technologies. However, hard technology improvements on their own have failed to deliver sustainable schemes and improve the livelihoods of irrigation farmers (Inocencio et al., 2007): broken and decaying infrastructure is just one element of an underperforming system. While technologies that are more efficient may help improve yield, they will not necessarily improve profitability. A great many irrigation schemes are trapped in a negative cycle of infrastructure provision, unprofitable farming, lack of investment in maintenance, infrastructure degradation leading to donors subsidizing infrastructure rehabilitation (Pittock & Stirzaker, 2014; Bjornlund et al., 2017).



Key Lessons Learnt

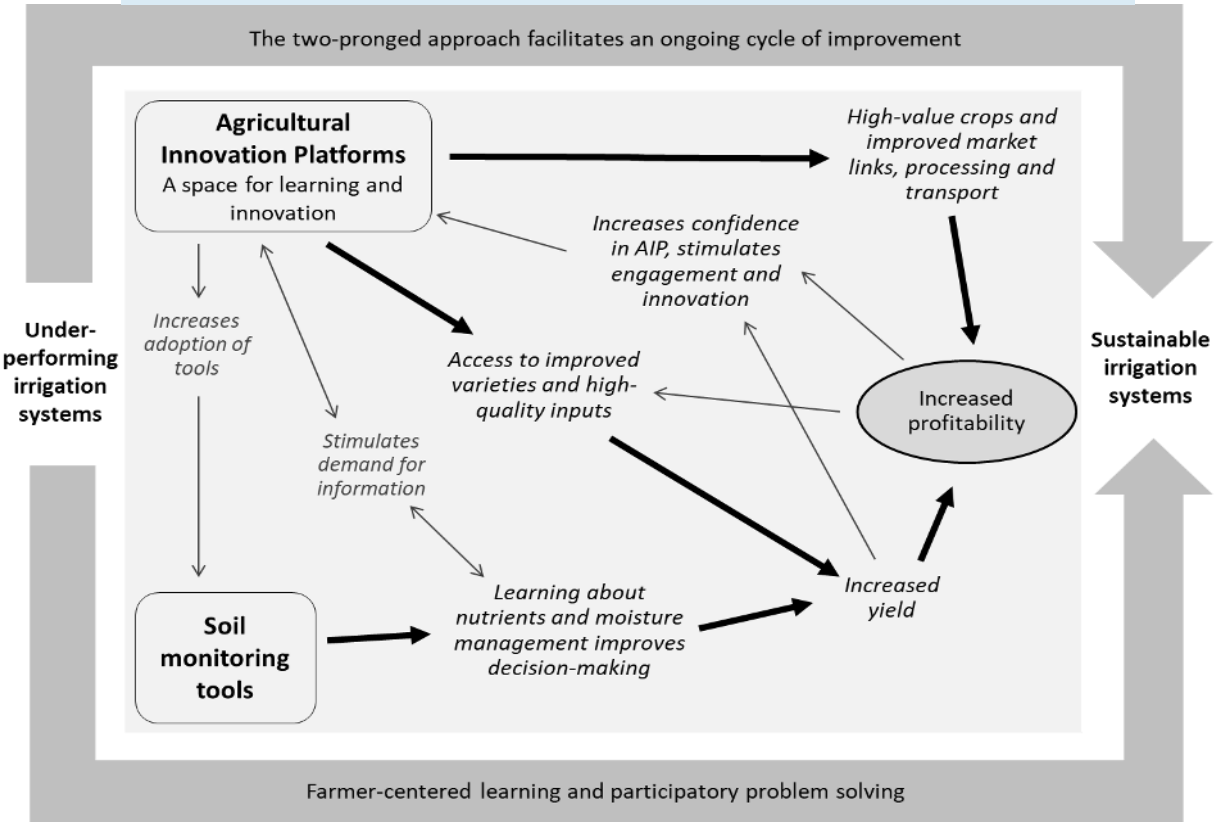
When farmers have access to simple tools they will learn themselves and rapidly change their agronomic practices. Below are some of the key lessons learnt in the course of implementing the Transforming Irrigation project:

- Lesson 1: Complex socio-ecological systems require multiple interventions.
- Lesson 2: Invest in institutions and human capacities
- Lesson 3: Draw on local knowledge
- Lesson 4: Choose entry points to achieve early positive outcomes
- Lesson 5: Allow extension officers' roles to evolve
- Lesson 6: Foster collective thinking to identify opportunities based on a common vision and priorities
- Lesson 7: Identify and resolve the 'deal breakers'
- Lesson 8: Irrigation learning systems must be self-sustaining

IMPROVING THE PROFITABILITY OF SMALL-SCALE IRRIGATION SCHEMES

A consortium of research partners from Australia and Africa are implementing a project that aims to improve the profitability of small-scale irrigation schemes funded by the Australian Government through the Australian Centre for International Agricultural Research (ACIAR). The research is implemented in Mozambique, Tanzania and Zimbabwe each with very different biophysical and socioeconomic characteristics. Within each the focus is on the following districts, Maputo and Manica provinces (Mozambique), Mbeya irrigation zone (Tanzania) and Insiza/Filabusi and Gweru districts (Zimbabwe). All six schemes were constructed well before the project commenced (Table 1) and predominantly funded by government or, in some instances, donors.

Figure 1: The two-pronged approach and how it influences profitability



The project features a two-pronged approach consisting of two complementary entry points to transition small-scale irrigation schemes towards long-term sustainability (Figure 1):

- **Smart water management (SWM) technologies** were introduced to monitor soil moisture and nutrients and facilitate farmer learning about irrigation water management to increase yield (this is discussed in a separate policy brief titled Smart Water Governance – Agriculture Innovation Platforms).

- At the same time, **smart water governance and learning processes**, in the form of Agricultural Innovation Platforms (AIPs), were introduced to bring key stakeholders together to develop solutions to a range of challenges presenting barriers to turn increased yield into increased profitability.

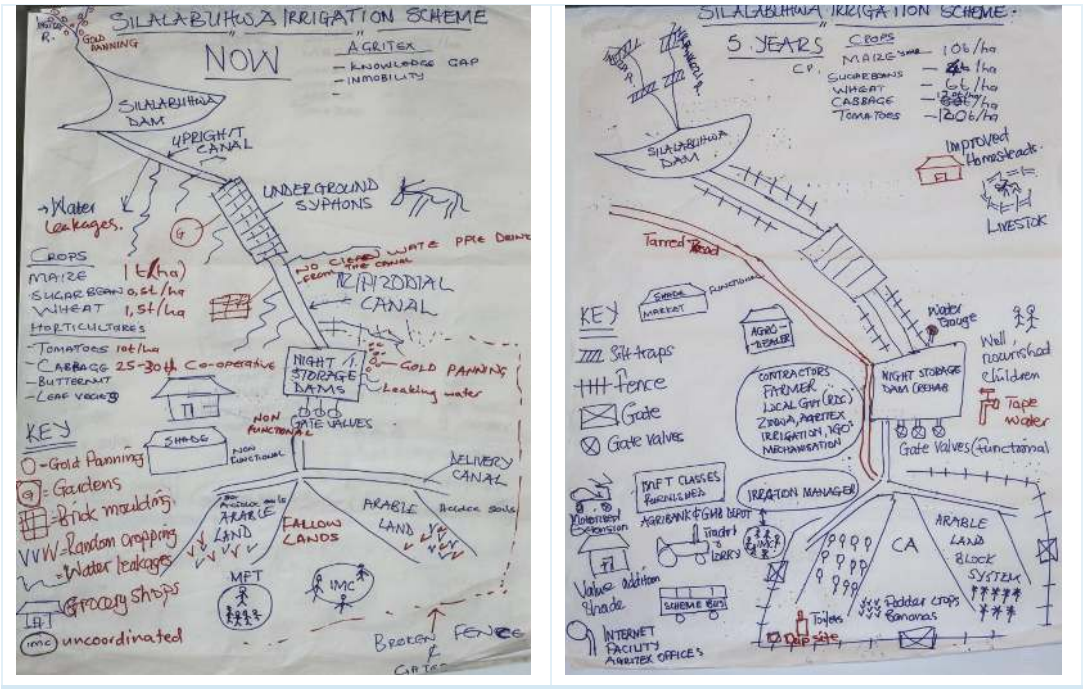
AGRICULTURE INNOVATION PLATFORMS (AIPS)

Agriculture Innovation Platforms (AIPs) are defined as forums "established to foster interaction among a group of relevant stakeholders around a shared interest" (Makini et al., 2013, p. 2) and dialogue is facilitated amongst a diversity of stakeholders to identify synergies between different components of the system (Homann-Kee Tui et al., 2013). These platforms have been widely used in Africa in a diversity of farming contexts—for example, seed, maize, honey and livestock production (Makini et al., 2013)—and the Forum for Agricultural Research in Africa has advocated their use as the preferred approach to research for development (Schut et al., 2017).

This project uses AIPs for the first time with irrigation schemes as they are particularly well-suited to simultaneously address multiple barriers, which in the scheme context are the technological, capacity and institutional challenges that are constraining adoption and profitability. The forums provide a space for learning and experimentation and generating adaptive capacity (Boogard et al., 2013) through:

- Empowering stakeholders and creating a platform where they can be active decision-makers for their own future.
- Fostering paradigm shifts amongst service providers, farmers and other stakeholders to transition from subsistence agriculture to farming practices that are more market-oriented and profitable.
- Building local capacity to innovate and analyse challenges and opportunities, reduce risk and increase income.
- Improving communication and networks between stakeholders along the value chain, and between farmers and water supply/management institutions/organisations.
- Enhancing participant's capacity for self-organization, representation and communication.
- Fostering greater respect and elevated status for farmers from government and private sector employees.

Figure 1: Examples of the current situation (left) and desired situation (right) produced from the visioning exercise in Silalatshani, Zimbabwe (van Rooyen et al., 2017)



AGRICULTURE INNOVATION PLATFORMS OUTCOMES

Across the schemes the AIPs have facilitated a shared vision amongst those with an interest in making the schemes more successful and valuable relationships have been built (de Lange & Ogutu, 2016). Alongside facilitating the learning generated from the tools, the AIP processes have systematically addressed many critical barriers that were negatively impacting yield and profitability, which has augmented the learning gained from the soil monitoring tools and enabled this to be translated into other outcomes.

The following briefly lists the range of AIP outcomes (van Rooyen et al., 2017):

- Capacity building – consolidating the learning from the soil monitoring tools, empowerment and relationship building through the actual AIP process, farm record keeping, gross margin calculations, demonstration plots, and visits to other schemes.
- Plot management - changed agronomic practices including crop diversification, plot levelling, manure management
- Input supplies - collective negotiation with input suppliers and ensuring supply of good quality seed and fertiliser.
- Financial - linking farmers to finance institutions to access credit and addressing water payment arrears.
- Markets and marketing - identification of high-value crops and buyers for these crops, market research committees to liaise with local agri-dealers, and new storage facilities.
- Scheme maintenance – dam wall, canal and fence maintenance; canal lining, replacing broken equipment; and installing new infrastructure.
- Governance – participatory scheme mapping, revision of irrigation association constitution, scheme-scale business planning, audits of plot ownership, re-allocation of unused plots to youth.



In **Tanzania**, the project has facilitated a participatory mapping process within the two schemes. During the AIP process for Magozi and Kiwere schemes, it was identified that the size of the irrigation schemes was estimated and farmers did not know the exact sizes of their plots, which is important as this is linked to the water fee owed by each farmer. It was, therefore, agreed that the schemes should be mapped as individual plots due to the importance of this information for planning and decision-making.

An important component of this process was to walk all plot boundaries within the scheme with the neighbouring farmers and the use a Global Positioning Systems (GPS) to document the coordinates along the boundaries. The resulting community mapping and database of the schemes records: plot boundaries, ownership status, mobile phone number, sizes of plots, irrigation canal networks, farm access roads and drainage networks.

Several benefits have resulted from the mapping:
i) the information supports the issuing of customary certificates of land occupancy by government agencies, which farmers can use to access finance;
ii) farmer's trust in the fairness of area-based water use fees has increased; and
iii) communication within the schemes has improved. Further, these benefits have contributed to increased participation in scheme maintenance and willingness to pay fees.

Furthermore, the AIP process has also been instrumental in facilitating that the scheme's irrigation associations developed business plans. The associations are also proactively revising their constitutions to reflect better practice: as a result of agreement gained through the AIP and the learning gained from a visit to the Igomelo scheme in Mbeya, which was facilitated by the AIP.



In **Zimbabwe**, the AIPs have been very active in facilitating farmer integration into the value-chain. At the Silalatshani Scheme, the AIP facilitated the resolution to two far-reaching policy issues. The AIP helped negotiate a solution to a longstanding conflict with the local water authority, Zimbabwe National Water Authority (ZINWA).

The conflict related to the size of an outstanding water bill, which had arisen during a period when Zimbabwe was experiencing hyperinflation and multiple exchange rates were in use during the transition from the Zimbabwe to the US dollar. The uncertainty over this water debt was a critical issue standing in the way of potential project success and was one of the major reasons for irrigated plots being idle at the commencement of the project.

Additionally, the water fee had been based on a business model that depended on full use of the scheme and profitable farming businesses, neither of which were the case (van Rooyen et al., 2017).



In **Mozambique**, the 25 de Setembro scheme has an ageing farmer population and many are therefore no longer able to manage their plots, which poses a threat to the scheme's economic and social sustainability. The farmers identified this problem during the AIP meeting. After some discussion with the district's extension services, farmers decided that, when allocating unused plots the relatives of the owners should be offered the plot first, before inviting people from outside the scheme.

Unused plots have since been reallocated and approximately 17 young women and men have become involved in irrigated farming. The cooperative has elected a young farmer as vice-president, which shows that members have recognized the value of giving responsibility to young farmers. The AIP process at the 25 de Setembro identified that the lack of a business plan made it difficult for farmers to obtain and manage a bank loan. Farmers lacked the necessary skills to develop such a plan and neither banks nor local authorities were providing this training.

LESSONS LEARNED

During project implementation, the team learned many critical lessons about how to facilitate the process of change towards profitable and sustainable small-scale communal irrigation systems.

Lesson 1: Complex socio-ecological systems require multiple interventions.

Small scale-irrigation schemes are complex systems that require many physical and institutional elements to work well for schemes to be sustainable. Multiple interventions are, therefore, needed to transform irrigation systems to a more sustainable and profitable state; thus, contributing to poverty reduction, food security and economic growth.

Lesson 2: Invest in institutions and human capacities

Substantial investment in institutions and human capacity is essential for irrigation schemes to thrive. This requires a paradigm shift from irrigation development that only focusses on water infrastructure.

Lesson 3: Draw on local knowledge

A purely 'top-down' technocratic approach to governing small-scale irrigation schemes results in failures. Irrigation agencies need to draw on the different kinds of knowledge held by farmers and foster the capacities of farmer organisations to enhance their self-reliance and profitability. The concept of subsidiarity is important: devolving to farming communities clearly defined responsibilities and opportunities for self-governance.

Lesson 4: Choose entry points to achieve early positive outcomes

Previous experiences with implementing AIPs in Africa, shows that they are only successful if there is a focussed entry point (Pittock and

Stirzaker, 2014). One entry point for this project was soil monitoring, which has helped farmers to understand the root causes of low yields. And farmers' adoption of learning from the tools was swift. The second entry point was the AIP, which facilitated learning from the tools, identified priority barriers and solutions, and achieved early positive results.

Lesson 5: Allow extension officers' roles to evolve

AIPs work well when they continuously receive information to stimulate and structure learning. Encouraging involvement of stakeholders along the value chain stimulates new connections and options for solutions: facilitation is key to their success. There is potential for the role of extension officers in Africa to evolve from a 'command and control' approach that is failing, into a facilitation role that is more rewarding and effective.

Lesson 6: Foster collective thinking to identify opportunities based on a common vision and priorities

Farmers' main constraints are those that influence their income earning capabilities, such as, access to: markets for quality inputs and selling produce; knowledge about what to grow and how to grow it; transport to take produce to markets. Providing supportive mechanisms, such as the AIP, that enables collective identification of problems and opportunities, agreement on a common vision, and prioritization of interventions: collective thinking to overcome barriers is critical.

Lesson 7: Identify and resolve the 'deal breakers'

It is critical to identify the key issues within each irrigation scheme that might be deal breakers. These are issues that, if not resolved, will prevent or negate all other efforts. For example, the unsettled ZINWA water bill in the Silalatshani scheme in Zimbabwe and the leaking infrastructure in 25 de Setembro in Mozambique

Lesson 8: Irrigation learning systems must be self-sustaining

Despite the positive outcomes, the distribution of free equipment and use of external capacity to implement AIPs do not guarantee longevity of use and continuing impact. That farmers have expressed a willingness to pay for the tools, is confirmation of the positive outcomes that they have experienced and an important first step. However, for the learning system to be successful in the longer term, farmers need to take their learning from the tools to a deeper level (e.g. exploring the seasonal patterns), the learning from the tools and AIP needs to spread beyond the project schemes, and institutional arrangements and networks (i.e. AIP or equivalent institution) need to become self-sustaining.



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This publication is part of the research for development project described here was funded by the Australian Government through the Australian Centre for International Agricultural Research (ACIAR) and implemented in Mozambique, Tanzania and Zimbabwe.

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The Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) is an autonomous regional stakeholder driven policy research, analysis and implementation network that was formally established by Ministers of Agriculture from Eastern and Southern Africa in 1997. FANRPAN was borne out of the need for comprehensive policies and strategies required to resuscitate agriculture. FANRPAN is mandated to work in all African countries and currently has activities in 17 countries namely Angola, Benin, Botswana, Democratic Republic of Congo, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

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