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Fostering Multi-Stakeholder Co-Learning for More Sustainable Resource Use and Improved Livelihoods in Mozambique

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Abstract

The Central Mozambican provinces are climatically quite diverse. While some provide farmers with favourable environments, others make agriculture a complicated and risky endeavour for the hard-working and persistent. In Marara district, in Tete province, the climate is semi-arid, around 600 mm of rain fall every year, but mostly in two months. In El Nino years, there is even less rain if any at all. The local smallholder farming systems are mostly rain-fed, and integrate crops and livestock. Dryland crops, goats, and cattle, are the systems' backbone. Information and inputs are hard to come by for farmers. Extension services are underequipped and cannot provide as much support as would be desirable.

In this challenging environment, our project seeks to understand how we can support a transition to more sustainable resource use and improved livelihoods for farmers. By using an open innovation platform approach, we aim at improving social and professional linkages between all actors: farmers, extension, private sector and government. Following a participatory identification of strengths, weaknesses, opportunities and threats, we provided technical trainings, encouraged experimentation and facilitated analysis. We want to build capacities and to foster co-learning of all actors. To stimulate self-organisation and to facilitate linkages with market actors and extension services, we included modern information and communication technology in the project set-up.

As farmers expressed a deep interest in soil, we developed a soil health training that was tailored to the specific context in Marara. We visited several members of the innovation platform in their fields and interviewed these farmers about challenges and mitigation strategies. We prepared information on soil processes, related it to current agricultural management practices in the area, and chose four fields to visit with participants during the training. We documented several stages of the training implementation using video equipment. The trainings ended with a feedback workshop. Here, we want to present experiences with this type of training and lessons learned, as well as set these in relation to feedback from screenings of our video in several different settings.

Keywords

Extension, film, innovation platform, participation, training, soil

Introduction

Central Mozambique: Tete province attracts much investment; it is home to the world's largest coal deposit, and to the country's only established marketplace for goat trading. From here, goats travel as far as 1.600 km to Maputo butcheries. But farmers struggle to profit adequately: markets are frequently dysfunctional; El Niño and climate change render rainfall in the semi-arid environment (see Figure 2) increasingly unreliable; information and inputs are scarce.

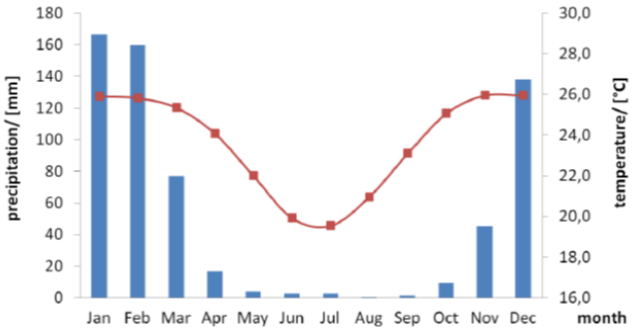

Figure 1. Climate data from Mozambique. Average precipitation in mm rain (blue bars) and mean temperatures in degrees Celsius (red boxes) per month. Based on data in (1) and (2). Caution is advised as meteorological data are often only available on large scales, i.e. province or even country data.

In this challenging environment, we sought to facilitate capacity building and self-organization, by strengthening relations between the actors of agricultural value chains, and to promote conversion to more sustainable use of natural resources.
An approach that has proven useful to strengthen relations between actors and to encourage co-learning is the Innovation Platform (IP) (3).

Methodology

We use an open IP approach to provide stakeholders with room for exchange, co-learning and co-development of sustainable, local solutions to local challenges. The study site, Marara district, is located in Central Mozambique, in Tete province. The villages in which the farmer members of the IP work and live are situated between 55 and 85 km from the provincial capital of Tete city. Sixty farmers of the AAPACHIMA association in Marara are part of the IP, as well as representatives from NGOs, government, extension services, the private sector and local and international researchers.

Farm Health

Among the IP activities, there was a subset we termed "Farm Health". At an initial workshop, farmers stratified into groups based on resource endowment, defined priorities for improving their farming system together with representatives of extension services, of government and researchers. Next, farmers were asked in interviews during individual farm visits to define their understanding of "farm health" and about their visions and goals, as well as steps towards achievement of those. Based on these analyses, activities were jointly designed (see Figure 2).

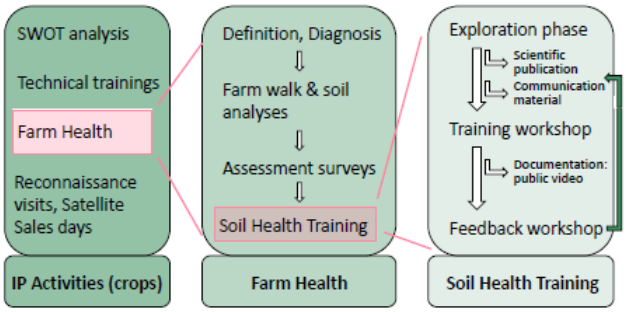

Figure 2. Outline of Farm Health Activities within the IP Activities.

Farm walks and soil analyses were undertaken. Technical trainings were set up together with local extension to provide knowledge about intercropping, seed multiplication, organic fertilization strategies, etc. Exploratory visits and meetings with the private sector served to procure information, but also to establish and/ or strengthen functional relationships between market actors. There were workshops for planning, monitoring and evaluation, and joint crop trials to encourage self-organization, experimentation and innovation. After a year and a half, we assessed activities and outcomes. Subsets of farmers from all three resource groups were interviewed for outcomes related to actions, knowledge, perspectives, beliefs, and values and norms.

Soil Health Training (SHT)

During the period of the farm health assessment, soil health, fertility and nutrient management crystallized as topics of utmost importance and interest to farmers. There-fore, a training on soil health and related processes was set-up for the final project phase. In a first step, nine farmers with different soil types and diverse biophysical backgrounds of fields were interviewed by the researcher team about their practices, challenges and mitigation strategies (see Figure 3A). Soil profiles were taken using an Auger and documented using photography; they served to derive soil types according to (4); soil samples were taken for later chemical analysis in the laboratory. Next, topics for the SHT were chosen in a way to facilitate joint learning about challenges specific to the local context and the relation to soil processes (see 3B). The final workshop was set-up for two consecutive days of SHT with a sequence of theory, practice in the field, and closure with discussion and debriefing the field (see 3C). The entire SHT was implemented twice with different participants from the farmers' association, extension services, government, NGOs and local research.

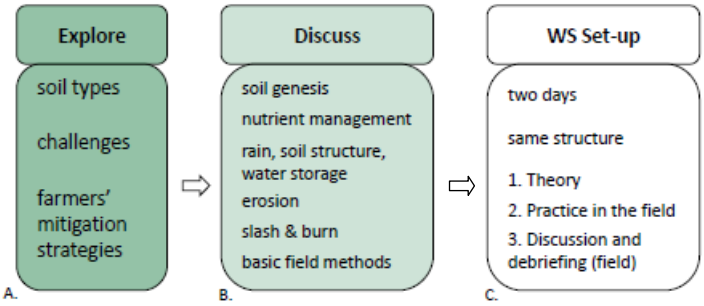

Figure 3. Development and Implementation of the SHT. A. Steps of the exploration phase. **B.** Overview of training topics. **C.** Outline of workshop (WS) set-up.

Screening of SHT Video and Collection of Feedback

All steps of the training were documented using Panasonic 4K video equipment. Scenes were cut at a later stage upon returning from the field. The final video on SHT was screened at the final project workshop in September 2018 in Tete, and presented at several scientific conferences, as well as to the funding agency of the research project. Feedback to the training approach was collected at two stages – during and right after SHT, as well as following film screening and discussion – both, in oral and written form, at different occasions. Whenever feedback was given orally, it was documented in written form with the shortest delay possible.

Results and Discussion

Farm Health Assessment

Farmers described a healthy farm above all giving high yields; healthy soil, high quality of produce and high crop diversity - an indicator for resilience - were other features (see Figure 4). When asked about IP-related changes, farmers mentioned changes in several areas, among them experimentation and innovation, nutrient management, knowledge sharing and networking, as well as investment. Taken together, we observed an appropriation of responsibility and increased confidence in designing measures to modify agricultural practices. In addition, the interactions

within the social network were favourable influenced by IP activities. A major factor, albeit an unspecific one, was surely the fact that IP activities enabled meeting the other farmers in more remote areas, which is an enormous challenge under regular circumstances where transportation is hardly available and ICTs are still not as established as in the Global North.

Figure 4. Feedback from Farm Health Assessment. A. Farmers' definition of a healthy farm. **B.** Areas in which farmers reported important changes through the implemented IP activities.

Soil Health Training – Feedback from IP Members

„My whole life, I have used fire to open up new fields, but it's crazy. And I could only use them for a couple of years, then I had to shift to new ones. Now that I know what happens in the soil, I would never do it again." (farmer)

„Don't worry, if I hadn't thought yesterday was useful, I wouldn't have returned today!" (farmer)

„This is how we should do it, just go out to the fields." (extension)

Reception of SHT Video – Feedback from Scientific & Transdisciplinary Community

A soil researcher from Oman already uses the video in his classes with under-graduates. An artist partnering with scientists to create public awareness of soils and related challenges promoted the video among her collaborators to share experiences and possibly spark ideas for new projects. A researcher involved in curriculum development at Maputo's University Eduardo Mondlane expressed his interest in setting up similar transdisciplinary training courses with his students.

Conclusions

We conclude based on the feedback from farmers and other IP members, that the farm health activities that were co-de-signed and implemented within this project are able to support co-learning. Based on the positive feedback to the SHT, we continue to advocate for more participatory approaches for training courses in development practice. The SHT video can be a useful tool to demonstrate an example of such a training approach.

Links

Link to the English video on the SHT: **https://youtu.be/QyTxiEY_VK4**
QR code: see left
Portuguese version will follow soon on the same YouTube channel!

References

(1) Instituto Nacional de Meterologia (undated) *Atlas de precipitação Moçambique*

(2) World Bank Climate Change Knowledge Portal (accessed online on 2018/07/04) http://sdwebx.worldbank.org/climateportal/index.cfm?page=country_historical_climate&ThisRegion=Africa&ThisCCode=MOZ

(3) Homann-Kee Tui S, Adekunle A, Lundy M, Tucker J, Birachi E, Schut M, Klerkx L, Ballantyne P, Duncan A, Cadilhon J, and Mundy P (2013) *What are innovation platforms?* Innovation Platforms Practice Brief no.1 International Livestock Research Institute (ILRI) Nairobi https://cgspace.cgiar.org/handle/10568/34157

(4) USS Working Group WRB (2015) *World Reference Base for Soil Resources 2014*, update 2015, International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rome

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