Essay on Development Policy

Organic Agriculture - a powerful Approach to enhance Household Food Security in the Highlands of Tanzania?

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NADEL MAS-Cycle 2012-2014

March 2014
**Abbreviations**

<table>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>CBTF</td>
<td>Capacity Building Task Force on Trade, Environment and Development</td>
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<td>EAC</td>
<td>East African Community</td>
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<td>EAOPS</td>
<td>East African Organic Products Standard</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>IAASTD</td>
<td>International Assessment of Agriculture Knowledge, Science and Technology for Development</td>
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<td>IFOAM</td>
<td>International Federation of OA Movement</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>NBS</td>
<td>National Bureau of Statistics, Tanzania</td>
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<td>OA</td>
<td>Organic Agriculture</td>
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<td>PDI</td>
<td>Poor Dietary Intake</td>
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<td>PGS</td>
<td>Participatory Guarantee System</td>
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<td>SAT</td>
<td>Sustainable Agriculture Tanzania</td>
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<td>SOAAN</td>
<td>Sustainable Organic Agriculture Action Network</td>
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<td>TanCert</td>
<td>Tanzania Organic Certification Association</td>
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<td>TOAM</td>
<td>Tanzania Organic Agriculture Movement</td>
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<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>URT</td>
<td>United Republic of Tanzania</td>
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<td>WFP</td>
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1. Introduction

The concept of Organic Agriculture (OA) has first emerged in Tanzania in the early 1990s. Since then it received growing attention from development organizations, especially as a potential approach to enhance livelihoods and sustainable food production (Bakewell-Stone, 2008:25f).

In Tanzania, agriculture is still the main source of income for around 80% of the population and accounts for 27.7% of the GDP. The sector is dominated by small-scale, predominantly rain-fed subsistence farming facing various challenges like variable weather conditions, health shocks, pests, and limited access to agriculture support services, inputs and technologies as well as to markets which often result in food insecurity and rural poverty (CIA, 2014). The National Strategy for Growth and Reduction of Poverty II addresses these issues and promotes modernization of the agriculture sector, skills development for farmers and involvement of the private sector. These interventions go along with a shift from small- to medium- or large-scale farming to increase productivity and growth of the agriculture sector and finally improve national food security (URT, 2010). On international level, there is a considerable discussion ongoing about the adequacy of the dominant model of agricultural intensification and growth, which relies on increased use of capital inputs, such as fertilizer and pesticides (IAASTD, 2009).

Achieving household food security in Tanzania is still a challenge for a large proportion of people. This becomes clear while talking to farmers on one hand and reading national food security studies on the other hand. The recently published FAO report estimates that 33% (15.7 million) of the total population in Tanzania are undernourished2 (FAO, IFAD, and WFP 2013:43). The highland regions of Tanzania are particularly relevant in terms of food security. First, they have a high population density and are prone to changing weather conditions. Second, they are favoured and fertile regions with a high potential to improve household food security. As figure 1 shows the highlands of Tanzania are divided in three regions: 1) Uluguru-, Pare and Usambara mountains; 2) Mt. Meru/Mt. Kilimanjaro and rift valley; 3) Southern highlands.

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1 On average, small-scale farmers in Tanzania have 2.6 acres (approximately one hectare) of land (NBS, 2011:54).
2 Undernourishment is a state of inability to acquire enough food, which lasts for at least one year. It is defined as a level of food intake insufficient to meet dietary energy requirements. (FAO, 2013). Data from 2011-2013.
Despite their similarities, these regions differ agro-ecologically and socio-economically.

The volcanic soils around Mt. Meru and Mt. Kilimanjaro for example show a higher natural fertility compared to the sandy clays in the mountain ranges of the first region (de Pauw 1984:22/141).

The essay at hand will focus on the highland region, including the Uluguru-, Pare and Usambara mountains and will analyse the potential of OA to enhance household food security in the corresponding region. Effects, remaining challenges and future perspectives of OA are illustrated with reference to the four dimensions of the food security concept.

Figure 1: Map of Tanzania showing the mountain ranges including the Uluguru - and Usambara mountains (red circles) (Msuya et al., 2010:213).
2. Household food security in the highlands of Tanzania

“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” (FAO, 1996).

This widely recognised definition of food security reflects the multiple dimensions of the concept which comprises of four food security pillars: access to food, food availability, food utilization and stability. The concept is generally applicable to assess food security on individual, household, national or global level. The essay at hand will focus on household food security of people living in the highlands of Tanzania.

“A household is considered food secure if it has the ability to acquire the food needed by its members to be food secure” (Pinstrup-Andersen, 2009:6).

Despite Tanzania’s economic and agricultural growth in the last years, food security on household level is still not guaranteed. Figure 2 illustrates that in 2010/11 8.3% (730 000) of the total population in Tanzania were classified as having a Poor Dietary Intake (PDI) meaning that they lack both sufficient quantity and diversity of food. Food insecurity in Tanzania is often a transitory or seasonal phenomenon (URT, 2011) with food shortages peaking outside the main harvest periods. Nevertheless, an analysis of the World Food Programme revealed that 1.7% of total households in Tanzania suffer from chronic food insecurity. Like in other developing countries, food insecurity in Tanzania is mainly a rural problem with 87% of the PDI households living in rural areas (WFP, 2013:26ff). The National Panel Survey 2010/11 revealed that 37% of people living in rural areas were concerned about not having enough food. Reasons for food shortages range from crop pests, droughts, and land scarcity to no access to farm inputs or money (NBS, 2011:35ff).

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3 PDI is a common food security indicator that identifies those households that are lacking both sufficient calorie quantity and different types of food.
Household food insecurity is, among other factors such as inadequate child and maternal care, one of the underlying causes for the moderately high prevalence of undernourishment\(^4\) (33\%) in Tanzania. The country is not expected to reach the United Nations Millennium Development Goal (MDG) 1 of halving this number until 2015 (FAO, IFAD, and WFP, 2013:43). The following paragraph takes a closer look at the main challenges for households living in the mountain ranges of Tanzania to be food secure. Case studies from the study area, the Uluguru- and the Usambara Mountains, will serve as examples to illustrate some challenges according to the four food security dimensions.

**Access**

This dimension depicts physical, financial and socio-cultural access to food. For farmers living in remote and steep slopes of the Uluguru Mountains considerable constraints are the physical and financial access to markets and the lack of infrastructure that disables transport of food. Farmers living up-hill have to walk to town to have access to markets where they can sell their surplus or purchase other food. This is very time consuming and exhausting and shortens the productive time farmers could use to cultivate their plots. But often it is the only possibility to generate income, which is highly needed to satisfy basic needs.

Access to food is further influenced by social regulations such as norms that limit access to food for women or other groups (Reis et al., 2011:6f). Limited or no access to knowledge, information and extension services is another challenge and hindered

\(^4\) Proportion of total population undernourished.
Usambara mountain farmers to change their cultivation methods in a way that they could enhance household food security (Reyes, 2008:94).

**Availability**

The availability of food on a national level refers to sufficient quantities of food supplied by domestic production or food imports. Tanzania is still a net importer of major food crops such as maize, rice and wheat (FAOSTAT, 2009). On a household level, availability applies to the supply side with local production, degree of self-sufficiency, stocks, available food aid and trade as decisive factors. In the study areas Uluguru and Usambara Mountains, the declining production per unit of cash and food crops (e.g. maize, beans, fruits, horticulture and spices) endangers the availability of food for households living in the highlands. Reasons for decreasing yields are land scarcity, soil depletion, poor rainfall patterns, and inappropriate agriculture practices on the steep slopes of the mountains (Madulu et al., 2004:5).

**Utilization**

This dimension directly links food security with health aspects. Clean and safe water, an adequate diet, sanitation and health care are fundamental to utilize food in a way that physical needs are met and people reach a state of nutritional well-being. Knowledge on food quality, safety and appropriate cooking and conservation techniques are prerequisites. Children and other family members living in food insecure households that do not consume enough high-quality food are vulnerable for malnutrition and diseases. This can impair physical strengths and therefore productivity, which is particularly crucial for subsistence farmers to make their living (WFP 2013:42f). Villages in the Uluguru Mountains have year-round access to high-quality surface water that enables households to prepare their food in a safe way and makes people less prone for diseases and malnutrition (Hess et al., 2008:15ff).
Stability

In order to be food secure, a household or individual needs to have access to adequate food at all times, referring to the stability of access, availability and utilization. Stability can be hampered by political shocks like elections or war, by climatic changes, e.g. drought, floods, or any other extreme weather, or by economic shocks such as price fluctuations.

In 2013, the short-rain season known as vuli (October – December) in Tanzania, started late and so did the planting of the second season crops. These modified weather conditions will result in a harvest delay and will temporarily destabilise the availability of food for small-scale farmers. Depending on stocks and yield, households may suffer from food shortage (FAO, 2013:17). The price stability was recently hampered as well. Strong local demand of cereals, and maize in particular, led to an increase of wholesale maize prices of 74% between June and October 2013, when maize was traded at a record level, about 30% more than in 2012 (FAO, 2013:18). This increase in price can have a positive short-term effect for small-scale producers, if they have access to the markets, which is rarely the case in the highlands, but is detrimental for households that have to purchase maize.

3. Organic agriculture in Tanzania

“Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved (IFOAM, 2008).”

Tanzania has a relatively long history of OA. Some first practices, such as agroforestry\(^5\), were promoted since the 1980s. Certified OA emerged in the 1990s and in 2004 the first product certification for the domestic market was accomplished by the local

\(^5\) Agroforestry is “a production model that integrates tree species with production of other agricultural products, into a multi-story system” (SOAAN, 2013).
certification body TanCert⁶ (Bakewell-Stone, 2006). Nowadays, the development of the organic farming sector is promoted and coordinated through the umbrella organisation Tanzania Organic Agriculture Movement⁷ (TOAM), formed in 2005. Like in other developing countries, approximately 80% of the farmers practise low-external input agriculture. The Tanzanian Poverty and Human Development Report in 2007 revealed that 87% of the farmers were not using chemical fertilizer and 72% were not using agrochemicals as a result of high costs (URT, 2007:80). These traditional production systems are considered as near-organic since they do sometimes not completely fulfil the organic standards. Certified OA in contrast is often export-oriented. The certification process is very costly and attached to a lot of paper work which makes certification inaccessible for hardly educated farmers with little resources (Bakewell-Stone 2008:23/26, UNEP-UNCTAD 2010:41).

Recently, so called Participatory Guarantee Systems (PGS) for OA were introduced in Tanzania and piloted by Uluguru Mountain farmers under the supervision of Sustainable Agriculture Tanzania (SAT)⁸, an organization based in Morogoro, that was built on farmers need and deals with sustainable agriculture (see Box 1). PGS are low-cost, locally based quality assurance systems that are built on a foundation of trust, social networks and knowledge exchange. PGS are especially suitable for resource-poor smallholder farmers who sell their surplus in the domestic markets (IFOAM, 2013a).

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⁶ Tanzania Organic Certification Association: http://www.tancert.or.tz/
⁷ More information on: http://www.kilimohai.org/
⁸ More information on: http://kilimo.org/WordPress/
Tanzania is part of the Ecologic Organic Agriculture (EOA) Initiative for Africa that seeks to mainstream OA in the African development agenda. On a national level, the government also initiated and supports several green-revolution-like agriculture initiatives. The National Agriculture Policy contains a reference to OA, mainly focusing on the potential of an increase in income (URT, 2012:25f). In 2013, Tanzania formulated organic farming policies which were presented on the third East African Organic Conference in Dar es Salaam in July 2013 (The Guardian, 2013). Despite these recent achievements, OA still has little advocacy and the government continues to subsidise

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synthetic fertilizer which increases its use and hinders promotion of OA (UNEP-

**Box 1: Participatory Guarantee System: The Case of the Maendeleo Farmer Group**

The Maendeleo Farmer Group has 23 members and is located in Towelo, a village in the Uluguru Mountain range. The mountains lie southeast of Morogoro town, between altitudes from 700 to 2400 m above sea level. Rainfall is bimodal with short rains in October–December and long rains in March-May. The area is home to the matriarchal organised Luguru tribe whose members depend on subsistence agriculture. In 2010, SAT started to teach the group OA practises, such as: Cultivation of medical plants, intercropping of vegetables (e.g. maize and beans, carrots and leeks, tomatoes and onions), production of botanical pesticides from neem tree (Azadirachta indica), terrace building, and compost making. It is the first PGS group in Tanzania certified under the EAOPS standards. Group members are organised in different committees (e.g. for training, marketing, inspection) with emphasis on collective responsibility and carry out different tasks according to their capabilities. Their organic produce is used for own consumption and surplus is sold in the SAT Organic Shop in Morogoro and in an Organic Shop in Dar es Salaam. The PGS system enables the group to benefit on individual and community level without having the cost-intensive third-party certification and paper work. According to several group members, benefits from the new practises are manifold: Agriculture is less cost-intensive in terms of fertilizer and pest management, self-sufficiency increases, as well as farmer’s income and access to finance. Remaining challenges are the accessibility of resources, e.g. manure is not available close by and farmers have to walk long distanced to get it. The same is true for the inspections of group member’s plot, because they are scattered around a big area. In addition, farmers volunteering a lot for the group have difficulties to allocate enough time for family activities (IFOAM, 2013b and 2013d:16ff).

UNCTAD 2010:17).

In April 2007, the East African Organic Product Standards (EAOPS), developed by a regional working group, were adopted by the member states of the East African Community (EAC): Uganda, Tanzania, Kenya, Rwanda and Burundi. The EAOPS is the first standard developed through a collaboration of private organic movements and national standard bod-

**Figure 3: Organic mark of East Africa (IFOAM, 2013c).**
ies and is the second regional organic standard in the world after the European Union’s. Agricultural products from Tanzania that are labelled “organic” must therefore comply these standards. The standard provides general requirements for organic production and specific guidelines for crop production, animal husbandry, beekeeping and also instructions for handling and labelling of organic produce (EAC, 2007). In the mountain ranges of Tanzania, different OA practises and approaches are applied, depending on the location and resources available. This functional integration of locally available resources with resource conserving technologies, illustrated in Box 2, seems to be particularly promising for highland regions where deforestation and soil degradation threaten the livelihoods and food security of a fast growing poor population. Complex agroforestry systems providing a multitude of products and environmental services, as exemplarily presented in Box 2, can be found all over the highlands in Tanzania. The most prominent and best described agroforestry sys-
tems are the so called Chagga Homegardens on the foothills of Mt. Kilimanjaro (Fernandes 1984:76ff).

**Box 2: Spice crops agroforestry systems in the East Usambara Mountains**

Different tribes habit the Usambara Mountains: Shambaa (78%), Pare (16%), Mbugu (5%) and others (1%) which also depend on subsistence farming. Major food crops include: Cabbages, maize, wheat, irish potatoes, sweet potatoes, beans, peas, bananas, cassava, and yam. Cash crops vary within the mountain ranges from tea and spices to fruits (plums, pears, apples, mangoes, oranges, bananas) and some green vegetables. However, yields from these crops have been declining over the years due to land scarcity, poor agricultural practices, poor rainfall pattern and reduced soil fertility (Msuya et al., 2010:213, Nkombe 2003:4, Madulu et al., 2004:5). Further, the rich biodiversity of the Usambara Mountains in Tanzania is threatened. Although forests are vitally important for the local population and as national water reservoir, they are cleared for agriculture production, such as spices. Sustainable spice crops agroforestry systems therefore provide an alternative to better balance food and income security for households and improved ecosystem conservation (Reyes, 2008:134). The spice crop agroforestry system imitates the multilayered system of adjacent natural mountain forest. The agroforestry species diversify the production system and make it less vulnerable to weather events (dry periods, heavy rains etc.) and pest outbreaks. Furthermore, they diversify household incomes by delivering non forestry timber products (fruits, local medicine etc.), timber and firewood.
4. **Effect of OA on household food security**

OA is a holistic approach that influences food security through five mechanisms: 1) making use of local resources, 2) promoting resource conserving technologies, 3) building on existing knowledge, 4) tapping new markets, and 5) promoting social development (Hauser et al., 2005). The following paragraph will illustrate some major effects of OA practices on each food security dimension.

**Access and availability**

An increased crop diversity on Uluguru mountain farmers’ plots (see Box 1) directly increases the availability and access to food for the respective households and at the same time reduces the risks associated with a particular crop failure. Due to a high demand of locally produced organic products in Morogoro town, farmers from Towelo can sell their products at the Organic Shop and benefit from an increase in income. Other studies in the same region revealed a similar effect. Farmers were able to increase their financial security: First, through selling non-certified organic plantains and pineapples in the local market and second, as a result of the reduced cost of production by using locally available resources (Bakewell-Stone, 2006:45/46). This additional income increases the purchasing power of households, allowing them to buy supplementary food or pay for the school fees of children (IFOAM, 2013d:17). The social organisation, for example through a PGS system or farmers associations, can further increase farmer’s access to training and knowledge as well as to agricultural inputs and financial services. Practising OA in an organized group strengthens communities and facilitates the management of collective natural resources (Bakewell-Stone, 2006:45). In regions, e.g. the highlands of Tanzania, where subsistence agriculture is dominant and where extreme weather conditions occur, OA is often superior to conventional agriculture in terms of yields (Badgley et al., 2006:88). The use of compost rehabilitates soil fertility, reduces soil erosion and contributes to higher yields. This results in increased availability of food. A higher quantity of food in turn facilitates access to food for all household members and improves their food security. In addition, higher yields of organic products benefit other people in the area who have better access to high-quality food to improve their health and nutri-
tion status (UNEP-UNCTAD, 2010:26). OA can also have a positive influence on gender equity. OA practices are less dependent on agricultural inputs to which women in East Africa typically have little or no access. OA therefore allows women to farm on equal level with men and improves women’s access to agriculture and food (UNEP-UNCTAD, 2008:15). Additionally, certified OA in Tanzania creates new employment opportunities (e.g. spice sorting) and better working conditions for women (UNEP-UNCTAD, 2010:28f).

Utilization and stability

In the highlands of Tanzania, where vulnerability for malnutrition is high, organically produced food, with a high nutritional value and low pesticides residues, positively affects food utilization and therefore peoples health and nutrition status. Additionally, in the case of SAT, training in OA also includes practical advices about food preparation and storage which is also beneficial for households to improve their utilization of food. Extreme weather conditions are supposed to increase with progressing climate change and have the potential to destabilise food security in the highlands of Tanzania. OA comprehensively influences the stability of the three food security pillars through different mechanisms. First, OA increases biodiversity, which is a crucial element to build up and strengthen the overall resilience and persistence\textsuperscript{10} of mountainous ecosystems and therefore stabilises food production for the households. As an example, maintaining natural forests as well as agroforestry systems (see Box 2) could stabilise local microclimates (Pfeiffer, 1990) and help to reduce the negative side effects of climate variations on household food security (Reyers, 2008:89). Second, crop diversification stabilises the availability, access and utilization of food. Diversified yields, distributed throughout the seasons, reduce the economic risk of failure and food shortage and enable an improved diet and nutrition for household members (Bakewell-Stone, 2006:43).

\textsuperscript{10} Resilience is the capacity of a system to resist shocks and stress whereas persistence describes the capacity of a system to continue over a long time (UNEP-UNCTAD, 2008:20).
5. Conclusion

Household food security in the highlands of Tanzania is threatened by various environmental, socio-economic and political processes. OA is an emerging and holistic agro-ecological approach that addresses many of these factors and has great potential to enhance food security through multiple pillars such as access, availability, utilization and stability of food.

The following aspects of OA seem to be most relevant for improving the food security of households living in the mountain ranges of Tanzania: Diversification, social organisation, use of locally available resources and conservation of ecosystems. They strengthen the farmer’s self-reliance and independence from inputs, sustain resilience and persistence of the agricultural ecosystems and open up new markets and income generation possibilities.

Looking at the manifold effects of OA on household food security it can be concluded that each of the four food security pillars is positively influenced by OA. However, people living in the Uluguru- and Usambara Mountains of Tanzania seem to benefit most from increased and stabilised food availability and access to food. Improved access to knowledge and information about OA can be highlighted as an essential and powerful aspect that directly influences all food security pillars.

Some constraints attributed to practising OA in highlands are summarized below. 1) Certified OA, supported by the Tanzanian government, is still a niche market and not very suitable for resource-poor smallholder farmers living in the mountains in terms of costs, bureaucracy and access to knowledge and infrastructure. 2) Access to knowledge and training is a limiting factor for the development of the organic sector particularly in remote areas and is to date mainly provided by private organization. 3) The long-term perspective for investments, a prerequisite for households to benefit from optimised productivity, stabilised yields and OA as a whole, is regularly endangered by economic, social or political factors.
Consequently, one can draw the conclusion that OA is indeed a powerful approach to enhance the household food security in the highlands of Tanzania. If and to what extend OA will be promoted and implemented in the near future greatly depends on Tanzania’s national development strategy. At this stage, the National strategy is in line with OA but rather promotes certified OA to improve incomes thereby neglecting OA’s manifold potential to improve livelihoods and household food security.
References


