The limits and opportunities of the entrepreneurship injunction in collective irrigation: the case of horticultural value chain in Mozambique

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Introduction and justification

To face food security challenges and more inclusive development many African countries need to increase the productivity of small scale agriculture. Yet, many policies and research interventions to have failed to raise farm productivity and the despite massive resources invested, the impact and visible effects of technology-driven productivity interventions (green revolution, modernization) are negligible at the local level.

This has led to a review of agricultural policies and discourse focusing on the conversion of low productive peasants into small entrepreneurs fully integrated into dynamic value chains and market as a pathway for agricultural growth and poverty reduction. In parallel, in search for solution for complex real-world problem and the acknowledgement that the success of complex innovation is related the extension and solidity of the socio-technical network that supports it, new approaches for innovation using transdisciplinary approaches have been experimented. Such approach which aims to promote complex innovations that tackle in the same time the technological, social, organizational and economic dimensions of change relies on transdisciplinary approaches. Multi-stakeholder platforms help to facilitate the innovation process, exchange, learning and reflection between academia and people outside academia and to develop institutional arrangements that support vertical and horizontal coordination.

Irrigation which allows for mitigating climate variability is a key factor to increase productivity. But many small scale collective irrigation scheme have had limited success due to various issues such as inadequate return on investment, poor governance, poor maintenance and weak market integration. In recent years various projects have focused on increasing irrigation productivity by mobilizing new innovation approaches. This is the case of the ACIAR project "Increasing irrigation water productivity in Mozambique, Tanzania and Zimbabwe through on-farm monitoring, adaptive management and agricultural innovation platforms". The project encourages transdisciplinary interactions at plot level to increase on farm water management and established 'Innovation Platforms' comprising farmers, political representatives and players across the market value chain, to identify institutional and market constraints and to stimulate opportunities for change.

By combining the analysis of existing database and outcomes of participatory workshops in Mozambique, we argue that the coordination processes which are necessary for the good functioning of collective irrigation are particularly demanding in the most challenging situations. These coordination issues which suppose the development of specific capacities and capabilities are generally overlooked when focusing on the economic and technical aspects of irrigation.

Methodology

The methodology mobilized various tools: (1) analysis of the baseline surveys of irrigators in two pilot case study in the Maputo Province, Mozambique (Boane and Khanimambo scheme) characterized by differentiated market access. (2) An analysis of secondary data mainly a survey of 272 horticulture producers in the Boane and Moamba district conducted in 2014 as part of the trilateral partnership

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between Mozambique, Brazil, and the United States survey and price analysis of 8 crops in the Maputo and Boane market (3) a series of participatory activities to characterize crop choice, value chain functioning and strategies in the two schemes studied.

Results

There were clearly two different types of market situation: In the Boane district that bordered the metropolis of Maputo-Matola, 27 different horticultural crops mostly irrigated were grown and sold. Locally, the price of local traditional food and some horticulture crop is higher than in the capital revealing an existing local demand. There was no information on economic margin for these crops. The price of other horticultural crops was more volatile locally and in the capital market revealing a competition between schemes and/or importation from neighboring South Africa. In the Khanimambo case located 150 km from the capital, the market was very limited and strictly local.

Not surprisingly, small scale irrigated schemes gathers different types of farmers depending of the size of the irrigated plots, workforce availability, the education level and social connections. Farmers of the Boane scheme identified themselves more specifically in 4 types. In the area, a clear pattern of crop preferences by farmer type was identified depending of farmers 'objectives, workforce availability and access to funding. In the second case, the irrigation difficulties (flood risks, poor market access) have tended to discourage farmers and only a small number of farmers, principally women kept on cultivating with a food security objective.

In practice farmers in the Maputo surrounding identified three main marketing strategies and value chain functioning for horticulture crops depending of the importance of demand and the types of interactions with buyers. In Khanimambo, very restricted local market and distance from the main consumption area meant that a collective organization was necessary to make profit.

Collective action was limited in the Boane scheme as even irrigation was an individual activity. The dynamic market situation provided different market opportunities for the different types of farmers. Collective action focused on connecting the association with the external powerful actors as a way to increase association assets. This strategy was successful and limited the irrigation costs at farmers' level by providing periodic rehabilitation and alternative funds for the functioning of the association irrigation. The outcomes from the innovation platform fall within this model: it permitted a rehabilitation of the scheme and access to a new credit scheme but did not modify the coordination modalities between external actors and farmers. Thus the capacity of adaptation of the association mobilizes mostly political connections rather than internal capabilities. But the innovation process is leading to more cooperation at scheme level as the irrigation pattern needs to be reviewed due to the technological changes.

In Khanimambo, there was a stronger need for collective action both for the commercialization and maintenance of the scheme as technology and market did not permit the development of individual practices. Strengthening the capacity and capabilities for internal coordination is thus an absolute necessity for the sustainability of the scheme. Little attention have been given to this issue and the top-down assistance which tend to predominate might on the contrary jeopardize the limited collection action capacity by encouraging inequitable distribution of the benefits of the intervention to the better connected.

Discussion and conclusion

In irrigation, better integration in value chain has often been associated with practices to reduce the dependence of farmers to the collective aspects of irrigation, for example by developing small reservoir capacity at farm level. This is associated with the development of medium scale irrigators or emerging farmers often sustain irrigation or at least initial investment by off farm income. In parallel a stronger interest of political elites and funding agencies to support individual irrigation have emerged. But small scale farmers have often no choice but to depend in more collective irrigation practices which are far more demanding and difficult to handle than individual system.

Innovation platform are supposed to facilitate the development of new coordination arrangements between irrigators and actors of the value chain. Little attention has been given to the capacity of collection action of the association which is a crucial determinant of irrigation sustainability where the development of more individual irrigation is limited. However, in the Boane case study the unexpected consequences of a technological change are creating an opportunity to develop better internal coordination process around water management and thus internal adaptation capacity of the association. In the dynamic market context of Boane, improvement of profitability notably for the more vulnerable farmers may be more related to the improvement of on-farm practices (for example careful choice of crop association and rotation), to minimizing treatment and irrigation costs as well as cash management during a crop cycle than formalizing the relationship in the value chains.

In the less favorable context as the Khanimambo scheme a more detailed understanding of the economic profitability of the scheme is necessary including clear differentiation of production costs between the rainy and dry period. A stronger attention should be given to the development of capabilities and management capacity of the association itself in order to strengthen their ability to compensate for the limited opportunities provided by the socio-economic and natural environment. This could start by more closely associating the association in the rehabilitation of the scheme, keeping in mind that empowerment is a long term process.

The Mozambican new irrigation policy requires that maintenance of the scheme and long term management be undertaken by association. Sustainability is mainly understood in term of profitability of irrigation and capacity of farmers to pay for repairs. But the social and political dimensions of sustainable maintenance of irrigation scheme are generally overlooked in this model. There is notably a discrepancy between the association governance model which is perceived by farmers in Mozambique as an egalitarian scheme to facilitate access to external financial resources and the business orientation and sustainability injunction that will necessarily increase the socio-economic difference between farmers and the inequitable share of the irrigation expenses between farmers; Currently, the water fees which aims to cover maintenance cost are not related to plot size. With sustainability in mind, it might be necessary to encourage other form of cost sharing or even form of governance such as the traditional partnership. In this model, farmers having the capacity to find resources outside of irrigation are in charge of paying for repairs and to bring market opportunities to the other farmers; this is associated to clearly acknowledged differentiated endowment and irrigation rights between farmers

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