Tropentag 2016, Vienna, Austria
September 18-21, 2016

Conference on International Research on Food Security, Natural Resource Management and Rural Development
organised by the University of Natural Resources and Life Sciences (BOKU Vienna), Austria

Agroecology in the Context of Rural Development Interventions in Burkina Faso: A Smallholders' Livelihoods' Catalyst?

Diane Kapgen[a], Laurence Roudart[b]

a Université Libre de Bruxelles (ULB), Centre d'Études de la Coopération Internationale et du Développement (CECID), Brussels, Belgium. Email diane.kapgen@ulb.ac.be
b Université Libre de Bruxelles (ULB), Centre d'Études de la Coopération Internationale et du Développement (CECID), Brussels, Belgium. Email laurence.roudart@ulb.ac.be

Introduction

In today's era of the sustainability debate renaissance, agroecology has advanced to becoming an integral part of agricultural and rural development approaches. The *International assessment of agricultural knowledge, science and technology for development (IAASTD)* identified agroecology as a promising approach to "*resolve the interrelated global problems of hunger, rural poverty, and sustainable development*" (Méndez et al. 2016). These recent debates on the future of agriculture brought the agroecological concept to the political stage and increased its popularity among many different development cooperation actors, aiming to improve livelihoods of smallholder farmers in developing countries.

In remote rural areas of eastern Burkina Faso, the livelihoods of smallholder family farmers remain strongly dependent on subsistence agriculture. Their livelihoods are characterized by poor financial and physical assets, as well as difficult access to human and social capitals. These farm household situations are embedded in a context of degrading soil, loss of flora, and changing rainfall patterns, as well as very low non-farm income opportunities. In this setting, agroecology could provide a stable and continuous way of life for peasant households and communities: as a multi-principled concept (Méndez et al. 2016), it seems promising for building a strong and balanced nexus between livelihood assets and in consequence enhancing livelihoods integrally. By going beyond the ecological and agronomic objectives and by including socio-economic, methodological and political purposes, agroecology has the potential to act as transformative catalyst not only at the field and farm levels, but also for institutional and political structures at higher levels: village, region, nation and even world (González de Molina 2016). This latter aspect is crucial because smallholders' livelihoods are strongly shaped by transforming structures and processes and the overall vulnerability context (Scoones 2015).

However, in becoming a key element of rural and agricultural development projects, agroecology runs the risk of being twisted by implementation actors, leading to a unilateral focus on agricultural practices and conventional top-down extension (Hagberg 2001). This overall context frames our PhD research that seeks to shed light on the question whether agroecology turns into just another imposed technical package or if it sustainably improves smallholders' livelihoods.

Material and Methods

We debate the above-mentioned research topic through a case study of rural development programs implemented under the umbrella of agroecology by the Burkinabe NGO ARFA (*Association pour la Recherche et la Formation en Agro-écologie*). We conducted semi-structured interviews with 90 farmers and 18 key personalities during a thorough field research in 7 villages of the Bilanga

municipality in the Gnagna Province, East Region of Burkina Faso. The resulting interview transcripts and field reports are explored through qualitative content analysis. To gain genuine empirical insight, we analyse two interconnected sets of subquestions: (1) how is the concept of agroecology appropriated and diffused by ARFA, how and why are the project elements adopted or not by different smallholder farmers, and (2) what impacts are consequently generated on smallholders' livelihoods, and what differences arise between adopter farmers and non-adopter farmers, as well as between adopters themselves.

To investigate these questions, we needed a hybrid, dynamic and holistic framework. We designed a combined conceptual framework by integrating the Francophone "*Agriculture Comparée*" (Mazoyer and Roudart 2002) and the Development Anthropology based ECRIS[1] related concepts (Bierschenk and Olivier De Sardan 1997) into the Anglo-Saxon Sustainable Livelihoods Framework (SLF) (Scoones 2015).

The SLF assembles the main factors that affect people's livelihoods and the essential relationships between these. The building blocks of sustainable livelihoods are a range of livelihood assets, tangible or intangible, which people have access to and control over: natural, financial, physical, human and social capital. People combine these capitals for creating livelihood outcomes through pursuit of activities. This process is influenced by building and destroying effects of the vulnerability context (trends, shocks and seasonality), which people have limited or no control over on an individual or small group basis, and by overall transforming structures and processes (policies on different levels, institutions, organizations, legislation, local culture and power structures). Depending on the strength of their asset base, people, both on an individual or group basis, can influence structures and processes.

The concepts of the francophone *Agriculture Comparée* approach add an agronomic dimension to the SLF: at the field level, the concept of *système de culture* is used to identify the cultivated crops, their succession on the different plots, and the farming techniques used. At the farm level, the concept of *système de production* helps to understand in which way land, labor and capital are combined for vegetal and animal production and processing, and to characterize the differences between the existing farming systems in the study region.

The ECRIS related concepts allow for better assessing social and power structures, the internal structures and functioning of the farmer groups, the relations between group members, and the relations between group members and non-group members.

Results and Discussion

Appropriation of agroecology by ARFA and the farmers: innovative farming techniques

The analysis of the region's farming systems revealed a package of farming techniques introduced by ARFA. The most important and now widest-spread technique is an *improved version of stone bunds*. They avoid water runoff and topsoil erosion, and thus restore and improve soil fertility. Stone bunds can be classified as a traditional technique because they have been used in other regions of Burkina Faso since several generations. However, they were hardly known in the study region before their introduction by ARFA (and government extension agents to a lesser extent) 20 years ago. Unlike traditional stone bunds, which are mostly used for contouring single plots, ARFA promotes an improved version, characterized by measurements of height curves in the plots and the use of precise intervals and depths for digging in the stones. The bunds are then reinforced by planting herbaceous plants and shrubs alongside. The second most important technique is *compost production* by mixing animal excreta, vegetal residues and ashes in a concrete-lined pit. The compost shows efficiently for restoring soil fertility season after season. Further techniques that were not or hardly known by farmers in Bilanga before ARFA introduced them are planting pits

[1] Enquête Collective Rapide d'Identification des Conflits et des Groupes Stratégiques (*Rapid Collective Inquiry for the Identification of Conflicts and Strategic Groups*)

(*Zaï* in the local language); agroforestry on cultivated plots; improved early-maturing varieties; livestock housing; conservation tillage with zebu- or donkey-drawn ploughs; row seeding; biological control of plant pathogens and biological soil stimulation; crop rotation; intercropping. Permanent soil cover with crop residues is also favored by ARFA, however it is not new to most farmers. Paradoxically, the art of letting the soil covered during the entire off-season is vanishing because crop residues are needed as livestock fodder during the dry season. Here, one agroecology-based technique (livestock housing intensification for compost production) might lead to the eradication of another one (soil cover), which shows the importance of paying attention to dynamics between different components of the agroecosystem.
This notwithstanding, the adoption of the promoted techniques generally strengthens farmers' natural capital base at the field and farm level by enhancing resilience to changing rainfall patterns, and to degrading biodiversity and soil conditions. Farmers with a high adoption degree experience better yields, a result that is almost uniformly expressed by farmers. The prevailing perception of farmers is that agroecology constitutes a set of modern techniques, farm equipment, and (external) inputs, not used by their ancestors, and brought to them by ARFA. While farmers do not perceive agroecology in the sense of more sustainable agriculture, ARFA's actions reveal that the NGO interprets agroecology mainly as a compendium of farming techniques that are in accordance with the ecological principles of agroecology.

Community level intervention: irrigated vegetables and organic sesame

On a community level, ARFA supports irrigation schemes for vegetable cultivation for local markets, thus enhancing local production-consumption cycles. Vegetable cultivation remains strongly dependent on the access to water points and irrigable land plots but can create profitable off-season income and add nutritional value to a household's diet. More recently, ARFA has been pushing organic sesame production for international markets. While opening a new market opportunity, it contributed to farmers' dependency on unpredictable external buyer markets for this important income generating cash crop.

Diffusion through farmer groups and consequent unequal distribution of impacts

It is essential that for farmers, agroecology is equal to "*being provided with modern techniques*" and that these techniques require new knowledge. As Altieri and Toledo (2011) note, agroecology is "*highly knowledge-intensive*", and ARFA organizes village-based farmer groups and farmer-field-schools to transfer knowledge and skills necessary for implementing the agroecological techniques. As ARFA's interventions are all mediated through the farmer groups, membership also provides social organization and gives access to farming tools and inputs. In sum, the groups address some of the socio-economic principles of agroecology: the strengthening of social and knowledge networks and the socio-political empowerment of smallholders. But, looking closer, our data reveals that impacts are unequally distributed between group members. The nomination of initial key members (president, secretary and treasurer) was often strongly pushed by ARFA extension workers because of these farmers' literacy and social position in the village. Their nomination leads to social exclusion because less educated and networked farmers are very rarely able to be part of this inner circle of the group. Equipment grabbing by the groups' leaders adds a further dimension to this problem: the efficient implementation of agroecological techniques requires a stock of equipment, like carts for transporting stones, pickaxes for digging in encrusted soil or concrete for lining compost pits, just to name a few. While ARFA provides equipment through the farmer groups, each group is self-responsible for distributing it among its members. As the quantity provided by ARFA is far too small, group leaders in several villages kept the equipment for themselves. The poorest, often manually tilling farmers, who are already restricted by time and labour constraints for implementing the techniques efficiently, are then further handicapped by being refused access to equipment.

Differences in training quality constitutes another major discrimination factor between group members. The knowledge diffusion process is top-down oriented: most commonly, ARFA extension workers train one or two bureau members per group, which then transmit the acquired know-how to their group fellows in village assemblies or field schools. This is not a problem per se, but several farmers explained that their leaders imparted the new knowledge too theoretically, incompletely or carelessly, leading to consequent difficulties during practical implementation in their own fields. As farmer-to-farmer diffusion beyond the group remains low, differences in adoption efficiency are even more tangible between trained (group members) and untrained (non-group members).

Conclusions and Outlook

By wrapping up the findings on our different subquestions, we conclude that agroecology, even when mainly reduced to agroecological farming techniques, can contribute to strengthening smallholders' livelihoods at the farming system level. Nevertheless, broader livelihood empowerment is difficult to achieve because development projects are conflicted arenas where interests and visions of different actors mingle. Furthermore, the risk of enhancing existing disparities as well as creating new inequalities between farmers is high. There is also a legitimate question regarding the durability of a transition to agroecology if it is limited to the transfer of technical knowledge and equipment and doesn't include a larger perspective of agroecology. This paper can only sketch some major findings of our research. The comparison of ARFA's current practice with scientific literature on the multi-principled, multi-leveled concept of agroecology, and about the findings derived from development cooperation critics like the *Farmer First* argumentations (Chambers et al. 1989; Scoones and Thompson et al. 1994; Scoones and Thompson et al. 2009), suggests possible evolutions that could plausibly allow ARFA to trigger a transition to more integrally and equally enhanced livelihoods.

References

ALTIERI Miguel A. and TOLEDO Victor Manuel (2011): The agroecological revolution in Latin America: rescuing nature, ensuring food sovereignty and empowering peasants. *Journal of Peasant Studies* 38(3), p. 587-612

MÉNDEZ V. Ernesto et al. (2016): *Agroecology as a Transdisciplinary, Participatory and Action-Oriented Approach*. In: MÉNDENZ V. Ernesto et al. (eds.) (2016) Agroecology. A Transdisciplinary, Participatory and Action-Oriented Approach. CRC Press, Taylor & Francis Group, p. 1-21

GONZÁLEZ DE MOLINA Manuel (2016): *Political Agroecology. An Essential Tool to Promote Agrarian Sustainability*. In: MÉNDENZ V. Ernesto et al. (eds.) (2016), p. 55-71

SCOONES Ian (2015) Sustainable Livelihoods and Rural Development. Practical Action Publishing, Warwickshire, pp. 149

HAGBERG Sten (2001) *Poverty in Burkina Faso. Representations and Realities*. Uppsala-Leuven Research in Cultural Anthropology, Uppsala University, p. 6

MAZOYER Marcel and ROUDART Laurence (2002) *Histoire des agricultures du monde. Du néolithique à la crise contemporaine.* Éditions du seuil, p. 64-72

BIERSCHENK Thomas and OLIVIER DE SARDAN Jean-Pierre (1997) ECRIS: Rapid Collective Inquiry for the Identification of Conflicts and Strategic Groups. In: *Human Organizations* 56(2), p. 238-244

CHAMBERS Robert et al. (eds.) (1989): *Farmer First*. Intermediate Technology Publications, London, pp. 219

SCOONES Ian and THOMPSON John (eds.) (1994): *Beyond Farmer First*. Practical Action Publishing, Warwickshire, pp. 301

SCOONES Ian and THOMPSON John (eds.) (2009): *Farmer First Revisited*. Practical Action Publishing, Warwickshire, pp. 357