

Towards resilient and profitable farming systems in Central Mozambique using an open Innovation Platform approach

Sabine Homann-Kee Tui¹, Michael Hauser², Carlos Quembo³, Claudio Gule⁴, Fernando Assane⁴, Feliciano Mazuze⁵, Julio Rainde^{1,3}, Claudio Sixpence^{1,3}

Barriers for smallholder farmers

Farmers in Central Mozambique do not benefit adequately from growing markets for crops and livestock. Ecological, economic and social barriers are intertwined:

1. Absence of functional markets restricting farmers from investing in agriculture;
 2. Lack of incentives to improve agricultural practices resulting in unavailability of biomass limiting surplus;
 3. Lack of motivation to engage in social organization;
- As a consequence, farmers lose the ability to respond to market opportunities and to adapt to different forms of shocks that threaten their livelihoods.

Innovation platforms (IPs) help to address some of the barriers and underlying dynamics, but do not tackle the root causes impeding the transition from subsistence to sustainable, market-oriented farming.

In this study we develop a methodology for facilitating open IPs as niches for change in dryland ecosystems.

The intervention: Open IPs for change

While 'closed' IPs promote technologies with a limited number of actors and for a limited time frame (incremental change), 'open' IP's encourage an infinite number of actors to engage in the reconfiguration of entire social-ecological systems, value chains and context in which they operate (transformative change).

In a decentralised way, actors find solutions to technical, economic, social and environmental challenges. Open IPs foster learning, they encourage self-organized, vertical collaborations between actors at local and regional level. As such open IPs nurture, integrate and expand ongoing initiatives, rather than creating new structures.

The open IP approach used in this study has five supplementary thrusts (Figure 1).

1. Understanding farm types
2. Strengthening resilience as long term capacity to adapt
3. Developing Inclusive markets for short term benefits
4. Engaging multiple actors in learning based change
5. Scaling open IPs as drivers for change

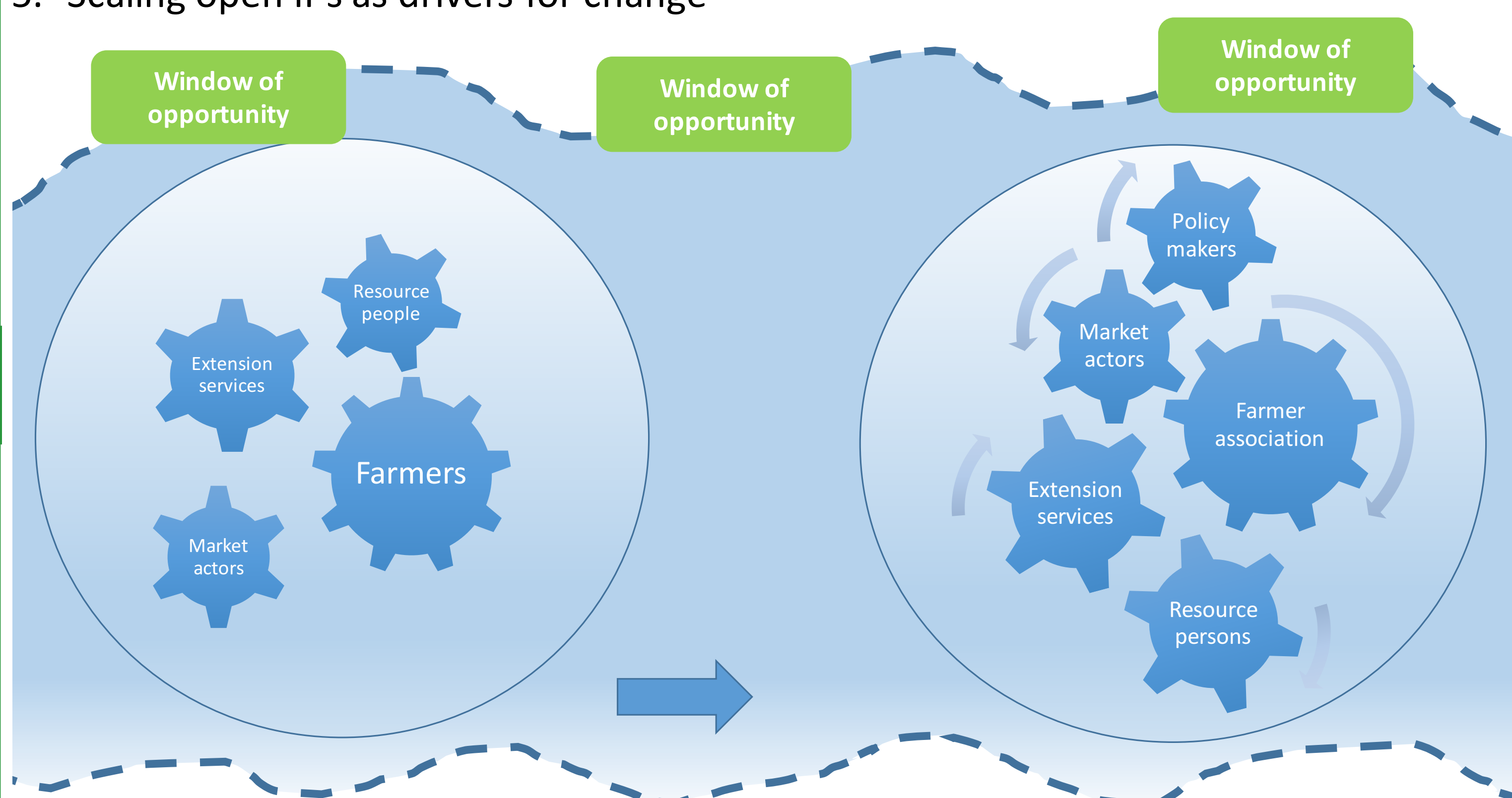
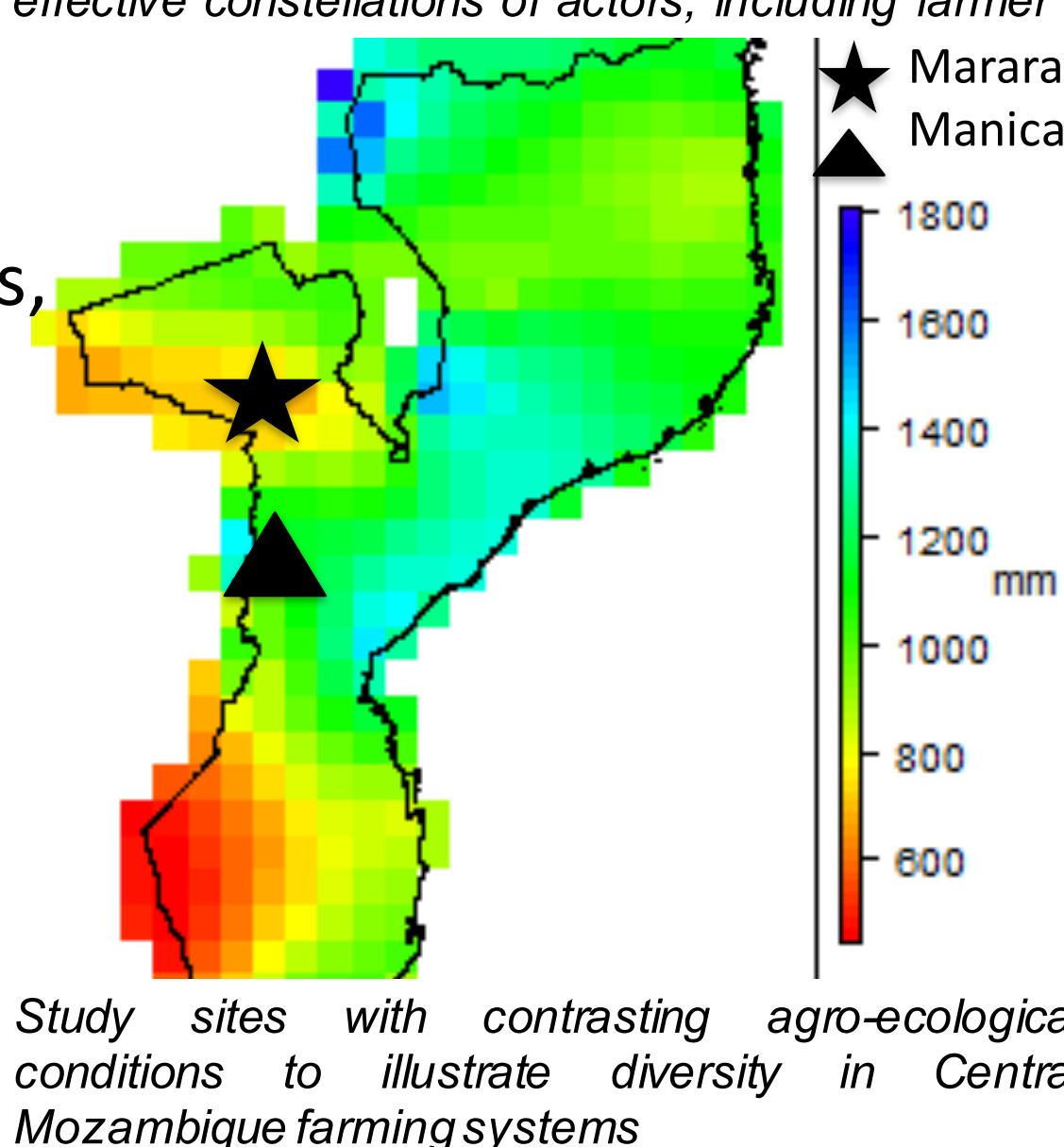


Figure 1. Research thrusts support IPs to emerge from loose networks towards more effective constellations of actors, including farmer associations, extension services, market actors, policy makers other resource persons.

We engaged multiple actors in reconfiguration of their socio-ecological systems, in two different environments, Marara and Manica Districts, where IPs provide space and momentum for breakthrough, multiple development outcomes:

- Semi-arid Marara, <650 mm rain per year, high potential to supply livestock to local and regional meat markets.
- Humid Manica, >1000 mm rain per year, good soils, high potential for crop production and marketing.



Study sites with contrasting agro-ecological conditions to illustrate diversity in Central Mozambique farming systems

Results

1. Short-term profits from improved marketing of goats and beans

IPs were tested in response to underdeveloped access to markets and market actors.

- In Marara the IP facilitates goat sales through local markets. Farmer associations now interact with large buyers on quality requirements and prices. Government and development organizations that invest in goat sales will directly contribute to welfare, food security and education in drylands.
- In Manica, farmers attracted new organizations to build storage facilities for common beans and started storing the grain collectively. Empowered in production and market processes, farmers now decide collectively on sales; some more than doubled their revenues within two years.



Farmers start selling more goats to buyers who demonstrate market requirements to them and ensure humane conditions during transport (2016).



Income from common bean sales used for infrastructure development at the farm (2015).

2. Biomass enhancing technologies, tailored to farm types

Supporting IPs one needs to discern farmers different capacity to participate in markets, reinvest in agriculture and reduce risk. At the study sites, we found three farm types:

- Female farmers struggle with market access because they have little natural, social and economic assets, and low negotiation power, limiting their re-investments.
- Young male farmers with off-farm income, who actively invest in biomass production and better market access, as they are building their families and farms.
- Elder male farmers with relatively large farm assets and established market relations, diversify and intensify biomass production and illustrates where the system can go.

3. Mechanism for strengthening longer-term resilience

IP's leaping transformation must cover issues beyond research to create conditions for engagement and uptake. The IPs built farmers capacity to represent their interests.

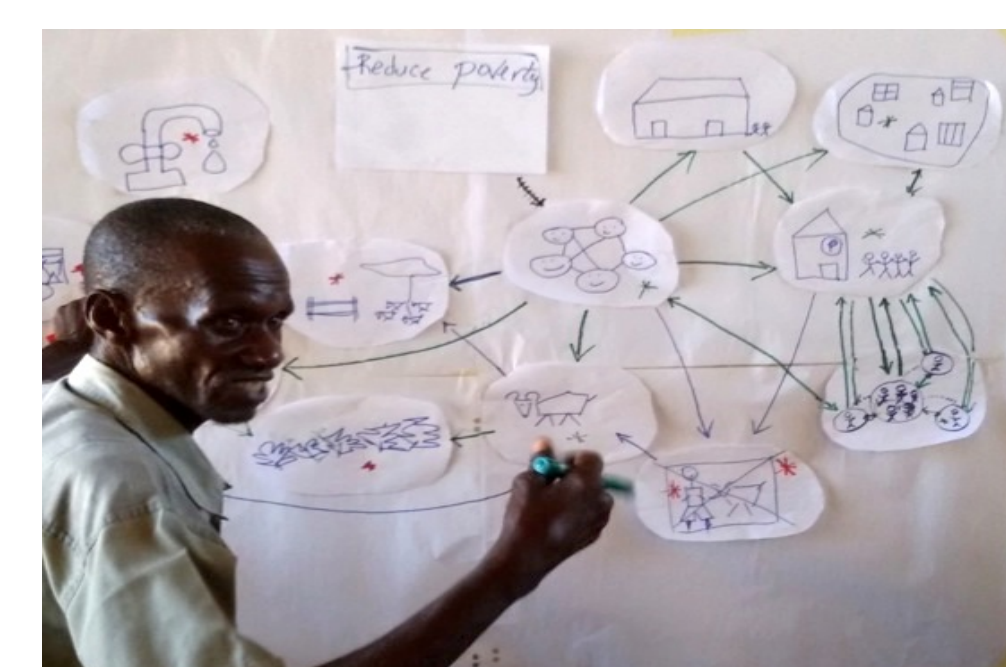
- In Marara, associations were created and land was legalized to provide farmers with land tenure security and collateral to apply for investments.
- In Manica, government officials supported farmers in their request for road infrastructure development, as necessary precondition for buyers to attend to the emerging markets.

4. Learning based value, beliefs and behavioral change

IPs encourage self-organisation. Exploring technical and market demonstrations, better informed, actors generated new linkages and forms of engagement.

5. Inclusive and effective drivers for rural change

IPs have the potential for nudging change beyond the IP. They built new networks, learning alliances and generated interest for and confidence in market-oriented farming in both districts.



Farmer synthesizing IP achievements, synergies and gaps for his peers in Marara (2015)

Lessons & conclusions

Vision: In open IPs, members unify under a common vision, create ownership and connectedness, which in turn helps matching technology requirements with market linkages and capacity development.

Boundaries: Open IPs support integration of actors at large scale and long term, matching interests, collaboration and knowledge sharing across traditional boundaries. Support services enhance farmers' capacity to participate in related processes.

Governance: Open IPs encourage people to find new ways to collaborate, build social structures, adapt rules and procedures to reach their full potential. They gain capacity as actors and as IP. Actors track their own progress. Presenting advances and challenges to policy makers and support organizations strengthens their ability to claim and negotiate.

Learning: Nurturing communication and information sharing, links to instructional and policy changes is required. Actors must change values, attitudes and self-perception. This is part of an ongoing learning process, building agency for actors themselves to influence the conditions for farming and for marketing their produce.