No quick fixes

four interacting constraints to advancing agroecology in Uganda

Isgren, Ellinor

Published in:
International Journal of Agricultural Sustainability

DOI:
10.1080/14735903.2016.1144699

2016

Document Version:
Publisher's PDF, also known as Version of record

International Journal of Agricultural Sustainability

ISSN: 1473-5903 (Print) 1747-762X (Online) Journal homepage: http://www.tandfonline.com/loi/tags20

No quick fixes: four interacting constraints to advancing agroecology in Uganda

Ellinor Isgren

To cite this article: Ellinor Isgren (2016): No quick fixes: four interacting constraints to advancing agroecology in Uganda, International Journal of Agricultural Sustainability, DOI: 10.1080/14735903.2016.1144699

To link to this article: http://dx.doi.org/10.1080/14735903.2016.1144699

Published online: 08 Mar 2016.

International Journal of Agricultural Sustainability, 2016
http://dx.doi.org/10.1080/14735903.2016.1144699

Routledge
Taylor & Francis Group

No quick fixes: four interacting constraints to advancing agroecology in Uganda

Ellinor Isgren[a,b*]

[a]*Centre for Sustainability Studies (LUCSUS), Lund University, PO Box 170, Lund SE-221 00, Sweden;*
[b]*Centre of Excellence for the Integration of the Social and Natural Dimensions of Sustainability (LUCID), Lund University, PO Box 170, Lund SE-221 00, Sweden*

A century after its inception, agroecology has entered mainstream development debates as a more sustainable alternative to conventional agricultural modernization of relevance not least for improving smallholder agriculture in sub-Saharan Africa. Agroecology is a broad concept considered to have transformative potential, yet as a research field it has often been technology-centred and focused at the local level. Building on the experiences of Ugandan agroecologists working in an array of agricultural professions throughout the country, this paper identifies and discusses major barriers to agroecology in Uganda. Inductive analysis of qualitative data from interviews and focus groups generated four types of interacting barriers; constraints at farmer level, an agricultural knowledge system favouring conventional approaches, adverse and intertwined political and economic interests, and cross-cutting ideological and discursive pressures. These broad challenges become manifest in the accounts presented, making clear that barriers to and therefore also appropriate strategies for advancing agroecology must be treated as contextual even if a 'global movement' is emerging around it. The discussion suggests theoretical lenses for further inquiry into agroecology and its realization in light of these constraints.

Keywords: agroecology; rural development; Uganda; agricultural sustainability; modernization; agricultural knowledge systems

Introduction

Many governments in sub-Saharan Africa have paid increasing attention to agriculture in recent years, seeking broad-based economic growth and poverty reduction (UNCTAD, 2009). In Uganda, the government aims to eradicate poverty through an 'agricultural revolution' and thus transform Uganda 'from a peasant to a modern and prosperous country' within 30 years (GoU, 2010; MAAIF, 2012). In practice, however, the modernization agenda has become increasingly divergent from that of poverty reduction (Hickey, 2005; Lwanga-Ntale, 2013). While Uganda experienced pro-poor growth during the 1990s largely through improvements among smallholders, the primary focus has shifted towards larger land holdings (Hickey, 2013). Meanwhile, concerns about environmental and social consequences of modern food and farming systems have generated a proliferation of ideas on alternative ways to practice agriculture and organize food systems (Beus & Dunlap, 1990; Horlings & Marsden, 2011). As one such alternative, agroecology has entered mainstream development discourse as a mode of agriculture that combines environmental integrity with high productivity and economic viability (Altieri, Funes-Monzote, & Petersen, 2012) that is of particular relevance for sub-Saharan African

*Email: ellinor.isgren@lucsus.lu.se

agriculture (De Schutter, 2010). However, research around agroecology has been largely preoccupied with technological innovation and local level case studies (Gonzalez de Molina, 2013) while it is becoming widely acknowledged that achieving sustainable agriculture requires social and economic change through concerted action across scales (IAASTD, 2009). This leaves a large knowledge gap between promising practices and strategies for supporting their realization.

Acknowledging that potentials and barriers of 'scaling up' agroecology (De Schutter, 2010) are likely to be contextual, the aim of this paper is to identify key challenges to agroecological development in the particular context of Uganda. The paper is structured in four parts: first, I introduce agroecology and the research setting, together with theoretical and empirical perspectives on agricultural sustainability which informed the research design. Second, I describe how qualitative data were generated through individual and focus group interviews, and explain the data analysis process. Third, I present four types of barriers to agroecology in the Ugandan context using the thematic areas developed from the data. Finally, I discuss the findings and point towards salient questions and useful frameworks for further research.

Agroecology – an alternative pathway for agricultural development

The concept of agroecology originated in the 1920s to describe the application of ecology to crop agronomy (Wezel et al., 2009). In the 1980s, agroecology started being used explicitly as an attempt to create a scientific basis for more sustainable alternatives to industrialized agriculture (Hecht, 1987) while also gaining increasing attention outside of academia. Agroecology thereby evolved into an ambiguous concept: 'a science, a movement and a practice' (Wezel et al., 2009). As a *scientific field* it has become increasingly interdisciplinary, although the natural sciences have remained dominant in agroecological research (Dalgaard, Hutchings, & Porter, 2003). Agroecological *practices* draw on natural ecosystem functions to improve efficiency, substitute inputs and reorganize farming systems, often through different forms of diversification (Wezel et al., 2014) and through synergies between traditional practices and scientific research (Altieri & Nicholls, 2005). However, some take issue with the idea of defining agroecology as a discipline or set of practices, preferring to speak of a holistic and co-evolutionary perspective on agriculture where ecological and social embeddedness call for decentralized control over agri-food systems (Gliessman, 1998; Marsden, Banks, Renting, & Van Der Ploeg, 2001; Sevilla Guzmán & Woodgate, 2013). As such, agroecology has also come to be linked to food sovereignty and viewed as a *movement* – most notably as employed within the international peasant organization La Via Campesina (Rosset & Martínez-Torres, 2012).

Recent years have seen agroecology become part of mainstream development discourse. In 2010, the sitting UN Special Rapporteur on the Right to Food submitted a report emphasizing the key role of agroecology in achieving this human right in sub-Saharan Africa (De Schutter, 2010). The International Assessment of Agricultural Science and Technology for Development (IAASTD, 2009) and the 2013 UN Conference on Trade and Development report (UNCTAD, 2013) both called for greater support for agroecological practices and research. Even so, agroecology has not acquired momentum in terms of research funding and support from public authorities around the world, which have tended to favour a reductionist technological paradigm (Vanloqueren & Baret, 2009). De Schutter (2010) thus argues that the main challenge for agroecology is geographical and institutional up-scaling. According to Levidow, Pimbert, and Vanloqueren (2014), agroecology can grow either by *conforming* to the dominant agricultural regime or by *transforming* it, where the first implies making agroecological practices compatible with conventional agro-food systems and current modernization models. The second calls for transformation of social institutions and economic relations alongside technological development, and is

the conceptualization generally endorsed by agroecology scholars and advocates who argue that many aspects of agricultural sustainability otherwise remain unaddressed (Altieri & Nicholls, 2005; Méndez, Bacon, & Cohen, 2013).

Prospects for scaling up agroecology given particular social and political settings are poorly understood, with research mainly focused either on agroecology as local practice or as global movement. This leaves out how to elaborate regional and national strategies (Gonzalez de Molina, 2013). In the next section, I introduce Uganda as a relevant context for exploring agroecology as an alternative agricultural development pathway.

The Ugandan setting

With a majority of the population engaged in agriculture and high rates of rural poverty, agriculture features prominently in Uganda's development policy framework. There are dual reasons for highlighting agriculture; its conduciveness to broad-based growth and poverty alleviation (MAAIF, 2010), and its role in spurring growth in other parts of the economy, thus contributing to the goal of 'modernizing' the country by allowing Ugandans to eventually leave agricultural work (GoU, 2013). Although emphasis on agriculture has intensified in recent years it is not new; under president Museveni, the government has long envisioned agricultural transformation[1] as part of the broader agenda of nation-rebuilding (Hickey, 2013).

Uganda's generally favourable agro-climatic conditions and dominance of small, diverse farms using low levels of external inputs (Leliveld, Dietz, Foeken, & Klaver, 2013) imply promising conditions for developing agriculture using agroecological principles and practices. However, recent policies and interventions show that the favoured strategy to realize an 'agricultural revolution' (MAAIF, 2010) is intensified and commercialized production of strategic commodities, with the private sector taking a leading role. Agro-processing and adoption of modern technologies like mechanization, irrigation, improved seeds and phosphate fertilizers are central (GoU, 2013), alongside expert knowledge and technology transfer (MAAIF, 2012). This echoes a long-dominant model of agricultural modernization (Hardeman & Jochemsen, 2012). But when these strategies are placed next to the aforementioned objectives and rationale, contradictions begin to emerge between competing goals. Modernization through agricultural growth seemingly trumps aims for a pro-poor, smallholder-oriented development process (Bahiigwa, Rigby, & Woodhouse, 2005; Hickey, 2013). While the two are often presented as going hand in hand, the poorest in rural communities have not been prioritized in the government's search for quick and visible 'results' (Ellis & Bahiigwa, 2003).

From an environmental perspective, little has been written on what implications the current policy orientations have had, or can be expected to have. The Plan for Modernisation of Agriculture (PMA) of 2000 was argued to be ineffective in addressing issues of environmental sustainability and agroecological heterogeneity (Oxford Policy Management, 2005). This document has been replaced, but according to Bategeka, Kiiza, and Kasirye (2013) the main difference is 'who runs the show'. There is a tendency to pose commercialization of agriculture is posed as inherently linked with sustainability, through the logic that subsistence farming is a major driver of environmental degradation (NEMA, 2010). One particular critique is persistent neglect of organic agriculture, despite significant growth and market demand (Tumushabe, Ruhweza, Masiga, & Naturinda, 2007). Another is the welcoming of foreign land investments, posed as vital to agricultural modernization while civil society actors voicing concerns about negative environmental and social impacts get labelled as 'enemies of progress' (Lyons & Westoby, 2014) and face increasing hostility from the government (Human Rights Watch, 2012).

Thus, opening up for alternative strategies of agricultural development in Uganda appears justified but also contentious. Alternatives stressing agricultural sustainability must also struggle

with the ambiguity and complexity of this concept and its achievement, a debate that I introduce below.

Conceptualizing, researching and promoting sustainable agriculture: conflicting approaches

Here I bring out key points from the debate on how to conceptualize and achieve agricultural sustainability, and end by discussing the implications of past research – and its gaps – for studying agroecology in the chosen research setting.

Like sustainability, agricultural sustainability does not lend itself well to a precise definition, but generally includes dimensions of environmental soundness, sufficient productivity, economic viability and social desirability (Schaller, 1993). Within the debate around achieving sustainable agriculture dates back to the 1950s (Pretty, 2008) and two major standpoints can be discerned: 'conventional' agriculture can be fine-tuned through improved efficiency and precision, or more fundamental societal transformation is required (Schaller, 1993). Proponents of the latter, including most agroecology advocates, argue that 'truly' sustainable agriculture cannot be achieved without radically re-orienting agricultural research and development efforts, and revisiting the ideological underpinnings of agricultural modernization (Hardeman & Jochemsen, 2012; Horlings & Marsden, 2011).

When it comes to fostering agricultural sustainability in practice, research within the field of political ecology has repeatedly shown how local human–environmental interaction is shaped by larger politico-economic, discursive and cultural structures (Bryant, 1998; Paulson, Gezon, & Watts, 2005). Agriculture is no exception (Hardeman & Jochemsen, 2012). However, this is not always reflected in agricultural research, and agroecology is a case in point. While social movements have engaged with agroecology in a political manner (Rosset & Martínez-Torres, 2012), the academic field has been predominantly technocratic and focused on the field, farm or local level (Gonzalez de Molina, 2013). In general, much research on transitions towards sustainable agriculture has zoomed in on farmers' *adoption* of practices, consequently drawing attention to their attitudes, values, knowledge and habits (e.g. Karami & Mansoorabadi, 2008; Petrzelka, Korsching, & Malia, 1996; Salamon, Farnsworth, Bullock, & Yusuf, 1997; Schoon & Te Grotenhuis, 2000; Wandel & Smithers, 2000). This does not necessitate placing all responsibility on farmers, as conclusions often call for action from policy-makers, researchers and extension services (e.g. Rodriguez, Molnar, Fazio, Sydnor, & Lowe, 2009; Smit & Smithers, 1992). Attention has been directed towards structures like land tenure regimes (Carolan, 2005; Neill & Lee, 2001), epistemic challenges (Carolan, 2006; Pannell et al., 2006) and socio-cultural pressures like the meaning of a 'good farmer' (Burton, 2004) and of masculinity (Barlett & Conger, 2004). In the (comparatively smaller) body of research engaging explicitly with other key players in the agricultural system than farmers, much has focused on agricultural research and extension and found deep-rooted constraints to supporting agricultural sustainability (e.g. Cerf, Guillot, & Olry, 2011; Röling, 1990; Vanloqueren & Baret, 2009). Still, there has been a problematic tendency to reduce strategies to education and persuasion of farmers, without efforts to ensure that alternative practices have real social, cultural and/or economic comparative advantage (Pannell et al., 2006).

Although far from exhaustive, the above review shows that transitioning towards sustainable agriculture must be understood as a process of systemic change, not only adjustments at the level of farmers' practices. Also two limitations of this literature are of particular significance to this paper; firstly, empirical insights mainly come from industrialized countries. According to Lee (2005), agricultural systems are often defined as 'sustainable' on the basis of *inputs* used, whereas in developing countries there is a stronger focus on agricultural *outputs* for addressing

problems of poverty and food insecurity. When very low levels of inputs are used, such as in Uganda (Leliveld et al., 2013) sustainable agriculture may not be about using *less* off-farm inputs (Lee, 2005) so much as finding alternative ways to enhance productivity than solely using *more*. Secondly, many studies deploy agricultural sustainability as meaning specific conservation practices and technologies. As shown above, this is not always an appropriate way to conceptualize agroecology. In Table 1, I use data generated for this paper to illustrate this, and also show how this ambiguous concept should be understood in *this* case. Through the methodology described below, I discerned three major dimensions to participants' conceptualization of agroecology (Table 1). The first can be read as an onto-epistemological position; the second two represent concrete implications of this position.

This conceptualization suggests that for understanding barriers to agroecology it is not sufficient to identify difficulties in promoting certain practices to farmers – we must also understand factors that hinder actors in different societal spheres from reasoning and acting in line with the above principles.

To conclude this section, let me return to a few basic points. In this study, I explore agroecology as an emerging alternative to conventional agricultural modernization, focusing on the constraints to implementing agroecology in Uganda. Processes of improving agricultural sustainability are highly complex and contextual, not least when approached through a concept like agroecology. This, and the lack of previous research from sub-Saharan Africa and Uganda, called for a qualitative, exploratory methodological approach described below.

Methodology

Participants

Since 2010, one university in Uganda has offered a master's programme in agroecology, initially supported by the Swedish development agency (Sida). The programme is interdisciplinary and practice-oriented, aiming at developing agricultural professionals' understanding of the challenges and potentials of small-scale farming by integrating perspectives from research, education, extension, development work and farmers' practices (Eksvärd et al., 2014). The existence of this programme offers a unique opportunity to explore the prospects of agroecology in Uganda, so upon permission from the coordinator I invited graduates and final semester students with relevant professional experience to participate in the study via the programme email list. The study uses

Table 1. Analysis of study participants' conceptualization of agroecology showing three major dimensions to the concept as viewed by Ugandan agroecologists.

(1) A systemic perspective of agriculture	
Situations must be assessed from a *wide spatial and temporal perspective* using a range of biophysical and socio-economic variables. The *human–nature relationship* is viewed as interconnected and interdependent, where human decisions and actions affect the environment sometimes in indirect, unpredictable ways	
(2) The role of agricultural expertise	(3) Practices and technologies encouraged
The *purpose*, *responsibilities*, and *working methods of the agricultural professional* are reassessed. A systemic approach requires collaboration between disciplines and stakeholders, and deepened involvement of farmers. Key competences include *critical thinking*, *humility* and commitment to environmental and social justice *ethics*	Agroecology does not equal promoting or discouraging *particular practices*; however, agroecologists tend to favour certain practices like intercropping and rotation, organic fertilizers, integrated pest management, nitrogen fixating crops and local varieties and oppose *habitual use* of and *dependence on* conventional inputs like fertilizer and biocides

this programme as an entry point, but does not aim to *evaluate* the education as such. Hence the programme's stated ambitions and definitions are not part of the analysis – rather, it was important to understand perspectives on agroecology held by participants themselves (Table 1), in order to then understand what perceived constraints are in relation to.

In total, 26 people were able to participate in 2 focus group discussions and 8 individual interviews, conducted in multiple locations in April 2014. One focus group was mixed gender, the other males only (due to availability of participants in the area) which skewed gender distribution somewhat (18 men and 8 women) compared to the programme's relatively even distribution. Participants worked in a variety of agriculture-related professions (Table 2) in all four regions of Uganda, both before and during enrolment (accommodated by weekend lectures). This enabled insights from a range of institutional and geographical settings.

Data generation and analysis

I employed a qualitative interview approach, which is useful for understanding participants' experiences, opinions and values (Kvale, 2008). Individual interviews were combined with focus group discussions, as these two methods are associated with different and sometimes complementary benefits and drawbacks in regards to depth, breadth and efficiency (Morgan, 1996). Individual interviews provide opportunities to explore issues in depth without interference; focus groups are valuable in that they create a social that helps participants explore and clarify their views (Kitzinger, 1994) but with the drawbacks of potential 'group effects' (Carey, 1994). The fact that focus group participants knew each other had to be taken into consideration, but appeared to contribute to an open discussion climate and a sense that the activity was mutually valuable.

Using a constructivist approach, I treat the research interview as a process of co-production, rather than one where information is drawn from passive subjects (Gubrium & Holstein, 2001). From this it follows that the researcher's role in co-constructing the findings is not seen as 'contamination' but an inherent part of the methodology, albeit one that requires reflexivity and transparency. By using interviewees' personal experiences as the point of departure, I strived to stay close to their 'lived world' (Kvale, 2008) and increase trustworthiness by generating rich and detailed descriptions (Creswell & Miller, 2000). The interviews were semi-structured, with four (interlinked) parts beginning with an opening dialogue around the participants' educational and professional background and current work. We then explored the meaning of working as an 'agroecologist' in terms of how views, aspirations and working methods had changed as a result of studying agroecology. The third and most thoroughly explored topic was challenges of utilizing and promoting agroecology perspectives within one's field of work. Finally, participants were

Table 2. Current professions among the respondents and number of respondents in each category.

Professional profiles of the participants	(Total 26)
Agricultural extension and advisory services (NAADS, farmers' associations, local governments or private consultancies)	(10)
Non-governmental organizations (agricultural development projects)	(6)
Education (teaching in primary school, secondary school or university)	(4)
Research organization (NARO, consultative group for international agricultural research [CGIAR])	(2)
Organic certification organization (certification officer, standards development)	(2)
Government agency (under Ministry of Agriculture)	(1)
Financial institution (agricultural loans)	(1)

encouraged to reflect upon the future for agroecology in Uganda and bring up any additional thoughts. Focus groups followed a similar pattern. Interviews and focus groups were recorded upon permission and transcribed, and a field journal was kept to record non-verbal data, methodological decisions and reflections on the process (Charmaz, 2014).

Analysis of the material was based on a grounded theory approach (Charmaz, 2014) of coding in three steps beginning alongside data generation: initial coding, focused coding and a final step aiming to identify important relationships between the themes (see Figure 1). Two coding processes were done to first identify how the participants construed agroecology (Table 1) and then identify structural barriers (four themes presented below). Constant comparison between transcripts, notes, codes and categories was done to ensure consistency throughout the analysis – from participants' accounts, via the coding process, to the interpreted findings.

Since interviews were structured around lived experiences, which of course vary, themes represent a synthesis of the accounts rather than consensus between them. In the sections below, analytic narratives are combined with transcript excerpts that provide emblematic examples and allow the reader to trace my interpretations. Participants have pseudonyms and no detailed personal information is disclosed.

Barriers to agroecology in Uganda's agricultural system

Constraints at farmer level: smallholders' productive assets and economic incentives

The first of the four themes relates to the productive assets available to smallholders and the economic incentives for how to use them. Agroecology is frequently argued to be attuned to the interests of poor farmers partly because it builds on existing structures of diverse, small-scale farming systems rather than seeking to erase them (Altieri, 2009). Some accounts offered support for this logic; for example, Godfrey works as an agricultural advisor for a farmers' association and sees high acceptance to agroecological practices because smallholders in the area traditionally do mixed farming with little external inputs, and tend to be knowledgeable of their local environment and its importance. Other had more mixed experiences regarding ability to and interest in adopting agroecological practices. Fred, a local government extension officer, spoke of shifting 'culture':

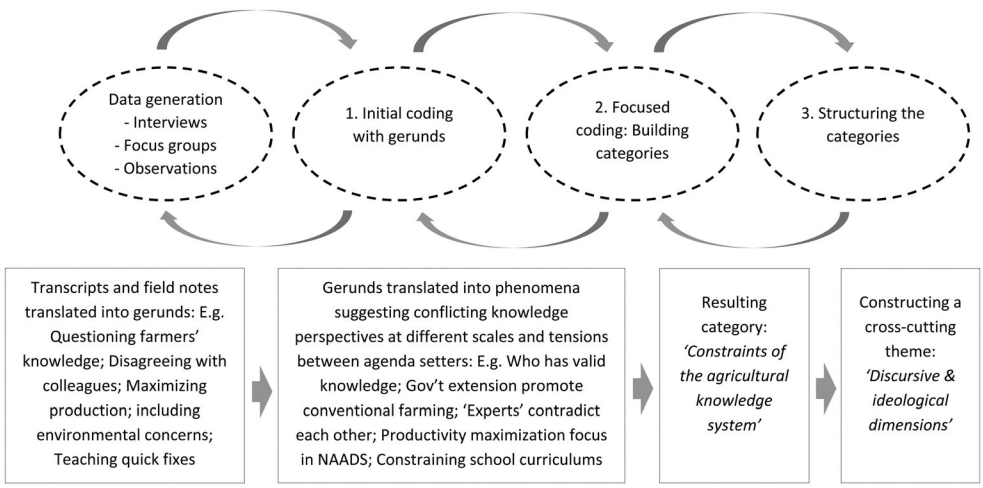

Figure 1. Data analysis process and examples from the coding process.

> Fred: Copying and pasting is destroying us, our culture, because in Uganda there are some features with their intrinsic values, could be mountains, could be other things. But now because of western culture … we are now saying no, it is not very important.

Fred alludes to immaterial co-determinants of agricultural practices such as what is valued in society, which I will return to below. That said, many also acknowledged the economic rationality of smallholders increasingly seeking 'modern' solutions. In what initially seemed paradoxical, participants emphasized accessibility and low capital intensity as a key merit of agroecological practices, but then proceeded to describe a variety of aspects making poor smallholders unable or unwilling to opt for them. Upon further analysis, this paradox could be resolved by considering two underlying messages in the accounts; firstly, although often less capital intensive than conventional alternatives, developing agroecological farming systems still requires *some* form of investment (be it money, labour or use of land). Secondly, initial investment is only one among many factors that play a role in farmers' decision-making.

In the short term, many explained, applying conventional inputs tends to produce relatively reliable, immediate and observable results, making them intuitively attractive while negative impacts often take time to emerge. They also save labour, which is costly, sometimes scarce and associated with drudgery and low status. The benefits of agroecological practices, meanwhile, often seem to take longer to materialize, are not easily measured in terms of yields and monetary value, and require more labour – not necessarily in the long term, but initially. Premium prices awarded to certain production systems (e.g. organic) are generally only available to a small (but growing) number of farmers who are formally certified. While application of fertilizers and pesticides to a strategic crop can produce a large harvest exchanged for a one-time sum, an agroecological farming system – while perhaps more resilient and sustainable – produces smaller yields of a variety of products, thus income that 'trickles in'. Such income is experienced as less palpable and measurable; it can also be less suited to costs like school fees, and less compatible with prevailing intra-household power relations (i.e. more difficult to control). Furthermore, developing diverse farming systems is discouraged by market mechanisms that favour volumes and standardization, in turn reinforced by policies that emphasize strategic commodities. Simon works for an NGO aiming to improve smallholders' involvement in value chains, and faces the problem of how to value agroecological systems using their current approach that is focused on particular commodities:

> Simon: Because we [agroecologists] are talking about a multiplicity of benefits, and some of them are not quantifiable, you can not attach a value. But you know they are there, so that's the challenge […] You come to the farm, you are looking at one product, let's say coffee … but you know the focus of these smallholders is not only coffee, it is on so many things, but we're focusing on coffee. So it means their efforts in the totality of the smallholder farm are not given the level of recognition that we want to see.

Land was the most commonly recurring productive asset discussed in particular issues of fragmentation and insecure tenure. The relationship between land tenure security and long-term investment in farming is a complex one (e.g. Place & Otsuka, 2002) but here it arose in the sense that that 'squatters' (farmers using the land of absentee landlords) hesitate to invest in activities like agroforestry due to the risk of getting evicted without notice. Land fragmentation, on the other hand (e.g. having to farm several small pieces of land, sometimes far apart), was described as something that makes it challenging to develop integrated farming systems. Some assets needed for developing diverse agroecological farming systems are ones that need to be purchased (such as livestock and apiculture equipment). Thomas, who works as an agricultural officer for a district government, has encouraged farmers in the region to produce honey and while many are

able to do so using traditional hives, protective gear is prohibitively expensive. Knowledge and information is another type of asset, with a common concern being that developing diverse, locally adapted agroecosystems is a knowledge-intensive task. Although knowledge intensity (rather than capital intensity) is often framed as a benefit (Holt-Giménez & Altieri, 2012), it was often framed here as constraint not least in light of the current research and extension set-up (next section).

Collective strategies like pooling of resources, labour and land were commonly mentioned as a promising strategy for overcoming the types of constraints covered here, as well as other problems like exploitation by traders. However, the level of farmer organization around the country was described as overall low, suggesting that this forms another (indirect) barrier.

Constraints of the agricultural knowledge system

The second theme is constraints related to actors and institutions engaged in agricultural research, extension and education, that is, the agricultural knowledge and information system (Röling, 1990). This also includes views on (agricultural) knowledge itself. A recurrent concern was that agricultural research conducted at Ugandan research institutions is narrowly focused on yield maximization, single crops rather than farming systems, and takes for granted conventional inputs and monoculture systems. Environmental dimensions may be addressed, but often in the superficial manner required by policy directives. There is also the issue of *how* research is conducted; participants spoke of 'old ways', referring to non-participatory approaches and one-directional knowledge dissemination. They particularly brought up two types of examples of how mainstream agricultural research is problematic; one is that technologies and practices are developed and promoted by virtue of being modern, 'scientific' and documented in a controlled environment, yet may be 'irrelevant' to smallholders or environmentally 'inappropriate' across Uganda's heterogeneous biophysical settings. Another is that alternative approaches fail to be explored or even acknowledged, resulting in lack of data on agroecological practices and few sites for experimentation and demonstration. In part, the desire for formal agroecology research was also rooted in the experience that 'what can be read in books' is perceived as the only valid knowledge – also increasingly among farmers. This is noteworthy given agroecology's emphasis on traditional knowledge and farmer-to-farmer knowledge sharing (Rosset & Martínez-Torres, 2012). Daniel, who works as an extension officer, spoke of the scepticism he sometimes sees among farmers when he suggests solutions inspired by other farmers:

> Daniel: He'll tell you 'that one is a village man, how can he tell you something which works and will help us to solve problems'.

Daniel works within the National Agricultural Advisory Services (NAADS), an important but inconsistent actor in Uganda's agricultural knowledge system.[2] Many participants lamented its underfunding, poor coordination and premature privatization – concerns which may be shared by other agricultural professionals, but are relevant considering agroecology's knowledge intensity and the experience that inaccessible extension services particularly affects smallholders. Participants experienced NAADS (like the national research institutes) as 'conventional', habitually promoting agro-inputs and approaching agriculture in a reductionist manner. Consequently, agroecologists working within extension described how they feel like they confuse farmers, as they contradict other 'experts'. James does agricultural extension as part of an NGO, and explains:

> James: The biggest challenge we are having when going back to the farmers is that we have contradicting messages. People like us from a non-government organization promote sustainable farming

> practices, organic farming practices … and then government organs come in again they are promoting conventional farming […] So you end up finding that some farmers become rigid to which direction to take.

Esther, who is also engaged within an NGO carrying out agricultural development projects, shared a similar account but hers involved another NGO in the same area operating mainly by giving away inputs. NAADS extension officer, Daniel described how his divergent perspective sometimes makes it difficult to collaborate with colleagues;

> Daniel: We reached a time where we would never meet in one moment. Because we would never agree, we would never agree. Because for him it is like, do everything you can to ensure that you maximize production. But then I was also saying we should also care for the environment and sustain it so that it also caters for the needs of future generations.

These dilemmas were mirrored by accounts of participants working as educators at various levels. Agriculture is taught as a subject in primary and secondary school, but according to Henry (a secondary school teacher), few pupils continue with the subject when it becomes optional because agriculture is associated with backwardness, poverty and low status. He was also troubled by the national curriculum for agriculture education, saying that there are things he would rather *not* teach:

> Henry: When I look at the curriculum at secondary level, and what I did at agroecology masters, it is a bit contradicting what is in the secondary curriculum. What the curriculum is preaching people to do is basically non-sustainable agriculture.
> Interviewer: Mm. What kind of things?
> Henry: Like … mostly constant use of pesticides. Basically they preach the use of external inputs, fertilizers, when you find the soils are not fertile. The quickest means.

Another interviewee emphasized that although it is positive that agriculture is now taught, pupils do not get to learn about the linkages between agriculture and the environment. Charles teaches agriculture at a private university, and similarly to James above, he has noticed that teaching approaches like organic pest management confuses the students, as other professors teach them to routinely apply chemicals. When asked about attempts to discuss this with colleagues, he stated that this had not been constructive and had sometimes, instead, led to his expertise being questioned. Several used the terminology of needing a new 'breed' of agricultural professionals. Christine, who works with organic certification, stated that she frequently faces 'biased' academics and government officials:

> Christine: The rest of the government departments and everybody else thinks organic farming is just backwards […] So we need a breed, and I think every university needs this kind of course in Uganda. Because it's going to bring out a breed of scientists that can look at the other side of the point. They don't necessarily have to go into conventional, this has always been, this is how it has to be, but they actually question. I think our scientists and researchers are the way they are because of the systems they went through.

Intertwined in Christine's, Henry's and several other accounts are value judgments and discourses related to farming, and I return to these in the fourth theme.

Constraints in the political economy of agricultural development

The third theme concerns the political and economic interests vested in particular pathways of agricultural development: particularly issues related to agricultural policy and politics, the role of private agribusiness, and the intermingling of the two.

As for the first, respondents discussed content as well as implementation of national policies governing agriculture. Several stated that while it is not clear exactly what is meant when the government speaks of agricultural modernization, it materializes as propagation of 'modern' inputs and technologies despite often being environmentally degrading and/or unconducive to poverty reduction. This can occur directly (through subsidies, giveaways and investments) or indirectly via the agricultural knowledge system. Agricultural policies might seem distant from day-to-day activities, but to Moses, who runs a small NGO, government policy is a 'big challenge':

> Moses: It looks silent, but when it comes to application it has got a direct impact. Because what my colleague has talked about, use of external inputs and insisting on irrelevant or inappropriate technology as result of research, is affecting the implementation of a system wide approach so much. To really have nature playing its own role.

A second aspect is the implementation of political objectives and policies. Although some policies were described as good 'on paper', there were concerns among participants regarding the commitment to put these into practice (signalled, for example, by insufficient support for local governments to enforce environmental regulation and failure to live up to budget allocation commitments). When offering explanations to current policy orientation and weak implementation, many interviewees gave reports of corruption. Some examples were forms of corruption that negatively affect de facto support for agricultural development at large (like embezzlement of funds); but others were related to vested interest in attracting capital intense agribusiness investments – even to the point of allowing illegal activities. Sylvia, who has started her own agricultural consultancy firm, exemplified this by pointing to how the government – under influence of donors and private corporations – has welcomed back dichlorodiphenyltrichloroethane (DDT) for fighting malaria. Aside from environmental and health impacts, she explained, this creates serious problems for organic producers whose concerns are not being taken seriously. Other recurrent examples used to explain how corrupt practices influence agricultural development were land acquisitions and genetically modified organisms (GMOs). Aside corruption, participants also pointed to how short-term political interests create a bias towards investments with immediate, visible impacts that can generate political support, but disincentivize critical evaluation of policy impacts. At the same time, participants often believed that the government has genuine faith in the virtues of conventional agricultural modernization in creating economic growth, beside which concerns like environmental sustainability and corporate control get framed as less significant.

As shown, many participants' accounts contained concerns of how private (often foreign) agribusiness actors' interests getting woven into politics and policies. Even accounts about 'bias' towards conventional practices within agricultural knowledge institutions (see above) were sometimes attributed to private actors' influence, since much research is privately funded. Similar constraints were also described among development practitioners, whose organizations tend to be dependent on foreign donors. Grace works as an agricultural advisor within an NGO, and explains:

> Grace: If it's a project that is promoting a herbicide or pesticide, maybe a certain company funds it. But it is still difficult to get funds for things that are concerning sustainable farming where the benefit is not necessarily just income, but looking at the profit of the farm in a holistic way.

In problematizing this, participants mainly discussed the environmental impacts of allowing these actors to steer development. A few also drew on the discourse on food sovereignty that has come to be intertwined with agroecology (Holt-Giménez & Altieri, 2012). In a focus group, participants, for example, discussed the 'enslavement' of farmers in tea plantations and indirect 'land grabbing' their expansion produces, and how smallholders are becoming increasingly dependent on costly commercial inputs. For Charles, the university teacher, countering powerful interests conflicting with those of smallholders' lies at the heart of the challenge for agroecology:

> Charles: I'm looking at this group of agroecologists as generals, who are not having even enough guns, but are going to fight terrible armies of very tough people … for the sake of saving millions of innocent people who are under great danger. But this war must be multipronged, it must be fought in a very humble way, very tactfully, and not by actually saying please now people you must do this and this … we should develop tools where people can start discovering what is right and what is wrong on their own.

A language of 'struggling', 'fighting' and 'waging war' was employed by several participants, also outside this particular focus group, when describing the feeling of challenging powerful (economic and/or political) actors, often suggesting that this must be done collectively.

Discursive and ideological dimensions of agricultural change

Three themes have now been presented that differ in terms of what part of the agricultural system they manifest themselves in. However, something they all share is that they point to discursive and ideological factors involved in shaping agricultural change. The fourth and final theme elaborates on these dimensions.

A frequently recurring topic in the interviews was perceptions of 'modernity' and 'backwardness' as they relate to agriculture. At a general level this relates to agriculture as a whole, expressed in accounts about very low occupational prestige, underinvestment in the sector, disinterest in agriculture as an academic subject, and the strong drive to reduce the need for agricultural labour despite growing unemployment. Isaac, who has a background in teaching but is now working with agricultural loans at a large bank, spoke of people 'hating' agriculture:

> Isaac: Then there is the other problem that comes from hating the production of crops and rearing animals. People hate agric. […] You see in Uganda they look at it as unproductive … for people who are very poor, who are very backward.

As has been touched upon above, Henry similarly explained how a majority of his secondary school pupils drop agriculture and view it as a subject for 'peasants' with no education. In one of the focus groups, participants discussed how young men in the area increasingly abandon farm work because they do not view it as a real occupation. Benjamin, who coordinates an NGO network for supporting sustainable agriculture, described how youth come under peer pressure when they have inherited farmland:

> Benjamin: When they [boda-boda drivers][3] find this boy with a hoe, digging from morning to afternoon … they are down there [in town] maybe taking a bottle of beer after earning something like three thousand shillings[4], and they say 'why are you backward, this work is for your grandmother. Sell this land and come and join town life'.

While these are constraints of agricultural development generally, participants portrayed them as indirectly discouraging agroecology given its knowledge intensity and the lower degree of

mechanization it is associated with. However, there are also accounts showing the devaluing of *specific* kinds of agricultural practices, technologies and knowledge. The following exchange between two focus group participants captures several aspects of this:

Benjamin: Now imagine an old woman in the village, the first question they would ask me, 'but Benjamin we thought you had a degree in agriculture, we have never seen you with a pump, you mean you don't know how to spray?'
Moses: Yeah
Benjamin: So, people are kind of like … what comes from the west is best, what is here … is backwards
Moses: Is backwards
Benjamin: And it is an attitude we really have to.
Moses: To change
Benjamin: Change, among the people. Even though we try to do many things, with that attitude it really becomes complicated for the agroecologist to fit in the society.

Several similar accounts were given; Esther works within an organization implementing a community-driven development project in a community where most farmers use little inputs and mostly traditional technologies like hand hoes. Despite this setting, she stated that one of the biggest challenges she faces is that farmers in the community have moved 'far into conventional agriculture' in terms of what they view as good practices:

> Esther: They feel that is modern, they feel that is the fashion somehow. They feel this clean white stuff [chemical fertilizer] is better if I applied it on my crop than the manure that is going to dirty my hands.

Emmanuel, who works as a researcher within the National Agricultural Research Organization (NARO), frequently interacts with farmers and farmer organizations and often encounters the assumption that chemical fertilizer use is a necessity. While he does not categorically oppose use of fertilizers, he is critical of how this has come to be seen as the only way to raise yields:

> Emmanuel: Quite often people are convinced that for you to produce sizeable yields, you must use these fertilizers. So people ask, I have my coffee, which fertilizer can I apply? I have my bananas, they are not doing well, which fertilizer can I apply?

As implied in the exchange between Benjamin and Moses, some interviewees noted how farmers associate 'modern' technologies with education and knowledge. This can also be seen among agricultural professionals; previously I provided the example of Charles being questioned by his colleagues for endorsing organic practices. Christine, who works with organic standards and certification, explained that she is often accused of promoting 'backwards' farming and referred to this mindset as her biggest challenge;

Christine: The moment you stand up and say I'm an organic farmer, or I work with an organic movement, then people just get biased … So you get people telling you organic cannot feed the world, organic is just nothing, it can't do anything. You get all these crazy ideas of people thinking it is backwards
Interviewer: And who are these people who are.
Christine: Mainly people that are academicians, these professors in agronomy. People that are not so practical, classroom people. They see the world in

> industrialization, they think the farm works best if it has machines, it has robots, it has big, big chunks of hectares of land. To them that is sustainable, it makes business sense, it makes economies of scale.

In her view, she explained being modern means also counteracting the negative effects of development, but that doing that in Uganda make people think you are 'backwards'. Above, Christine also alludes to how the concept of sustainability gets reduced to its economic dimension. Several others alluded to this tendency, not just among academics but also policy-makers; that 'sustainability is having money'. George, a NAADS extension officer, explained that when he attempts to bring up sustainability in terms of environmental considerations, he is frequently questioned by farmers and colleagues; why does he support ecological or sustainable farming when the 'developed world does conventional agriculture'? Others described being accused of being influenced by foreigners when caring about environmental impacts, and how colleagues in research and extension dismiss concerns about social sustainability and justice as though such concerns are merely signs of sentimentality.

Discussion and conclusions

This paper takes its point of departure in recent calls for scaling up agroecology in sub-Saharan Africa, given its potential as a sustainable mode of agriculture demonstrated to be effective in combating food insecurity and poverty among smallholders (De Schutter, 2010). By qualitatively exploring the perspectives of Ugandan agricultural professionals educated in agroecology, the aim was to identify key constraints to practicing and advancing agroecology in Uganda at a time when agricultural modernization features strongly in the government's strategy for economic growth. The rationale behind this approach is not that agroecology offers a finished package for agricultural sustainability, that all that remains is implementation – but that despite known merits, it is risks remaining a path left unexplored.

As the meaning of agroecology can differ substantially across contexts (Wezel et al., 2009), elaborating on the participants' *own* understanding was both a methodological necessity and a conceptual contribution. Agroecology is conceptualized here as a holistic outlook on agriculture characterized by human–environment interconnectedness, and a normative environmental and social justice ethic. This leads to concrete outcomes like systemic problem assessment, collaborative and participatory approaches, and reassessment of expertise. While agroecology does not necessarily equal organic agriculture, there is a tendency to view agrochemical inputs as 'quick fixes' with negative long-term effects. Interestingly, there is no inherent contradiction with the government's ambition of *commercializing* agriculture, but scepticism towards the commodification strategy and the welcoming of increasing reliance on commercial inputs.

Through inductive analysis of interview and focus group material, I then developed four types of barriers to agroecological transition for a synoptic, interpreted overview of the data. Interestingly, direct parallels can be seen between the first three themes and the way that agroecology is commonly conceptualized as practice, science and/or movement (Wezel et al., 2009). This suggests that the three are indeed indivisible (Sevilla Guzmán & Woodgate, 2013) in a process of 'scaling up' agroecology. Because of its immaterial nature, the fourth theme of discourse and ideology gets expressed *through* the others, and the actors within. However, its prominence in the accounts led me to analytically separate it for the sake of clarity. The four themes are comprehensive (partly a result of the strategic inclusion of voices from different professional and geographical settings) and looking only at category level, findings mostly echo what has been previously argued as necessary for institutionalizing agroecology across the board – like major

policy reforms and new research and development agendas (Altieri & Toledo, 2011). Deeper engagement with the accounts, however, makes clear that constraints are also contingent on the particular setting, and I encourage future research to critically build upon this analysis. Below, I underline key findings while pointing towards critical issues and relevant theoretical lenses for further inquiry.

Firstly, there are constraints and relative (dis)advantages of adopting agroecological practices at the farmer level, related to basic production factors of land, labour and capital. Clearly, even though agroecology has emerged as a smallholder-oriented approach, it is no silver-bullet that can dodge the multiple pressures experienced by resource-poor farmers. Challenges arise in terms of access to resources for developing complex farming systems, and in the nature of economic returns where temporal perspectives are important. Most constraints at farmer level are shaped by external factors like land tenure and market incentives, and thus not fixed. What can also be noted, however, is that some constraints point to mismatch between the virtues of agroecology as viewed by the global community of scholars and activists, and smallholders' lived reality under the 'food imperative' (Jerneck & Olsson, 2013). For example, labour intensity has been argued to be a merit considering underemployment (De Schutter, 2010) and 'meaningfulness' of agricultural work (Timmermann & Félix, 2015) but is hardly a benefit at the individual farmer level where labour is costly, arduous, and sometimes scarce. Such mismatch calls for development practice, research and debate around agroecology that is grounded in livelihoods perspectives (Amekawa, 2011).

The second theme points to the role of agricultural knowledge and expertise. Participant accounts particularly illuminate the narrow focus on raising productivity through a fixed set of technologies that is found among mainstream institutions for agricultural research, extension and education. This does not just support a development trajectory at odds with agroecology, but also leaves a void in terms of the scientific insights, demonstration opportunities and knowledge sharing needed to advance agroecology, which is knowledge-intensive (Altieri & Nicholls, 2005). Additionally, accounts depict tendencies to invalidate ideas motivated by environmental or social concerns, and to devalue knowledge originating outside of formal scientific research, even among farmers. It has long been stressed that that 'truly alternative agriculture' requires truly alternative agricultural science (Kloppenburg, 1991). Complex objectives like agricultural sustainability and food security place high demands on agricultural knowledge and information systems (Röling, 1990) and like in many parts of the world, deep-rooted resistance to change has been found within Ugandan agricultural research institutions (Hall & Nahdy, 1999). Future studies addressing this problem must consider that although formal institutions for agricultural knowledge are important, the seemingly hegemonic position of certain forms and locations of knowledge production means that agroecology's epistemological challenge extends beyond them.

The third theme brings together matters of policy, politics and broader economic interests, termed the political economy of agricultural development. On these topics, participants sometimes drew on contentious issues related to agricultural technologies and land use in Uganda, such as land acquisitions, GMOs and DDT – but often more mundane questions like the push to increase use of inorganic fertilizer, issues with similar vested interests but less contentiousness and thus less attention. In the accounts, private economic incentives, political interests, corruption and modernization ideology seem to blend into each other to block agroecological pathways in Uganda, where modernization of agriculture long has been central to the government's overall political agenda (Hickey, 2005) and where foreign capital is the main source of funding for research and development (Kiiza, 2012). Agroecology has started to get scrutinized through political economy lenses, both from 'within' the movement and by more sceptical voices (Bernstein, 2014; Holt-Giménez & Altieri, 2012; Holt Giménez & Shattuck, 2011; McMichael, 2014). The challenge will be to better link these highly theoretical and often global perspectives with the local

and empirical that has dominated agroecological research, to better understand the implications in given settings.

Finally, I treat recurring ideological and discursive dimensions as a constraint that cuts across the other three. Most central here is what gets embraced as 'modern', or discarded as 'backwards'. The tendency to associate alternative agricultural practices (Beus & Dunlap, 1990) and rurality in general (Cruickshank, 2009) with outdatedness is known, and so are the strongly ideological characteristics of agricultural modernization (Hardeman & Jochemsen, 2012) – but the implications for agroecology have not been given due attention. This is not to say that all constraints are simply products of ideology, nor that the current discourse is entirely monolithic.[5] But struggles about human–environment interaction are both material and about *meaning*, and claims about what is modern/backwards, sustainable/degrading have often been employed more or less deliberatively to further particular agendas (Bryant, 1998). Understanding these dimensions is necessary when questioning dominant development pathways through agroecology, but so is self-reflection on discursive practices and ideological underpinnings so as to avoid falsely representing the heterogeneous perspectives of peasants (Bernstein, 2014) including desires for 'modernity'.

Moving from barriers towards strategies for overcoming them, a productive starting point suggested by this paper's findings is collective action, both for overcoming smallholders' resource and market constraints and in the context of collective claims making. The latter has received less attention in this setting compared to the former (e.g. Andersson & Gabrielsson, 2012; Markelova, Meinzen-Dick, Hellin, & Dohrn, 2009) despite the prevalent notion that agroecological transition must come 'from below' (Parmentier, 2014) through rural social movements (Méndez et al., 2013). Marginalized groups' resistance to elite claims is a common theme in political ecology research (Bryant, 1998) and this study does not call into question that this can (and does) occur. But the accounts also echo Bebbington's (1996) caution that accessing 'modern' ideas and technologies previously out of reach can seem emancipatory, despite new dependencies. If peasant life is widely considered undesirable, not least among youth, the agroecological discourse of 'defending peasant life' (Martínez-Torres & Rosset, 2010) may not be the most mobilizing one. Then there is also the question of capacity to enact emerging resistance. Uganda has a history of conflict and political interventions that has disrupted farmer organization (Flygare, 2006), a civil society described as largely compliant and service-delivery oriented (Hickey, 2005; Wilson & Holt-Giménez, 2010), and political hostility towards actors that raise questions around land investments and environmental concerns (Human Rights Watch, 2012). Like agroecological practice rejects universal 'quick fixes' and inevitably varies across settings, its advancement 'from below' must be expected to come through heterogeneous movements with 'all their variations of specific processes of agrarian change and the circumstances of different rural classes, specific histories, experiences and cultures of struggle' (Bernstein, 2010, p. 120).

To conclude, Uganda's project of agricultural modernization warrants not only critical scrutiny but also a serious discussion about alternative development pathways. At the global level, agroecology is gaining support as a conceptually appealing, scientifically sound and practically realizable alternative for addressing rural poverty and food insecurity. However, this study points to deep-rooted structural barriers to scaling up agroecology in the Ugandan context. Some are immediate; discouraging farmers from developing agroecological systems materially, informationally, economically and culturally. Others perpetuate and reinforce immediate constraints by way of the political economy, epistemology and ideology of agricultural change. Intensified engagement with the former is crucial, but in isolation reduces agroecology to a welcome – but ephemeral – tool for helping smallholders get by while awaiting the agricultural revolution.

Acknowledgements

Many thanks also to the research participants who generously shared their knowledge and experiences. Also thanks to Anne Jerneck and Barry Ness for comments on earlier drafts.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This work was financially supported by the Linnaeus Centre LUCID, funded by the Swedish Research Council Formas, and the fieldwork was financially supported by the Nordic Africa Institute.

Notes

1. In his first speech as president in 1986, Museveni stated that he does '*not want a country of peasants*' (quoted in Hickey, 2005).
2. NAADS was restructured in the beginning of the 2000s from a public extension system to a public–private partnership, where services were contracted out to private providers and costs were gradually shifted to local governments and farmers (Okoboi, Kuteesa, & Barungi, 2013). In May 2014 (shortly after this research was conducted), the President directed the Cabinet to dissolve NAADS due to 'non-performance' and 'mismanagement of funds'. In June, it was announced that the Ugandan army officers would be deployed to coordinate NAADS activities.
3. Motorcycle taxi, a common mode of transportation in both urban and rural areas, usually driven by young men.
4. Approximately 1 USD.
5. For example, in his 2012 State of the Nation address president Museveni lamented the failure of smallholders to contribute to agricultural growth, and referred to a particular agroecological farm and training centre as offering 'the solution' (2012).

References

Altieri, M. A. (2009). Agroecology, small farms, and food sovereignty. *Monthly Review*, *61*(3), 102–113.

Altieri, M. A., Funes-Monzote, F. R., & Petersen, P. (2012). Agroecologically efficient agricultural systems for smallholder farmers: Contributions to food sovereignty. *Agronomy for Sustainable Development*, *32*(1), 1–13.

Altieri, M. A., & Nicholls, C. I. (2005). Agroecology and the search for a truly sustainable agriculture. Mexico City: United Nations Environmental Programme.

Altieri, M. A., & Toledo, V. M. (2011). The agroecological revolution in Latin America: Rescuing nature, ensuring food sovereignty and empowering peasants. *Journal of Peasant Studies*, *38*(3), 587–612.

Amekawa, Y. (2011). Agroecology and sustainable livelihoods: Towards an integrated approach. *Journal of Sustainable Agriculture*, *35*(2), 118–162.

Andersson, E., & Gabrielsson, S. (2012). 'Because of poverty, we had to come together': Collective action for improved food security in rural Kenya and Uganda. *International Journal of Agricultural Sustainability*, *10*(3), 245–262.

Bahiigwa, G., Rigby, D., & Woodhouse, P. (2005). Right target, wrong mechanism? Agricultural modernization and poverty reduction in Uganda. *World Development*, *33*(3), 481–496.

Barlett, P. F., & Conger, K. J. (2004). Three visions of masculine success on American farms. *Men and Masculinities*, *7*(2), 205–227.

Bategeka, L., Kiiza, J., & Kasirye, I. (2013). *Institutional constraints to agriculture development in Uganda. Research series no. 101*. Kampala: Economic Policy Research Centre.

Bebbington, A. (1996). Movements, modernizations, and markets. In R. Peet, & M. Watts (Eds.), *Liberation ecologies: Environment, development, social movements* (pp. 86–109). London: Routledge.

Bernstein, H. (2010). Class dynamics of agrarian change. Sterling, VA: Kumarian Press.

Bernstein, H. (2014). Food sovereignty via the 'peasant way': A sceptical view. *The Journal of Peasant Studies*, *41*(6), 1031–1063.

Beus, C. E., & Dunlap, R. E. (1990). Conventional versus alternative agriculture: The paradigmatic roots of the debate. *Rural Sociology*, *55*(4), 590–616.
Bryant, R. L. (1998). Power, knowledge and political ecology in the third world: A review. *Progress in Physical Geography*, *22*(1), 79–94.
Burton, R. J. (2004). Seeing through the 'good farmer's' eyes: Towards developing an understanding of the social symbolic value of 'productivist' behaviour. *Sociologia Ruralis*, *44*(2), 195–215.
Carey, M. A. (1994). The group effect in focus groups: Planning, implementing, and interpreting focus group research. In J. M. Morse (Ed.), *Critical issues in qualitative research methods* (pp. 225–241). London: Sage.
Carolan, M. S. (2005). Barriers to the adoption of sustainable agriculture on rented land: An examination of contesting social fields. *Rural Sociology*, *70*(3), 387–413.
Carolan, M. S. (2006). Do you see what I see? Examining the epistemic barriers to sustainable agriculture. *Rural Sociology*, *71*(2), 232–260.
Cerf, M., Guillot, M., & Olry, P. (2011). Acting as a change agent in supporting sustainable agriculture: How to cope with new professional situations? *Journal of Agricultural Education and Extension*, *17*(1), 7–19.
Charmaz, K. (2014). *Constructing grounded theory*. London: Sage.
Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, *39*(3), 124–130.
Cruickshank, J. A. (2009). A play for rurality – modernization versus local autonomy. *Journal of Rural Studies*, *25*(1), 98–107.
Dalgaard, T., Hutchings, N. J., & Porter, J. R. (2003). Agroecology, scaling and interdisciplinarity. *Agriculture, Ecosystems & Environment*, *100*(1), 39–51.
De Schutter, O. (2010). *Agroecology and the right to food human rights council 16th session agenda item 3*. A/HRC/16/49: United Nations General Assembly.
Ellis, F., & Bahiigwa, G. (2003). Livelihoods and rural poverty reduction in Uganda. *World Development*, *31*(6), 997–1013.
Eksvärd, K., Salomonsson, L., Francis, C., Tesfay, G., Abraha, Z., Mekelle, ... Kiggundu, T. S. (2014). Narrowing the gap between academia and practice through agroecology: Designing education and planning for action. *NACTA Journal*, *58*(2), 148.
Flygare, S. (2006). *The cooperative challenge: Farmer cooperation and the politics of agricultural modernisation in 21st century Uganda*. Doctoral dissertation, Department of Economic History, Uppsala University.
Gliessman, S. R. (1998). *Agroecology: Ecological processes in sustainable agriculture*. Boca Raton, FL: CRC Press.
Gonzalez de Molina, M. (2013). Agroecology and politics. How to get sustainability? About the necessity for a political agroecology. *Agroecology and Sustainable Food Systems*, *37*(1), 45–59.
GoU. (2010). *National development plan (2010/11–2014/15)*. Kampala: Author.
GoU. (2013). *Uganda vision 2040*. Kampala: Author.
Gubrium, J. F., & Holstein, J. A. (2001). *Handbook of interview research: Context and method*. Thousand Oaks, CA: Sage.
Hall, A., & Nahdy, S. (1999). New methods and old institutions: The 'systems context' of farmer participatory research in national agricultural research systems: The case of Uganda. Agricultural Research and Extension Network (AgREN) Network Paper no. 93. London: Overseas Development Institute.
Hardeman, E., & Jochemsen, H. (2012). Are there ideological aspects to the modernization of agriculture? *Journal of Agricultural & Environmental Ethics*, *25*(5), 657–674.
Hecht, S. B. (1987). The evolution of agroecological thought. In M. A. Altieri (Ed.), *Agro-ecology: The scientific basis of alternative agriculture* (pp. 1–20). London: IT Publications.
Hickey, S. (2005). The politics of staying poor: Exploring the political space for poverty reduction in Uganda. *World Development*, *33*(6), 995–1009.
Hickey, S. (2013). Beyond the poverty agenda? Insights from the new politics of development in Uganda. *World Development*, *43*, 194–206.
Holt-Giménez, E., & Altieri, M. A. (2012). Agroecology, food sovereignty, and the new Green Revolution. *Agroecology and Sustainable Food Systems*, *37*(1), 90–102.
Holt Giménez, E., & Shattuck, A. (2011). Food crises, food regimes and food movements: Rumblings of reform or tides of transformation? *The Journal of Peasant Studies*, *38*(1), 109–144.

Horlings, L., & Marsden, T. (2011). Towards the real green revolution? Exploring the conceptual dimensions of a new ecological modernisation of agriculture that could 'feed the world'. *Global Environmental Change*, *21*(2), 441–452.
Human Rights Watch. (2012). *Curtailing criticism. Intimidation and obstruction of civil society in Uganda*. New York, NY: Human Rights Watch.
IAASTD. (2009). *Agriculture at a crossroads. The global report of the international assessment of agricultural knowledge, science, and technology.* Washington, DC: Island Press.
Jerneck, A., & Olsson, L. (2013). More than trees! Understanding the agroforestry adoption gap in subsistence agriculture: Insights from narrative walks in Kenya. *Journal of Rural Studies*, *32*, 114–125.
Karami, E., & Mansoorabadi, A. (2008). Sustainable agricultural attitudes and behaviors: A gender analysis of Iranian farmers. *Environment, Development and Sustainability*, *10*(6), 883–898.
Kiiza, J. (2012). New developmentalism in the old wineskin of neoliberalism in Uganda. In C. Kyung-Sup, B. Fine, & L. Weiss (Eds.), *Developmental politics in transition: The neoliberal era and beyond* (pp. 211–232). New York, NY: Palgrave Macmillan.
Kitzinger, J. (1994). The methodology of focus groups: The importance of interaction between research participants. *Sociology of Health & Illness*, *16*(1), 103–121.
Kloppenburg, J. (1991). Social theory and the de/reconstruction of agricultural science: Local knowledge for an alternative agriculture. *Rural Sociology*, *56*(4), 519–548.
Kvale, S. (2008). *Doing interviews*. London: Sage.
Lee, D. R. (2005). Agricultural sustainability and technology adoption: Issues and policies for developing countries. *American Journal of Agricultural Economics*, *87*(5), 1325–1334.
Leliveld, A., Dietz, A. J., Foeken, D. W. J., & Klaver, W. (2013). Agricultural dynamics and food security trends in Uganda. Research Report 2013-ASC-2. London/Leiden: Overseas Development Institute.
Levidow, L., Pimbert, M., & Vanloqueren, G. (2014). Agroecological research: Conforming – or transforming the dominant Agro-food regime? *Agroecology and Sustainable Food Systems*, *38*(10), 1127–1155.
Lwanga-Ntale, C. (2013). Chronic poverty in Uganda: Lessons from 10 years of research and policy engagement. In A. Shepherd, & J. Brunt (Eds.), *Chronic poverty: Concepts, causes and policy* (pp. 246–269). New York, NY: Palgrave Macmillan.
Lyons, K., & Westoby, P. (2014). Carbon colonialism and the new land grab: Plantation forestry in Uganda and its livelihood impacts. *Journal of Rural Studies*, *36*, 13–21.
MAAIF. 2010. *Agriculture for food and income security. Agriculture sector development strategy and investment plan: 2010/11–2014/15*. Kampala: Author.
MAAIF. (2012). *Proposed action plan to operationalise the non-ATAAS component of the agriculture sector development strategy and investment plan*. Kampala: Author.
Markelova, H., Meinzen-Dick, R., Hellin, J., & Dohrn, S. (2009). Collective action for smallholder market access. *Food policy*, *34*(1), 1–7.
Marsden, T., Banks, J., Renting, H., & Van Der Ploeg, J. D. (2001). The road towards sustainable rural development: Issues of theory, policy and research practice. *Journal of Environmental Policy and Planning*, *3*(2), 75–83.
Martínez-Torres, M. E., & Rosset, P. M. (2010). La Vía Campesina: The birth and evolution of a transnational social movement. *The Journal of Peasant Studies*, *37*(1), 149–175.
McMichael, P. (2014). A comment on Henry Bernstein's way with peasants, and food sovereignty. *The Journal of Peasant Studies*, *42*(1), 193–204.
Méndez, V. E., Bacon, C. M., & Cohen, R. (2013). Agroecology as a transdisciplinary, participatory, and action-oriented approach. *Agroecology and Sustainable Food Systems*, *37*(1), 3–18.
Morgan, D. L. (1996). Focus groups. *Annual Review of Sociology*, *22*, 129–152.
Museveni, Y. K. (2012). *The state of the nation address 2012*. Kampala: The State House of Uganda.
Neill, S. P., & Lee, D. R. (2001). Explaining the adoption and disadoption of sustainable agriculture: The case of cover crops in northern Honduras. *Economic Development and Cultural Change*, *49*(4), 793–820.
NEMA. (2010). *State of the environment report for Uganda 2010*. Kampala: Author.
Okoboi, G., Kuteesa, A., & Barungi, M. (2013). The impact of the National Agricultural Advisory Services program on household production and welfare in Uganda African growth initiative. Working Paper 7. Washington DC: Brookings Institution.
Oxford Policy Management. (2005). *Evaluation report – The plan for the modernisation of agriculture – Main report*. Oxford: Author.

Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). Understanding and promoting adoption of conservation practices by rural landholders. *Animal Production Science*, *46*(11), 1407–1424.

Parmentier, S. (2014). *Scaling-up agroecological approaches: What, why and how?* Brussels: Oxfam-Solidarity.

Paulson, S., Gezon, L. L., & Watts, M. (2005). Politics, ecologies, genealogies. In S. Paulson, & L. L. Gezon (Eds.), *Political ecology across spaces, scales, and social groups* (pp. 17–40). New Brunswick, NJ: Rutgers University Press.

Petrzelka, P., Korsching, P. F., & Malia, J. E. (1996). Farmers' attitudes and behavior toward sustainable agriculture. *The Journal of Environmental Education*, *28*(1), 38–44.

Place, F., & Otsuka, K. (2002). Land tenure systems and their impacts on agricultural investments and productivity in Uganda. *The Journal of Development Studies*, *38*(6), 105–128.

Pretty, J. (2008). Agricultural sustainability: Concepts, principles and evidence. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*(1491), 447–465.

Rodriguez, J. M., Molnar, J. J., Fazio, R. A., Sydnor, E., & Lowe, M. J. (2009). Barriers to adoption of sustainable agriculture practices: Change agent perspectives. *Renewable Agriculture and Food Systems*, *24*(01), 60–71.

Röling, N. (1990). The agricultural research-technology transfer interface: A knowledge systems perspective. In D. Kaimowitz (Ed.), *Making the link: Agricultural research and technology transfer in developing countries* (pp. 1–42). London: Westview Press.

Rosset, P. M., & Martínez-Torres, M. E. (2012). Rural social movements and agroecology: Context, theory, and process. *Ecology and society*, *17*(3), 17.

Salamon, S., Farnsworth, R. L., Bullock, D. G., & Yusuf, R. (1997). Family factors affecting adoption of sustainable farming systems. *Journal of Soil and Water Conservation*, *52*(4), 265–271.

Schaller, N. (1993). The concept of agricultural sustainability. *Agriculture, Ecosystems & Environment*, *46*(1), 89–97.

Schoon, B., & Te Grotenhuis, R. (2000). Values of farmers, sustainability and agricultural policy. *Journal of Agricultural and Environmental Ethics*, *12*(1), 17–27.

Sevilla Guzmán, E., & Woodgate, G. (2013). Agroecology: Foundations in agrarian social thought and sociological theory. *Agroecology and Sustainable Food Systems*, *37*(1), 32–44.

Smit, B., & Smithers, J. (1992). Adoption of soil conservation practices: An empirical analysis in Ontario, Canada. *Land Degradation & Development*, *3*(1), 1–14.

Timmermann, C., & Félix, G. (2015). Agroecology as a vehicle for contributive justice. *Agriculture and Human Values*, *32*(11), 1–16.

Tumushabe, G., Ruhweza, A., Masiga, M., & Naturinda, B. (2007). *Integrated assessment of Uganda's organic agriculture sub-sector: Economic opportunities and policy options to mitigate negative socio-economic and environmental impacts*. Kampala: United Nations Environment Programme.

UNCTAD. (2009). *World investment report 2009: Transnational corporations, agricultural production and development*. New York, NY: Author.

UNCTAD. (2013). *Wake up before it is too late: Make agriculture truly sustainable now for food security in a changing climate*. Geneva: Author.

Vanloqueren, G., & Baret, P. V. (2009). How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations. *Research Policy*, *38*(6), 971–983.

Wandel, J., & Smithers, J. (2000). Factors affecting the adoption of conservation tillage on clay soils in Southwestern Ontario, Canada. *American Journal of Alternative Agriculture*, *15*(4), 181–188.

Wezel, A., Bellon, S., Doré, T., Francis, C., Vallod, D., & David, C. (2009). Agroecology as a science, a movement and a practice. *A Review. Agronomy for Sustainable Development*, *29*, 503–515.

Wezel, A., Casagrande, M., Celette, F., Vian, J.-F., Ferrer, A., & Peigné, J. (2014). Agroecological practices for sustainable agriculture. *A Review. Agronomy for Sustainable Development*, *34*(1), 1–20.

Wilson, J., & Holt-Giménez, E. (2010). Creating movement and momentum – A reflective piece on NGO sustainable agriculture support to farmers in east and southern Africa. *Journal of Peasant Studies*, *37*(1), 215–220.