Short-term solutions to improve land productivity – An action-research experience in the village of Saméné (Ségou region), Mali

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Abstract: *Traditional top-down approaches to agricultural development projects have often failed to ensure application of innovation by farmers. Alternative approaches with deeper involvement of farmers are required, especially in areas showing social and environmental crises such as the West-African Sahel. In this context, an action-research experience was conducted with farmers of a village in central Mali in partnership with local and international research centres and development programmes. Some major constraints relative (i) to relationships between villagers and national authorities, (ii) to land tenure issues and (iii) to within-family relationships, that prevented farmers from improving productivity of their land have been identified. Negotiation among the involved stakeholders and collective reflection on technical aspects of agro-ecosystem management lead to the identification of short-term solutions to overcome these constraints.*

Keywords: *Action-research, West-African Sahel, Land degradation, Constraints, Social relationships.*

Traditional top-down knowledge application systems in agriculture are characterized by a three-step process: (i) knowledge production by researchers, (ii) knowledge diffusion by extension agents, (iii) knowledge adaptation/application by rural actors. Such systems have often proven inefficient to drive actual change, especially in the context of development policies in Sub-Saharan Africa. Lack of inclusion of farmers' knowledge, and overlook on local social relationships have proven to be the main causes of these failures (Deygout et al., 1998; Rocheleau, 1999; De Leener & Nanema, 2007).

A solution to overcome this stand-still could be a deeper integration between formal research and local know-how (Deygout et al., 1998), with the goal to improve endogenous knowledge rather than applying exogenous solutions. Alternative research approaches based on partnership and "horizontal participation" among concerned stakeholders and focused on local practices and innovations are therefore required (De Leener, 2004).

In this context, an MSc research stage was conducted from October to December 2007 in the village of Saméné, in the Ségou region (central Mali, West Africa), as part of the activities of an IFAD programme (Composante Interuniversitaire des projets IFAD/ICRAF/IPGRI) based on an action-research approach. In this paper we present the methodological guidelines and the preliminary results of research conducted in the village, with a particular focus on the impact on local society.

This research aimed to strengthen the potential of local innovation processes in improving the sustainability of local agro-ecosystems. In details, all the concerned stakeholders (i.e. farmers, research centres, IFAD development project) have been given the opportunity to establish effective collaboration by empowering farmers' role in research design, implementation and validation.

The methodology was based on an action-research approach already developed in the context of an IFAD program previously conducted in Niger (De Leener, 2004). The main guidelines were: (i) establishment of a partnership among all the involved stakeholders, (ii) employment of auto-diagnostics aimed to raise farmers' research demand, (iii) collaborative planning of research activities with farmers, (iv) research validation with all the stakeholders.

By discussing with farmers, a general research question was established: *"How can we counteract soil degradation dynamics in the short term"*? Autodiagnostics aimed to discover the causes of soil degradation occurring in the village land, and specifically to assess the constraints preventing farmers to improve their farming practices towards sustainability. The autodiagnostics consisted in direct and participatory observation of landscape (Dupriez & De Leener, 1993): "participatory walks" and focus groups in the fields of the five sectors of the village. Local practices were characterized with farmers by understanding their three dimensions: modality, opportunity and effectiveness (Deffontaines, 1988). Results of this survey were presented and discussed in a general assembly.

We discovered that three major constraints prevented farmers to improve land productivity and were leading to resource degradation:

Farmers cannot prune great shea trees (*Vitellaria paradoxa*) that are common in their fields because they fear to be fined by the national forestry service. Lack of pruning results in severe yeald losses to cereals due to tree overshadowing and in sub-optimum tree productivity.

Farmers cannot fallow their land because otherwise they lose use of their field, due to a local tenure rule established thirty years ago. Fallow abandonment is causing soil fertility loss as well as difficulties in livestock management (no place to keep them) and insufficient work capacity, due to the excess land surface to be cultivated yearly.

Many farmers work on highly fragmented land, due to the ongoing phenomenon of family separation, which results in insufficient work capacity and the consequent abandonment of productive fields.

The specific objectives of research were then to find short term solutions to overcome these constraints.

The problem of shea trees was solved by providing farmers the occasion to discuss it with the responsible of the national forestry service for their village, who explained that shea is a protected species and explained to farmers the formal procedure to obtain authorisation for pruning. Since then, farmers have started to submit their pruning applications.

The problem of fallow had to be addressed both from the technical and the political viewpoints. Group interviews were planned and carried out with a sample of families from each sector of the village. This inquiry aimed to collect qualitative and quantitative data about farming and cropping systems and farmers' viewpoint about fallow and other issues. The data collected will be used to assess the relative importance of each factor and build up a simple decision support system.

Since each family recognised the importance of fallow and the possibility to do it, a negotiation between farmers and the land owner (the village chief) was conducted. As a result, after thirty years fallow is now being reintroduced. A collective reflection on the technical solutions that could make fallow more efficient for soil fertility restoration and fodder production was deployed. The conclusion was that technical assistance by involved research centres is required for plantation of leguminous fodder trees such as *Acacia albida* (balanzan) in fallow fields.

The partnership-oriented process deployed to generate results can possibly have greater importance than results themselves, since it showed to have several implications in terms of empowerment of rural actors' capacities. Direct involvement in the research process allowed farmers to better frame it in their socio-political context and to enhance their ability to appraise and master the crucial technical and socio-political aspects of their agro-ecosystem management.

Social relationships in Saméné village seemed to be carachterised by authoritarian decisions and by lack of confrontation and discussion among stakeholders. This type of research, due to the occasions of collective discussion, reflection and problem solving provided, may help break that system and empower rural actors at different levels of social relationships (in our case: within each family, within the village and with the external stakeholders).

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