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Organic agriculture in post-war Uganda: emergence of pioneer-led niches between 1986 and 1993

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Abstract

Uganda is the largest producer of organic commodities in Africa. While most of the literature associate the start of organic agriculture in Uganda with the first certified project, no accounts exist about non-certified organic agriculture before 1993. Both in Europe and in the USA, pioneers drove non-certified organic agriculture as a response to economic, ecological and social crises. Uganda suffered two decades of civil war ending in 1986 causing multiple crises. We explore how post-war conditions influenced the emergence of organic agriculture in Uganda. We conducted individual semi-structured interviews with 12 organic agriculture experts from Central and Southwestern Uganda. Interviews were held in English using interview guides informed by a transition theoretical perspective. Interviews were tape-recorded, transcribed and analyzed using deductive and inductive coding. Our analysis shows that the degraded environment, food insecurity and economic instability after the war created a sense of urgency for the rehabilitation of livelihoods. Pioneers, including civil society activists, farmers, entrepreneurs and researchers, responded by promoting low-cost, resource-conserving technologies and agronomic practices to smallholder farmers. Economic liberalization, decentralization and institutional vacuum eased pioneers' activities, despite facing opponents from the government and research. Through experimental learning, demonstration farms and cooperation with the Catholic Church, public extension services, researchers and international development-oriented non-governmental organizations, pioneers reached out to farmers in Eastern, Central and Southwestern Uganda. As challenging as post-war crises may be, they offer opportunities for changing development trajectories. Therefore, reconstruction and rehabilitation efforts can accommodate sustainability concerns and allow the introduction of course-changing measures in any sector.

Key words: organic agriculture, pioneers, niches, transition, Uganda, rehabilitation, post-war crisis

Introduction

Uganda is the largest producer of organic commodities in Africa. The 189,610 organic farmers amount to 1.9% of all farmers in Uganda (2012 data; Uganda Bureau of Statistics, 2014). Altogether, they cultivate 231,157 hectares (ha) of land (2013 data; FIBL and IFOAM, 2015), representing 3.37% of arable land (FAO, 2015). Although low, the number of organic farms and the amount of land under organic cultivation are the highest in Africa. Following India, Uganda has the second largest number of organic farms per country worldwide. Despite high transportation cost, Uganda is among the five largest organic fruit exporters in the world (FIBL and IFOAM, 2015). Between 2010 and 2013, the growth rate amounted to 1.18% annually (FIBL and IFOAM, 2015). Authors attribute this growth to a variety of factors: rising international demand for organic products (Forss and Sterky, 2000; Kidd et al., 2001; Gibbon and Ponte, 2005), traders linking organic farmers to international markets (Parrott and Van Elzakker 2003), Uganda's fertile soils and favorable climate (Nycander, 2000), the absence of external inputs (Van Elzakker and Leijdens, 2000; Kidd et al., 2001), donor support by SIDA (Swedish International Development Cooperation Agency) through EPOPA (Export Promotion of Organic Products from Africa) (Gibbon, 2006; Taylor, 2006) and institutionalization within Uganda (Ssebunya, 2006).

In Uganda, the first project to export certified organic fruits and vegetables to European markets was launched by the private company Suntrade (now known as Amfri) in 1993 (Gibbon, 2006). A year later, Lango Organic Farming Promotion (LOFP) inaugurated a certified organic cotton project in Northern Uganda

(Crucefix, 1998; Gibbon, 2006). For Crucefix (1998) and Gibbon (2006), these projects are the foundation of organic agriculture. While there is agreement about the start of certified organic agriculture, no accounts exist about non-certified organic agriculture before 1993. In this paper, we explore the relation between the emergence of organic agriculture and the multiple crises Uganda faced between 1986 and 1993.

Evidence from other countries suggests that people search for alternative livelihoods and economic activities in response to ecological, economic and social crises. Organic agriculture benefited from such crises. In Europe, for example, organic agriculture emerged in response to a crisis of 'chemical-intensive, technically advanced farming […] in the form of soil degradation, poor food quality and the decay of rural social life and traditions' after World War I (Vogt, 2007, p. 9). Environmental degradation, notably the Dust Bowl, partly caused by conventional agriculture, spurred organic agriculture in the USA. Economic poverty and associated food shortages during the Great Depression contributed to this search for alternatives in farming (Guthman, 2004; Heckman, 2006; Vogt, 2007). In Cuba, the collapse of the Soviet Union in 1989 halted the import of agrochemicals from the Soviet Union to Cuba. This crisis resulted in a countrywide, state-mentored conversion from high-external-input agriculture to organic agriculture based on locally available resources (Funes, 2002; Altieri and Toledo, 2011).

The literature also suggests the importance of pioneers for the promotion of organic agriculture as a response to ecological, economic and social crises. For instance, Jerome Rodale popularized organic agriculture in the USA (Heckman, 2006; Vogt, 2007). Sir Albert Howard and Lady Eve Balfour were among those who pioneered the organic agriculture movement in Europe (Heckman, 2006; Vogt, 2007). In Austria, the anthroposophist Rudolf Steiner founded biodynamic farming and was instrumental in spreading the idea in Europe and the rest of the world (Vogl and Darnhofer, 2004). The literature lists similar and often less recognized pioneers for Asia (Willer and Yussefi, 2000; Parnwell, 2005), Australia (Paull, 2008) and Latin America (Armesto and Hernández, 2006; Altieri and Toledo, 2011). Most pioneers shared a strong desire and inner drive for environmentally sound farming and food security. Characteristic of such pioneers are determination and persistence against resistance and criticism (Heckman, 2006; Vogt, 2007).

In Africa, the literature on the combined contribution of crises and pioneers to the emergence of organic agriculture is comparably thin. One reason is the small amount of research on organic agriculture in Africa. Parrott and Van Elzakker (2003), for example, offer one of the few analyses of the development of organic agriculture in Africa. Taylor (2006) provides an overview of sector developments in East Africa, including Uganda. However, authors do not mention crises or pioneers as drivers of organic agriculture.

In this paper, we analyze how non-certified organic agriculture emerged in post-war Uganda between 1986 and 1993. We examine ecological, economic and social crises alongside economic reforms as drivers of non-certified organic agriculture. We explain how pioneers created niches of non-certified organic agriculture and how these eventually laid the foundation for today's certified organic agriculture in Uganda. We also show how non-certified organic agriculture between 1986 and 1993 differentiates itself from traditional farming before 1986, and how it is different from certified organic agriculture after 1993. Although such accounts are critical for the agrarian history of Uganda, they are missing in collective memory and historiography about organic agriculture.

Transition theories

Understanding how non-certified organic agriculture emerged in post-war Uganda requires a theory explaining how transitions from traditional or high-external-input agriculture to organic agriculture occur in response to crises. A transition is defined as 'radical, structural changes of a societal (sub)system' as well as 'shifts between equilibrium states of societal systems (energy, mobility, water, agriculture, health care, etc.) and […] the result of a co-evolution of economic, cultural, technological, ecological and institutional developments at different levels' (Transition Academy, 2015). Most transition theories (for an overview see Lachman, 2013), differ from early approaches to study changes, such as the diffusion of innovation perspectives by Rogers (1995). The diffusion of innovation perspective assumes that alternatives to existing paradigms, such as ideas about organic agriculture, gradually diffuse to a larger proportion of society (e.g., Padel, 2001), making their way through social networks based on variation and selection. In contrast, transition theories recognize the co-evolution of ideas, actors, infrastructure, institutions and policies, advancing classical diffusion thinking by emphasizing the interconnectedness of systems across time and scales.

According to transition theories, shifts between different modes of operations, such as the shift from traditional to organic agriculture, emerge from non-linear, intertwined socio-technical processes across different scales, often triggered by events or critical developments. Even though conditions under which transitions take place vary according to their location and situation in time, common traits can be identified, such as minimal control from authorities and a lack of fulfillment of food security and other basic needs (WBGU, 2011). Multi-level perspective scholars, including Geels (2002, 2011), Genus and Coles (2008), differentiate between socio-technical landscape, regime and niche. Socio-technical

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landscape stands for long-term external trends. The regime consists of social actors and their dominant social paradigms, institutions and rules. A niche represents the space actors create for protecting their invention from dominant selection rules. Pressures from and changes in the socio-technical landscape can destabilize the regime, and open a 'window of opportunity' for actors to create a niche in which they nurture a new idea or practice. Social actors who create niches we refer to as pioneers.

Pioneers formulate alternatives for the dominant social paradigms, beliefs and behavioral patterns and develop niches (Geels, 2002; WBGU, 2011). Their questioning of the established worldviews, the development of an idea for change based on their strong beliefs and their vision of desired future evolutions characterize pioneers. As pioneers operate in opposition to mainstream ideas of regime actors, they are often marginalized, and 'viewed as 'mad' by the majority'(WBGU, 2011, p. 245). According to the WBGU (2011, p. 242), pioneers are 'change agents' necessary for niches to emerge.

Darnhofer (2014, p. 4) calls niches the 'seeds of a transition'. Raven et al. (2010) suggest that niche formation is a central process in any transition process. The beginning of niche development is often so small that niches stay invisible to the regime, protecting them from aversive values, legislation, institutions and policies (WBGU, 2011; Darnhofer, 2014). Niches, thus, encourage experimentation and learning of the pioneers (Hermans et al., 2013). On the one hand, pioneers must protect their ideas from selection processes beyond domains they can influence, such as markets, policies and public opinions. On the other hand, they must engage with regime forces at some point to mainstream their idea and take it to scale. The right moment for recoupling niches and regimes is thus subject to controversy in the literature (Geels, 2002; Raven, 2006).

The multi-level perspective helps to understand how pioneers engage in niche development, support radical innovation, and eventually confront regimes. While this theoretical angle dominates transition studies in the energy (Raven, 2006; Kern and Smith, 2007; Van Eijck and Romijn, 2008) and transport sector (Kemp et al., 1998; Geels, 2005), Morrissey et al. (2013) suggest it for conceptualizing agri-food systems. Davidson et al. (2015) apply the multi-level perspective to explain how the appearance of bovine spongiform encephalopathy (BSE) caused cattle farmers in Alberta, USA, to change their cattle production from industrial to alternative livestock production. Respective niches developed despite criticism from the global agribusiness and the meat consuming society.

Schot and Geels (2008) summarize three internal processes that are critical to the success of niches: the articulation of visions, building of social networks and learning. However, niches face challenges in replacing an unsustainable system of production. Systems tend to strike back and to challenge niches and their actors, making it difficult for them to survive. Witkamp et al. (2011) explain such phenomena as selection pressure. Intermediary actors help niches increase robustness, and eventually translate selection pressure into feedback stimulating learning that improves niche performance (Hargreaves et al., 2013).

Methods

We collected data as part of a larger mixed-method investigation of organic agriculture in Uganda carried out in 2011. We used qualitative data from in-depth interviews completed with 12 snowball-sampled experts. At the time of the interview, all respondents were actively engaged in the organic agriculture sector, as either employees of companies, universities, development-oriented non-governmental organizations (NGOs) or the Ugandan Ministry of Agriculture. From the available dataset, we selected parts of the interviews referring to the period between 1986 and 1993. We had chosen these seven years because they define the post-war rehabilitation period prior to the launch of the first certified organic scheme.

We invited experts to interviews if they had knowledge of the history of organic agriculture in Uganda, or if they considered themselves as pioneers of organic agriculture. Half of the interviewees were pioneers themselves, without covering all the pioneers of organic agriculture in Uganda. The other half consisted of the second generation currently involved in organic agriculture with a strong historical knowledge of the sector. None of the invited interviewees declined. All interviewees were Ugandan nationals, nine males and three females, ranging in age from 35 to 60 years. Six of them lived in Uganda during the civil war. All respondents knew the early history of organic agriculture in Uganda. Most of them had a farming background; some had undergone formal agricultural training and managed a farm in rural Uganda.

Interviews followed a semi-structured interview guide and took between 45 and 120 min. Three interviews were done at two separate appointments. The interview guide included questions about the history, actors, networks, institutions and public policies relating to organic agriculture in Uganda. Preliminary findings from the literature review and document analysis informed the interview guide. These included questions about paradigmatic changes that organic agriculture underwent in Uganda. We asked each interviewee for his or her personal approach to organic agriculture. We did not pay any of the interviewees for the interview.

We tape-recorded and transcribed each interview. Upon request, interviewees received the audio of their interview for their record. We coded transcribed interviews in line with Strauss and Corbin (1998), using Atlas.ti. During the first phase of thematic content

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analysis, we assigned deducted codes drawn from the interview guide. During the second phase, we developed inductive codes to identify recurring patterns, categories and thematic families. We then prioritized and selected relevant quotes. We further analyzed descriptive text-based summaries, which supported the preparation of this paper.

Results

The results are organized to first present interviewees' accounts on the post-war crises in Uganda. We then report how interviewees referred to the pioneers and their strategic actions to promote organic agriculture among farmers. Finally, we present how interviewees characterized organic agriculture during post-war Uganda.

Interviewees' perspective on the post-war crises

Economic, ecological and social crises resulting from the Ugandan civil war put pressure on smallholder agriculture and the rural economy.

Interviewees spoke about farmers' economic crisis caused by national-level financial insecurity and rampant inflation. Between 1986 and 1993, the cost of external agricultural inputs had rapidly increased. With little financial resources to invest in farming, the majority of smallholder farmers in post-war Uganda had no access to mineral fertilizers, synthetic pesticides and improved seeds. This situation lasted until the 1990s.

> *In 1992, Uganda had no foreign exchange or anything. So there was no way that you could buy, if you wanted to buy, chemicals—they did not have the money. (Male, private sector)*

One agricultural researcher reported how the Structural Adjustment Program required by the International Monetary Fund removed public subsidies on farm inputs. These reforms divided Ugandan farmers into a minority of export-oriented, large-scale farmers who coped with increased cost for external farm inputs, and the majority of smallholders, for whom external inputs were economically out of reach. Credit systems and financial services were not accessible to farmers. Interviewees explained that the aggravated economic crisis forced farmers to use locally available resources more efficiently.

Interviewees spoke about environmental degradation, notably soil erosion on steep slopes and deforestation. In rural areas, especially where population density rose, the energy and firewood demand increased. Consequently, farmers encroached on forests, decreasing forest cover and biomass availability. Civil society activists we interviewed explained how traditional farming practices, such as shifting cultivation, were no longer feasible in densely populated areas. Increasing land demand caused reduced fallow periods leading to declining soil fertility and poor harvests. Farmers also expanded fields to vulnerable ecological areas, such as wetlands. A few years after the civil war, environmental degradation in rural areas raised people's concerns.

> *People started feeling scared that the desert is gradually spreading southwards. (Male, private sector)*

During the first years after the war, interviewees recalled periods of extreme poverty and food insecurity, i.e., undernourishment and malnutrition, among farmers in all parts of the country. Food insecurity was caused by lack of assets, low labor and land productivity, resulting in low food availability. Volatile food markets made food purchases expensive, which decreased the accessibility of farmers who were net buyers of food. Interviewees explained how food insecurity prompted farmers to focus on food self-sufficiency through diversifying the cultivation of food crops. Restoring rural livelihoods, including physical and financial assets of farmers, was a major development goal during that time.

Civil society activists we interviewed recalled institutional and political developments supporting organic agriculture. Interviewees referred to '*that kind of free open liberalization environment from the government'* (Male, civil society) during post-war Uganda. Economic liberalization and decentralization enabled civil society to substitute the dysfunctional public agricultural extension services through direct partnerships with farmers.

> *Personally, I was involved in mobilizing the farmers and training them, and we could work in any village, organize a meeting with the farmers, talk to them, sell the idea to them and the farmers buy it if they wish* [...] *and nobody would come, not even a local, to stop you. (Male, civil society)*

Pioneers and their strategic actions

When asked about people who promoted non-certified organic agriculture between 1986 and 1993, interviewees identified several Ugandan individuals. These individuals included civil society activists, farmers, employees of national and international NGOs, university researchers and lecturers, agricultural traders and public extension workers. Although the majority of these pioneers were Ugandan nationals, interviewees also referred to returning exile Ugandan and European entrepreneurs who engaged in the promotion of organic agriculture after the war. Their strategic actions initiated, developed and protected small but constantly growing initiatives promoting resource conserving technologies and sustainable farming practices to smallholders.

Almost all interviewees described how they and other pioneers benefited from cooperation with national and international NGOs and the private sector, of which some operated from outside Uganda. International cooperation supported pioneers in various ways. First, pioneers accessed technical information about organic agriculture. Some interviewees mentioned the German

Catholic aid organization Misereor, and the international Catholic aid organization Caritas. Other interviewees referred to the British grant-making charitable trust Kulika, which specialized in the provision of educational scholarships for East African trainees. Kulika awarded about 90 Ugandan farmers and extension workers with scholarships for training on organic farms in Berkshire, England. Two pioneers obtained biodynamic training at Emerson College in Sussex, England. One of them continued with organic agriculture training in Brazil afterwards. Other pioneers went for training at the Kenyan Institute of Organic Farming (KIOF) formed in 1987.

> *I went for an organic agriculture course, but I did not know which animal this was, this organic course, so I just went.* [...] *It was totally different and totally useful. (Female, civil society)*

Second, interviewees felt that having contacts and being associated with international NGOs increased their credibility. Third, interviewees spoke about foreign donors, i.e., individuals and development-oriented NGOs, which provided pioneers with direct financial project-based support to promote organic agriculture. In doing so, donors bypassed Uganda's public administration.

After training, two pioneers set up organic demonstration plots in Nysambia, a suburb of Uganda's capital Kampala. Pioneers wanted farmers to take the lead and train other farmers, and by doing so scaling out organic agriculture practice to other farmers.

> *So, you could find somebody, maybe who has never gone to an official farmer school, is now standing in front of other farmers and training them. (Male, civil society)*

To increase their outreach, credibility, legitimacy and authority pioneers formed national cooperation with the Catholic Dioceses of Uganda without the existence of religious motives.

> *We ran around different Dioceses, we worked through the Catholic Dioceses and ran around to preach the gospel to train, to tell them to change their agricultural programs and dioceses to organic. We helped them* [...] *training the staff, developing demonstration gardens, taking them to exposures, like bring them from Masaka to places where we had already started with demonstrations. (Female, civil society)*

Through the Arch Dioceses pioneers reached out to farmers in Luwero, Mpigi and Mukono District, three districts surrounding Uganda's capital Kampala. Interviewees reported that non-certified organic agriculture was geographically spread across the country, although pioneers working in different parts of the country lacked knowledge about each other's existence.

> *I started corresponding with* [...] *IFOAM and somebody wrote back saying* [...] *that in Uganda we already know that there are people involved in organic agriculture, what, I was shocked because it was just new to me that there were people already in Uganda. (Male, civil society)*

Until the end of the 1980s, the promotion of organic agriculture remained unnoticed by the majority of the public and the government.

> *It was so small that nobody could really look at it. The sector was still too young that it could even have a significant impact on the economy. (Male, civil society)*

Increasing awareness among the government, researchers and the private sector of the organic movement caused conflicts with people supporting high-external-input agriculture.

> *I was* [...] *going through thick and thin, especially with the government because we got attacked so much by the government. (Female, civil society)*

Advocates and critics of organic agriculture debated their contrasting positions about the future of Uganda and the role of organic agriculture on public television and in newspapers.

> *We had two interviews. One interview was with us* [...] *and another interview was by a professor at Makerere* [*University*]. *And this man was a soil scientist. He was saying organic agriculture can never ever provide any solution to the country. (Male, civil society)*

Pioneers reported how the opponents of organic agriculture were not able to intimidate them. Their vision of organic agriculture, an agriculture ensuring food and nutrition security, environmental protection, and rural development, provided them with orientation and motivation. The Catholic's Church continued support of organic agriculture helped pioneers to defend their vision and maintain the credibility of organic agriculture:

> *The church is strong, nobody could just come and say this (organic) is rubbish* [...]. *(Male, civil society)*

Organic agriculture's increasing outreach raised awareness and forged cooperation between the pioneers and public extension services operating under the Ministry of Agriculture.

> *We made the first demonstration, and we had to invite the Government officials and after believing it then we had Kampala district sending all its staff for the training which was a success. (Female, civil society).*

Several interviewees underlined the critical role of formal research for promoting organic agriculture, although it was difficult to work with the Makerere University and researchers opposing organic agriculture.

> *We need research and use of the appropriate use of organic manure, what quantities, we need organic manure also in a form that can be readily applied. (Male, private sector)*

Pioneers among interviewees spoke about their efforts to engage research in testing different agronomic options for rehabilitating and organically managing nutrient depleted and eroded soil. They contacted researchers directly, encouraging them to write research projects, and

inviting them to demonstrations managed by civil society activists. The Department of Soil Sciences at Makerere University was one of the first to respond.

> *So, we set up experiments on bananas and then because over the previous exposure in organics, this experiments, as I said, comparing the different aspects of using organics, in fact, this was one of the most comprehensive organic work. (Male, researcher)*

At the same time, an increasing number of development-oriented NGOs started supporting organic agriculture, including Environmental Alert, founded in 1988, the UNDP (United Nations Development Program) sponsored Africa 2000 Network in 1990, and JESE (Joint Effort to Safe the Environment), which started operations in Fort Portal (Western Uganda) in 1993. Only after 1993, organic agriculture spread to Northern Uganda, where the private company LOFP launched the first certified organic cotton project.

Interviewees' perspective on organic agriculture

While relief services dominated post-war Uganda, the pioneers among the interviewees focused on rehabilitating smallholder agriculture. This reorientation of relief to rehabilitation meant to increase the self-reliance of farmers.

> *He said, no, I think these people should now start doing something for themselves which can help them. They identified sustainable agriculture. (Male, civil society)*

Sustainable agriculture aimed at food and nutrition security through focusing on staple crops and the use of on-farm resources, achieving independence of external inputs. To close yield gaps and protect the environment pioneers promoted the use of sustainable farming techniques, including composting, kitchen gardens and raised beds for growing high-value vegetables, technologies for soil and water conservation, crop rotations, mixed cropping and agroforestry, biological pest controls, zero grazing of cattle and crop–livestock integration.

> *There was a lot of emphasis on cover crops and eventually* [...] *on agroforestry, then we also started hearing about organic agriculture. (Male, private sector)*

Although all interviewees used the expression 'organic agriculture' during interviews, a few underlined that in post-war Uganda, only a few knew about organic agriculture. In the interview, one civil society activist referred to the type of agriculture they promoted as '*Sustainable organic agriculture, that is how we called it'* (Female, civil society).

To address food security for all household members, pioneers offered farmers training in nutrition and human health, gender relations and community leadership. Some early organic agriculture initiatives promoted the use of renewable energy sources, such as biogas and the use of energy saving stoves to tackle the need of firewood and thus deforestation, as part of their environmental protection approach. One Interviewee underlined that they had no distinct market-orientation.

> *Around the 80s, 89, [...] our focus was on environment and to improve food security, then the market came in later. (Female, civil society)*

The lack of market-orientation is also reflected in private sector narratives.

> *Money, no, it was not a major expectancy at all.* [...] *We just sell (organic) because we needed organic. (Male, private sector)*

Farmers showed hardly any resistance towards organic agriculture according to interviewees. On the contrary, farmers wanted to learn how to improve their farming system by using organic farming practices. One interviewee summarized this as follows:

> *Whoever you were going to ask: What would you like to learn? People said: We would like to learn how to make compost manure. (Male, civil society)*

Interviewees differentiated organic agriculture from traditional farming, high-external-input agriculture, as well as certified organic agriculture. They felt that its focus on restoring food and nutrition security while ensuring the protection of the environment was unique for organic agriculture.

Discussion

Interviewees' accounts contribute to understanding the emergence of non-certified organic agriculture in post-war Uganda between 1986 and 1993. Figure 1 illustrates the factors and processes leading to this emergence.

Pressure

Our findings suggest that economic, ecological and social crises and the resulting pressure on farms contributed to the emergence of non-certified organic agriculture. Assertions of Angura (1993) stress the vulnerability of Uganda's agriculture and food system after the civil war. Reinikka and Mackinnon (2000) found 56% of the Ugandans below the absolute poverty line in a household survey in 1992. Maxwell et al. (1999, p. 412) refer to this time as a 'continuous struggle for survival'. The Structural Adjustment Program (1987–1992) under the National Resistance Movement (NRM) government increased food prices and declined wages, increasing the hardship of smallholder farmers (Angura, 1993; Maxwell et al., 1999). Our findings show that the program led to reduced subsidies on external agricultural inputs, pushing farmers to look for alternative ways of farming. Raynolds (1997; 2000) reported similar

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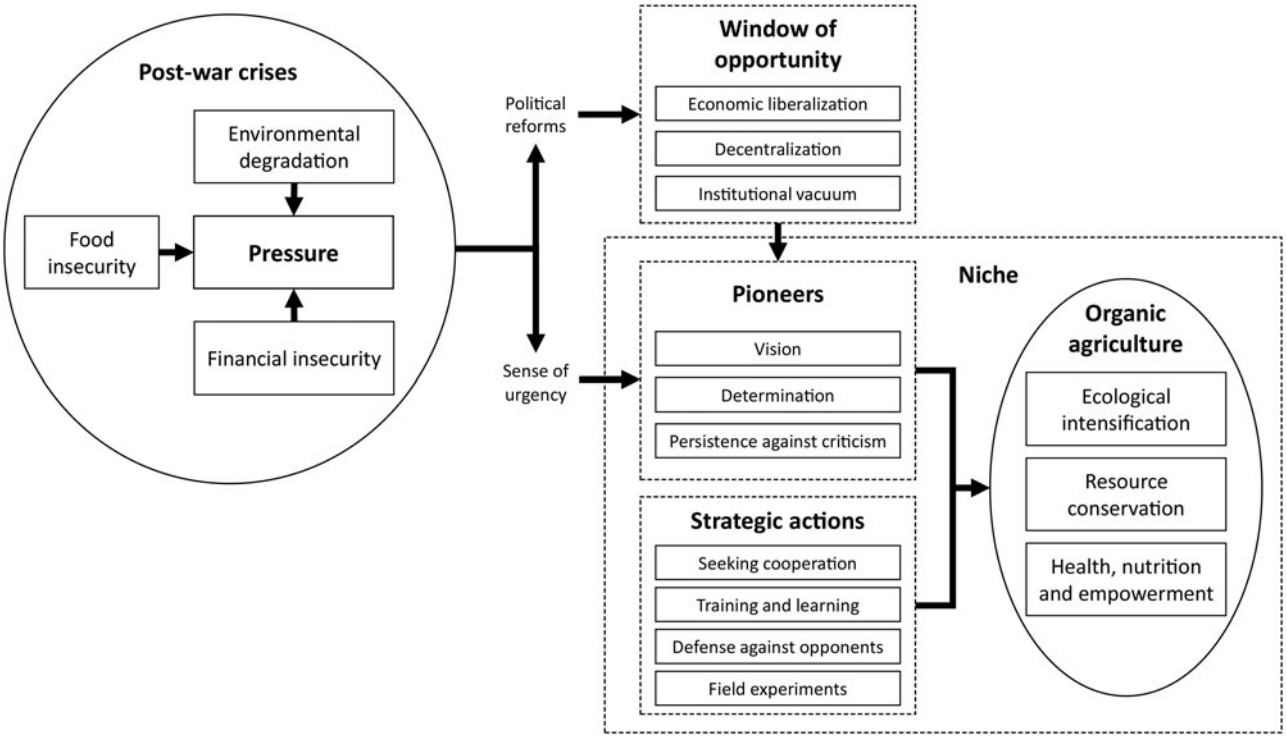

Figure 1. A process model of organic agriculture emerging in response to post-war crises (designed by the authors).

findings for the Dominican Republic. At the same time, soil erosion and declining soil fertility caused poor harvests. In line with Muchena and Kiome (1995), we found that the collection of firewood and traditional shifting cultivation against increasing population density caused environmental degradation. These economic, ecological and social crises seem to have forced farmers into finding agricultural alternatives that work under post-war conditions. Green (1995) suggests that the search for alternative routes to livelihood rehabilitation is a common trait of a post-war context. It appears that the rehabilitation of rural livelihoods drove the emergence of non-certified organic agriculture.

Window of opportunity

Much of the transition theory literature suggests that the destabilization of the dominant social paradigms and rules creates a 'window of opportunity' for alternative movements to develop (WBGU, 2011). Our findings suggest that the Structural Adjustment Program contributed to the creation of a 'window of opportunity'. After the war, the NRM government embarked on a series of political and economic reforms, including economic liberalization and decentralization, and the consequent breakdown of state monopolies (Egulu and Ebanyat, 2000). Particularly this fast and dynamic political, economic and social change is what Green (2000) identified as facilitating the creation of alternatives to business-as-usual scenarios. In this regard, Gibbon and Ponte (2005) outline how structural adjustment programs resulting in market liberalization facilitated the rise of buyer-driven value chains. Byrne and Klem (2015) refer to post-war situations as typical transitional stages, often fragile, unpredictable and chaotic. It appears that in Uganda the transitional stage after the war, despite all the distress it caused, created a 'window of opportunity'. The comparatively liberal political environment gave room to civil society activities, including the promotion of organic agriculture.

Pioneers

Research on transitions found that social and economic changes are not induced by the masses, but by pioneers capable and able to use the aspirations of masses (Bandura, 2004; Malchow et al., 2015). These findings correspond to our study as pioneers played a crucial role in the formation, development and defense of organic agriculture niches in post-war Uganda. These pioneers included civil society activists, university researchers and lecturers, entrepreneurs, including agricultural traders, public extension workers and farmers. From the interviews, we conclude that pioneers distinguished themselves from others through their vision of organic agriculture, their determination and persistence towards opponents and criticism. Although pioneers faced aversive opinions and interference from the government and public research, they maintained independence and continued their work. Bandura (2004, p. 613) compares the pioneers' searches for alternatives as 'swimming against the mainstream'. The pioneers of many other

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sectors, be it health, education or energy, master leadership, foster innovation and accompany changes in their domains, organizations and countries (Bandura, 2004; WBGU, 2011; Malchow et al., 2015). Our case contributes to understanding the characteristics of pioneers.

Strategic actions

We argue that the mere existence of pioneers is not sufficient to explain the emergence of non-certified organic agriculture in post-war Uganda. More important were their actions. We found that pioneers forged national and international cooperation with like-minded individuals and organizations, through which they accessed knowledge and finances. Foreign donors were of particular value. Uganda was subject to changing donor policies, oscillating between direct interference, deregulation, decentralization and privatization (Egulu and Ebanyat, 2000; Bahiigwa et al., 2005). In post-war Uganda, state-led modernization of rural services, agricultural practices and technologies dominated post-war rural development. Apparently, direct foreign funding of organic agriculture was critical and created independence of state sponsorship.

How learning creates and sustains niches has been suggested by Raven et al. (2010). Our study shows that learning, training and knowledge management supported the emergence of organic agriculture in post-war Uganda. Similar to our findings, Wallace (1997) recognizes the importance of training Ugandan agriculture extension workers and lead farmers in organic agriculture. Pali et al. (2007) refer to the importance of the British NGO Kulika for the organic agriculture movement. Kulika trained farmers rendered their training and extension services to other farmers, local NGOs and farmers' associations through the establishment of model farms. Other training centers followed, such as the St. Jude Training Centre for Sustainable Integrated Agriculture close to Masaka in central Uganda in 1994.

Van Mierlo et al. (2010) point out that new ideas mature through experimentation within the niche and between niche actors and the wider regime. Our findings support this assertion. Increased cooperation with government officials and researchers, notably those who at first disbelieved in organic agriculture, enhanced the outreach of organic agriculture. Similar to Uganda, the involvement of soil sciences contributed to the development of improved farming techniques, facilitating the spread of organic agriculture in Kenya and Tanzania (Muchena and Kiome, 1995).

Organic agriculture niche

Until 1986, most Ugandan farmers were smallholders applying traditional agricultural practices based on low external inputs (Forss and Sterky, 2000; Nycander, 2000). During the post-war period, however, organic agriculture was a holistic approach to farming. It aimed at food and nutrition security, environmental protection and rural development through the promotion of sustainable farming practices, and renewable energy sources and training in nutrition and human health, gender relations and community leadership. This non-certified organic agriculture was compliant with organic farming principles by the International Federation of Organic Farming Movement (for the principles see IFOAM, 2016). Our findings resonate with the core values of most young organic agriculture initiatives as being 'socially just, economically viable and environmentally sound' (Sligh and Cierpka, 2007, p. 30). According to Lockeretz (2007), this holistic, integrated approach developed organic agriculture from small niches into a worldwide agricultural practice.

Conclusion

Our study demonstrates how pioneers used the momentum of political and social change in post-war Uganda to respond to multiple crises through organic agriculture. In contrast to traditional farming and certified organic agriculture, pioneers focused on ecological intensification, resource conservation, health, nutrition and the empowerment of smallholder farmers. As challenging as post-war crises may be, they offer opportunities for changing development trajectories. Therefore, reconstruction and rehabilitation efforts can accommodate sustainability concerns and allow the introduction of course-changing measures in any sector.

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