



Organic Agriculture and Food Security: The Story of Africa

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ABSTRACT

Global food security problem has raised concerns on the best agricultural practices that will stand the test of time to replace the already failing conventional agriculture. Yields are reportedly decreasing despite the increasing use of inputs. In the quest of solving this problem, researches have revealed that organic agriculture can get the needed results in a more sustainable manner. Activists of organic agriculture are therefore of the view that it is the best option for food sustainability especially in developing worlds like Africa. Critics also think organic agriculture is a sort of luxurious lifestyle being championed by some few rich consumers of developed countries at the expense of the vulnerable majority. It is therefore unclear whether organic agriculture is the answer to Africa's food crisis. It was shown by literature that organic agriculture is the best model of agriculture for Africa in tackling the food needs of the continent. The superiority of organic agriculture over conventional agriculture was seen in its high yielding crops, high nutrient food produced, less energy consumption and less greenhouse gas produced during production, high drought and flood resistant crops with an overall positive impact on the ecosystem. However, challenges such as lack of national organic agriculture policies, low/no research in organic agriculture, high cost of organic certification and inputs, high illiteracy rate, and under developed markets in most African countries hampers widespread adoption of organic agriculture in Africa. Until these challenges are addressed by governments of African countries, organic agriculture cannot be the answer to Africa's food crises.

Keywords:

Organic agriculture; conventional agriculture; African countries; food security.

Academic Discipline and Sub-Disciplines

Agriculture, Farming Systems

SUBJECT CLASSIFICATION

Organic Agriculture, Food Security

TYPE (METHOD/APPROACH)

Review article, Literature Analysis

Council for Innovative Research

Peer Review Research Publishing System

Journal: JOURNAL OF ADVANCES IN AGRICULTURE

Vol. 5, No. 1

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INTRODUCTION

Background

The spread of organic agriculture methods globally has brought about a lot of debate and discussions on whether a large scale adoption of it will bring about an increase or decrease in global food security (Halberg et al, 2006). The world's population was 2.5 billion in 1950, increased to 6.1 billion in the year 2000 (Calvalho, 2006), and is estimated to shoot up to 9.1 billion by the year 2050 (FAO, undated). Nearly all these increase will be in the developing parts of the world. As population increases land holdings decreases hence many poor small-holder farmers have resorted to more frequent cropping, preventing traditional long fallow periods and other ways of harnessing ecological processes to restore soil nutrients lost with repeated harvests (Bennett and Franzel 2013).

Critics of organic agriculture therefore believes the promoting organic agriculture is a luxurious idea of the privileged rich consumers in developed countries (Halberg et al, 2006) at the expense of the vulnerable majority in the developing countries and hence large scale adoption and practice especially in these countries will cause food scarcity and starvation. Meanwhile activists of organic agriculture are also of the view that organic agriculture is the way forward in attaining for sufficiency for developing countries. For instance Rigby et al, (2000) accessed the relationship between organic agricultural systems and agricultural sustainability whilst Byrne et al, (2006) looked at the numerous reasons for which organic farming will provide a sustainable type of agriculture in these days of globalization, at least for the less industrialized nations.

It was because of such debates that Kristiansen (2006) believes organic agriculture is seen as panacea by activist but as an ideological nonsense by critics. Organic agriculture however should be looked at in a holistic perspective; acknowledging the numerous benefits as well as the shortfalls of it. This report is therefore aimed at looking at organic agriculture and its impact on Africa as less industrialized continent. This will be done by looking at the success stories, challenges and future prospects for Africa's organic agriculture whilst making recommendations for policy makers.

History: Origin, Early Development and Rise of Organic Agriculture

Origin

The concept of organic agriculture is an amalgamation of different ideas mainly in the German-speaking and English-speaking worlds. These ideas began at the end of the 19th century, especially the idea of biologically oriented agricultural system (Vogt 2007). Between World War I and World War II, conventional agriculture had a lot of challenges in the form of soil pollution, poor food quality and the deterioration of rural social and traditional life. As a stop measure to this challenge, pioneers of organic agriculture came out with a convincing, science-based theoretical farming system during the 1920s that became a successful and practicable farming system during the 1930s. According to Vogt (2007) and Bello, (2008), it was the growing awareness of the environmental challenges during the 1970s that attracted the interest and attention in organic agriculture in the global worlds of agricultural society and politics.

Early Development

Organic Agriculture has existed since the beginning of our modern day industrialized agriculture as the option for farmers. Kristiansen et al (2006a) alluded to this fact that most the of organic agriculture practices were the only way out for farmers before the introduction of in-organic impute like fertilizers, herbicides, fungicides, insecticides, mechanization and fossil fuels that made industrial agriculture possible. Meanwhile in most developing countries like Ghana, organic agriculture is still practiced as the only option for many house hold farmers who do not use any imputes but rely on natural processes (van Veluv, 2006). Most farmers in these countries have no access to the farm inputs and hence rely mainly on sustainable agricultural systems for production.

The Rise of Organic Agriculture

From very humble beginnings in the early part of the 20th century, organic agriculture has grown dramatically in importance and influence globally. A few statistics available tells part of the story: from almost negligible levels until the 1980s, the number of organic producers worldwide according to Willer and Lernoud (2015) has grown to an estimated 2 million by the end of 2013, with some 43.1 million ha of lands being managed organically. Worldwide organic market size also has expanded from 62.8 billion USD with organic per capita consumption per year of 8 billion USD in 2011 (Willer and Lernoud, 2013) to 72 billion USD with a per capita consumption of 10.05 USD in 2013 (Willer and Lernoud, 2015). There are 170 countries that have data on organic agriculture whilst 82 countries have organic regulations. Also 10 countries have more than 10% of the farmland in organic agriculture (Willer et al, 2013).

Definitions, Principles and Standards in Organic Agriculture

Definition

There are many definitions for organic agriculture with the differences of no legal importance (Varlyakov, 2012). In all definitions, the underlying issue is to enhance sustainability by enhancing a healthy soil and ecosystem. For instance according Sligh et al (2007), organic agriculture is often described in simple terms as a system of producing food and other agricultural products without the use chemicals. However from the perspective of the Codex Alimentarius Commission, the international food standards body established by the Food and Agriculture Organization (FAO) of the United Nations (UN) and the World Health Organization (WHO), the concept of organic agriculture has greater depth:



Organic Agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system (Codex Alimentarius Commission, 2007)

However, according to the IFOAM definition:

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, 2009a).

In both definitions emphasis are placed on the health of the soil and eco-system, biodiversity and a prudent use of sustainable agricultural practices taking into consideration local conditions. It means that the processes involved in organic farming will vary from one region of the world to another depending on the local conditions like farming methods, social, geographical and climatic factors (Kristiansen, 2006).

Principles of Organic Farming

Organic farming Principles serve to inspire the movements in organic agriculture in its full diversity by guiding the movement's development of programs, certifications, positions, standards and present a vision of their adoption world-wide. There four principles on which practices of organic farming systems depend. These according to IFOAM, (2009b) are:

- 1. Principle of health**
The principle of health states that organic agriculture systems should not only sustain but also enhance the health of soil, animal, plant, human and the entire planet as one and indivisible body.
- 2. Principle of ecology**
Organic agriculture systems should always rely on living ecosystem and cycles, working with these systems and cycles, emulating them and assisting in sustaining them.
- 3. Principle of fairness**
Organic agriculture should be built on healthy relationships that foster fairness with reference to the common environmental and life opportunities.
- 4. Principle of care**
This principle states that organic agriculture should be practiced in a responsible and precautionary way to safe guard the well-being and health of the environment for all generations.

Standards

The IFOAM currently revised its Organic Guarantee System (OGS) (Willer et al 2011). The new system approved in July 2010, contains several services, which are namely:

- The IFOAM Family of Standards, for standard owners
- The IFOAM Standard, for standard users;
- The Global Organic Mark, for operators
- The Community of Best Practice, for standard owners;
- The IFOAM Accreditation and the Global Organic System Accreditation, for certification bodies (Willer et al 2011).

The introduction of these services by IFOAM will create opportunities for organic agriculture stakeholders to get recognition for their effort in working for an organic standards and certification.

Legislation and Movements in Organic Agriculture

Legislation statistics in global organic agriculture

Global Organic legislations has shown an increased in the number of countries with organic standards to 74, whilst another 27 countries are in the process of drafting legislation (Willer et al 2011). In the EU region 27 countries have fully implemented organic farming legislation. For Non-EU have 11, the Pacific and Asia has 17, the Caribbean and the Americas has 18 whilst Africa have only 1 being Tunisia. Meanwhile 14 countries in Africa are in the process of drafting Organic agriculture legislation (Willer et al 2011).

The international federation of organic agriculture movements (IFOAM)

The IFOAM is the umbrella organization for the organic agriculture movements globally, bringing together over 870 member organizations in 120 countries (IFOAM 2012). IFOAM's **mission** is to unite, lead, and assist the various organic



movements in its full diversity. The goal of the movement is to ensure a global adoption of ecologically, economically and socially viable agricultural systems that relies on the principles of organic agriculture (IFOAM 2009c). Among the wide range of activities, IFOAM maintains an organic farming standard, and an organic accreditation and certification service which regulates the activities and operations of members in the field of organic agriculture.

The international society of organic agriculture research (ISO FAR)

ISO FAR supports and promotes Organic Agriculture research by facilitating a world-wide cooperation in research, education, methodological development, and exchange of knowledge. ISO FAR also supports research from individuals through, publications, membership services and events and also integrating stakeholders in Organic agriculture in the research process.

The mission of ISO FAR is:

- support individual researchers, from all background and disciplines, through publications, membership services and events, and relevant scientific structures;
- facilitate a global cooperation in both education and research as well as knowledge exchange;
- encourage methodological, conceptual and theoretical development, whilst respecting the ethos of organic agriculture, in a systems or an interdisciplinary point of view;
- encourage the involvement of all players, with their accumulated experience and knowledge in the prioritization, conduct, evaluation, development, and communication of research;
- foster relationships with related research bodies, including joint publications and events.

Research Institute of Organic Agriculture (FiBL)

The Research Institute of Organic Agriculture which in German is *Forschungsinstitut für biologischen Landbau* (FiBL) is a research institute that was founded in the form of a private foundation in the year 1973 by organic farmers and scientists. It was established with the mission of supporting the organic farmers that were sidelined at that time with research projects and consultancy. Researchers of FiBL work together with local farmers to come out with most innovative and cost-effective solutions to enhance agricultural productivity whilst considering the environmental, health and socio-economic impacts that will have on people (FiBL, 2013).

Current Global Figures of Organic Agriculture

Below are regional figures of organic agriculture for 2013 with the exception of Africa which will be discussed later in details:

Asia

The total organic agricultural area was 3.4 million hectares in 2013 and constitutes to 8 % of organic agricultural land globally with nearly 0.7 million producers reported most of which were in India. The leading countries by organic agricultural land in Asia are China with a total organic land area of 2.1 million hectares and India with 0.5 million hectares also. Timor-Leste tops organic agricultural area by proportion of total agricultural land which is about 7% (Willer and Lernoud, 2015).

Europe

In Europe, there are about 11.5 million hectares of organic agricultural lands including those in conversion areas constituting 2.4 percent of the total agricultural land. Twenty-seven percent of the world's organic land is found in Europe. The countries with the largest organic agriculture area are Spain (1.6 million ha), Italy (1.3 million ha), France and Germany (both have 1.1 million ha). Sales of organic products in 2013 totaled approximately 24.3 billion Euros an increase of 6% over 2012. Eight countries have more than 10% organic agricultural land: Liechtenstein (31%), Austria (19.5%) and Sweden (16.3%) (Willer and Lernoud, 2015).

Latin America

More than 300,000 producers managed 6.6 million hectares of agricultural land organically in 2013 constituting 15% of the world's organic land and 1.1 percent of the regions agricultural land. Leading countries are Argentina (3.2 million hectares), Uruguay (0.9 million hectares), and Brazil (0.7 million hectares). The highest shares of organic agricultural land are in the Falkland Islands/Malvinas (36.39%), French Guiana (17.9 %), and the Dominican Republic (9.3%) (Willer and Lernoud, 2015).

North America

More than 3 million hectares of farmland were managed organically in 2013. Of these, 2.2 million hectares were reported in the United States and 0.9% in Canada. This represents 0.7% of total agricultural land in the region and 7% of global organic agricultural land. The U.S. consumer sales of organics products were 35 billion USD in 2013 (11.5% increase from 2012) and have been forecasted to increase more 11% by 2014. Also U.S.s' export of organic products in 2013 reached 537 million USD, which is more than 20% increase from the previous year's export. In Canada, approximately 870,000



hectares of land area is into certified organic production. Canadian domestic consumption of organic foods and beverages as at 2013 was approximately 3.25 billion Canadian dollars whilst exports are valued over 500 million Canadian dollars (Willer and Lernoud, 2015).

The Oceania

The region includes Australia, New Zealand and the Pacific Islands states. There are almost 23,000 producers, managing 17.3 million hectares constituting 4.1% of the agricultural land in the region and almost 40% of the world's organic land (Willer and Lernoud, 2015). Almost 98% of the organic land in the region is in Australia (17.2 million hectares, 97% of which is extensive grazing land), followed by New Zealand (106,000 hectares), and Samoa (33,500 hectares). The highest shares of all agricultural land are in Samoa (11.8%), followed by French Polynesia (5.5%), Australia (4.2%) and Vanuatu (2.2%) (Willer and Lernoud, 2015).

ORGANIC AGRICULTURE IN AFRICA

Organic agriculture is a major and important option of agriculture for which Africa as a continent must consider developing. Organic agriculture has been practiced in Africa for ages but according to Parrot et al, (undated) the practice has been in the informal sector without certification. Organic agriculture has the potential to increase productivity whilst minimizing the negative impacts on the already degraded environment. It has improved livelihoods for small-holders in developing countries while minimizing the use of external resources that could become increasingly unaffordable as the world's rapidly growing population increases its demand for scarce resources needed for conventional agriculture, particularly water and energy (Bennett and Franzel 2013). Players in the Organic agricultural sector are therefore advocating and pushing for organic agriculture as the suitable form of agriculture for the continent. It is therefore not surprising when Africa is advised by many Scientists and researchers to follow the "Green Revolution" (agro-industrial) model which has worked well in many parts of Latin America and Asia (Ching, undated).

Statistics on Organic Agriculture in Africa for 2013.

Organic agriculture in Africa is gaining momentum. There is a growing recognition among policy makers that organic agriculture has a significant role to play in attaining Africa's food security (Agama, 2015). There has been improvement in many aspects of organic production in Africa. Below are some statistics showing some of the aspects.

Land Area

Organic agricultural land area in Africa remained steady in between 2010 and 2011 (Bouagnimbeck, 2013). However, there was an increase by almost 78,000 ha (7%) in 2013 compared to 2012 (Lernoud et al (2015). There were 1.2 million hectares of agricultural land in 2013, constituting 0.2 percent of the continent's total agricultural area and 3 percent of the global organic agricultural area. As compared with 52,000 hectares of land in the year 2000, the organic agricultural land has increased by more than 1 million hectares in 2011 (Bouagnimbeck, 2013). Figure 1 shows the top ten countries with the largest organic agriculture land area in Africa for year 2013.

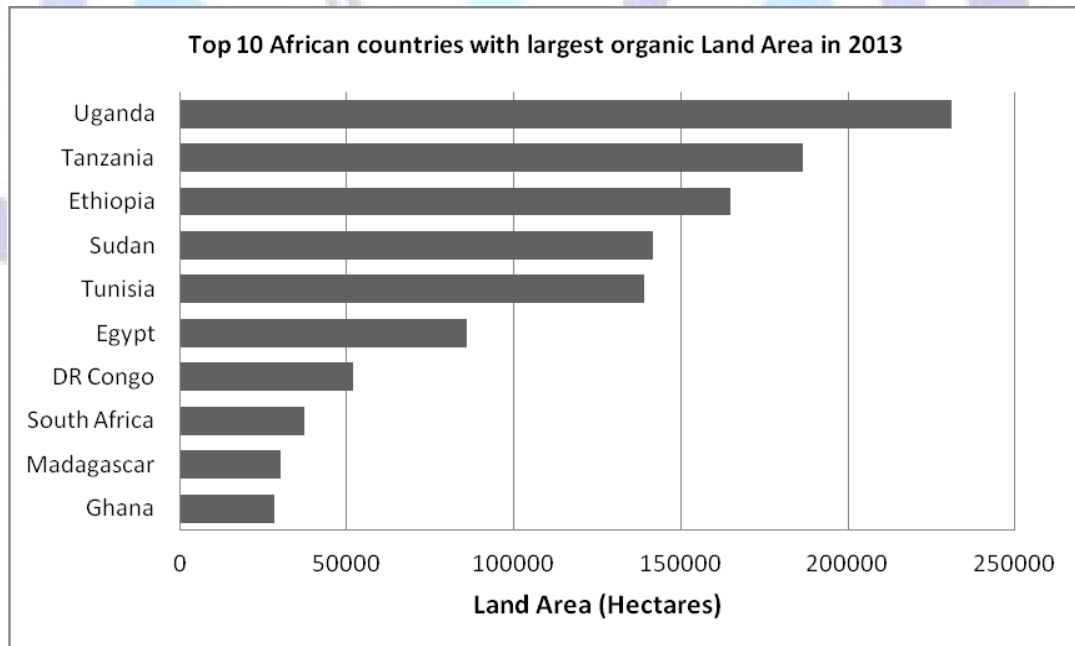


Figure 1: Top 10 countries with the largest organic agricultural area in 2013 (Adapted from: FiBL-IFOAM 2015).

Uganda leads in organic land area of 230,000 hectares. The country with the largest proportion of organic agricultural land is the Island state of Sao Tome and Principe with 7.2 % of total land being organic followed by Egypt (2.3%) and Comoros (1.7%) (Lernout *et al* 2015). Figure 2 shows the top 10 countries with the highest percentage (%) share of organic agriculture land in 2013.

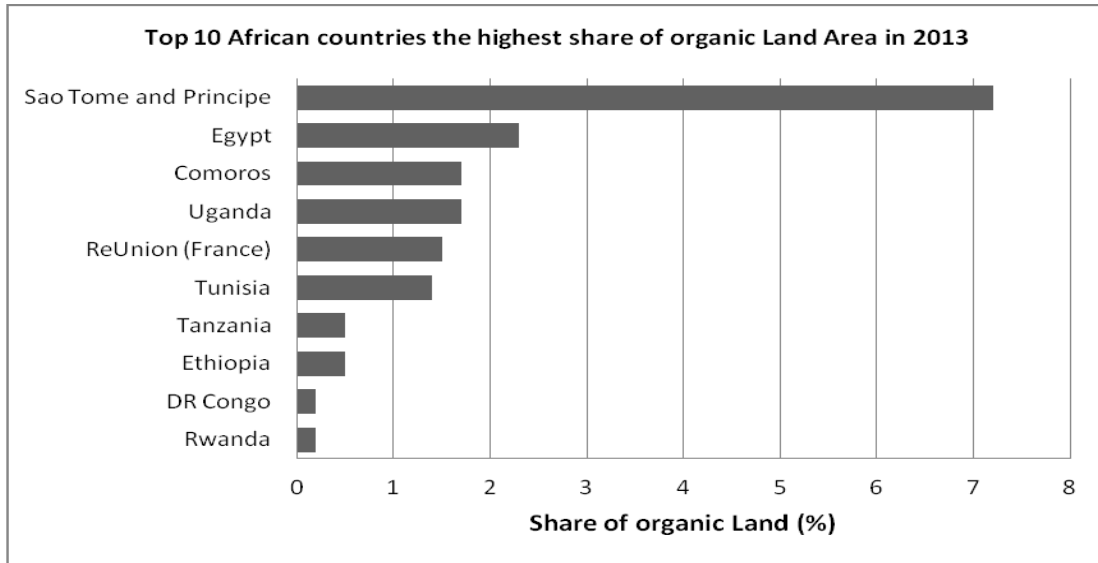


Figure 2: Top 10 countries with the highest (%) share of organic agricultural land in 2013 (Adapted from: FiBL-IFOAM 2015)

Land Use Type

In 2013, 47 percent of all organic farmland was used for permanent crops (568 000 hectares), 19 percent was used for arable crops (237 000 hectares), and five percent (64 000 hectares) were grassland/grazing area. Ethiopia, Tunisia and the United Republic of Tanzania have the largest permanent crop areas. The key permanent crop is coffee with organic area production amounting to 194 000 hectares in total. As no crop details were available for some of the biggest African coffee producers, it can be assumed that the total figure for organic coffee is higher. The largest coffee areas are in Ethiopia and Tanzania. Also, 19% of the organic farmland was used for *arable crops*; most of this land is oilseeds (126 000 hectares), textiles (64 000 hectares) and aromatic and medicinal plants. Aromatic and medicinal plants were grown on 23 000 hectares in 2013 with key producing countries being Tanzania, Madagascar and Morocco (Lernout *et al* 2015). Figure 3 shows organic agriculture land use type in Africa for 2013.

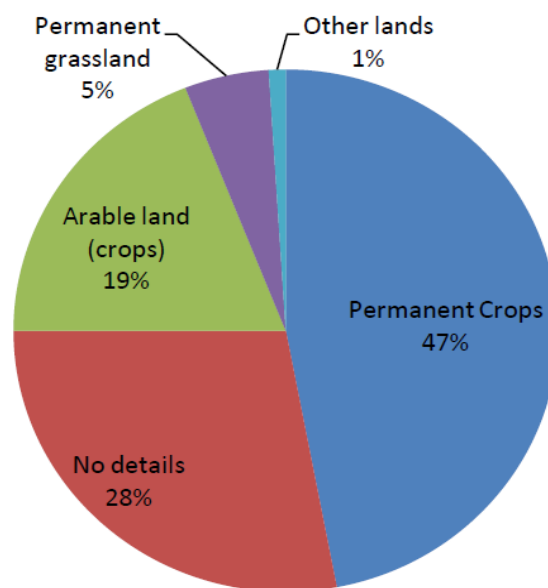


Figure 3: Organic Land use type in Africa for 2013. (Adapted from: FiBL-IFOAM 2015)



Organic Producers

There are more than 574 000 organic producers in Africa. The countries with the most organic producers are Uganda (189 000), United Republic of Tanzania (148 000), and Ethiopia (134 000) (Lernout *et al* 2015). Table 1 shows the top ten countries with the largest number of organic producers in Africa for the year 2013.

Table 1: Top ten countries with the largest number of organic producers in 2013 (Adapted from FiBL-IFOAM 2015)

Rank	Country	Number of producers
1	Uganda	189 610
2	Tanzania	148 610
3	Ethiopia	134 628
4	Senegal	18 393
5	Madagascar	14 550
6	Kenya	12 647
7	Burkina Faso	11 395
8	Zambia	10 055
9	Togo	9 428
10	Mali	8 048

Wild Collection

Wild collection has an important role in Africa, with more than 10 million hectares certified as organic. Zambia is the country with the largest beekeeping area with 6 million hectares (data from 2009), followed by Namibia (2.4 million hectares), and Morocco (817 000 hectares). Medicinal plants such as *devil's claw* (*Harpagophytum procumbens*) play the most important role in wild collection (Lernout *et al* 2015). Table 2 is a representation of organic will collection areas in Africa for the year 2011 showing the different categories of crops harvested.

Table 2: Use of wild collection areas in Africa for 2013 (Adapted from: FiBL-IFOAM 2015).

Land Use	Number of producers
Apiculrure	6 216 021
Berries, wild	150
Forest honey	110 000
Fruit, Wild	141
Medicinal & aromatic plants, wild	1 674 037
Nuts, wild	96 674
Oil plants, wild	685 494
Wild collection, no details	1 264 424
Wild collection, other	71 533
Total	10 118 473

Bodies and Movement in Organic Agriculture in Africa

Organic Agriculture has reached a high level of developmental state in many African countries and the national organic sector has in most of the cases organized itself into a national Organic Agriculture network or movement. These umbrella movements represent the organic sector of each country at the national and international level, linking stakeholders and making efforts in promoting and getting players in the sector (IFOAM, 2009d). The following national Organic Agriculture movements have been established:



The Ethiopian Association of Organic Agriculture (EAOA)
The Ghana Organic Agriculture Network (GOAN)
The Kenyan Organic Agriculture Network (KOAN)
The Organic Movement of Mali (MOBIOM)
The Organic Movement of Madagascar
The Rwanda Organic Agriculture Movement (ROAM)
The Malawi Organic Growers Association (MOGA)
The Namibian Organic Association (NOA)
The National Organic Agricultural Council of Burkina Faso (CNABio)
The National Federation of Organic Producers of Senegal (FENAB)
Organics South Africa (OSA)
Organization for Promotion of Organic Agriculture in Benin (OBEPAB)
The Tanzania Organic Agriculture Movement (TOAM)
The National Organic Agricultural Movement of Uganda (NOGAMU)
Organic Producers & Processors Association of Zambia (OPPAZ)
The Zimbabwe Organic Producers' and Processors' Association (ZOPPA)

Certification Issues in Organic Agriculture in Africa

Organic certifications started as a voluntary exercise by farmers in organic agriculture where members had voluntary inspections from colleagues using generally accepted standards. Currently, a third-party certification is been used which is formal and much more complex too. Even though organic certification began as a voluntary exercise, it has now become compulsory and is required for any kind of an "organic" claim on a product label by many governments. In Africa, the situation is a bit complex such that is a bit difficult to monitor. Certified Organics are in two forms: large scale and small farmer holder. The smaller scale farmer holders are the majority and their operations are difficult to monitor taking into consideration their numbers coupled with a "weak and struggling certifying bodies" who are not assisted by governments in many of the African countries. The inefficiencies in the regulatory bodies allow a lot of farmers to exploit the system and keep using the term "organic" on their products in order to get premium price for their produce.

Certification Bodies in Africa

Below are names of the list of certifying bodies operating in different countries in Africa.

Africert Ltd
AFRISCO
AGRIOR Ltd
Associazione Suolo e Salute
BCS Ethiopia
BCS Öko-Garantie GmbH
BCS Tunisie
BDOCA
CERES
Certisys
COAE Center for Organic Agriculture in Egypt
Control Union Certifications
Demeter-International e.V.
Ecocert
Egyptian Center of Organic Agriculture (EOA)
EnCert Ltd
ICEA



IMC Tunisie
IMO Institute for Marketecology
Institute for Marketecology
Istituto Mediterraneo di Certificazione (IMC)
Naturland-Verband
Qualité-France SA
SGS South Africa (PTY) Ltd
Soil Association Certification Ltd
TanCert
Uganda Organic Certification Ltd (UgoCert) (IFOAM, 2009e).

Some National Policies of Organic Agriculture

National policies for organic agriculture development will always have multiple objectives and these objectives according to Scialabba (2000) may include income generation, food self-reliance, natural resources conservation, and rural development etc. These objectives however may have different levels of emphasis depending on the country. Below are some examples of national organic agricultural policies in some African countries

The Rwandan Agriculture Policy

Rwanda has developed Strategic Plan for Agricultural Transformation and this plan emphasize on intensification, regionalization, professionalization, and Commercialization of agriculture (Rundgren, 2008). Although the Fertilizer Policy encouraged farmers on the use of chemical fertilizers but the policy document contains recommendations for organic fertilizer use. The Seed policy also recommended organic seeds to farmers. Soil Conservation and terracing are also promoted in the Rwandan agricultural policy document. The Rwandan agricultural policies are not pro-organic per se, but recommend organic practices to play an important role in attaining a sustainable form of agriculture alongside the conventional agriculture (Rundgren, 2008).

Tunisia's National Policy to Comply with EU Organic Agriculture Regulation.

The proximity of potential organic EU market has motivated national organic policy from the Government of Tunisia. This explains why Tunisia is the only country in Africa to have fully implemented her regulation of organic agriculture (Hube et al 2011). Farmers are being encouraged to convert to organic production. Measures to comply with EU Regulation a National Commission for Organic Agriculture were established in Tunisia to help stimulate the organic sector in 1999 According to Scialabba, (2000), there is a budget allocation for organic agriculture and subsidies of about 30 % of investments in organic agriculture by farmers and to cover 70 % over five year's costs of certification. BIOCERT Tunisia a certification body was created to take care of certification issue in Tunisia. The scarcity of organic fertilizer has prompted the research on how to turn organic waste into organic fertilizers. A Technical Centre was also established solely for professional training and research in organic agriculture (Scialabba, 2000).

Egypt's Policy on Pesticides Use

The Organic Agriculture movement was established in Egypt to help solve the threats posed by pesticide poisoning. Cotton is a pesticide intensive crop with an 18 percent of chemical plant protection active ingredients used globally. The Egyptian average yield of raw cotton for the past 20 years remained constant despite the increase of pesticides being used. The application of biodynamic methods in cotton production in the early 1990s was the reasons for the success made in cotton pest control by using pheromones. This feat raised the Egyptian government's interest in biological control. Recently, about 80 % of cotton production in Egypt's uses biological methods of control whilst making synthetic pesticides use forbidden. The Centre for organic agriculture in Egypt is the certifying body to ensure compliance with the EU Regulation 2092/91 (Scialabba, 2000).

Kenya's Policy on Food Self-Sufficiency

The Ministry of Foreign Affairs of Netherlands and the Institute of Organic Farming of Kenya did a four year research to look at the prospects of organic agriculture in Kenya and East Africa as a whole. Contrarily to the perception that organic agriculture in the tropics is constrained by the insufficient organic material (Scialabba, 2000), the research found a good and working organic systems. Organic agriculture systems out-performed conventional systems in maize in many aspects of the research. For example, there was minimal storage attack of weevil in organically grown maize than its conventional counterparts.

The opportunities available to women in organic agriculture are very appealing gives the opportunity of securing the family's food without thinking of cash or engaging in very dangerous activities which will have any negative effect on their health.



FEEDING AFRICA THROUGH ORGANIC AGRICULTURE

Organic Agriculture and Food Sustainability in Africa

Food security and sufficiency is a topic of great national concern in many countries of the developing world. Despite efforts and pledges being made every now and then from donor countries and organizations, the number of people suffering from hunger in Africa keeps increasing by the years (Borron, 2006). Producing enough to feed the ever increasing population in the coming years, while at the same time fighting poverty, hunger and malnutrition, is a big challenge facing African agriculture and it becomes more challenging considering the risks adverse climate variability in Africa (Garrity et al, 2010). To solve this problem, there will be a need to adopt a system that will be economically viable, environmentally friendly, socially acceptable and appropriate to needs of the local people (Boon et al, 2010). organic agriculture has proved to be that system which can alleviate the plight of these suffering nations in Africa.

Production Issues in Organic Agriculture in Africa

Pest and Disease Control

Crop protection in organic agriculture is not to control a particular disease or pests but at managing the crop's environment to be able to withstand attacks of these pests (Ariena et al, 2003). A sustainable approach to these pest and disease management of organic agriculture in Africa therefore cannot be found in pesticides, but in an integrated pest management approach which involves a combination of natural enemies, crop rotation and diversification, biological and mechanical control (UNEP, 2010). Farmers also use natural pesticides that are easy to prepare and apply, effective under local conditions and safe to handle. These pest management approaches or natural pesticide use should have no or minimal negative effect on the environment and other living organisms within the environment.

Weed Management

The use of rotational cropping is not only to control weed but also to reduce the incidence of pests and diseases in organic farming (Watson et al, 2002). Organic farmers therefore do not aim at eliminating all weeds, but rather they try to keep populations of weeds around the fields at controllable levels. Organic weed management excludes the use of synthetic herbicides but instead; rely on prudent tillage and cultivation practices for weed suppression (Liebman et al, 2002). Organic farmers enhance crop growth to increase its ability to stampede the weeds. In Africa most farmers control weed mechanically by hoeing, harrowing or flaming a practice described by Barberi (2002) as ineffective for both short and long term. This reason explains the reason of weed problems and low yields in most farming systems of in-official organic agriculture in Africa.

Soil Fertility Issues

Nutrient management in organically managed soils is different to non-organic soils (Stockdale, 2002). In conventional agriculture soils, often application of a soluble fertilizer is being used for soil fertility but organic agriculture systems, in contrast, relies on longer term solutions at the systems level (Watson et al, 2002) which are environmentally friendly. For example the use of organic manures or locally prepared fertilizers by farmers in Africa is the most cost effective and environmentally friendly way of improving soil fertility. Organic fertilizers can be made from composting organic matter or by the preparation of liquid organic fertilizers (compost tea) from sappy leaves. Below is a simple procedure used in preparing organic fertilizers.

A 3 step procedure for preparing liquid fertilizer

Step 1: Collect and chop green sappy leaves into pieces

Step 2: Immerse the chopped leaves in drum of fresh water and cover it. Stir every three days for 15 days.

Step 3: Sieve the mixture after 15 days and dilute it with two parts water and it is ready for use.

Animal Welfare Issues

According to Lund (2006) animal welfare concept in organic agriculture is understood in terms of natural living, which consist of the animal performing all natural activities, getting feed adapted to its physiology and living in an environment similar to the biotope which the animal is evolutionary adapted to. On that basis animal welfare in organic agriculture can be said to be better in Africa than those in developed countries as most animals are kept either on free range or semi-intensive system which allows them to perform all the activities mentioned by Lund (2006). Although animals on such systems may have a lot of freedom to move about, keeping animals on such systems too comes with its own challenges.

Advantages Organic Agriculture in Africa

Higher Yield

Conversion to organic agriculture has different effects on yield according to the geographical location and the amount of impute being used on the land earlier. In developing (less industrialized) countries organic agriculture gives equal or higher yields than conventional systems (Scialabba, 2010; Reddy, 2010) making it a better option for such countries. Africa is an example of a less industrialized world where the use of in-organic imputes are very minimal and therefore in



converting from conventional agriculture to organic agriculture using agro-ecological systems will give better yield, a fact highlighted also by (Halberg et al, 2006).

Use of Less Energy

Research has shown that, on average, organic systems use less energy than their Conventional farming system (Morgera et al, 2012). Some crops can even use less energy when they are grown organically. In the face of the current world energy crisis, it will be very advantageous for Africa to switch totally to organic agriculture and save some amount of energy (which is already scarce supply in Africa) for other sectors of the economy.

Minimal Effect in Greenhouse Gas (GHG) Emissions

Conventional agriculture has been identified to be a major contributor to the current global warming as a result of the emission of methane (CH₄) Nitrous Oxide (N₂O) and Carbon Di-oxide (CO₂). According Kotschi et al, (2004) agriculture represented for 15% of the global GHG emission in 1991. Organic agriculture however is popularly known to be a farming system without the use of chemicals (Troedson, 1991) and hence will save the environment from such catastrophe. Conventional agriculture uses large amounts of synthetic nutrients which enhances rapid development but shallow roots. Meanwhile organic agriculture system enhances soil fertility which in turn encourages crops to develop deeper roots, which also give rise to higher organic matter in the soil, increasing the Carbon sequestration in the soil (Borron, 2006) thereby reducing the green house gas effects in the atmosphere.

Drought and Flood Resistant Crops

The healthy soil structure derived in organic agriculture system helps to avoid problems associated soil degradation, which is imminent in conventional systems. Organic fertilizers (manures) are applied prior to sowing season to aid in fixing minerals in the soil. The mineralized component (which is not found in chemical fertilizers) is one of the most important ingredients that aid organic agriculture soils to capture and store more water than soils of conventional systems (Muller, 2009; Letter et al, 2003; Morgera et al, 2012). A research on climate variability in the US showed that, as a result of the improved soil structure, organic agriculture systems give greater and better yields in both severe drought and flooding periods and this will be a major advantage to farmers in Africa who are constantly face with climatic uncertainties.

Positive Impact Ecosystem

The current intensification and expansion of conventional agriculture is a major threat to global biodiversity (Hole, 2005). However organic agriculture systems actively use agro-ecological systems which encourage biodiversity which also as a result help maintain soil health and fertility. Organic agriculture systems are designed to take into consideration a balance in the natural ecosystems which will therefore present a less negative impact on the entire ecosystem in Africa.

High Nutrient Food Produced

Crops grown organically contained higher levels of essential nutrients than their conventionally grown counterparts. The organic crops also contained lower levels of nitrates, which can be toxic to the body. Research has shown that organic farming products are more nutritious and contains higher levels of dry mass. Africa is one of the continents with a higher percentage of the population (especially children) suffering from malnutrition. For example, according to van Veluv (2006) about 40% of children in northern Ghana are suffering malnutrition. A large scale adoption of organic agriculture will therefore help provide foods which are more nutritious to help curb the incidence of malnutrition in children.

National Challenges Facing Organic Agriculture in Africa

The development of organic agriculture in Africa like any aspect of economic development is riddled with a lot of challenges. These challenges vary from nation to nation but some are common for most of the Africa nations. Some typical national challenges faced by the organic agriculture sector in Africa are elaborated below:

Lack of National Organic Policies or Strategies

Governments of most African countries do not have any policies for organic agriculture development although there are few governments with national organic agriculture policies. Many governmental departments (i.e. Health Agriculture, Education, Tourism, Environment, Trade, Commerce and Finance etc) have a part to play in formulating national organic agriculture policies. In so doing they will be able cooperate to support the development of mainstream agricultural policies which also in the national level contribute to the government objectives.

No/ Low Research, Education and Training in Organic Agriculture in Africa

There is low or no interest in organic research in Africa. Most research conducted at concentrates on non-organic solutions to agricultural problems which are not what Africa needed. The ever rising demand from producers of organic products may push research institutions into organic research. Even though, there has been some integration of organic modules into mainstream agricultural education and training, dedicated organic courses are still lacking in those modules.



High Cost of Organic Certification

The cost involved in getting certification for an organic product is very high for many poor farmers in Africa. Most African producers do not have that large amount of produce to justify the high cost of certification. Majority of farmers in Africa are into small-scale production with an average cultivated area of less than a hectare making it less profitable and difficult to be certified and be able to renew the certification on yearly basis whilst remaining in business. Local certifying bodies should be given the necessary assistance so as to help cut down the cost of certification to an affordable level for farmers. Most African producers use the Participatory Guarantee Systems, which are a form of certification for the local markets and these systems are based on a system of trust between consumers and producers.

High Illiteracy Rate

The illiteracy rate of people in Africa is very high compared to other regions of the world. There is also a perception in Africa that farming business is for people couldn't make it to school and as result majority of educated people will be in the cities looking for white color jobs that do not exist. Farming is therefore left to the uneducated making transfer of formal knowledge very difficult. Any research findings will be very difficult to be communicated to farmers in Africa as compared to their counterparts in the developed world who can read and write.

Cost and Un- Availability of Inputs

The cost of organic fertilizers is also another challenge facing organic farmers in Africa. Small scale organic producers are able to prepare their own fertilizers from organic waste. Meanwhile the availability and the cost of large volumes of organic fertilizers for large scale organic farmers is a major challenge. There have been some efforts by governments of some African countries like Ghana and Tunisia (Scialabba, 2000) on researching on large scale local production of organic fertilizers for farmers.

Under Developed Local and Regional Markets

The local and regional markets for organic Agriculture in Africa are under developed. Farmers therefore produce for the international market which also does not favor the small scale producers. Meanwhile the majority of producers in Africa are the small-scale farmers. A well developed local and regional market will be in the good interest of the majority of the local producers especially the small-scale holder farmers.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The development and spread of organic agriculture coupled with the demand of organically produced food products globally is increasing at a very fast pace and statistics from research findings attested to the storey. Literature has shown that organic agriculture is the best option for farmers from developing worlds like Africa despite critics seeing that as an ideological nonsense of some few rich consumers of the west. Even though the advantage of organic agriculture over conventional agriculture has been found to be enormous, many production challenges coupled with lack of governments' interest in organic agriculture hampers widespread adoption in Africa. Until these challenges are addressed by governments of African countries, organic agriculture may not be the answer to Africa's food crises despite its being the best option.

Recommendations

The report seeks to make four (4) recommendations for African governments in adopting organic agriculture;

1. There should be harmonization and cooperation among member countries in developing organic agriculture in Africa.
2. Governments of African countries should formulate a national policy direction in the development of organic agriculture which will incorporate organic agriculture into mainstream agriculture planning.
3. More research should be done to find best and innovative scientific approach to organic agriculture that will best fit for Africa.
4. Finally, there should be efforts by African countries in developing the local and regional organic agricultural markets.

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