

Nudging sustainability transitions in Central Mozambique



How Agricultural Innovation Platforms empower marginalized smallholder farmers

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Summary

An Agricultural Innovation Platform (AIP) facilitates and accelerates transition of farmers from subsistence farming to socially inclusive, environmentally sound and market-oriented farming.

AIPs adapt interventions around interlinked levers in the food value chains, with entry points based on a good understanding of farming systems and input/output market requirements. Learning activities around these entry points strengthen stakeholder networks.

Capacitating farmers through stakeholder networks, using mutual learning and additional technical training sessions, improves their self-organization and helps them become entrepreneurs, with the private sector as business mentors and government and extension as facilitators and support.

Prospects for change in complex farming systems often appear few and uncertain, leaving farmers feeling helpless in the face of challenges. AIPs demonstrate that small interventions around significant leverage points will have far-reaching benefits.

With time, stakeholders facilitate multiple changes through AIPs, magnifying the impact and paving the way for initiatives beyond a project's lifespan. The 'AIP experience' changes their self-perception, resilience, motivation and empowerment forever.

Key messages

- AIPs help food value chain participants to understand and build stakeholder networks that are critical in marginal and high-risk agricultural regions (e.g. Marara District).
- When multiple stakeholders with different backgrounds, knowledge and skill sets are connected, their sound understanding of farming systems, market dynamics and socio-ecological implications helps identify best interventions to trigger change to ultimately enhance agricultural productivity while maintaining the environment.
- As they promote social learning and technical training along with inclusive implementation, AIPs build farmers' confidence and capacity to adapt and innovate to different environments.

Background

The MOREP II project on Nudging Sustainability Transitions Using Innovation Platforms and Market-Oriented Development in Mozambique has worked (2015-2018) through a farmer association, AAPACHIMA, with 60 farmers (representing different levels of resilience) in six villages in Marara District, Central Mozambique, about 80 km from Tete city.

It involved government departments for crop and livestock extension at district and provincial levels and a number of private abattoirs, traders and input suppliers.

ICRISAT*, BOKU/CDR# and IIAM§ worked together with the Government of Mozambique to understand and facilitate locally conceived change processes which could have significant impact for the farmers. The project was funded by the Austrian Development Agency and supported by the CGIAR Research Program on Water, Land and Ecosystems.

Context: Addressing the challenges of rural poverty

Poverty in drought-prone agricultural regions like Marara District has multiple implications – food insecurity, poor nutrition, low household income, poor education, etc. Risks such as unreliable weather, pest and disease outbreaks and livestock theft further demotivate farmers and discourage other stakeholders from investing in agriculture. Market opportunities are inaccessible to the poor. While extension services are ill-equipped to support farmers against such challenges, the private sector struggles due to high transaction costs and failure to source quality agricultural produce in adequate volumes. Current development programs, with isolated interventions, fail to address the complex challenges of lifting farmers out of poverty and increasing food security, while maintaining the environment.

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Why AIPs?

AIPs engage farmers, as well as those in business, government and civil society, to devise activities and outcomes for and through farmers. Often initially set up by research or development organizations, they back up heavily burdened government agencies set up to empower community-based organizations and improve performance of food value chains.

One of the key ingredients of a successful AIP is its investment in developing capacity. AIPs work beyond individual interests and examine the needs of an entire value chain in order to function more efficiently. Collaboration among various stakeholder groups is, therefore, critical for the development. Through the exposure, experimental setup and lessons learnt from the AIP, various stakeholders gain new perspectives, are able to change values and behavior patterns and redefine their roles within a food value chain.

In an AIP, the cogs (stakeholders) learn to work together and build a network using diverse individual functions by forming closer relationships and with positive feedback.

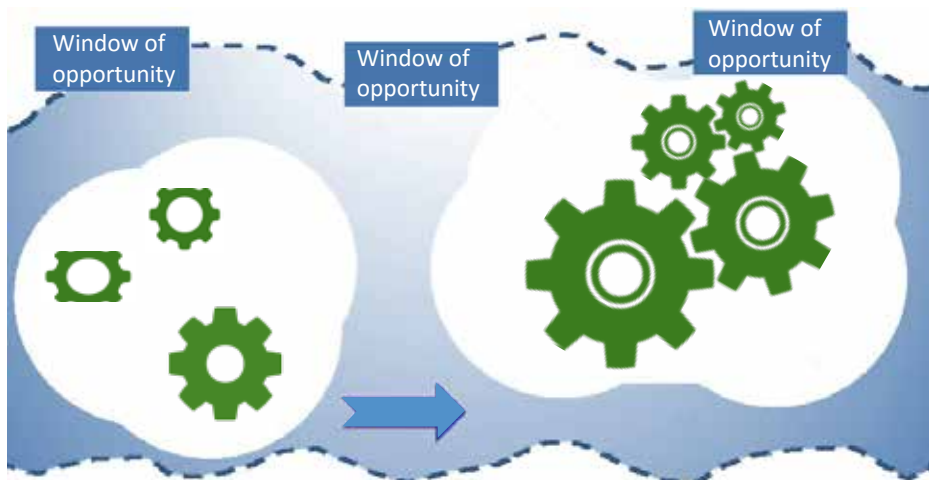


Figure 1. The structure and evolution of open AIPs, engaging food value chain participants in functional stakeholder networks, in a dynamic context.

Setting up the AIP in Marara District

1. Revitalizing the stakeholder network

Local experts with a good understanding of farming systems were consulted on the selection of stakeholders for the revitalization of the AIP. Smallholder farmers, being at the center of the AIP, were prepared to form strategic relations and links with key stakeholders: crop and livestock business people, input suppliers, transporters, buyers and processors.

2. Creating common understanding of AIP functions

At the MOREP II inception workshop participants came up with the most critical functions of the AIP:

- working as a whole towards a common goal
- soliciting support and linkages between on farm production and viable markets
- addressing stakeholders' diverse perspectives and needs
- maintaining momentum of motivation
- sharing information and experience
- coordinating activities between farmers and other stakeholders
- empowering farmers.

3. Identifying local development pathways

Farmers, together with other stakeholders, identified market-oriented goat production as the most significant pathway to food security and better livelihoods, due to a rising demand for livestock products. New investors have started sourcing quality meat from smallholder farmers, with a large number of informal traders competing to source goats for them.

However, the AIP identified four bottlenecks. It was therefore necessary that interventions be identified around these areas, with entry points simultaneously addressed:

- **Self-organization:** Lack of co-operation among farmers, within communities and the food value chain (resources, capabilities and trust are key factors which were often missing); weak relations between farmers and other stakeholders, lacking impetus to change current situation; farmers felt poorly informed by extension and support services, leading to low negotiation powers and exploitation by traders and other business people.
- **Functional markets:** Despite high demand for livestock, lack of access to basic market facilities, market price information and transparent operations hindered profitability. Emergency sales predominated market-oriented behavior, eroding farmers' income.

- **Technical know-how:** Low biomass for food and feed hindered farmers from increasing agricultural production and instead created trade-offs; farmers found it difficult to synchronize profitable agriculture with livestock demand for feed. Integrated crop-livestock production technologies remained underutilized.
- **Social security and inclusiveness:** Multiple risks, both biophysical (droughts, pests, diseases) and social (theft of livestock, conflicts), threatened farmers, with no effective mechanisms in place to overcome risks or protect farmers. These risks prevented farmers from building assets that would enable them to achieve security and sustainability to participate in markets.

4. Recognizing different resilience levels of farmers

Farming communities are diverse. E.g., in Marara District, resource constraints forced more vulnerable farmers to emergency responses, while those with larger herds, more land, higher labor productivity and more off-farm income, saw more benefits in agriculture and market improvement. The impact of drought and other shocks therefore varied greatly between farmers. Involving farmers with divergent resilience levels in the planning and management of AIP priorities, such as engaging in markets, was crucial.

The innovation process: Learning and self-organization

During stakeholder meetings, the AIP analyzed the multiple challenges and barriers in food value chains and looked at how opportunities could be seized using a range of interventions.

Farmers addressed some of the interventions among themselves, while for other issues, higher-level stakeholder engagement was required. The combination of approaches increased learning and interaction as well as enhanced innovation and self-organization within the food value chain. (Figure 2)

- **Win-win interventions** addressing the entry points, with short-term benefits, interdependent with the local development pathways
- **I-fund investments** (special funds defined by the IP to enable experimentation) underwrite some of the costs associated with the win-win interventions (too costly/risky for individuals)
- **Extra co-learning** to understand how positive feedback could be nurtured among stakeholders. Two critical areas were identified, technology uptake and market linkages. While farmers benefited from the social interactions, insights and lessons, the stakeholder network addressed underlying bottlenecks preventing market-oriented behaviors.

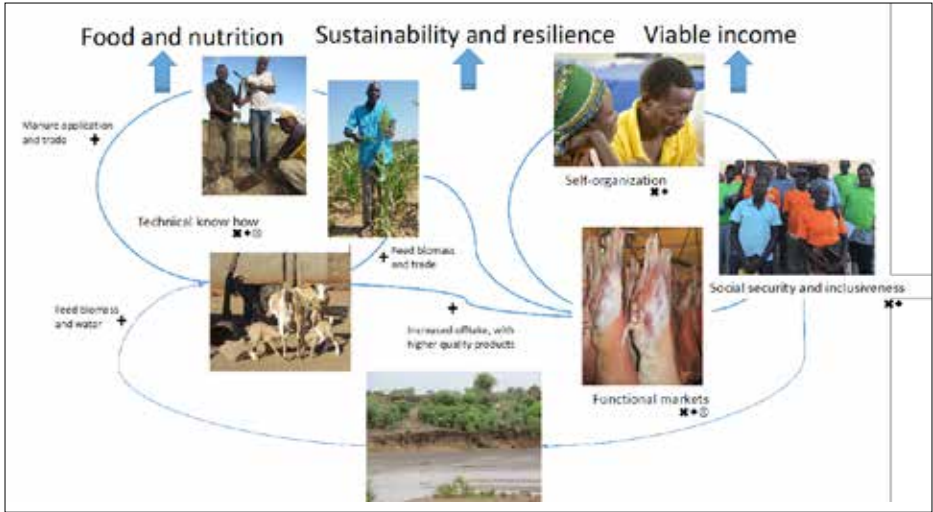


Figure 2. The AIP nurtures positive feedback in food value chains through win-wins (✕), I-fund investment (◆) and extra co-learning experiments (⊗).



(Above) Farmers, extension and researchers explore soils; (right) Farmer-buyer negotiations informed by flock dynamics.



Table 1. AIP-driven approaches and how they supported outcomes for enhancing market-oriented development in Marara District.

Self-organization among farmers	Functional goat markets	Agronomic technical knowhow	Social security and inclusiveness
Win-win interventions			
<p>Capacity building of AAPACHIMA farmers association including farmers of different resilience levels</p> <ul style="list-style-type: none"> • Effective coordination among farmers • Efficient collaboration with technical support services • Building strong social networks beyond communities <p>Empowering farmers through cell phones</p> <ul style="list-style-type: none"> • Timely information on prices/pests/diseases/emergencies • Links to larger social networks, in preparation of future large scale market initiatives 	<p>Exposure visits to abattoirs and meat processing plants for opening farmers eyes on product quality and destinations</p> <ul style="list-style-type: none"> • Dialog between farmers and large-scale buyers • Awareness of pricing mechanisms and infrastructure <p>Decentralized sales points for closer links between farmers and buyers, more efficient sales</p> <ul style="list-style-type: none"> • Private sector investment in quality product supply • Effective government support • Farmer empowerment through price-quality negotiations 	<p>On-farm demonstrations and technical training sessions</p> <ul style="list-style-type: none"> • Improved crop productivity • Increased biomass for livestock feed • Increased livestock productivity <p>Use of crop residue chopper and hay baler</p> <ul style="list-style-type: none"> • Improved availability of feeds with less labor • Improved coordination among communities through use of equipment 	<p>Farmer-government collaboration to curb livestock theft</p> <ul style="list-style-type: none"> • Safe environment for livestock sales • Incentives for investment in market-oriented sales of goats <p>Restocking and 'pass-on' approach, to include low-income farmers in goat business development</p> <ul style="list-style-type: none"> • Option for social protection programs supporting local development pathways

I-fund investment			
Provision of 6 cell-phones, one for each coordination farmer, with a contract for liability and training how to use the phones	Construction of three satellite sales points infrastructure	Provision for two crop residue choppers, one hay baler, and training for the same	Provision for five goats each to 12 farmers for restocking and pass-on
Extra learning experiments			
Farm health assessment		Flock dynamic simulations to improve goat market system	
Mentoring 15 farmers with experimental design for optimum farm health		Exploring goat flock dynamics and market flows, using simulation modeling	
<ul style="list-style-type: none"> • Participatory soil health training program for farmers, researchers and agricultural extension services • Soil analysis for soil type, quality, and management practices • Farm health conversion plans, goal setting and management improvement • Farmer self-evaluation in terms of changes in actions, knowledge, values and norms 		<ul style="list-style-type: none"> • Distribution of goat ownership, flock structure and sales pattern • Exploring willingness to invest in decentralized markets • Defining roles of farmers, technical support services, and private sector in decentralized goat markets 	

Impact on the stakeholder network

About 180 farmers, including Marara AIP participants, non-AIP participants and farmers in neighboring Changara District, were interviewed with respect to changes around the bottlenecks identified earlier (pg 6).

- **Self-organization.** AIP farmers, especially young farmers, acknowledged farmer relations through the AAPACHIMA association as critically important. The Marara AIP provided farmers with access to more diverse types of knowledge, and a better structure for coordination and self-organization.
- **Technical knowhow.** Due to strong relations between farmers and national researchers, AIP farmers differentiated more farm components, with more options for integration and synergies. Greater importance was attributed to structural elements and manure management for soil fertility to increase crop yields. At the same time more farmers used their crop residues for feed and grew fodder for their goats. They acknowledged the need for supplementary feeding and buck management in boosting reproduction.
- **Functional markets.** AIP farmers had a greater network supporting livestock marketing. They showed distinctly more and stronger relations with large buyers, compared to small traders, suggesting a professionalization of sales. They also observed positive development between large buyers and extension services. AIP farmers sold more livestock and generated more income from the sales. They related supplementary feeding and market-oriented timing of sales with meat quality, and hoped that this would be profitable to them, given the demand of quality meat.
- **Security and inclusiveness.** Awareness of economic losses due to unchecked livestock theft led to increased security in the region. AIP farmers perceived greater collaboration between provincial agriculture and local administration to control livestock theft. In Marara District women became more influential in decision making around goats (e.g. When to sell? How to use the income from goat sales?)



Farmer and government representatives illustrating their perception of change in the stakeholder network.

Conclusions and recommendations

Food value chain systems are complex and often driven by external threats rather than their strengths. Under high risk and unfavorable conditions, like in Marara District, market-oriented farming is critical to improve food security and to synchronize agricultural production with market demands. The experiences gained from this project illustrate that AIPs can facilitate changes along the entire food value chain, with entry points and interventions identified in support of self-defined goals.

- Rather than promoting technologies in silos, focus on networks and relations to stimulate positive systems dynamics. These dynamics encourage uptake within and beyond the network.
- Promote AIPs to create favorable starting conditions among stakeholders. Once they gain an understanding of market opportunities, changes in farming practices will take place.
- Ensure systems understanding and feedback through the AIP process, in order to identify disturbances that hinder stakeholders, both individually and collectively, from progress.
- Allow the AIP network to find innovative solutions beyond the scope of the individual stakeholder. Such solutions can change relations, create confidence and capacitate stakeholders in different ways.
- Interventions should be diverse and flexible, with cognizance that external influences can derail initial plans.
- Pay attention to forming relationships and making improvements visible to participants and decision makers at both the local and national level.
- Foster understanding and nurture relationships among stakeholders to back up the many technical solutions and their relevance, even if visible achievement requires a longer-term vision.

Statements on the social impact of the IP

Dr Filipe Vilela, Feed and Fodder Researcher, IIAM Angonia: *I see that farmers have gained a new philosophy; they are different now compared to before the project started. They know how to increase crop and livestock production, and they have started to implement their knowledge to supply to better markets. When farmers engage more regularly with large buyers they will understand even better how important it is to improve nutrition of their animals, along with the breed. Also, farmers with small flocks benefit as by selling together, they are in a better position to reduce costs for the buyer.*

Mr Carlos Njanje, farmer and president of the AAPACHIMA farmer association: *Before MOREP II, cultivating one ha of land was not enough to nourish our family. With MOREP II, we are able to produce more biomass on less land, to feed our families and produce higher quality feed for our animals. We will continue to improve the quality of produce sold to markets, be it livestock or vegetables.*

Dr Claudio Gule, Head of Tete Province veterinary services: *We observe a change in relationships between farmers and the rest of the value chain. Through the MOREP II project we held many meetings with large buyers like Mozagri and Canelfoods. That was unique! It transmitted a lot of knowledge right down to the base, to the farmers. Setting up infrastructure for decentralized selling points will provide an easy opportunity for farmers, buyers and technicians to interact, and provide more knowledge to farmers.*

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Front cover photo: *Sabine Homann-Kee Tui, ICRISAT*

Caption: *Farmers, extension, business people and researchers discuss priorities for future interventions, building on lessons from MOREP II.*

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