

Assessing the impacts of a transition to agroecology-based agricultural systems on smallholder farmers' livelihoods in Burkina Faso: The contribution of a methodological framework combining the Anglo-Saxon Sustainable Livelihoods and the francophone "Agriculture Comparée" approaches

(Contribution for theme 8: *Courant de recherche sur la recherche transdisciplinaire*)

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1. Introduction

During recent years, more and more studies have emphasized the importance of a transition to alternative agricultural systems through "*an agroecological development paradigm based on the revitalization of small farms which emphasizes diversity, synergy, recycling and integration, and social processes that value community participation and empowerment*".ⁱ While this debate is embedded in a context of global food systems,ⁱⁱ it is especially important in regard of the situation of African smallholders where "*sustainable agriculture offers new opportunities, by emphasising the productive values of natural, social and human capital, all assets that Africa either has in abundance or that can be regenerated at low financial cost.*"ⁱⁱⁱ According to the mentioned studies, agroecology and its field applied practices have the potential to meet the double challenge of high productivity and high sustainability and thus to improve livelihoods of smallholder farmers in developing countries.^{iv}

But regarding the durability and feasibility of a transition to agroecologically-based agricultural systems, other questions arise. Is it ethically just to promote agroecology (and consequently "withhold" the industrial way of farming) in the context of poor smallholder farmers in developing countries? How do more local production-consumption cycles make sense in West African rural areas where local cycles are the norm, not the exception and where government policies tend to promote a more industrial agriculture? Is it possible for smallholder farmers to "move up the social ladder" without becoming a "big farmer" and how can the agroecological pathway empower smallholders and give a perspective to young rural people?

The essential question in the light of analyzing the impacts of a transition in the portrayed context is of methodological nature. Which concepts can provide a holistic, hybrid, transdisciplinary and dynamic methodological framework that goes beyond the agronomic viewpoint and embraces the different dimensions of the rather woolly sustainability term with more depth and precision? The following contribution tries to answer this question by presenting a conceptual framework elaborated for our PhD study on the impact of agroecologically-based agricultural systems on smallholder farmers' livelihoods in Eastern Burkina Faso. The framework combines the Anglo-Saxon Sustainable Livelihoods Framework (SLF) and the francophone "*agriculture comparée*" related concepts.

2. Diagnosis

In today's era of the sustainability paradigm, agroecology has become subject of the debate on rural development approaches and the "agroecological transition" has been taken up by development agencies. In Burkina Faso like in other developing countries, many rural and agricultural development projects remain grounded in the definitions and categories of outside development technicians^v and hence it becomes imperative to avoid the decay of agroecology into "just another top-down technical package". Even in the domain of sustainable agriculture, examples of externally developed practices are common, like efforts in conservation agriculture in Eastern Burkina Faso, which have been poorly adopted by farmers; local non-specificity and ignorance of the role of social capital (and to some extent financial and human capital) being key reasons.^{vi}

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Conceptualised as a practice but also a movement and a science^{vii}, agroecology has been established as a discipline since the 1980s following Miguel ALTIERI's flagship publication "*Agroecology, the scientific basis of alternative agriculture*". According to MÉNDEZ, agroecology as a science can be divided into two main perspectives. The first and predominant perspective^{viii} is grounded in the natural sciences, concentrating research on ecological and agronomic processes, as well as biophysical and environmental aspects of agricultural production.^{ix} In the context of developing countries, these studies reveal increases in crop yield, soil recovery, biodiversity and resilience of production systems in the context of extreme weather events. They demonstrate that a wide range of agroecological practices has huge potential for further production increase while boosting soil fertility and other positive externalities.

But while certainly being a crucial dimension, yield increase does not automatically result in more sustainable livelihoods for smallholders: framing social, human, natural, financial and physical aspects, as well as locally varying vulnerability conditions on different levels contribute equally to smallholder farmers' life conditions and thus to a sustainable transition to agroecology. Up to now, few studies analyse the impact of a transition to agroecologically-based agricultural systems on smallholder farmers' livelihoods by adopting a large perspective of agroecology. Despite the claim for interdisciplinary research, many studies on the transition to agroecology in developing countries are framed by a focus on ecological and agronomic aspects^x and don't bridge "*the conventional chasm between ecological research and social realities in agroecology-based development.*"^{xi} The large perspective aims at the participatory development of agroecology-based agricultural systems. Agroecological farming practices on a field-, farm- or village level are then part of a broader transition to changing social, economic and political conditions (for example farmer field schools, local production-consumption cycles, farmer networks, market access, influencing political leaders).

AMEKAWA has recently criticized the absence of studies providing a holistic impact evaluation of agroecological transitions in developing countries and provided new insight on agroecology's strong conceptual links to sustainable livelihood approaches and sustainable agriculture. A basic principle of sustainable agricultural systems is that they accumulate stocks of the livelihood assets (natural, social, financial, human and physical) and increase the asset base over time. Unsustainable systems deplete or run down assets, decreasing it and liquidating the asset base over time.

From the beginning of the PhD research project, a major difficulty was the lack of studies that use the Sustainable Livelihood Framework as a conceptual framework for impact assessment or evaluating a change in livelihoods more generally. While there are some interesting reflections on the use of the framework in scientific research^{xii}, the SLF is commonly used as a planning tool for development projects and less for impact evaluation. Also, impact assessment studies often focus on one capital only and few try to integrate all five capitals equally. In order to develop the dimensions and indicators of our methodological framework, we therefore also relied on studies about sustainability impact assessment and converted the three pillars (ecological, social and economic) of the sustainability concept into specific dimensions of livelihood assets.

3. Theoretical concepts

In our study, we used the Sustainable Livelihoods Framework (SLF) as a basis for an enlarged operational framework. Rather than adopting the SLF lock, stock and barrel, we developed a novel framework by incorporating the concepts of the francophone "*agriculture comparée*"^{xiii}.

Based on the definition of livelihoods the SLF demonstrates the main factors that affect people's livelihoods and the essential relationships between these.^{xiv} The building blocks of sustainable livelihoods are a range of livelihood assets which people have access to and control over. They can be split in five so-called "capitals": natural, financial, physical, human and social capital. People combine these capitals in order to create livelihood outcomes through activities pursuit. The stronger the capital base, the more sustainable the livelihood. The weaker the capital base, the more vulnerable the livelihood. The five-capital building base is the focus point of our study's impact assessment (see section 4.).

The different capitals are 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 and small group basis. Trends can be of economic, natural, political and social nature. Shocks are majorly economic and natural, but can also consist of local conflict sources. Seasonality is characterised by specific local conditions (see section 4.).

Overall transforming structures and processes (policies on different levels, institutions, organizations, legislation, local culture, economic trends etc.) also have an influence on the access to assets. Vice versa, people, both on an individual and group basis, can have profound influence on structures and processes. In general, the stronger their asset base, the more influence people are able to exert. In theory, the strengthened livelihood base acquired through the transition to an agroecological system should thus enable peasants to change the overall transforming structures and processes on the longer term. Transforming structures and processes are the framing elements of our study, the context in which the determined impact on the different capitals has to be interpreted. In this overall context, people are generating livelihood outcomes (see section 4).

The SLF is combined with the *Agriculture Comparée* approach in order to create a novel operational framework. By adding an agronomic dimension, the transdisciplinarity of the original SLF is further enhanced and a purely social sciences view on the topic is avoided. Three main concepts of the *Agriculture Comparée* approach are integrated into our framework.

On the field level, the concept of *système de culture* is used to identify the cultivated crops and their succession on the different plots, as well as the crop management techniques used. It is important to not only rigorously identify the individual operations on the plots, but to also understand the reasons why specific techniques are employed or some varieties are favoured etc.^{xv} On the farm level, the concept of *système de production* is used to understand in which way land, labour and capital are combined for vegetal and animal production^{xvi}, and to characterise the differences between the existing systems in the study region. The concept of *système agraire* is used to understand what types of agriculture, each composed of a characteristic cultivated ecosystem and a defined social productive system, have succeeded historically in the study region^{xvii}.

4. Data, indicators, experience from the field (preliminary results)

Our research project tries to answer the following main research questions: “*Does the transition to agroecologically-based agricultural systems sustainably improve livelihoods of smallholder farmers in eastern Burkina Faso? How are agroecology-based livelihood outcomes generated? Are improvements restricted to ecological benefits and yield increases or are all the capitals of the livelihood base enhanced?*”

Concerning livelihood outcomes, we hypothesise that agroecology-based agricultural systems entail more farm income (*revenu agricole*), “empowerment” of peasants, a more sustainable use of the natural resource base, reduced vulnerability, and increased well-being.

The field research takes place in Gourma province (Eastern Burkina Faso). Several projects led by the local NGO ARFA (*Association de Recherche et de Formation Agro-écologique*) in Gourma since 1995 resulted in the adoption of agroecologically-based agricultural systems by smallholder farmers. We conduct semi-structured interviews with smallholder farmers and with their family members using open interview guides. These are based on dimensions and indicators derived from the five livelihood capitals and livelihood outcomes, as well as the concepts of *système de culture*, *système de production* and *système agraire*. The nature of this data is presented in the results at the end of this section. Moreover, in accordance with our conceptual framework, the following “framing” or interpretative context data are being collected on the field:

Data on trends: (a) economic: real prices of agricultural commodities at the different scales; (b) natural: soil degradation, climate change, biodiversity loss; (c) political: support for agroecology by local and national political authorities; (d) social: status of farmer according to adopted production system

Data on shocks: weather hazards, household tragedies, conflicts between farmers and between farmers and pastoralists

Data on seasonality: agricultural commodity prices, agricultural production flux, food availability

Data on transforming structures and processes: agricultural and land policies in Burkina Faso and on a decentralized level, place of agroecology at the different decision-making scales, NGO intervention at the local scale, markets at different scales, power relations at the local levels, traditional rules and societal norms at the local levels

After a discussion on the operational framework, we will present some preliminary results of our field research.

Result 1: Identification of the production systems (*systèmes de production*) in the study region, including *systèmes de culture* with ^{xviii}management techniques, estimations of yields and farm income; comparison of agroecology-based systems and other systems

Result 2: Impact of agroecological transition on social capital (empowerment, political and social representation and participation, information access, institutional support) and, vice versa, role of social capital for engaging in the transition

Result 3: Impact of agroecological transition on human capital (education, formation, as well as household health situation) and, vice versa, role of human capital for engaging in the transition
It should be noted that the presented results are preliminary.

5. Literature

ⁱ ALTIERI, Miguel A. et al. (2011): "Agroecologically efficient agricultural systems for smallholder farmers: contributions to food security". *Agronomy For Sustainable Development* 32:1-13

ⁱⁱ e.g. studies from Miguel ALTIERI, Jules PRETTY, Stephan GLIESSMAN, Michel GRIFFON, Pierre M. STASSART, Jan Douwe VAN DER PLOEG, Philip MCMICHAEL, Peter M. ROSSET

ⁱⁱⁱ PRETTY, Jules et al. (2011): "Sustainable Intensification in African Agriculture." *International Journal of Agricultural Sustainability* 9(1):5-24

^{iv} DE SCHUTTER, Oliver (2011): "Agroecology and the Right to Food", Report presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49], 8 March 2011

^v e.g. HAGBERG, Sten (2008): *Poverty in Burkina Faso. Representations and Realities*. Uppsala-Leuven Research in Cultural Anthropology (ULRiCA)

^{vi} MAZZUCATO Valentina and NIEMEIJER David (2000): "The Cultural Economy of Soil and Water Conservation: Market Principles and Social Networks in Eastern Burkina Faso". *Development and Change* Vol.31:831-855

^{vii} WEZEL, Alexander et al. (2009): Agroecology as a science, a movement and a practice. A review". *Agronomy for Sustainable Development*, INRA, EDP Sciences

^{viii} DALGAARD, T., HUTCHINGS, N.J., PORTER, J.R. (2003): "Agroecology, Scaling-up and Interdisciplinarity". *Agriculture, Ecosystems and Environment* 100(1):39-51

^{ix} MÉNDEZ, Ernesto V. et al. (2013): "Agroecology as a Transdisciplinary, Participatory and Action-Oriented Approach". *Agroecology and Sustainable Food Systems* 37(1):3-18

^x VAN DAM D., STREITH M., NIZET J., STASSART P.M. (2012): *Agroécologie. Entre pratiques et sciences sociales*. Educagri éditions, Dijon, France

^{xi} AMEKAWA, Yuichiro (2010): "Delineating the Multifunctional Role of Agroecological Practices: Toward Sustainable Livelihoods for Smallholder Farmers in Developing Countries". *Journal of Sustainable Agriculture*, 34:202-228

^{xii} e.g. DE HAAN (2006), DE HAAN and ZOOMERS (2005), SCOONES (2009), VAN DIJK (2011), ADATO and MEINZEN-DICK (2002), BOND and MUKHERJEE (2002), JAGGER et al. (2012)

^{xiii} e.g. studies from Marcel MAZOYER and Laurence ROUDART, Hubert COCHET

^{xiv} e.g. SCOONES Ian (1998), ELLIS Frank (2000), and work from Robert CHAMBERS

^{xv} SÉBILLOTTE Michel (1976): Jachère, système de culture, système de production : méthodologie d'étude. *Actes des Journées d'études Agronomie-Sciences Humaines*

^{xvi} REBOUL Claude (1976) : Mode de production et système de culture et d'élevage. *Économie Rurale* 112 :55-65

^{xvii} MAZOYER and ROUDART (2002): *Histoire des Agricultures du Monde. Du néolithique à la crise contemporaine*. Éditions du Seuil, Paris