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Achieving Social and Economic Development in Africa through Ecological and Organic Agricultural Alternatives

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Preface

This publication, *Achieving Social and Economic Development in Africa through Ecological and Organic Agricultural Alternatives*, is a follow up to FAO's 2013 publication *Organic Agriculture: African Experiences in Resilience and Sustainability*. It follows firstly, because it reports on the progress made since the Lusaka Conference in 2012, but secondly, because it pushes forward our understanding of how ecological and organic agriculture contribute not only to agricultural and ecosystem development, but also to social and economic developments. In Lagos, we learned that Ecological and Organic Agriculture (EOA) "has a significant role to play in addressing the pressing problems of poverty, food insecurity, land degradation, market access, food safety and climate change in Africa. Ecological organic farming systems increase yields, are resilient to climate change effects and are cost-effective. Further, EOA is climate smart, preserves biodiversity, provides ecosystem services, and produces lower carbon emissions." Both of these lessons remain pertinent to our ability to meet the new Sustainable Development Goals to eliminate global hunger and malnutrition.

This publication gathers together in one volume the plenary papers presented during the Third African Organic Conference that took place in Lagos, Nigeria from 5-9 October, 2015. The different chapters document the institutional support that is developing across Africa to ensure that research, markets, and policies can contribute to the positive developmental impact of ecological and organic agriculture. Together, they provide information about the status of ongoing initiatives to develop continent wide policy supports, national approaches and local innovations. A core theme of the event was the value of organic trade globally and the particular importance of focusing attention towards deepening access to national, regional and global markets for ecological and organic products.

The topics addressed in this volume reiterate the contribution of farmers, consumers, researchers, educators, public officials, civil servants, policy-makers, entrepreneurs, financiers and other promoters of ecological and organic agriculture to reducing food insecurity and rural poverty, by making agriculture, forestry and fisheries more sustainable and productive, enabling the creation of sustainable food systems and increasing the overall resilience of farmers' livelihoods. Thus, FAO remains committed to promoting this type of work, and is in the process of placing ecological and organic agriculture on the global agenda for agricultural development and policy through its series of International and Regional Symposia on Agroecology for Food Security and Nutrition in 2014-2015.

In partnership with the main organizers of the conference [Association of Organic Agriculture Practitioners of Nigeria (NOAN), Federal Ministry of Agriculture and Rural Development, Nigeria, African Organic Network (AfrONet), African Union Commission and IFOAM Organics International] the FAO is pleased to keep the dialogue open on the importance of ecologic and organic agriculture in Africa and encourages all partners to continue to work towards our collective goals of social and economic development in Africa.

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Ecological Organic Agriculture Knowledge, Information and Experiences: Going from Organic 1.0 towards Organic 3.0

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Abstract

Organic farming is considered and proved as sustainable, productive and profitable food and farming systems in a low-external-input / medium-output approach. Therefore: Organic is a success story. Nevertheless, from a global perspective, certified Organic is still a niche. But, more than 50% of the farms on the earth – mainly small scaled with low input / low output level – are managed with the measures and strategies of Organic farming, just without certification. This is the chance that Organic farming becomes a reputed and scaled-up solution to defeat the future global challenges in food and farming. Organic can help to prevent hunger, reduce farm land degradation and losses in biodiversity, mitigate climate change, income and jobs, and supply healthy and enough food with a low-external-input / medium output farming strategy. The Organic 3.0 approach is the basis for this contribution.

Introduction

Organic farming is considered and proofed as sustainable, productive and profitable food and farming system in a low-external-input / medium-output approach of the farmers' own concept (Figure 1). The globally harmonised principles of Organic farming – Health, Fairness, Care, Ecology and Quality –are targets and mission for millions of organic farmers all over the world (IFOAM 2005). In 2013, more than 45 million hectare in about 170 countries are managed under the standards of Organic farming and the global organic market has reached a value of 80 billion US-Dollar (Willer & Lernoud, 2015). Beyond agricultural practices and their technical and economic bases, organic farming was and is a life model and thus includes important aspects for social reform. Therefore: Organic is a success story (Paulsen et al. 2009, Rahmann 2010, Rahmann 2011, Zalecka 2014; Figure 2) because:

- Low/un-polluted products
- Environmentally sound
- Improving soil fertility
- High premium price – high farm income
- Organic is climate smart agriculture and multifunctional
- Suitable for low-external-input / medium-output production
- Export chances for development

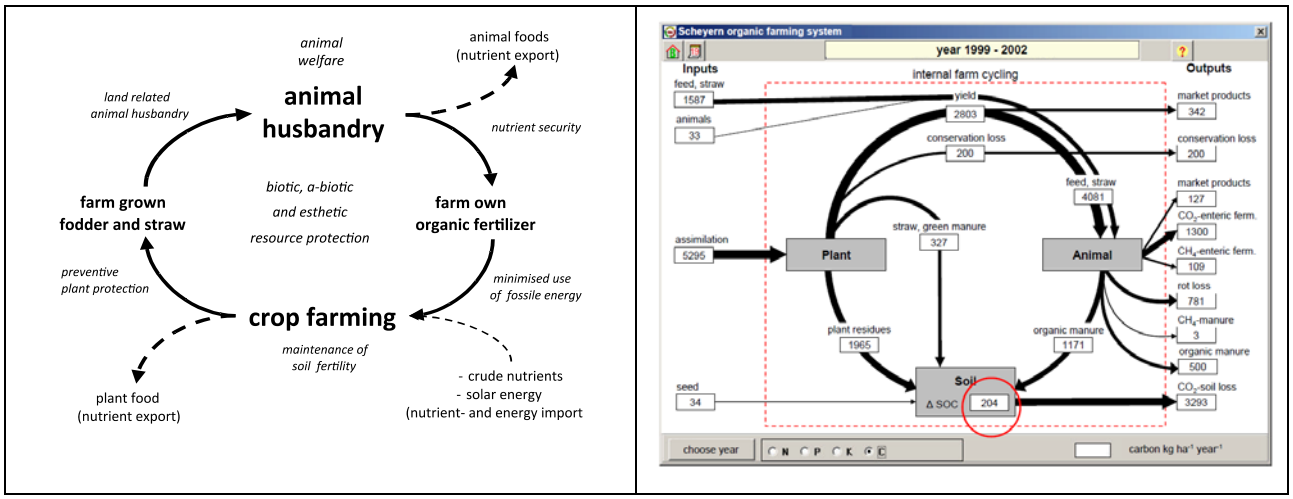
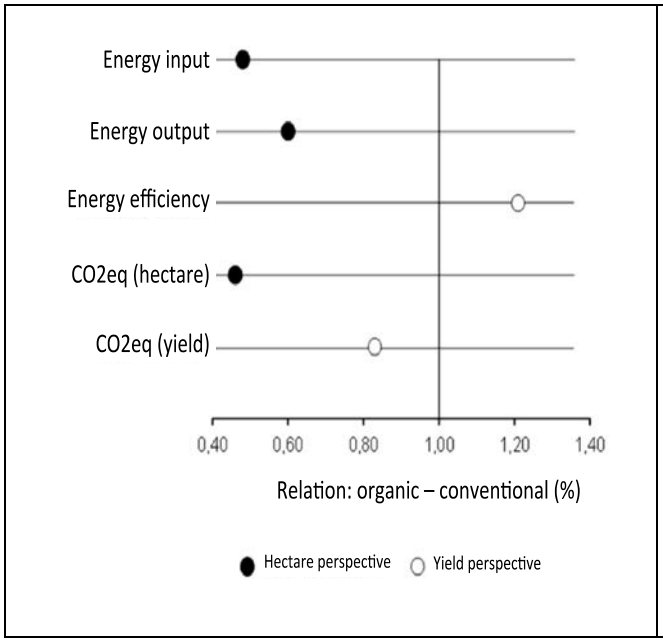


Figure 1. The cycle of Organic farming as model and in the Software REPRO (Hülsbergen & Rahmann 2013)



Subject	More biodiversity	Unclear, indifferent	Less biodiversity
Landscape	28	5	0
Flora on arable land	61	3	0
Flora on grass land	20	5	0
Flora perennial land use[3]	12	1	2
Invertebrates	77	12	7
Vertebrates	26	5	0
Bacteria, yeast, pests	6	2	1
Soil biota	38	15	0
Agro-biodiversity	28	2	0
Biodiversity in general	31	6	3
Total	327	56	13

[1] This includes organic farming, wild plant collection, traditional farming under organic standards (without certification).
[2] Multiple citations of 343 used papers are possible due to different conclusions for different species.
[3] Perennial land use: vineyards, orchards, special biotopes are for example: orchards, hedges, ponds, farm buildings, paths, fences, forests or stone heaps, special buildings, plantation or facilities for nature (e. g., herb loops). They are assessed in the context of adjacent farming systems.

Figure 2. Organic versus Conventional: Organic is climate smart agriculture (Hülsbergen & Rahmann, 2013) and better for biodiversity (Rahmann 2011)

Nevertheless, from a global perspective, certified Organic farming is still a niche. Less than 1 % of global farm land is managed organically and only a litte share of the global population is consuming organic qualities in a significant amount (Rahmann et al. 2009). But, more than half

of the world farming systems are managed with the measures and strategies of organic farming, but mainly in low-input / low-output systems (Rahmann & Aksoy 2014).

Africa lacks behind other continents in taking the chance of going Organic. There are slightly more than 1.2 million hectares of certified organic agricultural land in Africa, which constitutes about three percent of the world's organic agricultural land and only 0.1% of Africa´s farm land (FAOSTAT 2016). With about 574'000 producers and an average farm size of 2 hectare, Organic farming in Africa it mainly done on small scale farms. The majority of certified organic produce in Africa is destined for export markets (Willer & Lernoud, 2015). Key crops are coffee, olives, nuts, cocoa, oilseeds, and cotton. There is a growing recognition among policy makers that organic agriculture has a significant role to play in addressing food insecurity, land degradation, poverty, and climate change in Africa (see www.eoa-africa.org).

The future challenges of food and farming are severe:

- Feed 9 to 11 billion people in the next 30 to 80 years with enough, affordable and healthy food.
- Protect environment like soils, water, air, biodiversity and landscapes in increasing intensification strategies.
- Mitigate greenhouse gas emissions and adapt on climate change in all farming systems and value chains.
- Incorporate novel ethics, food habits, demographic and lifestyles in the food chains.
- Produce food on limited farm land and fossil (non-renewable) resources efficient and profitable.

These challenges must be addressed by all farming systems concepts on local, regional, national and global level. Organic can help to prevent hunger, reduce farm land degradation and losses in biodiversity, mitigate climate change, create income and jobs, and supply healthy and enough food with a low-external-input / medium output farming strategy. After decades of farmers driven development of resilient organic farming systems, the role of science becomes more important (Niggli et al. 2014).

The future challenges must be addressed by all farming systems concepts on local, regional, national and global level. Organic methodologies and tricks can play an important role as leading sustainable food system to alleviate small holder farmers from low-external-input / low-output towards sustainable low-external-input / medium-output farming systems. That will help to make sustainable, resilient and profitable food production. The "Organic 3.0" approach is the basis for this contribution (Braun et al. 2010, Strotdrees et al. 2011, Arbenz et al. 2015, DAFA 2015; Figure 3).

What has to be done that Organic is fit to contribute to tackle the future challenges?

There are two time dimensions: the next 35 years till 2050 and the time from 2050 up to 2100. In 2050 we will have approximately 9 billion people and 1 ha agricultural farm land per capita. In 2100 we will have 11 billion people and only 0.7 ha per capita. This discussion and challenge is the same like for conventional agriculture: limited resources needs to intensify (factor-factor

relation) and be more productive (output-factor relation) and be more efficient (factor-output relation).

Figure 3. Organic 3.0 – What is that?

My five visions about the need of Organic farming development till 2050:

Conventional can learn from Organic: The production must be more and more sustainable. That means: ecological sound, high ethical standards (e.g., animal welfare, fair trade), profitable and social acceptable. There is a need to change the industrial production strain of conventional and be back to local acceptable farming systems, where farmers can have a good income and the price is affortable for everyone. The external costs of production needs to be included into the price of products.

Organic can learn from Conventional: Efficiency and productivity with limited resources, e.g., agricultural land. Organic needs to be more productive to be accepted in societies with limited land and food quantities. Not all farm inputs are bad. Clear criteria are needed to incorporate good conventional strategies into Organic: e.g., synthetic amino acid if all feeds are produced on

the farm. Mineral fertilizers, if produced with renewable energy and in a quantity, which does not pollute the environment and products (Figure 4).

Scale-up Good Organic Farming Practice: Good Farming Practice is necessary to fulfil the consumer and public demands as well as be more efficient with limited resources. Both, organic and conventional have to train and trigger their farming systems on the track of better practice. In future we cannot effort spoiling and inefficient farming practices. Capacity building and training needs to the support of research, mainly via socio-economics: How can we transfer Good Organic Farming Practice to all farms as a permanent process (Figure 5)?

The food production needs more close links to the consumer: Consumer must accept, that in the coming future not everything will be always and everywhere for a cheap price available. It will be not possible and producable in the coming future that everyone on the earth will consume like the western world today. We need to avoid wasted food, reduce livestock and utilize novel food sources. Additionally, the consumers need to bring back valuable nutrients back to farming: clean and efficient.

Farming has to change from "commodity related" towards "needs related" production: Ecological Food First means also that non-food production is second and needs alternative - not farm related - production bases. Community Supported Agriculture needs to be improved and scaled-up.

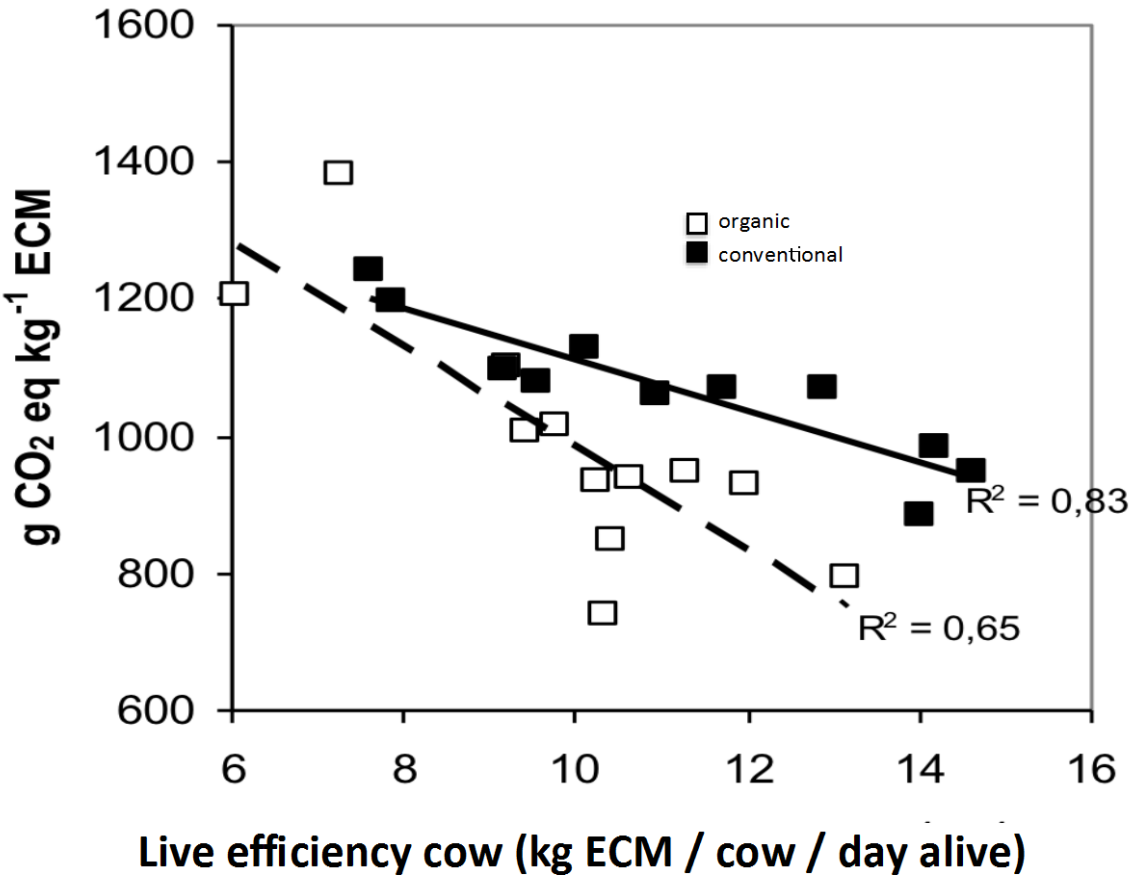


Figure 4. Organic versus conventional dairy farming: Greenhouse Gas emissions per kg of milk: more milk is less GHG with advantage Organic dairy (Hülsbergen & Rahmann 2013)

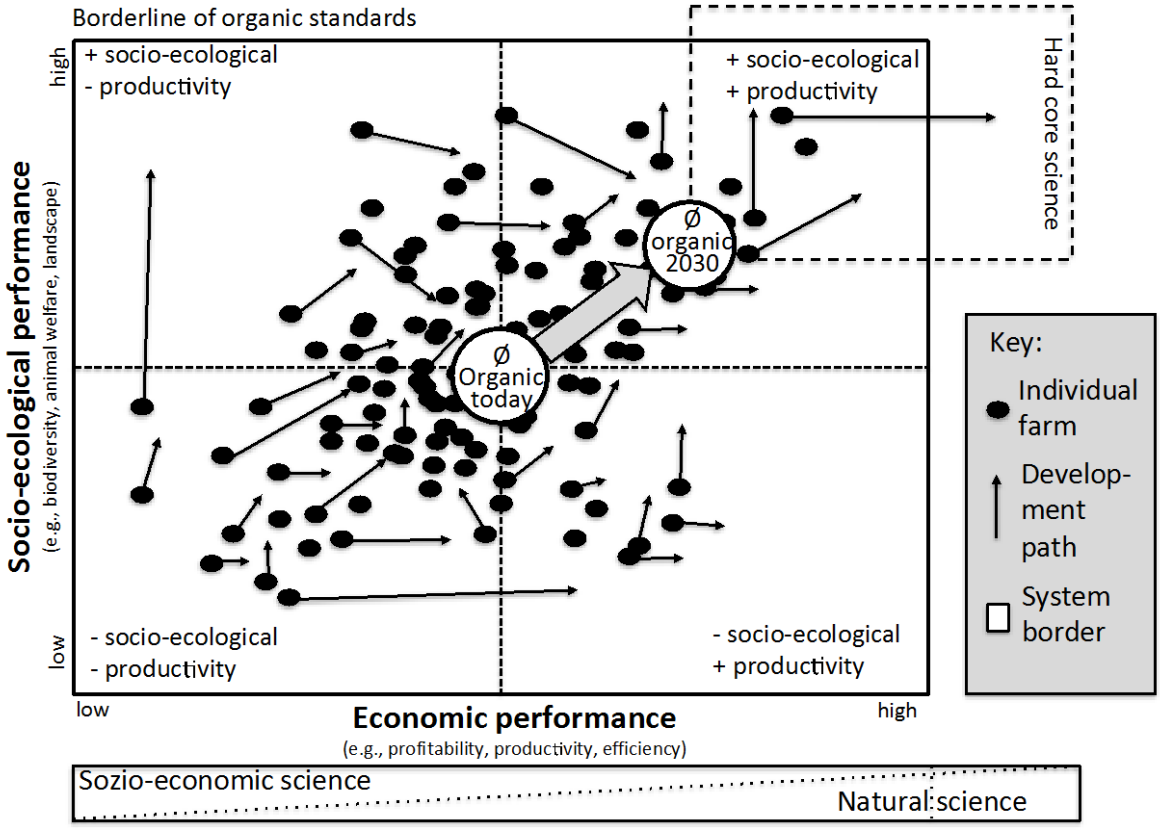


Figure 5. Scale-up „*Good Organic Farming Practice*“ to all farmers

What needs to be initiated today to tackle with the challenges after 2050?

There is no real discussion about food security and safety after 2050 and up to 2100. All the five vision from above will not be able to fulfil the demand of 11 billion people. As an organic farmer and scientists I must state that I am skeptical that we can improve „*Good Organic Farming Practice*“ to a level that the IFOAM principles are fulfilled (care, health, ecology, fair; plus quality). If we just continue with intensification and encroachment of farmland we cannot feed 11 billion people and preserve biodiversity, keep water clean and make good food available and affordable for everyone. I see following options, where the innovations (socially and technologically) have to be invented in the coming decades:

Less livestock and changed animal husbandry systems: Numbers of livestock needs to be reduced by a significant number, from ethical point of view probably even towards zero (in specific cultures and regions). That needs improved food consumption skills (e.g., avoiding malnutrion with vegan diets). Invention of novel protein food resources based on insects and sea food are necessary.

Local versus global food chains: The transport of food from one place to another place on the earth will be not as easy as today. Fossil energy and probably limited space will need new farming and food distribution systems. Probably people have to go to food areas and not food to people areas as today. Migration and better distribution of humans and food have to be initiated.

Land-less food production: Organic farming likes soil and prohibits soil-less food production. But: soil is scarce, probably degraded, polluted or sealed and therefore not avail for healthy food production. Food can be produced on sealed surface (urban agriculture, in-door/household, on roofs etc.). Aquaponics is a chance to link water and land related food production. Last but not least inventions should be done to substitute some food ingredients from agriculture towards reactor production. It can be thought about sugar or other carbohydrates produced by bacteria in large scale reactors in highly polluted and populated areas (e.g., in Asia). Human feces can be a resource to feed the bacteria and close the chain of production and consumption. Processed food can have a share of natural and artificial food. There is a need that such artificial food ingredient production is common and not private property to avoid shareholder influence on feeding people. Can you imagine: 25-50 % (or even more) of the food ingredients (mass components like carbohydrates) are produced in artificial reactors in urban or peri-urban areas, a lot of land space would be released for our Organic visions: biodiversity, recreation and landscape.

The suggestions for the second half of this century are brave and will probably create a deep debate in the Organic movement as well as in Conventional agriculture. But is brings a lot of chances as well. I guess, that private food companies have started already going towards a landless food chain. That must be avoided that food becomes an even more private and shareholder issue (like seeds and other farm inputs today). The socio-economic and technological innovations have to be started soon to be applicable and acceptable in the far future.

Conclusion

Organic 3.0 discussions have released a discussion about the future development of the Organic sector. There are many think tanks started ideas. Most of the ideas are very rough and not with practical visions for research. But there should be no time lost, that Organic takes the leadership for innovations, that helps to tackle with the future challenges, to design clear pathways to be more sustainable: food supply and to have ownership for the definition of ecology, health, care, fair and quality.

I hope that the Organic community in Africa and on the globe is brave and strong enough to lead in this century the sustainable food and farming development to tackle future challenges. That would need to throw away some of the ballasts of the Organic ideas of the last century. This century is the chance and the need for actions.

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