

## Farmer-Researcher Networks in West African Organic Value Chains. Economic and Sociological Challenges

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Key words: innovation, farmer-researcher networks, social systems, communication, organic cotton, sustainable rural development, national society, Africa.

### Author's Background

Gian L. Nicolay carries out his work on food and agriculture systems and sustainable rural development over the last 25 years from an action-research perspective. Nicolay is a trained agronomist and sociologist. Since 2009 he works as a scientist and development project manager for the Research Institute of Organic Agriculture (FiBL)

### Summary

*Farming in tropical Africa is getting more and more complex. Land shortages often lead to soil fertility decline, as the usual fallow can't be practiced anymore. Organic farmers have to compete additionally with subsidized synthetic fertilizer programs, cost-rising GMO competition and policy preferences for conventional and non-organic practices. The EuropeAid funded Syprobio project in West Africa (Mali, Burkina Faso and Benin) involves organic farmers, researchers and technicians from farm organizations organized in networks to develop innovative technologies to improve competitiveness of organic value chains as well to enhance food security for the producers. The main challenges of both economic and sociological issues are described and recommendations made. The role of information technology is presented and first research results are discussed on the use of video for farmer-to-farmer extension. Socio-economic preconditions are proposed in order to institutionalize these new communication tools and to further strengthen farmer-researcher networks as key components for sustainable development.*

### Background

Farming in tropical Africa is not anymore easy business. In the past, particularly in pre-colonial times, sufficient land availability for rural households, robust patterns of practice ruled by tradition, self-sufficiency with small degrees of exchange to feed the few non-producing households and urban and power-holding sectors, as well as relatively stable family and community relations assured that innovation was rather the exception than the rule. Today the situation has completely changed. Land has become a scarce resource, so that long fallow periods of 10 years and more are hardly possible anymore. Urbanization has left behind an impoverished class of peasants. Soil fertility decline has become the norm rather than the exception. Stable rules based in tradition have been replaced by fast changing patterns, impacting rural life and agriculture. Social dynamics and economic development, particularly globalization with neo-liberal politics over the last 30 years, has made self-sufficiency a redundant practice. Changing climate patterns leading in most cases to increased evapotranspiration and reduced or irregular rains (sometimes even more flooding) reduce the potentials for good yields and increase the risks for the producers. The above described patterns provide the context of the EuropeAid funded project Syprobio, which is running in Mali, Burkina Faso and Benin since 2011, involving farmers, researchers and extension staff within the cotton belt (Nicolay G., 2013). Higher livelihood complexity and the need for continuous innovation are resulting in order to keep acceptable living conditions for the rural people and to assure ecologically balanced systems. As a main consequence for agricultural research, which in the past could just focus on increasing productivity and yields, particularly for the relevant cash crops, business is different. Instead of getting the required additional support by the state, budgets are still low and recognition of researchers for achievements poor. The social gap between research and extension/advisory and small-scale farmer communities renders informal communication and societal contacts between these stakeholder groups difficult. Organic farming is often seen as a no-future issue supported by ideologically-driven NGOs from the North. Subsidy programs for mineral fertilizer may discourage organic farmers as well and GMO presence are increasing the costs for the organic production. Science itself is in crises, as it cannot describe and explain processes and structures of food and agriculture systems, particularly in the context of globalization and climate change. The new complexity needs, so our belief, new models, theories, research methods and money for public research. This research is needed in order to plan investments with long-term impacts and make them economic. Furthermore, societies have to cope with declining natural (biodiversity, water, soil), human and societal (family farms, rural communities, local culture) resources and increasing societal and environmental conflicts.

### Main chapter

#### Construction of farmer-researcher networks and emerging socio-economic challenges

##### *Experiences with farmer-researcher networks in organic value chains*

The topic of this presentation is on new farmer-researcher relations and their communication, as they were constructed within the context of a project in promoting innovations leading to more food security and more adaptation to climate change. Considering the above described dilemma, we are testing since 2011 a new model of innovation development with the following principles and assumptions: (1) Only the joint knowledge and experience of farmers and scientists can grasp the relevant and contextual realities and transform the problems into solutions; (2) Only ecological principled-farming has a chance to cope with a natural environment under stress (soil, water, biodiversity, toxicity, climate change); (3) Peasant-farmers have always found answers to systemic change (both bio-physical and societal); (4) If supported by trained scientists, farmer-driven innovations have the best chances to succeed in providing sustainable solutions.

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“Communication” has become the buzz-word in the project core team, composed out of the 100 research-farmers, about each 30 extensionists and researchers. The need for better communication is based on the making of a new social system (Luhmann, 1995). Already conceptualized as an actor network (Latour, 2005), each local group of farmers, extensionists and researchers, organized in the concerted actor circle (or in French: Centre d'Acteur Concerté; CAC), together with the innovation to be tested for its potential, is a societal cell or system looking for an optimized language and communication. Each system has a clear boundary and auto-regulated rules of operation. This communication pattern needs now a closer look under specific economic considerations.

The Syprobio project is handling 27 innovations at the time over 2 years at least. If we deduct the costs incurred by project management, than we still have net costs of around 8'100 USD per innovation (see Tab.1). Out of them, about 50% goes for transport, including per diem payments requested by the employees of research and extension organizations. That means that for each innovation to be checked and improved by scientific support, 8'100 \$ have to be budgeted. For a set of 27 ongoing innovation-testing, facilitated by researchers and running over a period of 2 years, 108'000 USD are needed for transport costs alone. If we assume that the investment of 8'100\$ per innovation testing bears a potential yearly benefit of 2\$ \* 10'000 adopters or 20'000 \$ (excluding the non-monetized benefits like farmer empowerment, social capital etc.), than the testing is profitable for society under the condition that only minor investments and running costs are needed for spreading the innovations to adopters

**Tab. 1: Costs for running scientific-controlled farmer innovations over two years (in USD)**

cost item	overall costs	% travel cost	travel costs	travel costs for 27 innovations
national research service	2600	90	2300	62100
farmer organization/extension	2000	30	600	16200
reserach facilitation	3500	30	1100	29700
total	8100		4000	108000

***The potential role of information technology and the economics of farmer-researcher communication***

Information technology in the form of mobile phones can play an important role during the testing of an innovation, its rolling-out and ongoing development and consolidation. These technological options have emerged only recently, but have not found yet a systematic use within public research and extension in SSA. In 2013, we started a research on “*Technology use as a tool for agricultural extension and farmer-to-farmer exchange, in the framework of the Syprobio program in West Africa*”. Here we test the feasibility to use videos through mobile phones for extension and farmer-to-farmer promotion of promising technologies and innovations. The reason for this applied research was the high transport costs bringing the researchers to the farmer fields (see Tab.1). Our assumption was that many transports- in average we have distances of 200 km- could be replaced by phone calls and ideally transmissions of pictures (f.ex insects or diseases to be identified). This part is essential to reduce the costs for innovation development. For the next step-scaling up and rolling out- we will have similar questions: how can this process be done in a more economical way than with classical means of extension, in order to reach more farmers with less costs. Some Syprobio technologies were recorded on video and tested in Burkina Faso and Mali. We have good reasons to assume that video has a bright future for extension and advice. Technology will progress and the costs will continue to fall (soft- and hardware). As the main content topics are dynamic systems, the combination of visual and audio elements and the illustrative character of videos allow advantages over static and uni-dimensional media and extension packages. If known or reliable extensionists and peer farmers appear on the video, the level of trust will be high enough to adopt or at least test innovations. The use of this information technology has however to be designed as a social system which fits into the concrete national society and food and agriculture sector requirement.

***Societal preconditions for viable agricultural systems based on family farming***

No single project can assure sustainable technological, economic and societal change and improve food security. A project has however the potential to open options and inform operations and programs within social systems, like farmer communities, organizations, value chain set-ups or larger societal groups, policy making and of course the scientific community. In this way, a project can act as a catalyst within the “substrate” of the given and selected society. Unfortunately, most people think in the narrow conception of projects as isolated events and do not provide the means to connect it with society in order to put it into the “real life” context. The reason may be that social realities are not well understood in their modern forms and the influence of globalization. Additionally, social realities are mixed with human realities in such a way that the functions of social systems are not captured appropriately or even ignored as drivers of development. If we take economy: This variable is often seen as fully independent from society and its actors like investors, managers, farmers or consumers are not reflected in being embedded in a complex net of institutions shaping their decisions and behavior. Hence, erroneous assumptions are made on the functioning of economy. Institutions are ignored as being relevant and the role of individuals is overestimated. The very influential financial partners active in developing countries bear here responsibility and they should encourage activities and processes leading to better connect or couple projects to society, including politics and economy. A project should be assessed on how it will impact society, people and the natural environment. For that to happen, society and people at least should be understood in a transparent and realistic way. Indicators for independence and sustainability would be the embedded procedures within the core or function systems of the national society: politics, economy, law, science, culture and civil society. These core systems, together with organizations – the State, private organizations, NGO etc, and networks, build and structure world

society including the national societies. The outcome indicators of projects should be addressing the needs of a functioning food and agriculture system based on family farms and providing the required services for society, people and its natural environment. These processes do not have to be limited to markets and be fully delegated to the private for-profit sector. Many crucial processes within sustainable agriculture and food systems are outside the economy and the market logic. We think here at the above discussed farmer-researcher networks, in creations of farmer-owned knowledge sharing options, in trust building, society compatible communication and ecosystem services, just to mention some. The conceptual barriers of agricultural cadres concerning organic, ecological or sustainable farming have to be reduced as well, as they bloc behavioral change at village level and increase development costs for needed sectorial transformations. This will reduce extra-costs in innovation research and extension and advice, as key topics to be developed are generic for all farming types, like soil fertility management, participatory research and extension, post-harvest management and marketing. We have good reasons to belief that organic farming has better chances to evolve under the conditions of embedded project conceptions and systemic understandings of society and economy.

### **Core messages and conclusions**

We conclude that innovative farmer-researcher networks have good prospects to succeed, if the key stakeholders within the national agriculture and rural development systems work hand in hand and invest in trust building, dialogue and a spirit of fairness and social justice, in order to make best use of available technologies for production and communication. This investment has its financial price. It is not free from economic costs. But the financial aspects of innovations leading to sustainable agriculture and more stable social systems adapted to the requirements of modern times should not be seen as costs but rather as investment into a safer future.

### **References**

- Latour, B., 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. OUP Oxford. Luhmann, N., 1995. *Social systems*. Stanford University Press.
- Nicolay G., D.R., Fliessbach A., Glin L., Sissoko F. , 2013. SYPROBIO: Driving farmer-led innovation platforms to address food security, poverty alleviation and resilience to climate change in West African cotton communities. In: Triomphe B, W.-B.A., Klerkx L, Schut M, Cullen B, Kamau G & Le Borgne E (Ed.), *Proceedings of the International Workshop on Agricultural Innovation Systems in Africa (AISA)*. CIRAD, Nairobi, pp. 156-161.