

Through *Perspective*, CIRAD provides the opportunity to explore new avenues for discussion and action based on research, without presenting an institutional position.

Organic agriculture in Africa: a source of innovation for agricultural development

Hubert DE BON - Ludovic TEMPLE - Éric MALÉZIEUX -
Pauline BENDJEBBAR - Ève FOUILLEUX - Pierre SILVIE

48

In Africa, official statistics contain little data on organic agriculture, even though its products are increasingly available on local and export markets. African consumer demand is growing, providing a dynamic economic opportunity. Today, there is no doubt that organic agriculture is making an important contribution to the agro-ecological transition process underway in Africa. It reduces the adverse environmental and health impacts of agriculture, particularly because it uses no synthetic chemical inputs. It improves the resilience of agricultural systems. Under certain conditions, its specific techniques can increase agricultural

productivity, even if its yields are on average lower than those in conventional agriculture. Organic systems are labour-intensive, and as such can be a source of employment for young people in rural areas. Some scientific studies and the initiatives undertaken by many local actors confirm the importance of organic agriculture in this continent. Agricultural research now needs to support its emergence, in a context in which very few studies have so far been conducted on this subject. To ensure these fledgling initiatives develop, research could also contribute to appropriate public policy making at different levels.

The African context

At the global level, organic agriculture covered 57.8 million hectares in 2016, including in-conversion areas, or almost 1.2% of cultivated farmland. For the African continent, certified organic agriculture covers 1.8 million hectares, or only 0.2% of cultivated land on the continent, according to statistics from IFOAM (International Federation of Organic Agriculture Movements) and FiBL (Research Institute of Organic Agriculture).

In African countries, the development of organic agriculture often raises the issue of ensuring food security for a rapidly growing population. However, little data is currently collected. Scientific and technical studies on organic agriculture are uncommon in Africa, as are development projects, and are often led by groups managed by specialised institutions.

In these countries, organic agriculture is generally recognised under its certified form for export. Directly organised by importers and experts rather than by farmers themselves, it responds to demand for tropical organic products in the developed countries. Traditionally, African governments have paid little attention to this sector, and the same is true of most development programmes. Indeed, agricultural policies in Africa are generally still marked by the pursuit of a production-oriented pathway, supported by agribusinesses, private foundations and most international organisations. The few projects that have sought to develop organic agriculture in Africa have done so with a view to exporting. Consequently, there is still too little recognition of its potential for agricultural development and for feeding local populations.

Most research institutions also fail to acknowledge organic agriculture as a potential lever for agricultural

development. This is partly due to controversies specific to the industrialised countries, which are directly transferred to Africa, despite the fact that the problems are different, whether agricultural, environmental, economic or social. These controversies concern the yields observed, which are on average lower than in conventional agriculture, meaning more space would need to be allocated to organic agriculture and its products would be sold at a higher price. They also relate to access to products in all social categories, to the higher production costs involved (a larger workforce), and to third-party certification.

However, the characteristics of organic agriculture make it a mode of production that is potentially suited to African agriculture, which is typically family-based with a low level of mechanisation, small-scale, labour-intensive and diversified (a variety of cultivated plants), using local resources and satisfying different needs (feeding the family, generating income). Scientific studies highlight the advantages of organic agriculture in the African context: fewer health risks for producers and consumers, better protection of natural resources, a more resilient environment, increased and enhanced agricultural diversity, higher income for farming families, and more secure outlets. Health risks are a serious concern in Africa: this is the case for fruit and vegetables consumed in cities, which contain pesticide levels that are often far higher than the maximum residue levels. Pesticides are sometimes used in excess or for the wrong reasons, and some are even unauthorised or expired. Finally, at the economic and social level, organic agriculture is labour-intensive (manual weeding, composting), which seems conducive to its development in countries with a large agricultural workforce.

The diversity of organic agriculture in Africa

In Africa, the current development of markets for organic products is a response to growing social demand, generally from increasingly well-informed urban consumers looking for healthy food. These consumers find themselves faced with a growing range of products with an ever increasing list of alleged "health" benefits.

In four countries (Benin, Burkina Faso, Cameroon, Senegal), the ABASS project [see box p. 4] has analysed the different types of agriculture that resemble organic agriculture. In association with the term agriculture, seven qualifiers have thus been listed by a panel of actors in this field: agro-ecological, certified organic, non-certified organic, sustainable, ecological, natural, and healthy. The actors identified all shared the desire to draw on local knowledge and to end the use of synthetic chemical inputs, especially pesticides and fertilisers.

Some of these types of agriculture are consistent with European organic agriculture standards, while others are less so. The level of detail in their technical

recommendations varies, especially regarding the use of synthetic chemical fertilisers (urea, NPK fertilisers), systematic organic fertilisation (compost, manure), the use of local seeds, the association between agriculture and livestock farming, animal well-being, and organic pest control (insects, diseases, etc.) with natural plant- or mineral-based substances. They also vary in the way they present local specificity, the importance given to the development of traditional knowledge, the sales channels used (in the field, on stalls, basket deliveries, specific shops, organic markets, supermarkets) and the consumers targeted (foreign expatriates, African middle-class, consumers with lower purchasing power). Finally, they differ in terms of the political vision supported by their promoters, which ranges between local organic agriculture with autonomous practices (local inputs, local participatory certification) and regulated organic agriculture (imported organic inputs, third-party certification).

Lower average yields but similar variability

At the global level, a yield analysis published in 2017 shows that yields in organic agriculture are on average lower than those in conventional agriculture, in the order of 10 to 32% for fruit and vegetables. But in some cases, they may be up to 50% higher, suggesting that productive organic agriculture is achievable. This global analysis also shows that organic agriculture does not increase yield variability: this is very important for producers, especially in Africa, for whom risk aversion is a decisive factor. Thus, despite lower average productivity, organic agriculture has many advantages: an increase in the resilience and stability of agricultural systems due to the diversity of species and varieties used; lower dependence on external inputs; and, above all, its proven environmental, health and social benefits.

In conventional agriculture, chemical pesticides and genetically modified crops contribute to simplifying work or to obtaining high yields; since these inputs are prohibited in organic agriculture, specific practices need to be developed. Phytosanitary constraints are a major technical challenge that calls for further research, especially for vegetable crops, which are very sensitive to insect pests and diseases.

The institutional aspects of organic agriculture in Africa

In the European countries, citizen recognition of organic agriculture emerged in the 1960s. In the 1970s and 1980s, private standards were created, then specific public policies were defined. In 1992, the European Union created a regulation for the European market – standard, label, monitoring mechanism (third-party certification, accreditation of third-party certifier).

On the African continent, despite the preservation in some regions of traditional farming systems without

chemical inputs, the development of organic agriculture is more recent. Its institutionalisation is still fragile, in spite of the progressive structuring of networks and specialised organisations at the national, regional and continental levels (see box p. 2). An East African organic agriculture standard exists, but is still seldom used by actors; most often, the standards applied are those of the importing countries (Europe, United States, Japan, etc.). In Uganda and Tanzania, for example, organic agriculture has developed on a large scale with many small

producers for export crops (coffee, cotton, tropical fruit, and fresh and processed vegetables), without government support.

Compliance with the standards of importing countries and the application of third-party certification are a guarantee of access to international markets for African organic products. However, third-party certification is costly, with producers paying certifiers for their monitoring services, and has administrative demands that make it inapplicable at the individual level for small African producers. This is why group certification processes exist, in which certificates belong to exporters or importers, rather than directly to producers, who are thus locked into a situation of high dependency.

To overcome the disadvantages of third-party certification, new systems are emerging, including participatory guarantee systems. These are designed to take better account of local conditions and to give producers greater autonomy. Advocated at the international level by IFOAM, they have been set up in Latin America, India and also in Africa. Participatory guarantee systems are organised by local groups of producers, consumers and other stakeholders. All of these actors develop and negotiate standards defining agricultural practices for organic agriculture according to local conditions, as well as monitoring procedures. These systems are aimed at enabling farmers to play a greater part in certification and to strengthen their position within the sector.

For public agricultural research, investment in organic agriculture can legitimately contribute to the goal of developing African agriculture for national and regional markets. To ensure all of the dimensions of organic agriculture are addressed, evaluation methods need to look at more than just the production criteria (the quantity harvested) and the short term; they must refer to the production of all ecosystem services, taking into account mixed crop-livestock farming associations, diversification at the territorial level and the needs of the territorial actors concerned. Innovative methods are required in order to analyse performances, to better integrate the impact of changes at broader scales and to aggregate data from different scientific disciplines. Agricultural research will thus point to technical and organisational implications specific to organic agriculture, and will enable its sectors to better position themselves in relation to conventional sectors.

To acknowledge and develop organic agriculture, national and regional public policies are needed. These policies must involve all actors concerned with agricultural production, whether public (national, local) or private, with the support of international development organisations. Finally, it is essential to articulate these policies with initiatives taken at the territorial level, according to processes targeting both adaptation to local conditions and monitoring of dynamics by the actors in these territories. ■

Organic agriculture organisations in Africa

The East African Community (www.eac.int/, Burundi, Kenya, Rwanda, South Sudan, Tanzania, Uganda) is the seat of a number of organic agriculture movements derived from the generic name "National Organic Agricultural Movement" (NOAM): the National Organic Agricultural Movement of Uganda (NOGAMU, since 2001, <http://nogamu.org.ug/>), the Kenya Organic Agriculture Network (KOAN, since 2005, www.koan.co.ke/), the Tanzania Organic Agriculture Movement (TOAM, since 2005, www.kilimohai.org/), the Rwanda Organic Agriculture Movement (ROAM, since 2007), and the Burundi Organic Agricultural Movement (BOAM, since 2011, <http://boam.bi/>).

In West Africa, examples include the Burkina Faso National Organic Agriculture Council (CNABio, www.cnabio.net/, since 2011) the Senegal National Organic Agriculture Federation (FENAB, since 2008, <http://fenab.org/>), the Benin Platform for Organic and Ecological Agriculture (PABE, since 2014, <https://blogboan.wordpress.com/tag/pabe-benin/>), and the Association for the Promotion of Organic Agriculture in Cameroon (ASPABIC, since 1997).

Movements also exist in Zambia, Nigeria and Namibia.

At the initiative of a number of East African movements, with the support of the Swiss Agency for Development and Cooperation, the idea of a continental African network emerged in 2008. AfrONet (African Organic Network, <http://afronet.bio/>) was thus created in 2014 as an international non-governmental organisation registered in Tanzania. AfrONet encourages and promotes ecological organic agriculture (EOA) on the continent.

These movements come together to organise conferences on organic agriculture. During the 3rd African Organic Conference in Lagos, Nigeria, from 5 to 9 October 2015, the 220 participants signed a declaration on the development of organic agriculture: "*The Lagos Declaration on Achieving Social and Economic Development through Ecological and Organic Agricultural Alternatives*". These regular conferences show that the African movements are becoming increasingly structured and recognised by the institutions. This is seen in the presence of delegations from many countries and institutional representatives – ministries of agriculture, the Forum for Agricultural Research in Africa (FARA, <http://fr.faraafrica.org/>), and the New Partnership for Africa's Development (NEPAD, www.nepad.org/fr). The 4th African Organic Conference is organised from 5 to 8 November 2018 in Dakar, Senegal.

The International Federation of Organic Agriculture Movements updates a world map of its affiliate organisations: Directory of Affiliates, <https://directory.ifoam.bio/affiliates/map>.

Perspective n°48 is based on studies by CIRAD conducted in partnership. Among these studies, two projects concern organic agriculture in Africa:

> the ABASS project (Diversity of organic farming in sub-Saharan Africa and contribution to food security, <https://ur-hortsys.cirad.fr/en/projets-de-recherche/l-agriculture-biologique-en-afrique-sub-saharienne-abass,2015-2018>) under the GloFoods meta-programme (Transitions to global food security, www.glofoods.inra.fr/en) conducted jointly by INRA (French National Institute for Agricultural Research, France, www.inra.fr/en) and CIRAD. In particular, this project organised a workshop per country, in Benin, Burkina Faso, Cameroon and Senegal, with actors from the sectors that identified as belonging to organic agriculture;

> the PROIntensAfrica multi-partner consortium comprised of 23 European and African partners (Pathways to sustainable intensification of the agri-food system in Africa, www.intensafrica.org/, 2015-2017, Horizon 2020 project, European Union research and innovation programme, convention n° 652671). This programme proposes an agenda for agricultural research and innovation based on a stronger partnership that includes organic agriculture.

This *Perspective* draws in particular on the following publications:

Andriamampianina L., Temple L., de Bon H., Malézieux É., Makowski D., 2018. Évaluation pluri-critères de l'agriculture biologique en Afrique subsaharienne par élicitation probabiliste des connaissances d'experts. *Cahiers Agricultures* 27 (4): 45002. <https://doi.org/10.1051/cagri/2018030>.

Bendjebbar P., 2018. La trajectoire d'institutionnalisation de l'agriculture biologique en Ouganda, *success-story* de l'Afrique subsaharienne. *Cahiers Agricultures* 27 (4): 45003. <http://doi.org/10.1051/cagri/2018029>.

Boni Y., Silvie P., Assogba Komlan F., Mensah A., Alabi T., Verheggen F., Francis F., 2017. Plantes pesticides et protection des cultures maraîchères en Afrique de l'Ouest (bibliographic summary). *Biotechnologie, Agronomie, Société et Environnement* 21 (4): 288-304. www.pressesagro.be/base/index.php/base/article/view/2482.

Fouilleux É., Loconto A., 2017. Voluntary standards, certification and accreditation in the global organic agriculture field: a tripartite model of techno-politics. *Agriculture and Human Values* 34 (1): 1-14. <https://doi.org/10.1007/s10460-016-9686-3>.

Fouilleux É., Loconto A., 2017. Dans les coulisses des labels : régulation tripartite et marchés imbriqués. De l'eupéanisation à la globalisation de l'agriculture biologique. *Revue Française de Sociologie* 58 (3): 501-531. <https://doi.org/10.3917/rfs.583.0501>.

Lesur-Dumoulin C., Malézieux É., Ben-Ari T., Langlais C., Makowski D., 2017. Lower average yields but similar yield variability in organic versus conventional horticulture. A meta-analysis. *Agronomy for Sustainable Development* 37: 45. <https://doi.org/10.1007/s13593-017-0455-5>.

Temple L., Touzard J.-M., Kwa M., Boyer J., Requier-Desjardins D., 2015. Comparaison des trajectoires d'innovation pour la sécurisation alimentaire des pays du Sud. *Biotechnologie, Agronomie, Société et Environnement* 19 (1): 53-61. <https://popups.uliege.be/1780-4507/index.php?id=11824>.

Temple L., Fouilleux É., Malézieux É., Raffleau S., De Bon H., Silvie P., Vayssières J.-F., Affholder F., Montet D., Joly H., Fernandes P., Bendjebbar P., Le Gal P.-Y., Maraux F., 2015. Contributions de la recherche agronomique à l'agriculture biologique dans les pays du Sud : note de synthèse, groupe de travail agriculture biologique, Cirad, Montpellier. CIRAD, Montpellier, 13 p. <http://agritrop.cirad.fr/575696/>.

A few words about

Hubert De Bon is an agronomist at CIRAD in the HORTSYS research unit in Montpellier (Agro-ecological Functioning and Performances of Horticultural Systems, <https://ur-hortsys.cirad.fr/en>). His work focuses on vegetable crops and organic agriculture. hubert.de_bon@cirad.fr

Ludovic Temple is an economist with accreditation to supervise research at CIRAD in the INNOVATION joint research unit in Montpellier (Innovation and Development in Agriculture and Food, <https://umr-innovation.cirad.fr/en>). He works on innovation systems for ecological transitions in agriculture and food security. ludovic.temple@cirad.fr

Éric Malézieux is an agronomist and researcher at CIRAD, working on the functioning and design of agro-ecological horticultural systems and agroforestry systems. After heading the HORTSYS research unit (<https://ur-hortsys.cirad.fr/en>) for 10 years, he now focuses more specifically on the development of global agronomy. eric.malezieux@cirad.fr

Pauline Bendjebbar is a doctoral student in the LISIS joint research unit (Interdisciplinary Laboratory Sciences, Innovation, Society, <http://umr-lisis.fr/>) and at UPEM (University Paris-Est Marne-La-Vallée, France, www.u-pem.fr/). She is hosted by CIRAD in the MOISA joint research unit in Montpellier (Markets, Organisations, Institutions and Stakeholders' Strategies, <https://umr-moisa.cirad.fr/>). Her thesis is a comparison of organic agriculture in Uganda and Benin. p.bendjebbar@gmail.com

Eve Fouilleux is Director of Research at CNRS (National Centre for Scientific Research, France, www.cnrs.fr/index.html) in the LISIS joint research unit, and works at CIRAD in the MOISA joint research unit in Montpellier. She is a specialist in agricultural and food policies and focuses on regulatory mechanisms for organic agriculture and the controversies surrounding this sector. eve.fouilleux@cirad.fr

Pierre Silvie is an entomologist and research fellow at IRD (French National Research Institute for Sustainable Development, France, <http://en.ird.fr/ird.fr>), on secondment to CIRAD in the AIDA research unit in Montpellier (Agroecology and Sustainable Intensification of Annual Crops, <https://ur-aida.cirad.fr/>). He works on organic cotton and food crops and focuses on the analysis of plant health risks linked to invasive exotic arthropods. pierre.silvie@cirad.fr

A few links

IFOAM. Participatory Guarantee Systems (PGS). <https://www.ifoam.bio/fr/organic-policy-guarantee/participatory-guarantee-systems-pgs>.

Organic World. Global organic farming statistics and news. <https://www.organic-world.net/index.html>.

Examples of organisations conducting research on organic agriculture:


> FiBL, Forschungsinstitut für biologischen Landbau (Research Institute of Organic Agriculture, Europe). www.fibl.org/

> ICROFS, International Centre for Research in Organic Food Systems (Denmark). www.icrof.org/

> IFOAM, International Federation of Organic Agriculture Movements (Germany). <https://ifoam.bio/>

> Louis Bolk Institute (Netherlands). www.louisbolk.org/

> University of Natural Resources and Life Sciences (Austria). www.boku.ac.at/en/

 This article is provided under the terms of the Creative Commons License CC-BY 4.0: Attribution 4.0 International <https://creativecommons.org/licenses/by/4.0/>

To cite this document
De Bon H., Temple L., Malézieux É., Bendjebbar P., Fouilleux É., Silvie P., 2018. Organic agriculture in Africa: a source of innovation for agricultural development. CIRAD, Montpellier, *Perspective* 48. <https://doi.org/10.19182/agritrop/00036>



Publication Director: Michel Eddi, CIRAD President Managing Director
Editors: Patrick Caron, Office of the Director General in charge of Research and Strategy
Cécile Fovet-Rabot, Scientific and Technical Information Service
Translation: Anna Kiff
Graphic design: Delphine Lavastre-Guard, Communication Service
Distribution: Christiane Jacquet, Communication Service

www.cirad.fr/en/publications-ressources/edition/perspective-policy-brief
perspective ISSN-L 2275-9190 - Email: perspective@cirad.fr

