Organic agricultural research in Africa: An overview

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How do we reduce hunger and poverty?

International Assessment of Agricultural Knowledge, Science and Technology for Development

The IAASTD Report for Sub-Saharan Africa states (IAASTD, 2008a, p.19 [www.agassessment.org]):

Strategies of rapid agricultural development need to be coordinated more directly with strategies for biodiversity and water conservation such as retaining areas of natural vegetation in production areas, keeping areas where pollinators can thrive, promoting organic agriculture, incorporating trees in agricultural landscape.
Africa needs Food sovereignty:

“Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It ensures that the rights to use and manage lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food.”

—Declaration of the Forum for Food Sovereignty, Nyeleni, February 2007
Comparison of Alliance for a Green Revolution in Agriculture Millennium Villages Project (AGRA-MVP) with the Export Programme for Organic Products from Africa (EPOPA). Extracted from Organic Agriculture: African experiences in resilience and sustainability.
African Organic Research

- NOARA
- FiBL/icipe/KIOF/KALRO/TSBF/Univ
- West Africa/Ghana/Nigeria/Mali
- South African Centre of Excellence (FS)
- NMMU Comparative Trials
- African Organic Farming Systems project (Zambia, Uganda, South Africa)
<table>
<thead>
<tr>
<th>Name of Project, Objectives, Year started, countries</th>
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| Farming Systems Comparison in the Tropics (SYSCOM) www.systems-comparison.fibl.org/ aims to generate solid comparative agronomic and socio-economic data on organic and conventional agricultural production systems at on-station and on-farm levels in the tropics. In Kenya the project started in 2007, with funding support from the Swiss and Liechtenstein Governments; Swiss Coop Sustainability Fund, and Biovision Foundation | • Institute of Insect Physiology and Ecology (icipe)  
• Kenya Agricultural and Livestock Research Organisation (KALRO)  
• Kenyatta University  
• Tropical Soil Biology and Fertility (TSBF) Institute of CIAT (TSBF-CIAT)  
• Kenya Institute of Organic Farming (KIOF)  
• Kenya Organic Agriculture Network (KOAN) |
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| Syprobio – improving farmers income and food security in organic production systems in Africa Website: [www.syprobio.net](http://www.syprobio.net) | • Helvetas  
• National Centre Régional de Recherche Agronomique (CRRA), Mali  
• Institut de l’Environnement et de Recherches Agricoles (INERA), Burkina Faso  
• Institut National des Recherches Agricoles du Bénin (INRAB)  
• Mobiom (Mali), UNPCB (Burkina Faso) and Uavigrev (Benin) (all three are farmer organizations) |
<p>| Project Objectives: Develop and implement organic production innovations that allow the 2 million cotton farmers to improve their income and food security in a context of climate change. Based on the existing organic cotton value chain. Prove that organic cotton systems work through the generation of specific research projects. Started 2011-2015 in Mali, Burkina Faso and Benin, with funding from EuropeAid |</p>
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• Kenya  
  o Kenya Agricultural and Livestock Research Organisation (KALRO)  
  o Institute of Insect Physiology and Ecology (icipe)  
  o Kenya Ministry of Agriculture, Livestock and Fisheries (MALF)  
  o KOAN & KIOF, Organic Agriculture Centre of Kenya (OACK), Participatory Ecological Land Use Management (PELUM Kenya), Macadamiafans Company Ltd.  
• Ghana  
  o University of Ghana, Department of Agricultural Economics and Agribusiness, College of College of Basic and Applied Sciences  
  o Agro-Eco Louis Bolk Institute (LBI)  
  o Directorate of Crop Services, Ghana Ministry of Food and Agriculture (MOFA)  
  o Ghana Organic Network (GOAN) and Ghana COCOBOD  
  o Forum for Agriculture Research in Africa (FARA)  
  o International Institute of Tropical Agriculture (IITA)  
  o Biovision Africa Trust (BVAT); African Organic Network (AfrONet)  
  o Forum for Agriculture Research in Africa (FARA)  
  o International Institute of Tropical Agriculture (IITA) |
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| Farmer-driven organic resource management to build soil fertility; [www.orm4soil.net](http://www.orm4soil.net) Understand why farmers are not investing more in soil fertility and then build up innovation systems based on agroforestry and other organic matter enhancing technologies. Research for Development. Started 2015-2020 in Ghana, Kenya, Mali and Zambia: With funding support from the Swiss National Science Foundation | • University of Ghana, Ghana  
• Centre Régional de Recherche Agronomique, Mali (IER)  
• Kenya Agricultural and Livestock Research Organisation (KALRO)  
• University of Zambia (UNZA) |
## Name of Project, Objectives, Year started, countries

Insect-based feed and fertilizer production via waste-transformation for small-holders in Ghana. Using insect larvae (*Hermetia illucens*) as additional decomposers in composting processes to address the problems of waste management, low soil fertility and limited availability of fish feed in Accra. Started: 2013 – 2016 in Ghana, with funding support from the Swiss National Foundation of Science, (SNSF)

## Partners to FiBL (implementing partners, National Project Advisory and/or Steering Committee members)

- University of Ghana, Legon Accra
- Biotechnology & Nuclear Agricultural Research Institute, (BNARI), Accra
- Centre for Scientific and Industrial Research, Water Research Institute, (WRI-CSIR)
- University of Cape Coast, Cape Coast
Formulating an organic farming policy and promoting it as a highly sustainable approach to food production in that it:
- seeks to enhance soil fertility and diversity at all levels and make soils less susceptible to erosion,
- offers a very high mitigation potential in particular regarding N and N2O due to a highly efficient recycling of manures from livestock and crop residues by composting as well as the use of leguminous crops to deliver additional nitrogen, and
- achieves high C sequestration in soils through the use of green and animal manure, soil fertility-conserving crop rotations with intercropping and cover cropping, as well as by using composting techniques.
Centre of Excellence for Food Security

- Kos en Fynbos food gardens
- School gardens, community gardens & food security (Livhuwani Malaba, E Cape & George)
- Studies of AgriParks (Eastern Cape & Limpopo)
- Development of George Urban AgriPark
- Work on nutrition and farming (Africa-wide)
- Paper w Prof Korsten UP on Organic Regulation
- Work with SANAS & SABS on certification
- Eden (& SA) Participatory Guarantee Systems
DST-NRF Centre of Excellence in Food
The South African Situation

Food security situation 2012

- Starvation/famine
- Acute hunger
- Chronic hunger
- Sub-adequate intake
- Adequate intake but worry about future supply
- Adequate intake with sustainable future supply of food

Food insecure | Vulnerable | Secure

12.6% | 8.9% | 21.5%

(Hendriks 2011 with data from Stats SA, 2013)
DST-NRF Centre of Excellence in Food Security

- **Food Creation**
  - Production, processing & preservation

- **Food Distribution**
  - Markets, livelihoods & value chains

- **Food Consumption**
  - Health, nutrition, choice & behaviour

- **Food Governance**
  - Safety, standards, policy & rights

- **Food Contestation**
  - Gender, identity, values & ethics
South Africa does not have a sustainable food system to realise food security & nutrition for the poor.
Collaborative Centre for Regenerative Agriculture

**Teaching:**
- Dip. AgMan.
- B Tech & Hons
- Post-graduates
- PGCE Agriculture Teachers

**Commercial AgriPark**
- Produce & process vegetables near sewage plant; use sewage form energy & compost; buy vegetables from local farmers; distribute to schools

**Basic Research:**
- Long-term Comparative Organic trials

**Farmer Outreach and Training for Food Security**
- Gardens: Kos en Fynbos movement
- Commercial Farmers
- Sustainable Agriculture Study Group

**Applied Research:**
- Uganda/Tanzania success Zambia progress South Africa

**NRF-RTF through DAFF**

Rainman Landcare Foundation

George & Eden Municipalities Centre of Excellence in Food Security (NRF); CSIR? DAFF? W Cape Dept Agric?
How did Uganda get 1.2 million farmers going with organic production and markets?

How did Zambia support 100,000 small scale organic farmers, and how do they farm?

What are the barriers to market access in SA?

How are soil organic matter and water use efficiency connected, and how do we improve?

How do we improve food quality/ availability?

What can schools do to improve food security?

Does organic farming work economically?
### Overview of post-graduate students in organic programme

<table>
<thead>
<tr>
<th>Topic</th>
<th>Degree</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market access small farmers - SA</td>
<td>M Tech</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Soil Organic Matter testing - SA</td>
<td>M Tech</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>School gardens &amp; food security - SA</td>
<td>M Tech</td>
<td>2015</td>
<td>2016</td>
</tr>
<tr>
<td>Biological pest/diseases – Trials SA</td>
<td>M Tech</td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>How Zambia Markets Organics</td>
<td>Doctorate</td>
<td>2015</td>
<td>2017</td>
</tr>
<tr>
<td>Zambian Organic Crop Production</td>
<td>Doctorate</td>
<td>2015</td>
<td>2017</td>
</tr>
<tr>
<td>Food Quality Comparisons – Trials SA</td>
<td>Doctorate</td>
<td>2016</td>
<td>2018</td>
</tr>
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</table>
Identified five critical barriers to market access:

- transport and distance to markets
- product quality
- product quantity
- the relationship between the seller and buyer
- barriers to market entry due to a lack of, or inaccurate market information.

If you remove the risks of marketing, you help the risk-averse producer to produce; Wim managed to stimulate production by being there every Thursday to buy everything that the farmers could produce.
Jane Nalunga: NOGAMU

- Organic agriculture in Uganda has been developing quite fast.
- Certified organic agriculture started in 1993.
- Uganda has the biggest share of certified organic land in Africa and the largest number of certified organic producers.
Current status

- Total Certified land 231,157 ha
- Over 205,000 smallholders certified
- Increasing exports to EU (2013 $42 mill – coffee, cotton, bananas, pineapples, vanilla, cashews, shea-butter)
- Developing local market

NMMU Research Project 1 (NRF)
Major Driving Factors contd.

- **Suitability and compatibility** to smallholder farming systems
  - Closer to and uses traditional farming practices
  - Relatively low risk, given production and resource constraints
  - Low market entry barriers for African smallholder farmers compared to conventional fruits and vegetable exports
Example 1: Water harvesting; Soil bunds with stabilizer grass
Example 2: Soil conservation; Mulched banana plantation
Example 3: Biodiversity, crop rotation, nitrogen fixation

Pineapples planted with jack beans (Canavalia ensiformis) as a cover crop
Draft Project Research Concept:
Development of Organic Agriculture in Zambia

Munshimbwe Chitalu, CEO OPPAZ
About Zambia

• Zambian Environment is pristine
• 75 million ha total land mass
  – 45 million ha - 60% natural forest
  – 1.5 million ha - 2% natural water bodies
  – 11.2 million ha - 15% cultivated
  – 17.2 million ha – Other users (Settlements, Range/Grazing)
• Population: 13 million
• Project 2: Governance & Markets
• Project 3: Agronomy

NMMU Research Projects 2 & 3 (NRF)
Countering factors

• Are the benefits real?
• Poor adoption due to poor technologies
  – Labour intensive, protocols for fertility, pest/disease management
• Poor Market access – Volume, Seasonality, Quality and Branding
• Inadequate policy provisions, lack of budgetary provisions
CROPPING SYSTEMS AND ORGANIC AGRICULTURAL DEVELOPMENT IN ZAMBIA

Presenter: Robert Munthali

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FORMS OF FARMING SYSTEMS IN ZAMBIA

Traditional and Conventional Farming Systems:
- Shifting Axe and Hoe Systems
- Semi-Permanent Hoe Systems
- Semi-Permanent Hoe and Ox Plough Farming Systems
- Fishing and Semi-permanent Hoe System
- Semi-Commercial Ox and Tractor Plough Systems
- Commercial System

Sustainable Farming Systems:
- Organic Agriculture
- Agroforestry
- Conservation Farming

NMMU RTF Research Project 3
Facts About Zambia and Agriculture

- Area: 752,614 Km²
- Population: 13,046,508 million
- Rural population: 68%
- Poverty levels: 64%
- HIV prevalence among adult population: 16%
- Climate: Tropical
- Rainfall: 1100 – 600mm
- Potential arable land: 42 million hectares (58%)
- Land under crop use: 1.5 – 2.0 million hectares per annum
- Cereal maize yield: 1.3-2.4 tonnes per hectare
- Percentage small-scale farmers in the country: 75%
- Contribution to national agricultural output by small-scale farmers: 80%
- Number of farmers practicing conservation farming by 1995: 35,000 farmers
- CFU and GART targeted increase CF farmers by from 120,000 to 240,000
- Farmers practicing Agroforestry under ICRISAT by 2005: 61,583 farmers
- Organic farmers by 2012: 40,000 farmers certified organic, and 100,000 farming organically.
First season ready for harvest, December 2014

Second season now harvesting, will replant third season September 2015
N’wa-Jama Mashele harvesting the first cow-pea crop at the Long-term Comparative Organic Farming Systems Research Trials on the Saasveld Campus of NMMU at George, W Cape. Water use efficiency study and biological pest control starting.