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Agroecology as an alternative development pathway: the case of Uganda

Isgren, Ellinor

2018

Document Version:

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Isgren, E. (2018). *Between Nature and Modernity: Agroecology as an alternative development pathway: the case of Uganda*. [Doctoral Thesis (compilation), LUCSUS (Lund University Centre for Sustainability Studies)]. Lund University.

Total number of authors:

1

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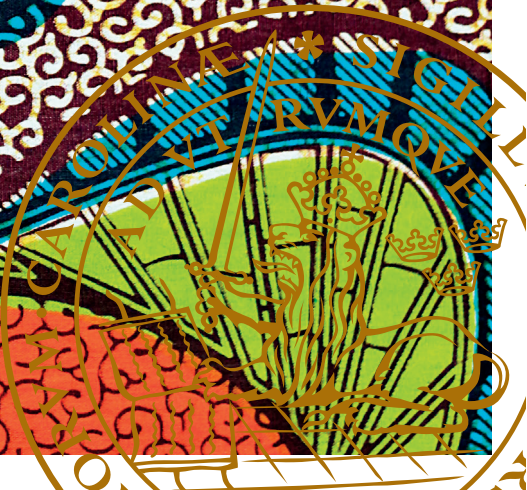


Between Nature and Modernity

Agroecology as an alternative development pathway:
the case of Uganda

ELLINOR ISGREN

LUCSUS | FACULTY OF SOCIAL SCIENCES | LUND UNIVERSITY





There is little doubt that what we today know as modern agriculture faces serious sustainability challenges, and many actors call for alternatives that can ‘feed the world’ also in the long term. Meanwhile, agricultural modernization remains a major development hope in many countries of the global South. In recent years, agroecology has been proposed both within and beyond academia as an alternative with great potential to resolve tensions between environment and society – or between nature and modernity.

In this thesis I examine this claim, and explore empirically how agroecology is pursued and constrained in the case of Uganda. Towards the end I turn my attention to civil society, and the possibilities for NGOs and farmers to collectively confront the dominant and contradictory neoliberal approach to development – and the logic of conventional agricultural modernization itself.

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Between Nature and Modernity

Agroecology as an alternative development
pathway: the case of Uganda

Ellinor Isgren



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DOCTORAL DISSERTATION

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To be defended in Ostrom, Josephson Building, Biskopsgatan 5, Lund.
21 March, 2018 at 10.15.

Faculty opponent

Dr. Henny Osbahr, Associate Professor, School of Agriculture, Policy
and Development, University of Reading, UK.

Organization LUND UNIVERSITY Author: Ellinor Isgren	Document name: Doctoral dissertation	
	Date of issue: February 28, 2018	
	Sponsoring organization: Lund University	
Title and subtitle: Between nature and modernity: agroecology as an alternative development pathway: the case of Uganda		
<p>Abstract</p> <p>Agricultural modernization has massively increased global food supply, but at a high environmental cost. Today many are calling for an agricultural 'paradigm shift', including several mainstream institutions. But to what? In recent years, agroecology has gained credence as an alternative approach that seeks to understand and manage farms as complex agroecosystems. From a development perspective, it is argued to not only hold potential for sustainable agriculture, but also as a model for inclusive development thanks to its particular applicability in sites dominated by small-scale low-capital farming. Uganda is one of many countries in sub-Saharan Africa where much hope is currently placed in agricultural development for poverty alleviation, economic growth and food security. Yet despite its promise to resolve tensions between development and environmental sustainability, agroecology remains largely ignored.</p> <p>The aim of this thesis is to understand if and how agroecology has potential to constitute a desirable and viable alternative pathway of agricultural development, and to provide insights about its achievability in Uganda. I do so by employing a research strategy rooted in critical modernity, critical realism and emancipatory social science, and by combining fieldwork methods and secondary material via an interdisciplinary approach. The thesis is structured around three interlinked tasks. First, I provide a critique of conventional agricultural modernization where I identify limitations and contradictions internal to this model of development, and explain the emergence and persistence of the particularly problematic form of agrarian politics in Uganda under the NRM regime. Second, I scrutinize the claim that agroecology offers a sustainable and viable model of agricultural development, and argue that there is convincing evidence for its potential to do so. When analyzing how this alternative is being implemented in Uganda today, and by whom, I find that agroecology is typically pursued by actors in civil society and academia as a form of smallholder-oriented 'modernization from below'. Agroecology contributes by providing principles for sustainable and locally adapted agriculture. However, I also find substantial barriers to agroecology that are structural in kind, and require more overt confrontation of 'modernization from above'. Third, therefore, I analyze the conditions for political engagement and broader mobilization for agroecology within Ugandan civil society, by looking at its historical formation and current strategies at national and local level.</p> <p>Beyond insights about the specific dynamics of agrarian change in Uganda, the thesis makes two main contributions: 1) it theorizes agroecology and its role in agricultural development, thus taking steps forward towards rethinking agricultural modernity, and 2) it advances the maturing field of sustainability science by using emancipatory social science to promote its critical problem-solving agenda.</p>		
Key words: Agricultural sustainability, smallholder farming, neoliberal modernization, sub-Saharan Africa, Uganda, civil society, rural social movements, emancipatory sustainability science, political ecology		
Classification system and/or index terms (if any)		
Supplementary bibliographical information		Language: English
Key title: Lund dissertations in sustainability science		ISBN (print): 978-91-982201-7-9 ISBN (PDF): 978-91-982201-8-6
Recipient's notes	Number of pages: 196	Price
	Security classification	

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Faculty of Social Science
Lund University Centre for Sustainability Studies

ISBN (print): 978-91-982201-7-9

ISBN (PDF): 978-91-982201-8-6

Printed in Sweden by Media-Tryck, Lund University
Lund 2018



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Abstract

Agricultural modernization has massively increased global food supply, but at a high environmental cost. Today many are calling for an agricultural ‘paradigm shift’, including several mainstream institutions. But to what? In recent years, agroecology has gained credence as an alternative approach that seeks to understand and manage farms as complex agroecosystems. From a development perspective, it is argued to not only hold potential for sustainable agriculture, but also as a model for inclusive development thanks to its particular applicability in sites dominated by small-scale low-capital farming. Uganda is one of many countries in sub-Saharan Africa where much hope is currently placed in agricultural development for poverty alleviation, economic growth and food security. Yet despite its promise to resolve tensions between development and environmental sustainability, agroecology remains largely ignored.

The aim of this thesis is to understand if and how agroecology has potential to constitute a desirable and viable alternative pathway of agricultural development, and to provide insights about its achievability in Uganda. I do so by employing a research strategy rooted in critical modernity, critical realism and emancipatory social science, and by combining fieldwork methods and secondary material via an interdisciplinary approach. The thesis is structured around three interlinked tasks. First, I provide a critique of conventional agricultural modernization where I identify limitations and contradictions internal to this model of development, and explain the emergence and persistence of the particularly problematic form of agrarian politics in Uganda under the NRM regime. Second, I scrutinize the claim that agroecology offers a sustainable and viable model of agricultural development, and argue that there is convincing evidence for its potential to do so. When analyzing how this alternative is being implemented in Uganda today, and by whom, I find that agroecology is typically pursued by actors in civil society and academia as a form of smallholder-oriented ‘modernization from below’. Agroecology contributes by providing principles for sustainable and locally adapted agriculture. However, I also find substantial barriers to agroecology that are structural in kind, and require more overt confrontation of ‘modernization from above’. Third, therefore, I analyze the conditions for political engagement and broader mobilization for agroecology within Ugandan civil society, by looking at its historical formation and current strategies at national and local level.

Beyond insights about the specific dynamics of agrarian change in Uganda, the thesis makes two main contributions: 1) it theorizes agroecology and its role in agricultural development, thus taking steps forward towards rethinking agricultural modernity, and 2) it advances the maturing field of sustainability science by using emancipatory social science to promote its critical problem-solving agenda.

Acknowledgments

*If I have weaknesses
don't let them blind me*

Paul Simon

It's a strange time to become a researcher, so I feel lucky to have come of academic age in an environment that not only helped me become one, but also made me unabashedly *want* to be one. Thank you to all my LUCSUS colleagues!

My two supervisors, Anne Jerneck and Barry Ness – like good parents you have allowed me to try my wings but never let me drift too far. Anne, thank you for always standing by, ready to help make sense of a messy reality, structure messy texts, or offer comfort in a messy life. It does take a village, and you have been at the heart of mine. Barry, thank you for often taking on the role as bad cop, even though you aren't really one, and for pushing me to cut the BS and be bolder.

Turaj Faran, you refuse to accept your influence on me/us but thankfully that has no bearing on its existence. I'm very glad for that. Thank you for providing shelter from the storm, too. I am also grateful to Lennart Olsson for his role in making LUCSUS such a vibrant place, and for consistently taking the time to engage with my work despite being buried in his own. Thank you Karin Steen, Maryam Nastar, John Morton, Elina Andersson, Henrik Egelyng, Chad Boda and Sara Brogaard for having read and discussed my thesis at various stages. Elina, special thanks for bringing me on board your research! Thanks also to Cecilia Kardum-Smith for compensating for my shortcomings in all things administrative.

People say the PhD journey can be lonely, but I've enjoyed the company of some truly amazing people who made my weaknesses a lot less blinding. David, I am glad we found our way out of that theoretical wasteland side by side. Our many confusing but ultimately enlightening conversations made life much more bearable, even enjoyable, this mad final year. Chad, the ferocious typing aside, I thank my lucky star for making you my perpetual office mate. I've learned so much from you, and one cannot lose motivation for too long with you around. Dearest Dejvid, impossibly clear-sighted, forever youthful, and a bridge over troubled water; you've heard it before, but thank you for everything. Emma Li, my unexpected sister! Thanks for letting me be your theoretical guru despite not deserving such a title, you inspire me to be braver and I hope there are many more joint adventures to come. Ebba, thank you for making the office a better place with your *cachaça* and quiet thoughtfulness, and of course for the memorable summer of "fun". Helena, thank you for your unapologetic straightforwardness, I have always appreciated it (and try to channel it sometimes). Henner, for fueling me with hugs, chocolate, questionable jokes and emergency food deliveries – thank

you! All LUCID PhDs whose paths crossed mine: Sanna, Stephen, Sandra, Finlay, Wim, Elina, Vasna, Maryam, Mine, Henrik, Torsten, Cheryl, Anna, Melissa, Sarah, Altaaf, Mads, Wondwosen and Siri, thank you for the inspiration, camaraderie and some excellent parties. I am also very grateful to the Swedish Research Council for funding the LUCID research school.

For making my work in Uganda possible (and much more), I am forever indebted to Thaddeo Tibasiima. On top of everything else, your friendship, humor and fantastic Toyota saved me from disaster many times. Everyone at SATNET; thank you for patiently sharing your time, insights, office and lunches with me. Clovis Kabaseke, you are a force of nature! Your wisdom and passion for agroecology has inspired me ever since that first focus group. The members of Kabarole United Organic, Kanyamura Thwekambe and Kaserengethe farmers associations – thank you for welcoming me into your groups and your homes.

Finally, I want to thank my parents Karin and Mats for 30 years of support, trust, and for sparking my wanderlust; Anni and Joakim for visiting me in Uganda (and for Ingrid Ellinor!); and of course Zorro for making me laugh even in the deepest valleys of thesis despair. And although you're no longer with us, thank you *morfar* Göte Isgren for teaching me the importance of education, hard work, good stories, and staying curious about the world.

List of papers

- I. Isgren, E. (2016). No quick fixes: Four interacting constraints to advancing agroecology in Uganda, *International Journal of Agricultural Sustainability*, 14(4), 428-447.
- II. Isgren, E., & Ness, B. (2017). Agroecology to promote just sustainability transitions: Analysis of a civil society network in the Rwenzori region, western Uganda. *Sustainability*, 9(8), 1357.
- III. Isgren, E. Politicizing agriculture in Uganda: Civil society dynamics and the prospects for agroecological alternatives (submitted to journal)

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Acronyms

AFSA	Alliance for Food Sovereignty in Africa
CR	Critical realism
CSO	Civil society organization
FAO	Food and Agriculture Organization of the United Nations
ESAFF	Eastern and Southern Africa Small-Scale Farmers Forum
GMO	Genetically modified organism
GoU	Government of Uganda
GR	Green Revolution
LVC	La Via Campesina
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organisation
NGO	Non-governmental organization
NOGAMU	National Organic Agriculture Movement of Uganda
NRM	National Resistance Movement
MMU	Mountains of the Moon University
OWC	Operation Wealth Creation
PELUM	Participatory Ecological Land Use Management
SATNET	Sustainable Agriculture Trainers Network
UMU	Uganda Martyrs University
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNFFE	Uganda National Farmers Federation

Note to the reader

There is something inherently appealing about *alternatives*; the way they promise something new and better. This is also the danger, because we might forget to ask fundamental questions. Can they work? What does it even mean to ‘work’? And what would it realistically take to achieve them?

I have certainly been guilty of side-stepping such questions in the past, a realization that made me take this thesis into a somewhat different direction than I originally foresaw. Seasoned readers of PhD dissertations know that a compilation thesis typically is a collection of journal articles with an introductory section that summarize and synthesize them. In Sweden, the introductory section is known as a ‘kappa’ – a coat. This thesis has a rather thick winter coat, and one that I ask the reader to think of less as a summary of the articles and more as an emergent property of the entire research process. Preparing, writing and publishing the three articles found at the end of the thesis provided me with much-needed stepping stones in that process. They contain important parts of the story – not least much of the empirical ‘stuff’ – but not the whole story. The ‘kappa’ is what enabled me to really dig into the bigger questions that must be faced if we are to seriously consider agroecology as an alternative.



Figure 1 The agroecological farm of Kabaseke Clovis, Kabarole, Uganda.

1 Introduction

1.1 Problem formulation and aim

Agricultural modernization has brought about massive increases in global food supply, but at a high environmental cost. Today, agriculture does not only impact most of the world's ecosystems, it often undermines its own viability through processes like soil degradation, climate change and disruption of vital ecosystem services (Foley et al., 2005; Longo & York, 2008; Tilman, Balzer, Hill, & Befort, 2011). Some argue that the very logic of modern industrial agriculture rests on continuous appropriation and substitution of nature, and that sustainability cannot be achieved without a sharp break from this logic (Magdoff, Lanyon, & Liebhardt, 1997; Marsden, Banks, Renting, & Van Der Ploeg, 2001). Such claims are not new, but what's different today is that they are no longer particularly radical. Increasingly, mainstream voices in the arena of agricultural research, development and trade are joining the call for a 'paradigm shift' (FAO, 2015, 2017c; IAASTD, 2009; UNCTAD, 2013).

But it is not in the nature of paradigms to suddenly shift. The global food system may be facing serious problems, but many powerful actors are hard at work trying to solve them without too disruptive a change (Friedmann, 2005). Agricultural development is no exception. After decades of neglect, there has been a resurgence of interest in 'agricultural modernization' for development on both international and national levels, with sub-Saharan Africa at the center of attention (de Janvry & Sadoulet, 2010). On the one hand, this is welcome; many countries still face high rates of food insecurity and rural poverty (IFAD, 2016) and agriculture is widely recognized as key for addressing both (Diao, Hazell, & Thurlow, 2010). On the other hand, although many actors now employ the discourse of sustainable development, the demonstrated ecological and social shortcomings of past decades' modernization processes have not yielded substantial re-thinking of agricultural development (Giraldo & Rosset, 2017; McMichael & Schneider, 2011; Sjöström, 2015).

This thesis departs from the position that it is imperative to seriously investigate new, more sustainable and socially just ways of accomplishing the objectives of agricultural modernization. I further propose that agroecology is an alternative of

particular interest. Agroecology was long confined to social movements and the margins of academia, but has begun to enter the mainstream in recent years, and has also spread geographically from its Latin American and European origins (Altieri, Nicholls, & Montalba, 2017; Altieri & Nicholls, 2017). This makes it important to investigate how agroecology is understood, practiced and constrained in different settings (Sanderson Bellamy & Ioris, 2017). In this thesis, I study both the conditions for and the implementation of agroecology in Uganda. Here, agriculture is shouldering a heavy burden; not only is it the main livelihood for a largely rural and rapidly growing population, but it is also central in the government's ambition for Uganda to become a "modern and prosperous country within 30 years" (GoU, 2015).

The overarching aim of this thesis is to understand if and how agroecology has potential to constitute a viable and desirable alternative pathway of agricultural development, and provide insights regarding its achievability in Uganda. A parallel aim is to advance the critical problem-solving agenda of sustainability science through an approach rooted in critical realism and emancipatory social science. On the basis of these two aims, I structure the thesis around three interlinked tasks. First, I provide a critique of conventional agricultural modernization both as an ideal model of agricultural development, and as actually pursued in Uganda. Second, I analyze the potential of agroecology to offer a more desirable model of agricultural development, and how this alternative is being implemented in Uganda today. Together, these two steps lead me to conclude that the type of transformational strategies that agroecology necessitates are most likely to come from civil society. Third, therefore, I identify trends and challenges regarding political mobilization for agroecology within Ugandan civil society.

In this introductory chapter, I first explain why agroecology is a relevant research focus and why Uganda makes for an appealing context to situate this research. I then elaborate on how I conducted the research; both the overarching approach mentioned above, and the more concrete process. I offer a brief note on engagement with theory and how this is reflected in the thesis, before finally returning to the three tasks and formulating research questions for each.

1.2 Why study the prospects for agroecology in Uganda?

Agroecology: A pathway towards sustainable agriculture?

Amongst the many different proposals for 'alternative agricultures' made in recent decades (see Beus & Dunlap, 1990), why should a thesis in sustainability science

take a specific interest in agroecology? Sustainability science is committed to developing and advancing ideas and practices with potential to foster more sustainable trajectories of nature-society interaction (Kates et al., 2001). Part of this task is to scrutinize the ideas and practices that societal actors argue have this potential. Are they valid claims? And if the claims hold up, how can the proposed ideas and practices be realized? In line with this, I chose to engage with agroecology for two main reasons. Firstly, agroecology has strong conceptual links to sustainability; indeed it has been argued to be the ‘science of sustainable agriculture’ (Altieri, 1995). Agroecology is associated with understandings of sustainability that emphasize the dependence of human societies on natural capitals and processes that cannot be substituted or overridden (Gianinazzi et al., 2010; Sevilla Guzmán & Woodgate, 2013). Within agroecology, society can certainly interact intentionally with nature to fulfil various objectives, but must seek to understand and take into account complex ecosystem interactions and biophysical limits. If farms are understood and managed as complex ecological systems, where beneficial interactions are consciously *enhanced* rather than *replaced* with human-made capitals, agriculture can be sustainable, resilient and highly productive (Altieri & Nicholls, 2005). In essence, agroecology promises to help resolve the growing tensions between agriculture and the environment, which threaten future food security (Tscharncke et al., 2012)

The second reason for taking an interest in agroecology is its growing credence in scholarly and political debate. One sign (which may also have reinforced the trend) is that agroecological approaches were endorsed by the 2009 International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). In the following year, the UN Special Rapporteur on the Right to Food emphasized the importance of agroecology for achieving food security (De Schutter, 2010). By 2014, agroecology was being enthusiastically embraced by NGOs and international development organizations, including the FAO (Silici, 2014). This is not only due to growing interest in sustainability, but also because agroecology is argued to contribute to social justice and development (De Schutter, 2010; Rosset & Martínez-Torres, 2012). However, the move into the mainstream has raised concerns amongst some that agroecology is being “co-opted”, and that its use must be critically scrutinized (Giraldo & Rosset, 2017).

In academia there has also been a clear surge in interest in agroecology during the 2000s (figure 2). This increased interest seems likely to continue. For example, a study based on consultations with stakeholders from 34 countries pointed to the ‘scaling up’ of agroecological farming practices as one of 100 key research questions for the post-2015 development agenda (Oldekop et al., 2016)¹.

¹ The consultation process with ‘development stakeholders’ mainly included participants from academia and non-governmental organizations, and the precise question they formulated reads:

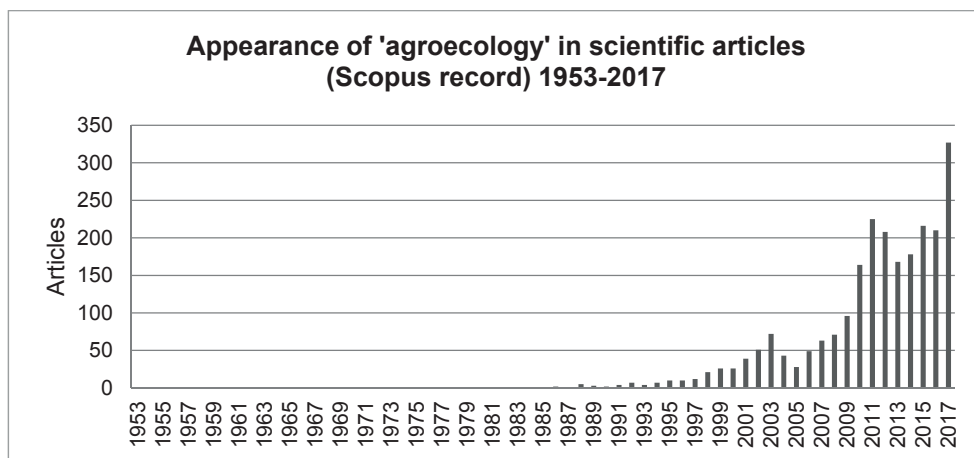


Figure 2 The first record of the term 'agroecology' in scientific articles in Scopus is from 1953, but it remained largely absent until the the 1990s. Use of 'agroecology' in has risen significantly during the 2000s. Although I have not conducted a full bibliometric analysis, I find when plotting this growth against the total number of publications in four randomly selected mainstream journals in agricultural science (Agric Sys, Adv Agron, Eur J Agron, and J Sci Food Agric) that the growth of agroecology in the literature cannot solely be attributed to the general increase in publications in the broader field. (Note that the graph excludes the journal Chinese Geographical Science, as all articles in this journal otherwise got included due to the name of the publisher).

Agroecology is an interdisciplinary scientific field (Dalgaard, Hutchings, & Porter, 2003), yet relatively little research has addressed the issue of social transformation towards agroecology, which to a great extent is a political question (Silici, 2014). While agroecological transition is a complex process locally (Duru, Therond, & Fares, 2015), it is essential to move beyond the local level, particularly in relation to the design of public policies that create a more favorable institutional framework at the state level (Gonzalez de Molina, 2013; Sanderson Bellamy & Ioris, 2017). Heterogeneity in terms of both prevailing agricultural systems and the socio-political conditions for change call for different solutions and strategies, and thereby also for situated research (Levidow, Pimbert, & Vanloqueren, 2014).

Ugandan agriculture in transition

Why then situate this research in Uganda? It is hardly where agroecology has the most visible presence; there is more vibrant public and political debate around agroecology in Latin American countries, which has been the focus of much scholarly literature (Altieri & Toledo, 2011; Ferguson & Morales, 2010; Rosset, Machin Sosa, Roque Jaime, & Ávila Lozano, 2011). This is one good reason to

“How can agro-ecological farming practices (including those that are not easily commodifiable) be effectively scaled up to address local and global food needs?” (Oldekop et al., 2016, p. 67).

turn attention elsewhere – as is the fact that massive efforts have been launched in sub-Saharan Africa in recent years by governments, donors, financial institutions, corporations and philanthropists for a ‘new Green Revolution’ (Holt-Giménez, 2008). In Uganda, agricultural modernization has been part of the current regime’s development discourse throughout its three-decade rule. The vision that the country will leave behind ‘peasant’ ways of life in order to become a modern country is a recurrent theme. Over the last decade the Ugandan government’s emphasis on agricultural modernization has only intensified, mirroring a general trend in international development (Sjöström, 2015) as well as the rise in foreign investors’ interest in agricultural land (McMichael, 2012; Munk Ravnborg, Bashaasha, Hundsbæk Pedersen, Spichiger, & Turinawe, 2013). The state’s attention to agriculture is called for; the majority of Uganda’s rapidly growing population lives in rural areas and engages in small-scale agriculture as the basis of their livelihoods (IFAD, 2013). It is estimated that one of four rural Ugandans live in poverty compared to one out of ten in urban areas (World Bank, 2016) and that around 12% of the population is chronically food insecure (FAO, 2017d). There are reasons for concern about the specific ways that agricultural development is implemented and *not* implemented (Hickey, 2013). This is all happening at a time when the political climate is making it increasingly difficult to raise critical questions about the government’s agenda (Human Rights Watch, 2012). Uganda thereby provides a highly relevant context to analyze the prospects of rethinking agricultural modernization through agroecology.

1.3 Research approach

In this section I explain my research approach in four steps, starting with some basic assumptions about modernity and development. These are linked to a particular understanding of the role and potential of scientific research, which leads me to my meta-theory and organizing principles. After going through these, I describe the more concrete aspects of my methods (including fieldwork in Uganda), and finally I reflect on questions of having ‘impact’ outside of academia.

Approaching development through critical modernity

Because this thesis revolves around such contested concepts as ‘development’ and ‘modernization’, I want to be explicit about some basic assumptions that underpin the research. Following Habermas’s conceptualization of modernity as an ‘incomplete project’ (Habermas, 1987), I approach agricultural development through critical modernity, which can be contrasted with uncritical and anti-

modern² perspectives. Critical modernity remains committed to modernity³ as an emancipatory project but assumes that in practice, this project is highly problematic and not inherently benevolent. A major problem is the way that capitalist modernization has allowed market rationality to (in Habermasian terms) ‘colonize the life-world’, or, more simply put, to dominate social and political life (Johnson, 2006). As the title of this thesis alludes to, it also been associated with a highly reductionist understanding of ‘nature’ that has contributed to many contemporary sustainability problems, not least in agriculture (Scott, 1998).

When viewing development⁴ from this perspective, it is clear that there is a long history of uncritical pursuit of modernity, resulting in highly problematic outcomes (Hart, 2001). But poststructuralist critiques of development, often yielding anti-modern stances, is not where I look for answers. These critiques have been constructive in revealing negative outcomes of development, but there are several fundamental problems with rejecting development as monolithic, inherently oppressive and ‘Western’:

It is to adopt, ironically, a particularly impoverished optic on power by seeing it as synonymous with domination and imposition. Finally, it is also debatable whether development is seen as necessary only for those who live in the Third World, nor is it clear that only outsiders view as desirable the changes that “development” introduces (Agrawal, 1996, p. 469).

Rather than rejecting development, critical modernity poses that its potential (to deliberately make the world better) must be separated from contemporary development *practice*. The latter has often failed to live up to the former (Peet & Hartwick, 2009). An important task is to understand why, and this is made

² Peet and Hartwick (2009, p. 279) refer to the latter “overly critical (post)modernism”.

³ ‘Modernity’ here is the broad phenomenon described by Therborn (2011, p. 54) as a “cultural designation, not any particular sort of social institutions, but an orientation that turns its back on the achievements and rules of the past, embracing the new present with a view to constructing a novel, this-worldly future”. In a similar vein Habermas (1987, p. 7) writes: “Modernity can and will no longer borrow the criteria by which it takes its orientation from the models supplied by another epoch: it has to create its own normativity out of itself”. The problem from a critical modernity standpoint is not modernity itself but the specific *social forms* that have come to dominate the ‘modern world’ (Peet & Hartwick, 2009).

⁴ A clarification of my understanding of ‘development’ is in order here. Hart (2001, p. 650) distinguishes between ‘little d’ and ‘big D’ development where the former refers to “the development of capitalism as a geographically uneven, profoundly contradictory set of historical processes” and the latter to the “post-second world war project of intervention in the ‘third world’ that emerged in the context of decolonization and the cold war”. This is a take on Cowen’s and Shenton’s (1996) earlier distinction between immanent and intentional development. What I speak about as development belongs in the realm of big D development in the sense that it is an intentional effort underpinned by notions of ‘progress’ and ‘improvement’, but without ascribing to it the particular characteristics of a particular era.

possible by application of scientific reason and inquiry⁵. It is through scientific inquiry that we know that many actions taken under the banner of development have been poorly planned, exploitative, and/or ideologically driven. It is also what enables us to develop better theories, models, principles and practices in development. This is clearly underpinned by a *realist* understanding of the world, but calls for epistemological humility and constant scrutiny of scientific theories, methods and conclusions (Langford, 2015; Mohan & Wilson, 2005).

Meta-theory and organizing principles

My overarching research strategy has two main components: the meta-theory of *critical realism*, and the three organizing principles (or tasks) of *emancipatory social science as* formulated by Wright (2010). The former led to an important modification of the latter in regards to the mode of critique, which I return to later in this section.

Whereas many disciplines come with a lot of theoretical and methodological provisions, sustainability science is a problem-driven, pluralistic research field (Isgren, Jerneck, & O'Byrne, 2017; Kates et al., 2001; Wiek, Withycombe, & Redman, 2011) that does not prescribe particular onto-epistemological positions, core theories or methodological toolkits. This is necessary for addressing complex problems arising out of nature-society interaction, but challenging for the individual researcher. As already implied above, this thesis is underpinned by the meta-theory of critical realism⁶ (CR) which as the name suggests is a form of realism; it “affirms that many things have a reality independent of what people say or think about them” (Porpora, 2013, p. 185). These ‘things’ are not only biophysical entities and processes. Social objects, relations and structures also exist outside of our beliefs about them, have causal power, and can be *known*. Epistemologically, CR assumes that knowledge is always mind-dependent, fallible and theory-laden. But even if we always know truth at levels *below certainty*, we can still make reasoned judgments about how well different claims and explanations correspond with truth, and act upon the most compelling alternative (Porpora, 2013). An important feature of CR is that it treats the world as ontologically stratified into three levels: an empirical level (where events are experienced, observed and understood through our senses and ideas), an actual

⁵ In the words of Peet and Hartwick (2009, p. 18) “the main problem with development is not that it is inherently coercive and controlling but that it has never been achieved in anything like the ways we have characterized it!”. They make a similar diagnosis as Habermas, arguing that the principles of modernity “have been perverted by the capitalist form taken by modernity”.

⁶ Roy Bhaskar’s *A Realist Theory of Science* (1975) is considered the inaugural work of critical realism. See Sayer (2000) for an accessible introduction to CR in the social sciences.

level (where events occur whether they are experienced/observed/understood or not) and a real level (where causal mechanisms produce events). Although knowledge is always ‘filtered’ through observation at the empirical level, the goal of science is to explain events by uncovering causal mechanisms and their effects (Fletcher, 2017). Without deterministically ascribing a benevolent role to science, “the independent existence of reality and causal powers ascribed to human reasons [in CR] strengthen the possibility of reclaiming reality and an emancipatory social science” (Yeung, 1997, p.55).

What is the particular appeal of CR in sustainability science? And how does one *do* critical realist research? Sustainability science is committed to contributing to societal ‘problem-solving’ (Cash et al., 2003; Wiek, Ness, Schweizer-Ries, Brand, & Farioli, 2012) but as pointed out by Jerneck et al. (2011) this problem-solving must be rooted in critical social science in order to really understand and address sustainability challenges and their intersection with persistent social problems. It is otherwise quite possible that ‘solutions’ fail to address underlying mechanisms, reinforce them or cause new problems. CR allows us to speak about problems in society-nature interaction which we cannot fully know but which are nonetheless real, cause harm, and call for solutions. It then urges us to identify the causal mechanisms which produce observable outcomes, particularly those that are problematic. While it doesn’t ascribe particular methods, CR emphasizes interdisciplinarity, methodological pluralism and triangulation (Danermark, Ekstrom, & Jakobsen, 2001), historical approaches (Steinmetz, 1998) and an ‘immanent’ (or internal) mode of critique (Bhaskar, 2013). The latter, explained in very general terms by Bhaskar (2013), is critique which is “internal, that is, involving something intrinsic to what is (or the person who is) being criticized” (Bhaskar, 2013, p. 12). The goal is to identify and explain *internal* contradictions⁷, as this offers the greatest possibilities for social change (Antonio, 1981). Interdisciplinarity is necessary because there is always a multiplicity of various causes behind concrete phenomena (Bhaskar, Danermark, & Price, 2018), and place-based and historical analyses are crucial because causal mechanisms are contextual and historical in their manifestation (Yeung, 1997). That is, causes do not operate in a vacuum but within a context, where they interact with other causes and give rise to emergent phenomena (Sayer, 2000, p. 14).

Critical realism thus provided me with a sense of direction regarding what to look for in research, and some important methodological principles to strive for. Emancipatory social science added more concrete guidance on what particular questions to ask, by providing a framework that is highly applicable to a problem-driven and solutions-oriented field like sustainability science (Clark, 2007; Miller

⁷ This means having to be clear about exactly what/who is being criticized. I return to this in the beginning of chapter 2.

et al., 2014). An anecdote from my own research process helps illustrating its appeal. When I began this work in 2013, I intended to study large-scale land acquisitions ('land grabbing'), a hot scholarly topic at the time. Many scholars were criticizing the phenomenon and questioning its developmental claims (e.g. McMichael, 2012; Scoones, Hall, Borras Jr, White, & Wolford, 2013). But the question of *alternatives* was surprisingly marginal, even if the problems cited as justification for land deals – poverty, food insecurity – were recognized as real and urgent (for example by Borras Jr, Hall, Scoones, White, & Wolford, 2011; De Schutter, 2011). As concisely put by Agrawal (1996, p. 472):

As long as one accepts the real-world existence of the problems to which “development” is posed as a solution, academic critiques become insufficient. You cannot replace something with nothing.

In such situations, researchers must ask not only what is currently problematic, but also how better alternatives can be developed and achieved. For ‘emancipatory social science’ that aims to do this, Erik Olin Wright (2010) outlines three tasks⁸.

- 1) In *critique and diagnosis* the purpose is to show how and why existing social institutions systematically create social problems – and social-ecological, sustainability scientists must add. Wright, whose research centers on capitalism as an economic system, does this based on a set of normative principles in the form of social and political justice. However, as suggested by CR above, I instead use an internal mode of critique and thereby seek my criteria within the system I look at (this may still seem a bit opaque, but will become clearer when I return to the more concrete issues at hand).
- 2) The second task is to *elaborate alternatives* with potential to eliminate or at least significantly reduce the problems identified. Such alternatives can be deemed desirable, but it is also important to assess their viability and achievability.
- 3) Finally, the third task is to propose a theory of *transformation* and identify strategies for how appealing alternatives can be achieved. An important part of this is to understand questions of agency, and how existing structures can be challenged.

All three tasks are important, even if some might require more attention than others at a given time. In this thesis I give them roughly equal weight, but make

⁸The idea of emancipatory science as such – science motivated by a desire to eliminate various forms of oppression – is of course not Wright’s creation, nor is his approach the only way to structure such research. It is *one* approach, and its accessibility and wide applicability makes it appealing for an interdisciplinary and problem-driven field like sustainability science.

strategic choices *within* each task. That is, evaluating *all* possible alternatives from *all* possible angles is well beyond the scope of the research (hence, for example, the choice to focus on agroecology in chapter 3 and on civil society in chapter 4). Furthermore, in line with the CR understanding that causal mechanisms have contextually and historically specific outcomes, Wright (2010) emphasizes that many aspects of viability and especially achievability are contingent on a wide array of factors (e.g. political, cultural). Much of the research process therefore revolved around the specific dynamics of agricultural change in Uganda.

Material and fieldwork activities

The thesis builds on primary material gathered through fieldwork in Uganda, analysis of key policy documents (and related material like official statements in speeches and public media), and available statistics and secondary material (e.g. scholarly literature, civil society reports). Fieldwork material, generated mainly through qualitative interpretive methods like interviews and observation, is utilized most extensively in chapters 3 and 4. As noted above, critical realism calls for multiplicity in methods and types of observations at the empirical level to understand deeper causal mechanisms (Yeung, 1997). More detailed descriptions of fieldwork methods are found in the appended papers, but table 1 provides an overview, and figure 3 shows selected photographs from fieldwork.

Table 1 Overview of fieldwork activities 2014-2017. The fieldwork periods in 2014, 2015 and 2017 form the main basis of papers I, II and III respectively. In 2016, the primary purpose of fieldwork was to discuss findings with participants (NGOs and farmer groups), along with some follow-up interviews and planning of the final phase.

Time	Duration	Participants	Methods
April 2014	4 weeks	Agroecology graduates/students in agriculture related professions (e.g. extension, research, education, NGOs)	Interviews, focus groups
February-March 2015	8 weeks	Local/regional/national NGOs farmers and farmer groups, researchers and local government representatives	Interviews, focus groups, participatory workshops, narrative walks, observation, document analysis
April 2016	3 weeks	Local/regional NGOs, farmer groups	Interviews, observation
February-March 2017	5 weeks	Regional and national NGOs/farmer organizations	Interviews, observation, document analysis

Conducting fieldwork on four separate occasions, roughly once per year, permitted me to move in and out of ‘the field’ in an iterative process, with each fieldwork period and subsequent analysis informing the next. In short, I began by developing a broad understanding of the conditions for promoting agroecology in Uganda by interviewing Ugandan agroecologists. I then moved on to a case study of a regional agroecological initiative, and ended by analyzing a particular set of issues that I identified as key for agroecology’s achievability in Uganda. As shown in table 1, the actors I engaged with during fieldwork included farmers (and farmer groups and organizations) but the primary focus was on actors and institutions working *with* or *on behalf of* farmers in various capacities. This was due to the types of questions I sought to address (table 2 below), combined with the way my understanding of the problem developed over time.

A substantial part of the fieldwork (for paper II and partly for paper III) was carried out in the Rwenzori region of western Uganda. During the first fieldwork period, I here identified a regional civil society network as an appropriate case study. In addition to finding an organization committed to agroecological development situated in the area, the region also made for an interesting setting. Generally, the Rwenzori region has high agricultural potential thanks to fertile soils and favorable climate, but it is very biophysically diverse, with hilly terrain in some parts and a hot, dry climate in others. It is also socio-culturally diverse, making it a kind of ‘microcosm’ of Uganda’s complex society and heterogeneous landscape (figure 4).

In addition to the activities described in the papers, there were two other fieldwork activities that I make reference to in the thesis. First, I made a study visit to St Jude’s Rural Training Centre, an agroecological training center and demonstration farm in Masaka, in April 2016. Second, I participated in workshops at Mountains of the Moon University (MMU) in Fort Portal, held in February 2017 as part of the process to develop a agroecology master’s program (referred to in the text as the ‘curriculum workshop’). Aside from the chance to observe how actors in academia grapple with the agroecology concept, participating in the curriculum workshop was an opportunity to put my findings into practical use. I also sought other opportunities to do so throughout fieldwork, for example in dialogues with NGO staff and in workshops arranged by authorities. This aspect of social ‘impact’ and ‘usefulness’ of research is a central issue in sustainability science which deserves a bit more elaboration.



Figure 3 Glimpses from fieldwork. From the top left: Interviewing an agroecology graduate, Kabarole (2014); workshop with local NGOs and community-based organizations, Kasese (2015); giving booklets with findings and pictures from previous fieldwork to a farmer group, Kasese (2016); after a meeting with a farmer group, Kabarole (2016); observations at St Jude Family Project, Masaka (2016); visiting a tea research station with a researcher and agroecology graduate, Kabarole (2015); with NGO staff and donors at cocoa cooperative, Bundibugyo (2017); curriculum workshop, Kabarole (2017).



Figure 4 Selected landscapes of the highly diverse Rwenzori region. From the top left: Lush farmland around lake Saka, Kabarole district; Ankole cow, Bundibugyo district; hillside farming along the Fort Portal – Bundibugyo road, Kabarole district; savannah on the edge of Queen Elizabeth National Park, Kasese district.

Having ‘impact’

As part of the agenda to be ‘problem-solving’, sustainability science seeks to produce knowledge that is credible and legitimate but also salient. For Cash et al. (2003) saliency “deals with the relevance of the assessment to the needs of decision makers” (p. 8086). So who are these decision makers? It is common for scholars to direct their attention to actors that obviously have power in society, like ‘policy makers’. But sometimes, even though political actions at a high level may be deemed necessary, decision makers at this level are beyond reach – for us, our arguments, or both.

Two lines of reasoning led me *not* to think of policy makers as my primary audience. First, the question of having impact is linked to questions of researcher positionality within the research context. Although the outsider/insider dichotomy is overly simplistic (Dwyer & Buckle, 2009), I have undeniably mostly been an ‘outsider’. In particular, being a ‘westerner’ comes with thorny baggage; it can certainly open doors, but is also associated with an oppressive colonial history which has implications in the present. For example, one issue I encountered during the fieldwork process was that politically unpopular views can be dismissed as

‘western’⁹. Second, regardless of my outsider status, my findings over time led me to better understand questions of agency and social change within the particular research context. These two aspects combined spurred me to interact with actors outside the policy arena, who might realistically be able to affect meaningful change: mainly Ugandan civil society organizations. The closest alliance I developed was with the civil society network studied in paper II. There many challenges and risks associated with researcher-NGO collaboration due to the different cultures and objectives (Roper, 2002). But the differences are also where the appeal lies. NGOs can have strengths that academics often lack, such as strong relationships with local communities and experience implementing projects within a particular setting. Academics, meanwhile, are in a position to contribute in areas where NGOs often struggle, such as theoretical grounding and attention to long-term structural change (Banks, Hulme, & Edwards, 2015; Mitlin, Hickey, & Bebbington, 2007; Roper, 2002). Throughout this collaboration, I found guidance in Burawoy’s notion of ‘reflexive science’, which “sets out from a dialogue between us and them, between social scientists and the people we study” (Burawoy, 2009, p. 25). Rather than trying to minimize interference and observe ‘subjects’ from the outside, we can turn ‘interference’ to an advantage - something which can be analyzed in dialogue with theory.

1.4 A note on theory

As described above, at a meta-theoretical level my research is informed by critical realism and emancipatory social science. Following this, the role of theory is to help me see and understand social and natural mechanisms that cause particular outcomes in the world by making me ask good questions, make sufficient and relevant empirical observations, and guide my analysis of empirical observations towards those mechanisms. Instead of including a separate theory chapter, I take the approach of introducing theory continually throughout the chapters. A major reason for this decision is that I engage with very diverse theories – a necessity in interdisciplinary research – meaning that it makes more sense to place them in direct contact with the specific issues that are being analyzed and discussed.

Since I seek to synthesize across (and beyond) the three papers, I will not elaborate on the theoretical/analytical approaches of the individual papers beyond what is necessary for the arguments being made. Three bodies of theory deserve mention, however, for their roles in the papers. First, the field of political ecology (e.g.

⁹ As I show in papers I and III, this does not only apply to people who are actually from the ‘West’; also concerns (e.g. about environmental impacts) voiced by Ugandans can be delegitimized as ‘foreign’.

Bryant & Bailey, 1997; Peet & Watts, 2002; Robbins, 2011) was important in informing the questions I started out with, and most directly influences paper I. Second, the field of socio-technical transitions (e.g. Geels & Schot, 2010) informed my analysis of the case study in paper II. Third, my analysis in paper III is underpinned by critical perspectives on civil society and insights from social movement theory.

1.5 Research questions and thesis structure

This thesis is structured into three main chapters (the ‘substance chapters’), in addition to this introductory chapter and a brief concluding discussion. The substance chapters synthesize the three papers and additional material to provide a historically informed narrative organized around Wright’s three tasks of emancipatory social science. I begin each chapter by posing two questions derived from the broader aim outlined in the beginning of this chapter: to understand if and how agroecology has potential to constitute a viable and desirable alternative pathway of agricultural development, and provide insights regarding its achievability in Uganda. Throughout the thesis, I refer to the three appended papers to direct the reader to more detailed empirical accounts and more in-depth analysis of certain issues.

Table 2 The three substance chapters of the thesis, and the research questions they center on.

Substance chapter	Research question(s)
2: Critiquing agricultural modernization	<p>What are the internal limitations and contradictions of conventional agricultural modernization?</p> <p>How is agricultural modernization being pursued in Uganda, why, and what is problematic about it?</p>
3: The agroecological alternative	<p>On what basis is agroecology a desirable alternative to conventional modernization?</p> <p>How is agroecology being employed on the ground in Uganda, and what structural constraints hinder the realization of agroecology’s potential as a development alternative?</p>
4: Mobilization for agroecology	<p>What are current trends and challenges in regards to political mobilization around agricultural development within Ugandan civil society, and how have these come about?</p> <p>How can existing civil society actors contribute to broader mobilization for agroecology in the future?</p>

Chapter 2 provides a critique of the dominant model of agricultural development, termed conventional agricultural modernization, and its implementation in Uganda. This builds mainly on a review of existing literature and secondary data. *Chapter 3* focuses on agroecology as an alternative pathway for agricultural development both in theory and in practice. This chapter draws substantially on papers I and II. *Chapter 4* narrows in on mobilization for agroecology within Ugandan civil society, building mainly on paper III. Each chapter begins with a short introduction, and ends with an implications section that sums up the main points and transitions into the following chapter. On account of being the final substance chapter, the implications section in chapter 4 is more extensive.

In the concluding chapter, *chapter 5*, I summarize my arguments, discuss key contributions, and highlight areas for future inquiry.

2 Critiquing agricultural modernization

When critiquing ‘agricultural modernization’, what is the object of critique? An abstract idea or its concrete implementation in a particular setting? This might seem like an odd place to start, but the distinction is important; abstract ideas cannot be concretely implemented in some pure form. Conflation of the two renders the implications of the critique unclear. It might be possible to sufficiently solve problems by improving *practice*, without radically new ideas – unless, of course, there is *also* something inherently problematic about the idea. The first part of this chapter intends to demonstrate how the conventional model of agricultural modernization contains inherent contradictions and limitations which make it unlikely to fulfil its own goals, especially in the long term. The second part looks at how agricultural modernization is implemented within historically produced conditions in today’s Uganda, and how this gives rise to additional problems. Together, this two-part critique provides the justification for seeking an alternative, but also an understanding of the challenges associated with actually realizing an alternative within the Ugandan context.

The chapter revolves around the following two questions:

- What are the internal limitations and contradictions of conventional agricultural modernization?
- How is agricultural modernization being pursued in Uganda, why, and what is problematic about it?

2.1 Promises and limitations of conventional agricultural modernization

Agricultural modernization is the dominant discourse around problems of rural poverty and food insecurity in sub-Saharan Africa today (Sjöström, 2015), including Uganda (Hickey, 2013). If we are to understand the internal limitations and contradictions of this agricultural development model – that is, to see whether and how it has problems delivering on its own objectives – we must to some extent establish what agricultural modernization *is* and what it is meant to achieve¹⁰. The aim of this sub-chapter is to establish something that we can call conventional agricultural modernization and offer a rather brief, but credible, internal critique.

Why ‘modernize’ agriculture?

The role of agriculture (and its modernization) in social change constitutes a long-standing debate in mainstream development theory. Within modernization theory that dominated in the 1950s and 60s, a pessimistic view was generally held regarding the capacity of agriculture to contribute to industrialization and economic growth (Oman & Wignaraja, 1991). Modernization theory has long been widely criticized for determinism, unilinearity, ethnocentrism, and reductionism (see Bernstein, 1971)¹¹. The pessimistic view on agriculture in relation to economic development has also been largely refuted, starting with Johnston and Mellor’s (1961) seminal study. Although the exact role of agriculture remains debated, there is now strong agreement that *generally*, agricultural growth through modernization has multiple important roles to play in economic development (Bezemer & Headey, 2008; Martinussen, 1997). Bezemer and Headey (2008, p. 1345) sum up the argument as follows:

there is overwhelming evidence from theory, history, and contemporary analysis that agricultural growth is a precondition to broader growth. A further important point is that agricultural growth is quintessentially pro-poor growth. The reasons are now well known: agriculture is generally labor intensive and skill-extensive, so that agricultural growth creates additional employment with low entry barriers.

¹⁰ Asking these kinds of (realist) questions is essential in critical realist research (Sayer, 2000): it “forces us to sharpen our conceptualizations” (p. 17) and is necessary for understanding relationships between A and B – say, between agricultural modernization and sustainability.

¹¹ That said, Marsh (2014) argues that modernization theory, while often caricatured in text books, is “far from dead”. Rather it has seen a revival, with some largely continuing within the original paradigm (e.g. measuring the ‘level’ of modernization with simple metrics and relating this to various societal characteristics), while others have developed theoretical extensions to account for anomalies (e.g. reflexive modernization, multiple modernities).

Increased agricultural productivity also lowers food prices for both the rural and the urban poor, who typically spend most of their household budgets on food.

An important point here is that agricultural growth is not only conducive to overall growth, but also to poverty reduction. That said, the framing of agricultural growth as “quintessentially pro-poor growth” is debatable; impacts on poverty do depend on what *kind* of agricultural growth occurs – specifically, the extent to which it is *small* farmers (for whom production of food staples is particularly important) that ‘modernize’ (Birner & Resnick, 2010). Finally, agricultural modernization today is often linked to the objective of food security. While the relationship between agricultural production and food security is now widely acknowledged to be more complex than assumed in the early days of the concept (Pinstrup-Andersen, 2009), the idea that agricultural modernization is essential for tackling hunger and malnutrition has been (and remains) a central tenet in development research and practice (Sjöström, 2015). In brief then, one can distinguish three central objectives for agricultural modernization: poverty reduction (especially rural), contribution to overall economic growth, and food security.

What does it mean then, more concretely, for farmers (and agriculture as a whole) to modernize? In the most basic sense, agricultural modernization is a process of raising agricultural productivity¹² (per unit of land, labor, or both) through coupled *technological* and *institutional* change (Oman & Wignaraja, 1991). An essential part of this process is transformation from subsistence-oriented production to production of a marketable surplus (commercialization). For a farmer, this surplus production can provide an income for different purposes like consumer goods, education and re-investment. From a social perspective, the surplus can supply a growing non-farming population with food, create up- and downstream demand, and contribute to state revenues (Martinussen, 1997). The main role of technological change is to help raise productivity. Technologies that increase *labor* productivity make it possible for a farmer to lower labor costs and/or expand areas of cultivation. At an aggregate level, labor can be ‘released’ to the non-farming sector. When labor productivity is low, increases here often have a particularly strong effect on poverty (McCullough, 2017). There is a need for caution here, though. If labor demand in agriculture is reduced without capacity elsewhere in society to ‘absorb’ it, the result can instead be worsened poverty. This is related to the fact that what looks like low labor productivity is not necessarily a technological problem. Recent findings by McCullough (2017p. 134) show that:

¹² ‘Raising productivity’ is a treacherous notion. Even when distinguishing between land and labor productivity, there are many ways of measuring productivity (e.g. different time frames, single crop vs. whole system), and there are other possible measures (e.g. energy returns) that are of significance from a social and environmental perspective. The reader is urged to keep this in mind when encountering arguments about productivity, both there and elsewhere.

in four Sub-Saharan African countries [Ethiopia, Malawi, Tanzania and Uganda], the agricultural sector is not a bastion of low productivity but, rather, a large reservoir of underemployed workers.

Technological change can of course also increase productivity per unit of *land* (intensification), thus increasing the output from agriculture and the income of farmers (provided that farmers can access markets under favorable enough conditions). Intensification is of particular importance when possibilities for expansion are limited¹³.

Institutional change, meanwhile, has the role of enabling technological change and commercialization. Land reforms can encourage investment in agriculture, inputs can be subsidized, prices controlled, credit provided, and research and extension services can develop and disseminate new practices and technologies. This implies that states have a key role to play, which indeed history (e.g. the Green Revolution) shows they do (Djurfeldt, Holmen, Jirström, & Larsson, 2005; Patel, Gartaula, Johnson, & Karthikeyan, 2015). Although seemingly just a side note here, this point will be very important when discussing the particular version of agricultural modernization seen in Uganda today.

Systemic tensions and limitations of conventional agricultural modernization

There is no lack of scholarly literature pointing out negative impacts of agricultural modernization on both humans/society and the environment. The purpose here is not to provide a full account of these, but rather to show that there are some serious, persistent and *systemic* problems that share a common denominator: the capitalist logic at the center of conventional modernization, which tends to incentivize the substitution of natural processes and human labor with human-made inputs and technologies.

Conventional agricultural modernization is widely characterized by four interacting tendencies: *specialization* (focus on one or a few products, separation of crop and livestock production), *intensification* (increased production per land unit or animal), *mechanization* (replacement of human labor with machinery), and *expansion* (increased scale of production) (Bernstein, 2009; Hardeman & Jochimsen, 2012). At the farm level, common outcomes include reduced agrobiodiversity (spatially and temporally), disrupted nutrient cycling, increased addition of nutrients, increased use of (mainly fossil) energy, increased use of

¹³ This certainly applies to Uganda, which has one of the world's most rapidly growing populations; the latest projection (Population Reference Bureau, 2017) estimates growth from 42.8 million (2017) to 95.6 million (mid-2050s).

pesticides, and frequent soil preparation. As noted above, technological change is crucial and has multiple roles like raising yields, shortening production cycles, reducing labor needs, protecting crops from pests and weather etc. As such, technology makes agriculture more like any other production of tradeable commodities, and requires as well as facilitates capital investment¹⁴ (Lewontin & Berlan, 1986). In terms of resource efficiency (inputs vs. outputs), the result can be highly irrational, but still be *economically* rational especially if labor is costly and inputs are subsidized (Magdoff, 2015).

But agriculture *isn't* quite like any other kind of production; it happens within a complex 'marriage' with nature (Jackson & Piper, 1989). One persistent problem is the necessity of routine application of pesticides and the resulting 'pesticide treadmill'. With low agrobiodiversity comes high susceptibility to both weed competition and pest outbreaks (Horrihan, Lawrence, & Walker, 2002) and conventional (chemical) strategies set off ecological and evolutionary processes that cause further problems. Firstly, pesticides are generally not only toxic to specific pests but also to their natural enemies, whose elimination means that the pest can resurge rapidly (Dutcher, 2007). Secondly, pest organisms tend to develop resistance to repeatedly applied chemicals (Tabashnik, Van Rensburg, & Carrière, 2009), thus new pesticides must continuously be developed and applied (Nicholls & Altieri, 1997). Pesticides can also have detrimental effects on soil organisms and contribute to undermining soil fertility (Mäder et al., 2002; Yasmin & D'Souza, 2010).

Soil fertility is in itself another major problem. According to Tilman (1998), the typical effect of 50 years of conventional agriculture (tilling combined with NPK-fertilizer) is a 50-60% loss of soil carbon and nitrogen. Many factors play into this process, one being the 'metabolic rift' or more simply inadequate replacement of nutrients (Tilman, Cassman, Matson, Naylor, & Polasky, 2002). As agriculture becomes specialized along with spatial separation of production and consumption, cycling of nutrients becomes increasingly difficult. The conventional solution is the application of synthetic fertilizer, produced through an energy intensive process using a finite resource (Foster & Magdoff, 1998). This adds nutrients, but doesn't sustain soil organic matter; a key determinant of soil quality (Rasmussen et al., 1998). Traditionally, farmers have used practices like crop rotation for maintaining soil fertility (and also managing pests), but access to cheap fertilizers (often subsidized to spur agricultural modernization) tends to disrupt such practices (Foster & Magdoff, 1998). For nutrient management that is sustainable in the long-term, it is necessary to re-organize agriculture more radically (Drinkwater, Wagoner, & Sarrantonio, 1998; Magdoff et al., 1997). This is of even

¹⁴ For example by generating conformity and reducing risk (e.g. via pesticides, irrigation, greenhouses, animal confinement etc.)

greater importance when soils are *already* degraded, as in much of sub-Saharan Africa, and thereby unresponsive to mineral fertilizers (Tittonell & Giller, 2013).

Finally, the nexus of energy intensity and climate change poses difficult challenges for modern agriculture. It has long been known that the productivity increase brought by agricultural modernization has come at a cost of energy efficiency. That is, the specific manner in which higher productivity has been sought has required higher input of energy (directly and indirectly), making agriculture a consumer of energy rather than a producer (Martinez-Alier, 2011)¹⁵. Measuring the energy balance of farming systems is complicated, not least because of the issue of system boundaries. However, it is clear that energy balance (e.g. ‘energy return on investment’ or EROI) poses a serious threat to agricultural sustainability in many places (Martinez-Alier, 2011; Schramski, Rutz, Gattie, & Li, 2011). One of the earliest studies demonstrating this issue was that by Pimentel et al. (1973), which pointed to falling energy returns in U.S. maize production between 1945 and 1970. On this basis, the authors raised concern about the ongoing spread of GR agriculture given its reliance on pesticides and fertilizer. However, analyzing the period 1991-2003, Arizpe, Giampietro, and Ramos-Martin (2011) concluded that energy-intensive agriculture continues to be amplified globally. This trend is extremely problematic in an era of growing energy demand and dwindling fossil fuels (Arizpe et al., 2011; Naylor, 1996). The other side of this issue is that agriculture contributes significantly to anthropogenic climate change – around 32% according to Pelletier et al. (2011) – which in turn poses a major threat to agricultural productivity in many places. This is especially the case in the tropics, and simplification of farming systems further exacerbates vulnerability (Altieri, Nicholls, Henao, & Lana, 2015). Thus, conventional modernization generates not one but several interlinked and ‘wicked’ problems related to energy and climate change.

These sustainability challenges – despite not constituting an exhaustive account – already provide compelling reasons for seeking alternatives to conventional agricultural modernization. But there is another set of arguments that question how well this model actually lives up to the promise of poverty alleviation and food security. These arguments are based on scholars’ interpretation of past or ongoing modernization processes – most importantly the Green Revolution (GR) of the mid- to late 1900s. The GR led to substantial increases in global food production, mainly of a few staple crops (rice, wheat, maize). Although GR technologies such as hybrid seeds, fertilizers, pesticides and irrigation have received the lion’s share of attention in academic and public debate, change was actively spurred and facilitated by states through public investment and institutional reforms (Djurfeldt

¹⁵ Of course, agriculture cannot *produce* energy as such, but when agriculture relies mainly on solar energy and human labor it can be a system that has a positive net balance of ‘useful’ energy.

et al., 2005). But what *were* the actual social outcomes and what can this tell us about agricultural modernization? One generalization that can be made is that impacts have been uneven, also within the ‘smallholder’ category. GR technologies are often argued to be *scale*-neutral (i.e. can benefit any size farm), but this doesn’t mean that they are *resource*-neutral. The risks and benefits associated with adopting GR varieties are linked to access to a variety of resources like credit, insurance, irrigation, fertilizers, labor and extension services (Bernstein 2010, Griffin 1979). Plant breeding, especially in the early years, was also poorly aligned with the conditions and needs of poor farmers and favored a minority of commercial farmers (Patel et al., 2015). For example, from the perspective of poor farmers it would be more beneficial to develop and improve seeds that do well in marginal environments and reproduce reliably, than ones that have to be continuously purchased and require very specific growing conditions (Chambers, 1984). A counter-argument is that it doesn’t matter if wealthier farmers benefit *more*, if most farmers benefit *some*. Aside from questions of equity, Patel et al. (2015) explains the problem with such reasoning:

The logic here is that as capitalist expansion in the countryside made land more profitable, wealthier peasants had a greater economic incentive to adopt the technology (‘differential adoption’) and acquire more land (resulting in ‘land alienation’), at the expense of poorer smallholders.

An example is Vietnam, a relative GR latecomer that went from being food-deficient to becoming a net-exporter of rice during the 1990s. And yet, in 2008 it was found that 14 % of the population – mainly small farmers, landless peasants and urban migrants – still suffer from undernourishment (Fortier & Thi Thu Trang, 2013). The debate around the GR is often polarized, and scholars on both sides of the argument have been guilty of selectively highlighting evidence (Chambers, 1984). But it is clear that this model leaves some better off and other worse off; most studies have found increased inequality in the wake of the GR (Freebairn, 1995). The model thereby has important limitations in regards to both poverty and food security, which are well known to be closely linked (Barrett, 2010). One problem that emerges, when we take into account that food is not just calories but also nutrition, is that specialization on particular commodities (in the GR, mainly staple cereal crops) tends to replace other crops that provide important nutrients and generally reduces dietary diversity, especially amongst poor farmers (Demment, Young, & Sensenig, 2003).

While I argue that these issues cannot be fully dealt with within the logic of conventional modernization – especially their cumulative effect – they have not yet led to a ‘paradigm shift’ in agricultural development. In fact, they remain poorly addressed in the recently reinvigorated effort to modernize sub-Saharan

African agriculture through a ‘new Green Revolution’. Sjöström (2015, p. 23) argues that:

Agricultural modernization, as a currently privileged discourse, frames problems and solutions to smallholder food insecurity in ways that serve to strengthen and reproduce current power structures in the global food system that support the phenomena of discrepancies and food insecurity.

An important reason, Sjöström argues, is the overly technocratic approach that fails to challenge the neoliberal mode of government that prevails in many African countries following Structural Adjustment. As a result, efforts threaten to perpetuate or even worsen small-scale farmers’ marginalization, while agribusiness corporations that stand to make significant gains from broad uptake of commercial inputs and actively use their power to influence development agendas (McMichael, 2005; Perfecto, Vandermeer, & Wright, 2009). If state-led conventional modernization has yielded benefits but also persistent problems, *neoliberal*¹⁶ modernization gives rise to an additional set of challenges.

2.2 Uganda’s quest for agricultural modernization

Modern agriculture is the key to everything else. That is what I want to see.

President Museveni (cited in State House, 2012)

In recent years, the Ugandan government has expressed high hopes for agricultural modernization as a vehicle for its overarching objective: becoming a ‘modern’ middle-income country by 2040 (GoU, 2013). In practice, as I will show, this project is riddled with contradictions. To better understand current patterns in agricultural development in Uganda, I will begin with a historical account¹⁷. As argued in chapter 2, historical analysis forms an important tool in critical realist

¹⁶ There is a large debate around what neoliberal/neoliberalism *is*, and the category sometimes lumps together too many things into a concept with little explanatory power (Peck, 2013). At a very general level, neoliberalism has two fundamental principles: “increased competition—achieved through deregulation and the opening up of domestic markets, including financial markets, to foreign competition” and “a smaller role for the state, achieved through privatization and limits on the ability of governments to run fiscal deficits and accumulate debt” (Ostry, Loungani, & Furceri, 2016, p. 38). As argued by Peck, it “has always been an unloved, rascal concept, mainly deployed with pejorative intent, yet at the same time apparently increasingly promiscuous in application”. I caution the reader therefore that the Ugandan neoliberalism that I will point to in this chapter is to some extent unique to the particular geo-historical context.

¹⁷ A historian would probably find this account frustratingly brief, and of course, infinitely more could be said. However, the point is to give a condensed account that helps avoid an ahistorical reading of what can be seen happening today.

research because the mechanisms that produce outcomes in the present are historically emergent (Gorski, 2009). In the account that follows I pay particular attention to the political economy of agrarian change, meaning the “social relations and dynamics of production, power relations in agrarian formations and ownership structures and their processes of change” (Bernstein, 2010).

Historical roots: Agricultural change in colonial and post-colonial Uganda

It can be difficult to decide where to begin a historical narrative, but colonization is an intuitive starting point, given the deep transformation that colonial rule meant for the territory now known as Uganda – not least in terms of land and agricultural production.

When the ‘Scramble for Africa’ began in the late 1880s, the area now known as Uganda consisted of separate kingdoms and chiefdoms. Land was held mainly on a communal basis or administered through feudal systems (Musisi, 1986), and although many areas produced a significant surplus, agriculture was mostly consumption oriented and peasants largely controlled their own productive process. These societies were far from static; by the nineteenth century, collection of in kind tributes was giving way to currency, which enabled and incentivized accumulation and the emergence of a non-agricultural social group who engaged in activities like metalworking and pottery (Mamdani, 1976). British colonizers encountered high levels of economic development and resistance, especially in Buganda, the largest kingdom (figure 5).

Eventually it became clear that colonial rule needed to be mediated by a class of collaborators in the form local elites, who would receive partial treatment for maintaining law and order (Mamdani, 1976). Uganda was thus declared a ‘protectorate’ encompassing the Buganda kingdom, with a relatively large degree of self-governance. The area was subsequently expanded to include the kingdoms of Tooro, Ankole, and Bunyoro, and finally the northern chiefdoms (see figure 5), but power to participate in colonial affairs remained strongly skewed towards Buganda elites (Batungi, 2008). Political and economic development was encouraged in a southern ‘production zone’, while the north was mainly treated as a source of labor and soldiers, on the basis of biophysical conditions and ‘presumed natural qualities’ of the people (Amone, 2014). Colonizers saw little point in encouraging unity between the diverse groups of the territory; rather, a ‘divide and rule’ policy was pursued that fostered separate (and even new) cultural and ethnic identities (Amone & Muura, 2014; Mamdani, 1976).

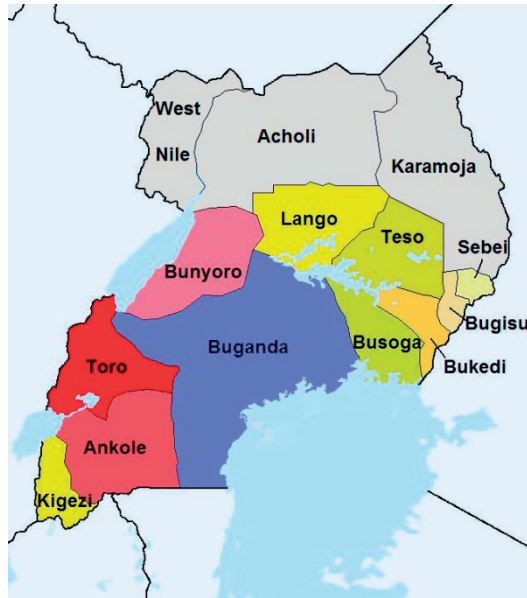


Figure 5 Administrative units in the Uganda Protectorate (1962). Purple/red/pink areas had centralized kingdoms prior to colonization (although some, like Buganda and Toro, were expanded); in the yellows, Buganda style centralized rule was introduced by the colonial administration. Based on Atieno Odhiambo, Ouso, and Williams (1977); graphics courtesy of Wikipedia.

Land was made British Crown Land, but some was distributed as private property to kings, royals and chiefs, especially in Buganda. This marked the beginning of a gradual and still ongoing conversion towards individualized property rights (Lastarria-Cornhiel, 2003). Equally important for the present-day situation is the fact that Uganda never became a ‘settler colony’ but was governed as a ‘peasant export colony’. There were some non-native plantations, but colonial administrators saw clear economic benefits in peasant-based production: with peasants living off the land, prices could be kept low and taxation high (Youé, 1978). Thus, for a long period, policies intended to “create and preserve a class of smallholders” (West, 1972p. 72)¹⁸. This did not mean that farmers necessarily prospered; the government extracted a large surplus through monopoly buying associations and eventually marketing boards. Economic exploitation created unity among peasants, and a cooperative movement gave rise to over 1600 cooperatives by the time of independence (Mamdani, 1984). The focus of the colonial administration was to encourage cultivation of cash crops for export; mainly cotton, coffee, and tea. Very little attention was paid to the production of

¹⁸ The narrative here focuses on the southern ‘production zone’. The situation was quite different in the north; see for example Mamdani’s account of the disruptive effects of colonialism on the transition from pastoralism to agriculture in Karamoja (Mamdani, 1982)

foodstuffs for local markets, even in regions that were profitably producing a surplus of food for surrounding areas (Carswell, 2007). Like elsewhere in Africa, colonizers showed strong skepticism towards existing practices of African farmers, such as polycultures and shifting cultivation, and instead had strong faith in what they (not seldom misguidedly) saw as 'modern' and 'scientific' agriculture (Carswell, 2007; Page & Page, 1991; Scott, 1998).

The smallholder-oriented approach began to change during the 1950s, with a shift towards encouraging large-scale farming and the use of modern technologies like fertilizers and tractors. This reflected the rapid modernization that was occurring in Europe, but was also an effort to 'stem the tide' of the independence movement by catering to the interests of local elites (Musisi, 1986). Independence nonetheless finally came in 1962, after what Khiddu-Makubuya (1994) describes as a negotiation by elites rather than popular struggle¹⁹. At that point, the economy was oriented towards primary production and Uganda's land-locked geographic position made international economic relations unfavorable (Kasozi, 1994). Imperialism had not only been driven by a thirst for resources, but also by the impetus to expand the market for industrial goods, thus the small-scale rural industries that had begun to emerge in pre-colonial Uganda had largely been decimated (Mamdani, 1984). Still, Uganda was better off economically than many other former colonies; it was resource-rich and a surplus-producing peasant agriculture sector covered around 75 % of cultivated land. In the early 1970s, however, Uganda entered two decades of political and economic turmoil worse than any other part of eastern Africa. Different political and economic fractions had formed within the elite during the colonial era, and peasants' isolatedness together with widespread parochial institutions like churches had enabled these fractions to reach deep into the countryside:

Aspiring compradors set the people against one another, and hid the actual enemy from them. Unlike militant nationalists, they did not even pinpoint the agents of colonialism. Instead of pointing at the repressive colonial army, for example, they talked of 'northerners' as the enemy; instead of indicating colonial chiefs, they pointed at the 'Baganda' as the enemy; and instead of singling out compradors, they defined 'Asians' as the enemy. (Mamdani, 1984, p. 21)²⁰

The inequitable and volatile social structures formed or exacerbated by colonial rule played a central role in Uganda's period of crisis (Kasozi, 1994). For

¹⁹ Of course there was struggle in some sense, but not the kind of unified nationalist movements seen in many other parts of Africa. Nor did independence itself produce unity: "Political independence had not resolved the contradiction between producers and non-producers; between commodity-producing areas and labour-exporting areas; between Buganda and the rest of Uganda" (Jørgensen, 1981, p. 203).

²⁰ 'Comprador' refers to a person who acts as an agent for foreign interests.

example, large differences in socio-economic conditions fostered tensions between the north and the south (Laruni, 2015). In some regions, such as in Tooro in the west, conflict was fueled by the double oppression that some ethnic groups had suffered under both foreign colonizers and local collaborators (Syahuka-Muhindo, 1995). During the crisis years, state resources like rural credit and development projects were often distributed in exchange for political support along ethnic, regional, and religious lines, but peasants also frequently became victims of state violence (Nabuguzi, 1993).

Of course, this tumultuous period had far-reaching economic consequences, not least in rural areas. Per capita incomes were almost halved between 1970 and 1987 (Bowden & Mosley, 2012). Relatively favorable natural conditions for agriculture helped rural populations survive, but the structure of agriculture was significantly altered (Mamdani, 1984). Many turned away from the formal export economy and shifted from crops that had to be marketed through the state towards those that could be marketed privately, or towards subsistence production (Nabuguzi, 1993). Extensive informal markets and smuggler networks emerged, particularly around coffee due to soaring world prices (Asiimwe, 2013). There were of course some deliberate interventions, most notably Amin's 1975 Land Decree which enabled a kind of state-facilitated land-grabbing of 'underdeveloped' land. This happened in some places characterized by high levels of land scarcity and social differentiation (Mamdani, 1984), but overall the policy had limited impact, and land policy was in a relative standstill in the period between Amin and Museveni (Green, 2006).

From liberation to liberalization: The Museveni era

As leader of the NRM, Yoweri Kaguta Museveni took power in Uganda in 1986 after a five-year guerilla war. during which the NRM built up a largely rural power base (Bowden & Mosley, 2012). Initially, the NRM made significant progress in terms of reversing 'institutional decay and terror' (Hickey, 2005), improving stability, and fostering national unity through broad-based governance (Tripp, 2010). For two decades, their strategy was to govern Uganda as a 'no-party democracy' where parties were essentially banned. The NRM justified this on the basis that sectarian and ethnically based politics had caused the post-independence turmoil (Carbone, 2003). In other words, before introducing multi-party democracy, the country's peasants needed to differentiate into socio-economic classes (Kasfir, 1998). However, tensions within the NRM eventually lead Museveni to endorse multi-party politics (Ahikire & Madanda, 2009; Oloka-Onyango, 2006) and the multi-party system was introduced in 2005. Since then, Museveni has stayed in power through three elections, but with increasing concerns about exploitation of the power of incumbency (EUEOM, 2011). The most recent election in 2016 was marred with reports of fraud and intimidation of

opposition leaders, journalists and voters (The Commonwealth, 2016). According to Golooba-Mutebi and Hickey (2016), many observers overemphasize the role of semi-authoritarian politics and fail to acknowledge the role of ‘softer’ forms of power like the president’s “responsiveness to popular concerns and fears and the careful management of political rivals”. Still, popular support for the regime seems to be waning, especially among urban youth. Three out of four Ugandans have never seen another president nor experienced the turmoil that preceded him, and the liberation argument is losing its clout (Reuss & Titeca, 2017). The liberation struggle still features centrally in government discourse, but is now overshadowed by the notion of progress: that the country has seen major economic improvements and that the NRM will “take Uganda to modernity” within a few decades (NRM, 2015).

Although Uganda under Museveni has indeed been hailed as a development success story, it has always been a complex one. Once a self-professed Marxist, Museveni started his presidency as a market economy skeptic (Mosley, 2012), but soon made a U-turn by committing to the economic and institutional reforms dictated by the International Monetary Fund and the World Bank. Uganda became one of the most reform-oriented countries in Africa; a ‘poster child’ for structural adjustment (B. Jones, 2009), as the 1990s and early 2000s saw rapidly falling poverty rates. Bowden and Mosley (2012) argue that these effects of liberalization were helped by the fact that Uganda had a large stock of smallholdings, unlike former settler colonies. The regime’s predominantly rural power base also incentivized pro-poor expenditure (Bowden & Mosley, 2012). However, others caution against seeing economic policy as the only factor behind growth and poverty reduction; improved stability also played a major role (Kiiza, 2012).

Agriculture was greatly affected by liberalization, for example through the dismantling of marketing boards. However, the exact consequences for farmers are difficult to assess (Bahigwa, Rigby, & Woodhouse, 2005). Initially, there was an upward trend in production and exports of agricultural commodities, but towards the end of the 1990s this tendency had largely run its course (Dijkstra & Van Donge, 2001). The cooperative system, which was already weakened by political and economic turmoil throughout the 1970s and 80s, had difficulties adapting to rapid liberalization and largely collapsed (Flygare, 2006). This had negative consequences for smallholder farmers, who lost bargaining power (Wiegratz, 2010). Economic growth in large-scale farming (e.g. the tea estates in the Rwenzori region) created some rural employment, but typically with wages so low that they only covered basic needs (State, 2010)²¹. In hindsight it became clear that

²¹ This problem remains; research participants in the Rwenzori region referred to working conditions on tea estates as ‘slavery’, with workers living on site and ‘getting paid in sugar and soap’. A 2013 article in the Daily Monitor (Ssebuyira, 2013) reported that tea estate workers in central Uganda were being paid 1,000 UGX per day (around 0.40 USD).

Uganda's economic growth in this period was highly unequal and biased towards urban areas in the central and western regions (Hickey, 2005; World Bank, 2010), and relatively jobless (Kiiza, 2012). Although the service sector replaced agriculture as the biggest contributor to GDP around the turn of the millennium, the vast majority of the population nonetheless depended upon agriculture for their livelihoods (figure 6). Upon diagnosing poverty as an almost exclusively rural problem, the government launched the 'Plan for Modernisation of Agriculture' (PMA) in 2000 as a central component of their eradication agenda (Bahigwa et al., 2005). This marked the beginning of a more agriculture-centered development discourse in Uganda.

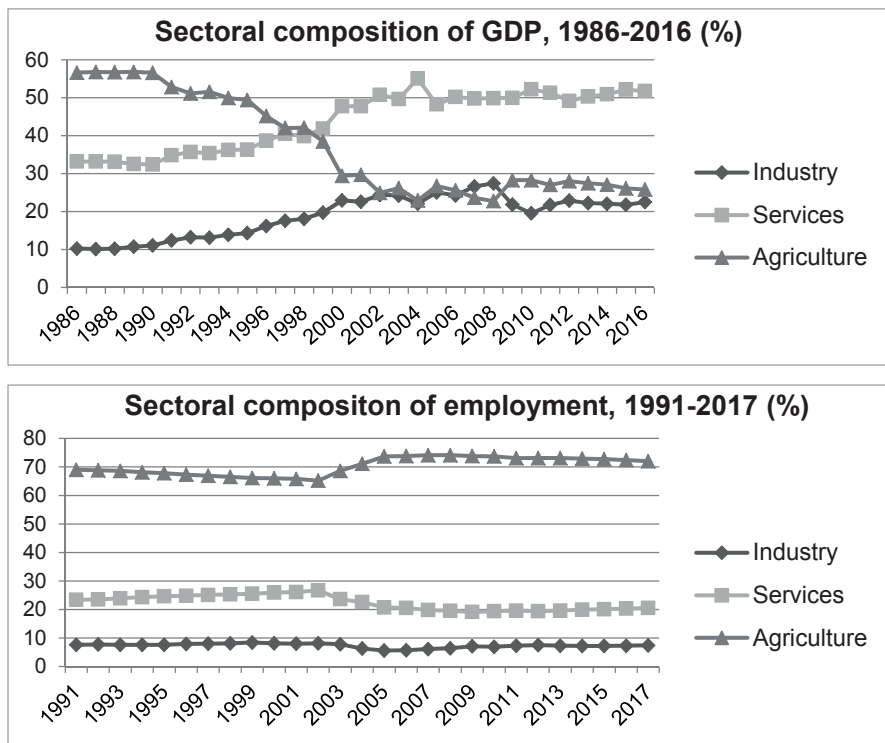


Figure 6 Top: Sectoral composition of GDP (1986-2016). Bottom: Sectoral composition of employment (1991-2017; earlier figures are not available). Both are based on statistics from the World Bank's World Development Indicators. This data should be interpreted with caution; for example, changes in measurement methods may have occurred during these time periods. However, the general trends are clear. That the relative contribution of agriculture to GDP declined during the 1990s and is no longer the largest sector in terms of value, and has been replaced by 'services' more so than by industry. Employment statistics meanwhile show little change; a majority of Ugandans work primarily in agriculture. Data source: World Bank (2018).

Agricultural modernization within ‘new developmentalism’

Turning ‘the peasantry’ modern is, in Museveni’s view, Uganda’s great challenge (Kassimir, 1999, p. 649). In his first speech as president Museveni declared that he “does not want a country of peasants” (Hickey, 2005). Modernization of agriculture itself has come to feature centrally as part of the strategy to become a modern, middle-income country since the government committed to a kind of ‘new developmentalism’ around the turn of the millennium (Kiiza, 2012). This section unpacks what the strategy entails.

A quick glance at table 3, which shows a number of indicators related to agriculture and land use listed in the government’s Vision 2040 (GoU, 2013), shows that the process of agricultural modernization and structural transformation that the government aspires to is a rather radical one.

Table 3 Indicators related to agriculture and land use from Uganda Vision 2040, reflecting the government’s aspirations for a rapid process of agricultural modernization, urbanization and structural transformation to make Uganda a ‘modern country’ by 2040. There is also an ambition for expanded forest- and wetland cover (GoU, 2013).

Indicator	2010	2040
Labor productivity (USD/worker)	390	6790
Urbanization (%)	13	60
Agriculture’s contribution to GDP (%)	22	10
Nominal agricultural GDP (billion USD)	3.8	60
Share of workforce in agriculture (%)	66	31
Forest cover (%)	15	24
Wetland cover (%)	8	13

The most central component of this strategy, judging by this document and others (such as the National Development Plans), is commercialization. According to the Vision 2040, the ambition is:

to transform the agriculture sector from subsistence farming to commercial agriculture. This will make agriculture profitable, competitive and sustainable to provide food and income security to all the people of Uganda (GoU, 2013, p. 45).

This implies a logic where making agriculture more market-oriented will result in food security and poverty reduction. It purports to also make agriculture sustainable, although it is unclear what is meant by sustainability and how this will happen²². Elsewhere, the Vision 2040 and the National Development Plan both

²²The figures listed in table 3 seem to suggest a ‘land saving’ logic, i.e. that increased productivity means that land can be set aside for forests and wetlands. There have also been tendencies to frame environmental problems as solely an issue of poverty. In a statement made by the president in regards to a controversial land deal, he reasoned that “it is more difficult for a backward

pose that getting farmers (especially smallholders) to participate more actively in markets will not only alleviate poverty but also make agriculture an engine of growth, by providing export earnings and supporting growth in agro-based industries. In other words, all the objectives characteristic of conventional agricultural modernization are present. The strong emphasis on commercialization is understandable given the relatively low market participation amongst Ugandan farmers. Although most are better categorized as ‘semi-subsistence’, it was estimated in 2010 that the median level of output commercialization was below 30% and the least commercialized 25% of farmers sold only 4% of their produce (Nivievskiy, von Cramon-Taubadel, & Zorya, 2010). The question of *why* this is the case is an important one, however. This leads to the question of productivity increase and technological change.

Productivity increase is the second central theme in government discourse on agriculture. In particular, the government emphasizes the production of strategic commodities which have commercial potential, including traditional export crops (coffee, tea, cotton), maize, beans, cassava, banana, citrus, fish, and livestock (GoU, 2015). The first National Development Plan suggested that some expansion (through mechanized agriculture) may be possible, as only about half of arable land is under cultivation. However, the plan acknowledged that expansion cannot continue for very long due to rapid population growth. Meanwhile, there is great potential for intensification, given the substantial ‘yield gap’ between farms and research stations (GoU, 2010). Both National Development Plans (I & II) acknowledge a wide range of causes for low productivity, from weak policy frameworks and land tenure issues, to costly inputs and inadequate infrastructure. To raise productivity, the government promises to:

invest in the development of all major irrigation schemes in the country; ensure continued investment in technology improvement through research for improved seeds, breeds and stocking materials; invest in the development of the phosphates industry in Tororo to reduce the cost of fertilizer (GoU, 2013, p. 47).

The government also commits to institutional measures like reform of the extension system, improved access to credit, strengthening of the cooperative system, reversal of land fragmentation (to “secure land for mechanization”), and to ensure that “land acquisition is driven purely by market forces” (GoU, 2013). But it is here that we begin to see signs of contradiction between policy and practice, because a large share of public spending is devoted to input provision (Danielsen,

country to guard against environmental degradation than for a camel to go through the eye of a needle” because too many people are farmers and the government has no money to ‘police and protect’ the environment (Museveni, 2007). While these are common (and not necessarily *wrong*) lines of reasoning, they are highly simplistic and completely neglect the problems within modern agriculture identified earlier in this chapter.

Matsiko, & Kjær, 2014; Nivievskyi et al., 2010)²³. It is true that the use of conventional inputs by Ugandan farmers is generally low (by global and sometimes also African standards) although reliable figures are difficult to come by. A majority use local, rather than ‘improved’, varieties of crops and livestock, and many are reported to apply neither synthetic nor organic fertilizer (Barungi, Guloba, & Adong, 2016)²⁴. Synthetic fertilizers are very costly, and application rates are among the lowest in the world – around 10 % of the sub-Saharan African average in 2010 (Sheahan & Barrett, 2014). Studies report that for most crops, less than 10 % of households apply pesticides (Ali, Bowen, Deininger, & Duponchel, 2016; Barungi et al., 2016), although use on horticultural crops has increased steadily during the 2000s (Karungi et al., 2016). That said, providing farmers with inputs does little to address the real barriers to higher productivity and market participation, which have more to do with factors like infrastructure, education and extension services (Nivievskyi et al., 2010). This is especially the case when many farmers lack the necessary knowledge and resources to use inputs in a manner that actually leads to increased yields (Sheahan & Barrett, 2017).

Although cause and effect cannot be understood through simple metrics, there are many signs that the current strategy has major shortcomings in relation to its own objectives. Annual growth in agriculture has been fluctuating wildly since 1986, but shows little sign of living up to the government’s vision (figure 7). The same can be said for trends in food security; undernourishment has increased both in relative and absolute terms since the early 2000s (figure 8). Poverty rates generally continued to go down in absolute and relative terms during the 2000s, albeit at slower rates than in the 1990s, but then rose again according to the national household surveys conducted in 2012/13 and 2016/17. The former reported a 19% poverty rate while the latter reported that 27% of Ugandans live under the national poverty line, the vast majority of them in rural areas (UBOS, 2017)²⁵.

²³ Synthetic fertilizer is clearly a particular concern of the government; in the 2016 State of the Nation Address, the president compared figures between Uganda and the US and assured that the government is “working with some investors to see how to tackle the problem”

²⁴ Figures vary greatly by crop, but this is reported to apply even for the most commonly fertilized crop (coffee). In combination with high levels of soil erosion and leaching, some of the highest rates of annual nutrient depletion in Africa have been reported in Uganda (Henao & Baanante, 2006).

²⁵ N.B. that Ugandan poverty statistics should be interpreted with caution because the national poverty line was set in 1993 and is too low by international standards (World Bank, 2016).

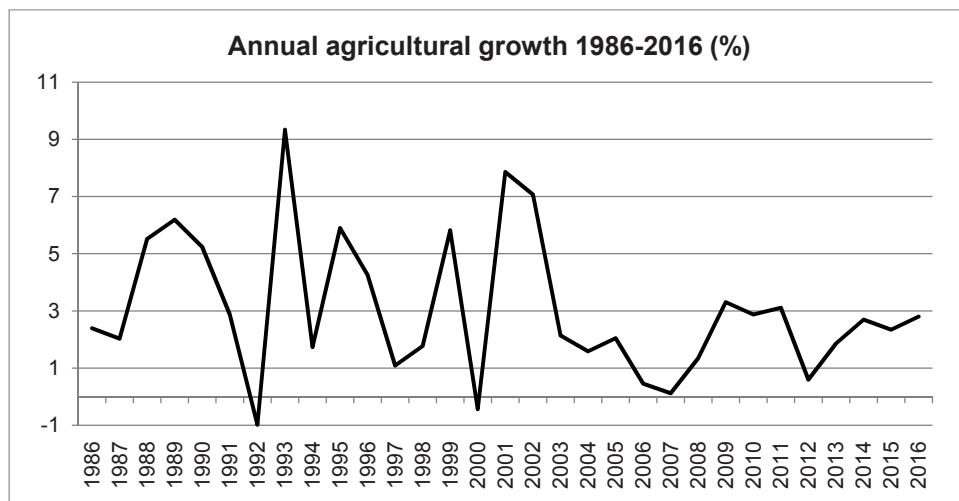


Figure 7 Annual agricultural growth (value added) in Uganda, 1986-2016. There has been significant fluctuation in annual agricultural growth since economic liberalization reforms were introduced in 1987. Recent years' figures (showing a growth of 1-3 %) are well below the target listed in table 3, which would require an average annual growth rate of 9-10 %. Data source: World Bank (2018).

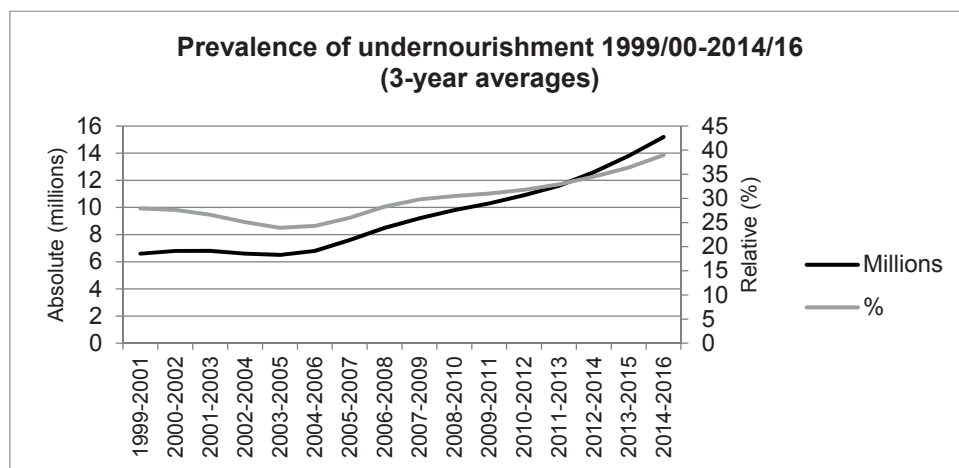


Figure 8 Prevalence of undernourishment in Uganda in absolute and relative terms, 3-year averages between 1999/01 – 2014/16. Since the mid-2000s, both have been increasing. Undernourishment here refers to an insufficient caloric intake compared to country-specific thresholds for minimum daily intake. Data source: FAO (2017b).

The contradictions of neoliberal modernization

On the surface, there is nothing too remarkable about Uganda's quest for agricultural modernization via commercialization and intensification, except maybe the rapid pace at which transformation is sought. In many regards the strategy aligns with the conventional model described earlier in this chapter, and as such we know it has some crucial limitations. But a closer look at its market- and technology-centered framing, and the ways that policy is (or isn't) implemented in practice, reveals a more complicated story.

Most fundamental is the problem of low public spending. The Ugandan government committed to allocating at least 10% of the national budget to agriculture when signing the Maputo declaration in 2003, but this has never been close to being met (figure 9). Instead, despite the 'new developmentalism' turn in policy discourse, the government remains committed to a neoliberal logic of development where its primary role is to create a 'conducive environment' for private enterprise²⁶. Kiiza (2012) argues that the market fundamentalism of the liberalization era remains entrenched within the ruling elite, and points to the close ties between the institutions that have the most influence over the national economy (e.g. the Bank of Uganda, the Ministry of Finance, Planning and Economic Development), and institutions like the International Monetary Fund and the World Bank.

The perpetuation of a neoliberal logic is not only a question of ideology, though. Foreign donors are still a major source of funding for both development programs and public research, and have significant "financial, political, and knowledge power to shape Uganda's development agendas" (Kiiza, 2012, p. 227). The long history of reliance on donor funding and foreign investment, B. Jones (2009, p. 158) argues, has made the ruling elite's economic survival more dependent on "its ability to mobilise resources from its relationship with the outside world" than on its success in stimulating economic and social change in the countryside²⁷. Some

²⁶ As cautioned earlier, neoliberalism as such is not a very precise explanatory concept. Nonetheless, for the purposes of this thesis it remains a useful label to distinguish between state-led agricultural modernization (à la Green Revolution) and the kind of market-led modernization pursued in Uganda today, embedded as it is in a broader strategy of economic liberalism, decentralization and privatization. As in many other countries, neoliberalism in Uganda has its origins in Structural Adjustment Programs, of which the basic anatomy was to "cut government expenditure, reduce the extent of state intervention in the economy, and promote liberalization and international trade" (Simon, 2008, p. 87). But as argued by Kiiza (2012) the perpetuation of neoliberalism in Uganda is shaped by the specific political-economic context.

²⁷ B. Jones (2009) calls this an 'extraverted' state. Uganda was amongst the world's most aid-dependent countries from the 1990s until the mid-2000s; donor money funded around 50% of the budget some years, and this figure was still around 30% in the late 2000s (Wiegatz, 2016, p. 71).

elites have vested interests in this system, as they have reaped substantial personal benefits by securing external funding (Kiiza, 2012).

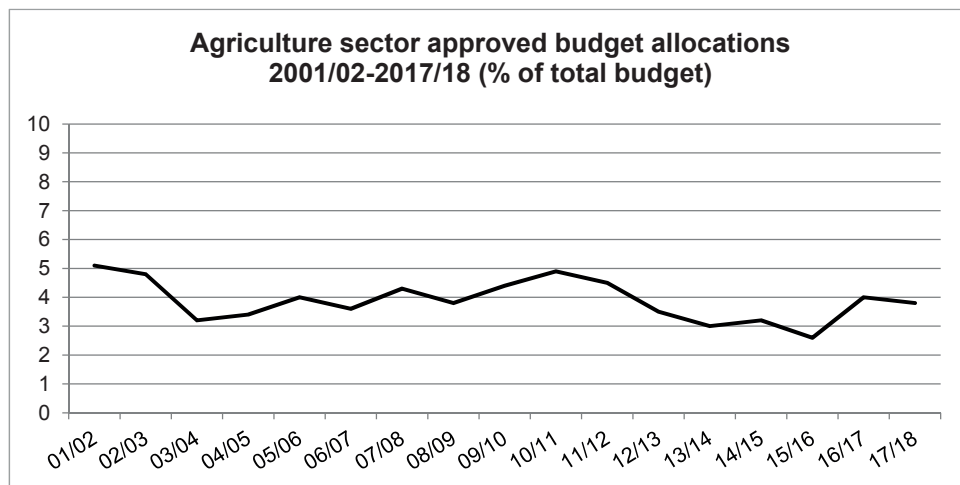


Figure 9 Agriculture sector budget allocations as percentage of total budgets, 2001/02 – 2017/18. The Ugandan government committed to spending 10% of national expenditure to agriculture by signing the Maputo Declaration in 2003. As the graph shows, this has never been close to being realized and no upward trend can be seen. Calculated based on Annual Budget Performance Reports GoU-MFPED (2015b).

When the kind of agricultural change that nonetheless *is* encouraged is examined more closely, one can see that there has been a reemergence of the ‘spearheading’ model, which dates back to the late colonial era when official policy began to shift towards elites’ interests. This model concentrates resources, for example via rural finance and extension, on relatively well-off farmers (often medium to large-scale). According to Hickey (2005), poor smallholders were never actually intended to be the main beneficiaries of policies like the Plan for Modernisation of Agriculture (PMA) despite its forceful poverty eradication framing. In practice, it was always oriented in such a way that it would benefit ‘economically active’ and ‘progressive’ farmers with existing assets that would enable them to quickly contribute to economic growth, particularly through export earnings. Since the beginning of liberalization, there has been a strong presence of a ‘trickle-down doctrine’ – the idea that “macroeconomic growth will automatically benefit the common man, including the peasants and workers, thus reducing poverty” (Wiegratz, 2016, p. 68). As legitimisation for these policies, the rural poor (often ‘peasants’) have been framed as inherently unproductive and ‘unable to benefit’ from development programs (Bahiigwa et al., 2005), essentially to blame for their own ‘backwardness’ (Hickey, 2005). Of course this is highly problematic, not least because it is inaccurate. As shown above, ‘peasants’ were once the basis of a

commercially oriented, more than self-sufficient agricultural sector²⁸ (Nabuguzi, 1993; Richards, Sturrock, & Fortt, 1973). The strategy has received criticism even from mainstream financial institutions like the World Bank (2011) for being economically distortive, fiscally expensive, and un conducive to structural transformation. One important way in which shortcomings arise is that Uganda's relatively jobless growth (Bbaale, 2013; Kiiza, 2012) continues. As many as 64-83% of Ugandans below the age of 30 are estimated to be unemployed (Reuss & Titeca, 2017). This reminds us of McCullough's (2017, p. 134) point that Ugandan agriculture is not so much "a bastion of low productivity but, rather, a large reservoir of underemployed workers". Even so, the Ministry of Finance, Planning and Economic Development points to the importance of mechanization and greater capital intensity in agriculture in order to "increase productivity and release labour to find employment in higher-value sectors" (GoU-MFPED, 2014).

Another problematic policy area is land governance. It should be acknowledged that this is a very politically complicated issue in Uganda, in large part due to the colonial legacy²⁹. The gradual shift towards individual freehold land tenure systems and insistence on having land-acquisitions "purely driven by market-forces" (GoU, 2013) can nonetheless be linked to the government's 'extraverted' neoliberal strategy. When the 1995 Constitution acknowledged four parallel tenure systems (freehold, leasehold, *mailo*³⁰ and customary), its recognition of customary tenure was regarded as progressive (Hundsbaek Pedersen et al., 2012). However, Mamdani (2013) argues that the purpose "was not to reinforce [customary tenure] but to target it for immediate control and eventual elimination" (Mamdani, 2013, p.7). The government clearly views customary tenure as an impediment to development, arguing that it causes tenure insecurity (Kaarhus, 2005). This is the dominant discourse internationally as well, but there is evidence from Uganda that perceived tenure insecurity stems from poor harmonization of the different systems, not from customary tenure per se (Munk Ravnborg et al., 2013). Nonetheless, individual freehold is lauded as the "property regime of the future" (MLHUD, 2013). According to Munk Ravnborg et al. (2013), part of the explanation is the government's desire to facilitate investments in large-scale agriculture and make way for oil discoveries. These processes are made much more difficult by customary institutions.

²⁸ The point here is not to idealize the colonial system, which in many ways was coercive and unjust, but to highlight the inaccuracy of framing smallholder farming as static and a barrier to development. This was clearly not the case during the colonial era, nor prior to it.

²⁹ A major issue is the fact that some groups benefited greatly from colonial distribution of land. According to Green (2006, p. 371), "Bugandan landlords have been one of the strongest forces in opposition to current attempts at land reform by the ruling National Resistance Movement"

³⁰ Mailo is a type of quasi-freehold that is mainly found in Buganda, established when land was distributed to kings and feudal landlords via the 1900 Buganda Agreement.

A final contradiction that deserves attention is the aforementioned prioritization of input provision over more effective strategies for achieving agricultural modernization. Two thirds of extension funding now goes to input supply (Danielsen et al., 2014), thus marking the return of a top-down, technology transfer model of extension long known to be ineffective also within Uganda (Barungi et al., 2016; Nivievskyi et al., 2010; Semana, 1999). To understand this discrepancy we must understand the NRM regime's increasingly precarious political situation. The changing face of the National Agricultural Advisory Services (NAADS) is a primary example of interventions in agriculture being used to mobilize political support, especially around election time (Joughin & Kjær, 2010). Bategeka, Kiiza, and Kasirye (2013, p. 6) notes that:

NAADS, whose statutory role is, as the name suggests, "advisory" eventually started providing agricultural inputs (such as improved seeds), thanks to the political expedience of using NAADS to mobilize voters' support during elections.

The latest step in this process was to place the Ugandan army in charge of key functions in agricultural extension via the so called 'Operation Wealth Creation' (OWC). Tapscott (2016) suggests that one likely motivation was to redirect public spending to the military, which has been increasingly mobilized for political purposes in recent years³¹. During fieldwork in 2017, I encountered numerous stories of beneficiaries seemingly being selected on political grounds, resulting in wasted resources since recipients did not necessarily have the interest, knowledge, or even land to use the materials. A parliamentary report supports this picture: inputs have been poorly aligned with local needs, often provided at the wrong time, and been insufficiently coupled with advisory services (Sectoral Committee on Agriculture, 2017). This issue cannot be counted among the inherent limitations of conventional modernization, nor can it be solely attributed to neoliberal development. Rather, it adds another layer to the critique of Ugandan agricultural modernization developed in this chapter: the prioritisation of the short-term political interests of a regime in decline.

2.3 Implications: A dual challenge

The first part of this chapter sought to elaborate a critique of agricultural modernization as a model of agricultural development. By critique I do not mean to simply find faults and look for particularly problematic examples, but rather to

³¹ There has been speculation in public media that OWC offered a way for the regime to "appease the jobless and broke veterans" who have become vocal critics of the government in recent years (Barigaba, 2014).

understand what the limitations of the model are – even when it is viewed in a generous light. I have argued that conventional agricultural modernization as a development model is fraught with two types of problems that can be seen as internal limitations. First, conventional modernization fosters agricultural systems that tend to undermine their own material conditions over time, with problems being particularly severe in contexts where soils are degradation-prone, pest pressure is high and climate change is expected to have significant effects (e.g. many parts of sub-Saharan Africa, including Uganda). Second, it suffers from systemic shortcomings in regards to poverty eradication and improved food security.

The second part of the chapter examined how agriculture has been governed in Uganda from the colonial era until today. Current policy discourse expresses an ambition for conventional agricultural modernization through commercialization and intensification, but in practice, this vision is seriously distorted. I propose two main causes. Agricultural modernization has become embedded within a broader strategy of neoliberal development, which began with Structural Adjustment but is perpetuated by the ruling elite on both ideological and material grounds. At the same time, the short-term interests of a regime in decline – in essence, the politics of staying in power – generate interventions based on possibilities to mobilize popular support, rather than the ambition to spur long-term transformation in agriculture based on the best available evidence. One problematic outcome is the persistently low levels of public spending on agricultural development. Another is the return of an approach that privileges so called ‘progressive’ farmers who can contribute to the goal of economic growth more quickly, to the detriment to the goals of poverty reduction and increased food security. There is also a tendency to favor simple technology transfer over measures with greater potential to yield robust improvements.

The initial critique demonstrates the necessity of alternatives to conventional modernization, but the great disconnect between discourse and practice in Uganda shows that we cannot assume that demonstrating the existence of a better alternative to powerful decision-makers will automatically spur change. In other words, there is a dual challenge: to find a desirable and viable alternative to conventional agricultural modernization, and to develop strategies for actually *achieving* such an alternative in the face of contemporary agrarian politics. I return to the issue of transformation in chapter 4. But first, I will go on to explore the question of alternatives – more specifically, the agroecological alternative.

3 The agroecological alternative

It is no easy matter to make a credible argument that “another world is possible”

Wright (2010, p. 23)

What is needed are countless elegant solutions keyed to particular places, which a more dialectical or inherently ecological perspective offers. It has been well said that what ecology can offer agriculture is not a set of easy answers, but rather a series of difficult questions.

Jackson and Piper (1989, p. 1592)

Showing that an alternative is possible is indeed not easy, especially when that alternative eludes clear definition. This chapter nonetheless takes on this challenge, first by examining the concept of agroecology in greater detail, both as a model of agriculture and as a mode of agricultural development. After this, I move on to synthesize my findings regarding the emergence and implementation of agroecology in Uganda, building mainly on the fieldwork process outlined in chapter 1. At the end of the chapter, I identify and discuss structural constraints to agroecology in Uganda, and tie my findings back to the conclusions drawn in chapter 2. This lays the foundation for tackling questions of transformation for agroecology, which is the focus of the final substance chapter. The following two research questions structure my analysis of the agroecological alternative:

- On what basis is agroecology a desirable and viable alternative to conventional modernization?
- How is agroecology employed on the ground in Uganda, and how is the realization of its potential as a development alternative constrained?

3.1 The case for agroecology

The first thing that must be understood about agroecology is that it lacks a clear, universal definition. It is often introduced as a science, a set of practices and/or a movement (as proposed by Wezel et al., 2009), which is less of a definition than a reflection of the concept's roots in multiple social and geographical contexts (Norder, Lamine, Bellon, & Brandenburg, 2016; Wezel et al., 2009; see also paper I). The *term* came about through scientists' attempts to integrate agronomy with the emergent field of ecology in the 1920s and 1930s (e.g. Bensing, 1928). But agricultural practices that today get labelled 'agroecological' (e.g. Wezel et al., 2014) have been observed in traditional farming systems in many parts of the world (Gliessman, 1998). This point is strongly emphasized by the contemporary rural social movements where agroecology has come to be fundamental (Rosset & Martínez-Torres, 2012). Due to the ambiguity of the term, and the extremely diverse range of actors who employ it, there is an array of different claims made around agroecology and its desirability as an alternative. In this sub-chapter I will disentangle these, beginning with the notion that agroecology enables 'truly sustainable agriculture' (Altieri & Nicholls, 2005).

Truly sustainable agriculture? The ecological rationale of agroecological farming

The fundamental basis of claims about agroecology and sustainability is the notion of the *agroecosystem*. An agroecosystem is "a site or integrated region of agricultural production – a farm, for example – understood as an ecosystem" (Gliessman, 2014, p.23). Like any ecosystem, agroecosystems contain biotic and abiotic components that interact with their surroundings and with each other through ecological mechanisms like nutrient cycling, predator/prey dynamics, symbiosis and succession (Jackson & Piper, 1989; Vandermeer & Perfecto, 2013). Unlike natural ecosystems, however, agroecosystems are managed by humans for specific purposes: to provide products for human consumption. By understanding and manipulating agroecosystem components and interactions, they can be made highly productive, sustainable, and resilient to disturbances (Gliessman, 1998). 'Agroecological practices' thus seek to generate and optimize those agroecosystem functions and processes. This is a highly context dependent effort since appropriate solutions depend on site-specific biophysical conditions, and also on the socio-cultural setting, since nature and society are understood as co-evolving (Marsden et al., 2001). Generally though, agroecological farming is knowledge-intensive and characterized by high levels of agrobiodiversity (Altieri, 2002). More concretely, agroecology is often thought of as having fundamental principles

which exist in slightly different variations in the literature. One example is the five guiding principles formulated by Altieri and Nicholls (2005), exemplified in table 4 with a variety of practices from the review by Wezel et al. (2014).

Table 4 Five principles for designing and managing agroecological farming systems, adapted from Altieri and Nicholls (2005), and examples of associated practices. For a more comprehensive list and categorization of practices, see Wezel et al. (2014). As seen here, many 'agroecological practices' have more than one function in the system.

Principle	Practices (examples)
Aim for biomass recycling, optimized nutrient availability and balanced nutrient flow	Crop-livestock integration, leguminous plants, green manure
Create favorable soil conditions for plant growth through management of soil organic matter and soil biotic activity	Leguminous plants, green manure, cover crops, reduced/zero tillage
Minimize losses of energy and matter through microclimate, water and soil management	Mulching, cover and catch crops, agroforestry, trenching/terracing, reduced/zero tillage, drip irrigation, hedges
Strive for high agroecosystem diversity at the species and genetic level (in time and space)	Intercropping, crop rotation, use of diverse cultivars, agroforestry
Enhance beneficial biological interactions and synergisms, thus promoting key ecological processes and services	Natural enemies, allelopathic plants, agroforestry, intercropping, landscape elements

Understood in this manner, agroecology closely resembles organic agriculture as defined by the International Federation of Organic Agriculture Movements (IFOAM, n.d.). Yet some agroecology proponents strongly distance themselves from organic agriculture, arguing that in practice it often amounts to little more than 'input substitution' (Rosset & Altieri, 1997). I will revisit this argument later on, because organic agriculture has seen rapid growth in Uganda (Andreasen & Lazaro, 2013). For now, the important point is that agroecological principles have consequences for the entire design of agroecosystems – at field, farm, and landscape levels. Monocultures are particularly problematic since, as explained in chapter 2, highly simplified agroecosystems necessitate routine application of agrochemicals. In agroecological farming, various aspects related to crop choice – locally adapted varieties, temporal succession, spatial distribution, landscape elements, leguminous crops, cover crops etc. – as well as integration of crops and livestock are key for both soil fertility management and crop protection (Doré et al., 2011; Wezel et al., 2014). One good example of an agroecological innovation is push-pull systems. In such systems, cereals, for example, are intercropped with an insect-repelling crop (which may have additional functions like nitrogen fixation). Around the field, other species are planted that draw pests away from the crop and attract predator species (Jiggins, 2014). Different forms of agroforestry are also common in agroecological systems since trees can provide many services aside from food, fuel, and fiber – such as soil stabilization, shading and nitrogen fixation (Wezel et al., 2014).

The necessity of restoring and maintaining soil fertility for rendering agriculture sustainable is a crucial argument for proponents of agroecology, not least in the context of tropical soils which often have relatively low capacity for retaining both organic matter and mineral nutrients (Noguera et al., 2011). The conventional approach to soil fertility centers on synthetic fertilizers, but as explained previously, there is a limit to which soil degradation can be ‘masked’ in this manner (Marenya & Barrett, 2009). Because agroecology is not a standardized model, it does not necessarily imply absolute zero-tolerance for the use of synthetic inputs like fertilizers. Views vary, but agroecologists tend instead to speak in terms like reducing, minimizing, ideally avoiding, or largely excluding off-farm input-use (Altieri et al., 2017; Sanderson Bellamy & Ioris, 2017)³². The crucial point is that agroecology involves diverse approaches to restore soil organic matter, support the health of soil organisms, improve water retention, increase fixation of atmospheric nitrogen, stabilize soils, and improve the cycling of nutrients. When soils are degraded, as in much of sub-Saharan Africa including Uganda³³ (Henao & Baanante, 2006; Tittonell & Giller, 2013), the kind of holistic strategy favored by agroecology is in fact often the only option for raising productivity (Rosset & Martínez-Torres, 2012; Tittonell & Giller, 2013).

One issue brought up in the critique of agricultural modernization in chapter 2 is the nexus of energy and climate change. Rural social movement actors have in recent years added the argument that small-scale farmers are ‘cooling the planet’ through agroecological methods (LVC, 2009) to their repertoire of claims. The scientific basis that LVC provides is from a study by Lin et al. (2011) that finds that agroecology is more likely to achieve greenhouse-gas reduction compared to ‘industrial’ agriculture both through reduced emissions and increased sequestration. Actual mitigation effects are of course highly contextual, and agroecology should not be seen as a silver-bullet solution to an issue as complex as climate change. Still, given the severity of this threat (not least for Ugandan agriculture) it is an argument worth taking seriously. Finally, a related point which

³² Agroecology is sometimes framed as strictly antithetical to agriculture that involves the use of external inputs. While this stance may well exist, I have not found it dominant in the scholarly literature, nor to be the official standpoint of organizations like La Via Campesina. Rather, it seems to be an argument used in attempts to discredit agroecology. Kershen (2012, p. 615) critically writes: “By rejecting science and technology and by intertwining with organic agriculture, the proponents of agroecology have restricted agroecology so that it does not use fertilizers”. I argue that this is an inaccurate assessment in several ways.

³³ Andersson (2014) rightly cautions against overly sweeping statements about (and/or visualizations of) soil fertility and land degradation, which obscure the complexity of soils and the extreme variation that often exists at local (and even field) level. Figures for vast areas (even entire countries) are often based on only a few samples. That said, there is strong evidence that in many parts of Uganda, different forms of soil degradation constitute a serious challenge to farmers’ livelihoods and to ecosystems.

is more widely argued is that agroecology can greatly improve the resilience of agriculture to environmental change such as climate-related variability and shocks. Above all, this results from greater functional diversity as well as improved soil quality (Altieri, Nicholls, Henao, & Lana, 2015; Holt-Giménez, 2002; Perfecto et al., 2009).

Agroecology as an alternative development model

For agroecology to have appeal over conventional modernization, the promise of truly sustainable agriculture is certainly important but not sufficient. Most contemporary literature on agroecology includes various claims about social and economic benefits, sometimes even to the point of implying that agroecological production systems are inherently ‘socially just’ (Altieri & Toledo, 2011; FAO, 2017a). This is clearly overly simplistic, but upon closer examination of how agroecology is argued to be socially desirable in various contexts in the Global South, two different rationales can be discerned.

In places where agroecology is strongly associated with rural social movements, mainly in Latin America, agroecology has been employed both practically and discursively in struggles against actors and processes perceived to threaten rural livelihoods and ways of life (Borras Jr., 2004; Rosset & Martínez-Torres, 2012). To understand this, it is important to recall that traditional farming systems and the knowledge underpinning them have long been recognized as crucial components of agroecology (Altieri, 2004; Norgaard, 1984). Aside from agroecological farming being practiced as a livelihood, the science of agroecology has helped legitimizing these movements’ claims (Holt-Giménez et al., 2010). For example, LVC refers to scholars’ findings about small farm productivity and links between agrobiodiversity and climate resilience (LVC, 2010). A bit crudely put, from this perspective, agroecology is framed as what small farmers *do* (at least when allowed to). Thus what is needed is a process of ‘repeasantization’ of agriculture (Van der Ploeg, 2008). There are many important issues raised by the scholars and activists working from within this framework, but there are others who argue that it essentializes and idealizes ‘peasants’ (Bernstein, 2014), and obscures the fact that many farmers aspire for *different* livelihoods and *better* material conditions than they have had in the past, including higher incomes (Agarwal, 2014).

The second rationale lies closer to the theoretical starting point of this thesis, and proposes agroecology as a sustainable and ‘pro-poor’ mode of agricultural development. This view is captured in De Schutter’s (2010) report as UN Special Rapporteur on the Human Right to Food, where he argued that agroecology provides:

a mode of agricultural development which not only shows strong conceptual connections with the right to food, but has proven results for fast progress in the concretization of this human right for many vulnerable groups in various countries and environments. [...] And it strongly contributes to the broader economic development. (De Schutter, 2010)

To summarize the logic behind this argument, the report argues that:

1. Agroecology improves yields through resource-conserving and low-capital practices that are particularly applicable for vulnerable smallholders, thus also reducing rural poverty
2. Agroecology helps address malnutrition problems by favoring diverse production systems
3. Agroecology is key for countering and/or adapting to forms of environmental degradation that limit productivity in many poor countries (e.g. soil degradation, climate change).

The third point has already been addressed. The second, which links agroecology to nutrition via agrobiodiversity, is important from the perspective of food security but is fairly uncontroversial (see for example Frison, Cherfas, & Hodgkin, 2011; A. D. Jones, Fink Shapiro, & Wilson, 2015). The first point, however, warrants more unpacking. This argument rests on research that has shown that agroecology offers smallholder-oriented, low-capital approaches for sustainably raising agricultural productivity, not least in small-scale farming in the tropics (Altieri, Funes-Monzote, & Petersen, 2012; Oakland Institute, 2015; Pretty, 2003, 2006; Pretty, Toulmin, & Williams, 2011). The idea of agroecology as a ‘low capital’ approach is fairly unproblematic, as farming with minimal purchased inputs like synthetic fertilizer and chemical pesticides reduces capital-intensity (Altieri, 2009; Gliessman, 2014). In Uganda, where most farmers are not only poor but fertilizer costs are also very high, this is no trivial point. Furthermore, there is an important gender aspect to consider, since accessing inputs, subsidies, and credit is often particularly difficult for women³⁴. Agroecology can thereby help overcome an important problem with GR technologies – the fact that they are not resource neutral (Patel et al., 2015). But can agroecology sufficiently raise *productivity*?

This seemingly simple question is challenging to answer, for a variety of reasons that Sanderson Bellamy and Ioris (2017) offer a good overview of. First of all, very little research funding is devoted to studying agroecological farming. There is also an array of methodological challenges, such as the wide range of different productivity measures. Some common measurement approaches clearly disfavor

³⁴ As cautioned by De Schutter (2010), agroecology should not be treated as automatically beneficial for women on this basis. As always, this depends on how interventions, investments, and projects are carried out in relation to local gender dynamics.

agroecology, such as measuring yields by crop rather than for the whole system. There is also no ‘typical’ agroecological system, and in reality farmers often apply agroecological principles partially and unevenly. Thus, the effect of full ‘agroecological transition’ is difficult to assess. Studies that systematically compare agroecological approaches alongside application of GR technologies in a given setting are particularly hard to come by. Rosset et al. (2011) claim that in the Global South, “peasant agroecological systems average a higher level of total productivity than conventional monocultures” but base this only on data from Cuba and acknowledge that causality is difficult to prove.

We *do* know, however, that agroecological approaches *can* offer yield increases at levels rivalling conventional intensification across a wide range of biophysical contexts. Altieri Altieri (1999) for example has reported tripled or quadrupled yields in grain-legume systems in Honduras after initiation of various agroecological soil conservation practices, and lists a range of cases with similar outcomes across Latin America. A large study measuring productivity increases upon the application of agroecological approaches (286 projects in 57 countries) showed an average crop yield increase of 79% over four years. When the data was reanalyzed to understand the effects of “organic or near-organic projects on agricultural productivity in Africa”, UNEP-UNCTAD (2008) on average found a 128% increase in crop yields in East Africa. In another study that summarized findings from ‘sustainable intensification’ projects in twenty African countries, Pretty et al. (2011) found that, on average, crop yields more than doubled over a period of 3 to 10 years³⁵. In short then, although it cannot be said that agroecology *never* involves trade-offs in yields vis-à-vis conventional technologies, the possibility of significant productivity improvements through low-cost approaches gives agroecology obvious appeal from a development perspective.

The question of labor productivity is even more difficult to assess, since it is severely under-addressed in agroecology literature (Bernstein, 2014). When Altieri (2009) assures us that “the energy return to labor is high enough [in agroecological peasant agriculture] to ensure continuation of the present system” he not only makes a very broad generalization, but also fails to acknowledge that the present system may not be the goal. As Agarwal (2014) points out, both individuals and governments may aspire for farmers to be more than self-sufficient, and for good

³⁵ These figures undoubtedly seem quite meaningless for readers that don’t have a reference point, and for the reasons mentioned, it is very difficult to provide figures for the sake of comparison. However, Pingali (2012) reports that yields for wheat, rice, and maize across developing countries rose 208%, 109% and 157% respectively between 1960 and 2000 mainly through application of GR technologies. Thus, the figures cited do amount to substantial increases. It is also worth remembering that soil degradation can make agroecological approaches *necessary* for raising productivity and that productivity measurements should consider aspects like energy returns.

reasons. In his report to the UN, De Schutter (2010) tries to address the labor issue from several perspectives, arguing a) that agroecological farming does not have to be labor intensive, especially after the initial phase, b) that labor intensity can be *positive* given high rural unemployment, and c) that agroecology is not at odds with gradual mechanization. This seemingly eclectic array of arguments reflects the fact that there is no straightforward relationship between agroecology and labor. Cherry-picking evidence is problematic. Altieri et al. (2015) notes that the adoption of bean intercropping by maize farmers in Honduras did not only triple maize yields, but also cut labor requirements for weeding by 75%. At the same time, it eliminated the need for herbicides. Other times, agroecological approaches increase on-farm demand for labor, and sometimes they create employment by opening up whole new seasons of production (Pretty, 2006). It is undeniable that the *extreme* levels of labor productivity seen in highly mechanized, large-scale agriculture require systems that contradict agroecological principles. As agroecology does not prescribe specific practices, it follows that there is scope for adaptation to different conditions also in regards to labor, making it an issue that must be tackled on a case-by-case basis. In the Ugandan context, a point from chapter 2 that is worth remembering is that low labor productivity figures are not so much a technological problem but rather an issue of high rural underemployment (McCullough, 2017). Approaches which create rural employment have obvious merit under such conditions, although one must still consider that labor can be a constraint for the individual farmer (as I discuss in paper I).

Finally, it should be noted that agroecological approaches are often argued to have a range of additional social benefits that Pretty (2006) calls ‘social side effects’³⁶. These include strengthened social and human capital (e.g. community organization, collective action, self-reliance, productive use of farmers’ knowledge, and capacity to experiment). Underlying such arguments is that agroecology necessitates farmers’ individual and collective participation in the development and dissemination of knowledge and practices (De Schutter, 2010).

³⁶ Referring to social and human ‘capital’ as side effects is somewhat provocative, given their importance from perspectives like sustainable livelihoods (Scoones, 2009) and capabilities (Sen, 1999). However, the logic of internal critique leads me to spend more time on more narrow productivity questions, in order to show that agroecology can sufficiently fulfil the basic objectives sought through agricultural modernization.

Good agroecology, bad agroecology?

There are still many gaps in existing research on agroecology that must be filled before all of the questions related to the viability of agroecology as a development alternative are fully addressed – especially since concrete solutions will vary between contexts. There is nonetheless strong evidence that agroecology goes a long way in overcoming the limitations associated with conventional modernization identified in chapter 2, and that it *can* do so without unacceptable trade-offs. This can be argued even without going into a more detailed analysis of the many aspects that have been described as ‘social side effects’ (Pretty, 2006), which are worthy of attention in and of themselves. From here, therefore, I move on to the empirical analysis of agroecology as it is actually pursued in Uganda.

As I do so, it is important to note that individuals and organizations can invoke agroecology as part of furthering many different agendas. As agroecology has become more mainstream, concerns have been voiced that some actors such as the World Bank, the FAO, and many NGOs are ‘co-opting’ and ‘selectively incorporating’ it in ways that reinforce rather than challenge the dominant agri-food regime (Giraldo & Rosset, 2017; Levidow et al., 2014). A concrete example is when practices like minimum tillage get referred to as ‘agroecological’ even though this practice in isolation is linked to continued or even increased use of agrochemicals (Beste, 2015; Holland, 2004). Other times, the usage of agroecology is less obviously problematic, but still has characteristics that make it more or less transformative. A useful way of illustrating this is the typology constructed by Holt-Giménez and Shattuck (2011), who identify four trends within contemporary responses to crisis in the global agri-food system: neoliberal, reformist, progressive, and radical (table 5).

Table 5 Four trends that have emerged in response to problems in the global agri-food system, most clearly signalled by the global food crisis of 2008, their solution logic and examples of key actors. This is a typology, and actors do not necessarily fit neatly into these categories (for example, some actors like the Consultative Group on International Agricultural Research (CGIAR) and the World Bank can be found both within the neoliberal and the reformist trend). Agroecology is most commonly featured within progressive and radical projects, but the latter tend to pursue agroecology in a more politicized manner. Note that PELUM (Participatory Ecological Land Use Management), which they locate in the progressive trend, is an African civil society network also found in Uganda.

Trend	Solution logic	Examples of key actors
Neoliberal	Economic liberalism, productivism	The World Bank, USAID, Monsanto
Reformist	State-led modernization, green capitalism, certification (e.g. large-scale organics, Fair Trade)	FAO, CGIAR, WorldWatch
Progressive	Decentralization and localization of food systems, alternative business models	Local food networks, urban and community-supported agriculture initiatives, PELUM
Radical	Redistribution of power, wealth and land for ‘food sovereignty’	Rural social movement actors e.g. La Via Campesina and climate justice movements

Agroecology is most commonly invoked and practiced within the latter two trends, which aspire to more fundamental reorganization of agri-food systems than the other two on the basis of sustainability and social justice. The ‘progressive’ trend remains largely focused on the local level and on developing practical alternatives. It encompasses the work of many NGOs and academic initiatives (Holt-Giménez & Altieri, 2013). The ‘radical’ trend more explicitly attributes social and environmental problems in agriculture to unequal distribution of power and resources. Therefore the proponents of this kind of agroecological thinking – mostly rural social movements in the Global South – call for solutions like structural reforms in markets and property regimes (Holt-Giménez & Shattuck, 2011). While of course a simplification, the typology is an important reminder that agroecology can be found within a wide range of initiatives and projects, with rather divergent ideas about what the problems are and how they should be tackled. This point must be brought along as we re-enter the arena of agricultural development in Uganda.

3.2 Emergence of an agroecological alternative in Uganda

In chapter 1, I acknowledged that Uganda is not the most ‘obvious’ case for investigating agroecology; there are other places where this alternative is much more visible. However, there are some very good reasons for why agroecology *should* be of interest in the Ugandan context.

One is the issue of soil degradation. Soil degradation is a multi-causal and unevenly distributed challenge which should not be framed too sweepingly, but it does constitute a widespread problem in Uganda and demands holistic and context-specific solutions (Andersson, 2014). For example, as seen in figure 10, the bulk of my fieldwork was conducted in a region that is often assessed to be particularly fertile. People would often tell me that “anywhere you drop a seed here, it will grow”. But the land is under intensive use, increasingly also the steep hillsides, and some of the worst erosion problems in the country are present in the region. Climate change is another threat to Ugandan agriculture, and its impacts are already observed in many areas (Okonya, Syndikus, & Kroschel, 2013; Osbahr, Dorward, Stern, & Cooper, 2011), which creates an urgent need for strategies that strengthen agroecosystems’ resilience.

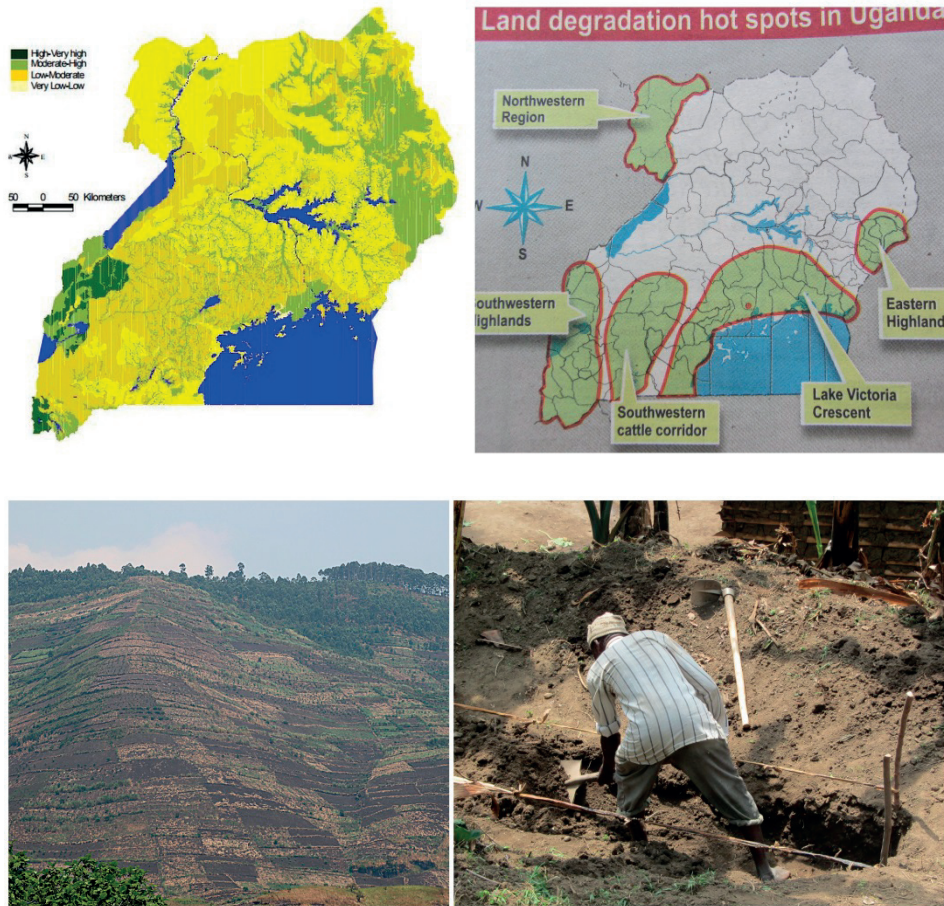


Figure 10 Top left: Rating of 'inherent productivity' of Ugandan soils from 1960. My primary fieldwork region, the Rwenzori region, roughly corresponds to the area in green in the west, implying that it generally has favorable conditions from a fertility perspective compared to much of the country. However, there is a lot of variation also within the region (as illustrated by figure 4). Image source: Harrop (1960). Top right: Ugandan newspaper New Vision reports on 'land degradation hot spots' in Uganda in February 2015, based on research by UNDP (2014). Much of the Rwenzori region is included in the south-western highlands 'hot spot' due to high levels of erosion and nutrient depletion. Combined, these maps reminds us that agro-ecological conditions vary along multiple gradients which all have to be taken into consideration to achieve sustainable use of land, and that soil fertility must be actively managed even where 'natural' conditions are good. Bottom left: Farmed hillsides, Kasese. Bottom right: Farmer digging a trench to control erosion, Kabarole. Heavy rains can move large quantities of soil and cause damage to fields, farms and transportation routes, as well as landslides. Many hillsides have been deforested for farming, and there is insufficient use of practices like trenches and contours. One barrier, according to a local NGO, is that these practices require organization and collaboration (e.g. between uphill and downhill farmers) which is lacking in many communities.

Socio-economically, there are a number of important factors to consider when judging between agricultural development strategies in the Ugandan context, all mentioned in chapter 2: a majority of Ugandan farmers are smallholders with limited capital, there is a persistent problem with food security (e.g. undernourishment), and soaring rural unemployment. As was also seen in chapter

2, conventional modernization – and even more so neoliberal modernization – has important shortcomings in all these regards that agroecology has the potential to address. The remainder of this chapter analyzes *how* and by *whom* agroecology is being pursued in Uganda today, and assesses the merits and limitations of their strategies in light of prevailing political-economic conditions.

Mapping agroecological initiatives

Mapping the presence of agroecological initiatives in Uganda is not as straightforward as it may sound; does one look for explicit use of the concept, or initiatives that reflect agroecological thinking in practice? While I began with the former, a snowball approach led me to include some actors that do not systematically employ agroecology as a discourse, but whose objectives, practices and relationships with other actors make them relevant in the context. To clarify, what I was looking to identify here was *institutional* initiatives, not all instances of agroecological approaches being practiced or promoted by individuals. Methodologically it was also impossible to be sure to identify highly localized initiatives, especially outside the main fieldwork region. Nonetheless, the list provided in table 6 provides a good basis for making an initial assessment of the (institutional) usage of agroecology in Uganda, and provides an entry-point for more in-depth analysis.

Five important insights can be derived from this mapping. First, explicit use of agroecology is quite limited. Even if most of the initiatives listed at some point have referred to agroecology in writing (e.g. in websites, strategic plans, signed statements), few of them do so systematically. Second, most agroecology initiatives are academic and NGO-based. This is of course partly an outcome of looking for ‘institutional’ initiatives, but that could also include farmer organizations. Among those listed, ESAFF and St Jude are the most directly farmer-based initiatives, although (as I get back to in chapter 4) this distinction is tricky. Third, some initiatives have formal or informal links with each other; the academic program at UMU in particular is informally linked to several other initiatives via its graduates. However, it is generally not a closely connected group of actors. In fact, interviews showed that they are not all aware of each other’s existence. Fourth, all initiatives have, to some extent, been facilitated (some even initiated) by foreign donors based in Europe and/or North America, mainly non-governmental. And finally, links with global agroecology/food sovereignty movements have only recently begun to form. However, several are part of African civil society networks.

Table 6 Overview of Ugandan organizations and initiatives that employ, endorse and/or promote agroecology in various ways (e.g. in development projects, educational programs, policy advocacy).

Initiative/organization	Type	Background and relevance
Agroecology M.Sc. at Uganda Martyrs University (UMU), central Uganda	Academic program	Agroecology program offered since in 2011, originally in partnership with a Swedish university and the Swedish International Development Agency.
Agroecology M.Sc. at Mountains of the Moon University (MMU) in Fort Portal, western Uganda	Academic program (planned)	Planned agroecology program; process began in 2016 in partnership with an Austrian university and Austrian donors. Two UMU graduates among the initiators.
St Jude's Rural Training Centre, central Uganda	NGO - Demonstration farm and training centre (local/regional)	Began as a family farm in the 1980s and grew into an NGO and training center for 'integrated organic' farming, registered in 1997. Have been working the past few years to establish an 'agro-ecology college'
SATNET (Sustainable Agriculture Trainers Network), western Uganda	NGO - Civil society network (local/regional)	Established in 2000; network of local NGOs and community-based organization across Rwenzori region. Focuses on organic and agroecological practices. One UMU graduate among staff.
Eastern & Southern Africa Small Scale Farmer's Forum (ESAFF) Uganda	NGO - Farmer-based organization (national/transnational)	Established in 2002 (Ugandan secretariat in 2010) as organization of small-scale farmer groups. First seen using agroecology explicitly after participating in 'Agroecology Learning Exchange' (see AFSA below). Applied to join La Via Campesina in 2017.
Participatory Ecological Land Use Management (PELUM) Uganda	NGO - Civil society network (national/transnational)	Has worked with "participatory ecological land use management" since 1995 as a part of the broader PELUM network (12 African countries). One UMU graduate among staff; a second enrolled as of 2016.
Food Rights Alliance (FRA)	NGO - Civil society coalition (national)	NGO coalition formed in 1999 to bring together CSOS working in with policy advocacy for sustainable agriculture and food security in Uganda. Sometimes employs 'food sovereignty' discourse.
National Organic Agriculture Movement of Uganda (NOGAMU)	NGO - Industry organization (national)	Established as industry organization for organic agriculture (producers, traders etc.) in 2001, engaged in advocacy, market and standards development, research and training. One UMU graduate among staff.
Alliance for Food Sovereignty in Africa (AFSA)	NGO - Civil society alliance (transnational)	Transnational alliance of civil society organizations advocating for small-scale farming "based on agroecological and indigenous approaches", with main office in Kampala. Launched in 2011.
Southern and Eastern Africa Trade Information and Negotiations Institute (SEATINI)	NGO - advocacy organization (national/transnational)	Founded in 1996; policy advocacy on trade issues including "agricultural and trade policies, strategies and practices that promote sustainable production". Has twice signed letters with other CSOs in support of agroecology (World Social Forum in 2007 and the Sustainable Development Goals in 2017).
Agroecology Learning Exchange	Event	Four-day workshop held at St Jude's in 2016 by AFSA together with multi-donor fund AgroEcology Fund (AEF) and Dutch NGO ILEIA. Participants included grantees, donors, and advisors of the AEF from , incl. representatives from PELUM and ESAFF.

The cracks of neoliberal development: Explaining the emergence of agroecology in Uganda

Despite the rather bleak picture painted in chapter 2, it is clear that there has been a growing presence of agroecological initiatives in Uganda during the past decade. While they are diverse, I argue that they can generally be understood as having emerged through the ‘cracks’ of neoliberal development. I make this point in paper II, using theory on socio-technical transitions which poses that cracks and contradictions *always* exist in socio-technical regimes, even if these regimes can seem very dominant (Fuenfschilling & Truffer, 2014). This idea, that the rules that govern technological change can never be fully stable or coherent, is drawn from institutional perspectives in sociological theory. Thus, it is not by chance that this evokes Wright’s (2010) emphasis on gaps and contradictions in the reproduction of social institutions, where he points to causes like complexity and path dependency. The resulting gaps provide “spaces for transformative strategies”, even if this is not necessarily what powerful actors intend. Wright (2010) argues this against those currents in social theory that treat existing power structures as so dominant (by way of force, hegemony, or both) that change becomes virtually impossible.

In this case, the cracks I refer to can be traced to the paradoxical and incoherent nature of neoliberal development. As I show in chapter 2, this model has internal shortcomings that provide powerful arguments for those arguing for change. Furthermore, the ‘hollowing out’ of the state has meant de-facto devolution of rural service delivery to non-state actors: mainly the donor-funded NGOs that proliferated in Uganda in the late 1980s and 1990s (Makara, 2003)³⁷. These types of actors do not per definition pursue progressive alternatives; in fact, as I discuss later in relation to ‘NGO-ization’ of Ugandan civil society, quite few of them do (Mitlin et al., 2007). My argument here is not that neoliberalism *as such* fosters progressive alternatives. But by largely abandoning rural areas (soon after an extremely tumultuous era, one might add), the state made room for an eclectic array of actors to address unmet needs in agricultural development. This has included agroecological initiatives, and before that, organic agriculture. Because of the strong presence of organic agriculture in Uganda, I will devote a short section to explaining why the emergence of agroecology nonetheless matters, even if it should not be treated as a competing alternative to organic agriculture.

³⁷ This proliferation of NGOs has several causes, where the neoliberal turn within Uganda is one, but the ‘civil society-turn’ in international development is also important. For simplicity’s sake I do not elaborate in this aspect here, but see section 4.2.

Beyond organic agriculture?

Uganda is one of Africa's largest producer of organic agricultural commodities, with around 190,000 certified producers in 2012 (Hauser & Lindtner, 2016). NOGAMU (the National Organic Agriculture Movement of Uganda) was established in 2001 as an umbrella organization engaged in certification, market development and advocacy, and there are various certification systems that link farmers to niche markets (mainly abroad). NOGAMU began lobbying for an Organic Agriculture Policy in 2004, and finally got approval from the parliament in 2016³⁸. In other words, organic agriculture has already become relatively institutionalized in Uganda.

Interestingly, the emergence of (non-certified) organic agriculture in Uganda shows a very strong resemblance to the emergence of agroecology (as described above). It arose in the post-conflict era as a practical way to address problems of food insecurity, economic instability and environmental degradation through methods that were low-cost and resource-conserving³⁹. It was promoted by "pioneers" – activists, farmers, entrepreneurs, researchers – and while there were opponents within the government and mainstream research, the institutional vacuum following liberalization and decentralization created space for these initiatives (Hauser & Lindtner, 2016). Had this been the end of the story, the relevance of agroecology would be questionable.

Today, one issue with organic agriculture is the prevalent perception that organic simply means the absence of inputs. This is reflected in the discourse of 'organic by default, not by design', as illustrated in the following interview quotes:

There's no money to buy fertilizer, there's no money to buy these chemicals, eh? So he just grows these things. I think the percentage use of agrochemicals in Uganda is very low... so we are doing organic farming but not by design (NARO researcher, 2015-02-18)

For us here we are organic producers by default, because we are not applying fertilizer, we are not using a lot of chemicals to control pests and diseases. So by default you are trying to do some form of organic farming although it's not actual organic farming (local CSO, 2017-02-08)

³⁸ At the time of the interview (March 2017) the policy was not yet implemented due to bureaucratic requirements that had yet to be fulfilled.

³⁹ The authors emphasized that what emerged at this time was *non-certified* 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 such it bears strong resemblance to how agroecology is commonly understood in Uganda today.

The phenomenon has also been described by Nalubwama, Mugisha, and Vaarst (2011). From this perspective, it is not hard to understand why many perceive organic agriculture as ‘backward’ and not conducive to development (as discussed in paper I). Organic agriculture in Uganda clearly has a discursive challenge to address. But it is not *only* discourse; it also reflects a deeper problem with organic agriculture, which must be understood in light of the growth of *certified* organic agriculture in Uganda since 1993 (Hauser & Lindtner, 2016). Like elsewhere in the world, this has meant standardization through third-party certification systems driven by growing market demand, mainly in the Global North. Evidence suggests that Ugandan farmers generally benefit economically from these schemes (Bolwig, Gibbon, & Jones, 2009; S. Jones & Gibbon, 2011) and there has been a steady proliferation of certified farmers – mostly smallholders, who often get certified as groups (Lockie, Lyons, Lawrence, & Halpin, 2006). The problem, agroecologists like Rosset and Altieri (1997) argue, is the tendency towards ‘input substitution’ resulting from this particular mode of standardization. It has been observed in many countries, despite organic agriculture having started out with quite radical ambitions (see for example Guthman (2004), McGee and Alvarez (2016), and Smith (2006)). In essence, the dynamic they describe is that market-oriented strategies give precedence to the narrow set of criteria that matter to urban consumers (e.g. avoiding pesticides) over more holistic agroecological considerations. This allows a ‘conventionalization’ that favors industrial actors and has questionable environmental merits.

That said, it is unfair (or at least premature) to dismiss organic agriculture in Uganda as mere input substitution, with no potential to contribute to agroecological development. The standards currently used by NOGAMU contain a wide set of rules and principles that go well beyond inputs (UgoCert, 2006). The question is whether conventionalization can be avoided in the long term. In an interview with NOGAMU conducted for paper III, I was told their strategy today is to emphasize health concerns (agrochemicals) in communication with farmers and consumers, and economic benefits (market opportunities, export revenues) in communication with farmers and policy makers. Environmental sustainability is not a powerful enough argument, and when it *is* invoked, emphasis is still on chemicals and fertilizers (see for example Nantume (2016)). These are exactly the narrow concerns that make way for conventionalization. Despite the many similarities, then, agroecology must constitute a different *kind* of alternative in order to live up to the transformative potential indicated in 3.1.

3.3 Ugandan agroecology as a strategy of sustainable modernization from below

In Uganda, initiatives for agroecology are above all encountered within NGOs and academic institutions (table 6). Experiences from other parts of the world suggest that this should result in a focus on the development of practical alternatives to conventional agricultural technologies, and on the local level (Holt-Giménez & Altieri, 2013; Wilson, 2010). In other words, they can be expected to mostly represent the progressive trend in Holt-Giménez and Shattuck's (2011) typology (table 5). The findings I present in papers I, II and III together largely confirm this. However, the actors I have studied are interpreting and employing agroecology in complex and sometimes surprising ways, which I propose are best captured by the notion of 'modernization from below'.

Modernization from below was coined by Bebbington (1993) in a study describing how indigenous federations, NGOs, and churches in Ecuador pursue 'alternative' agricultural development (including agroecology), but pragmatically incorporate practices and technologies typically associated with conventional modernization. The particular context where this idea was developed is of course culturally, politically and historically very different from Uganda, and the point is not to draw a direct parallel, but rather look to the general logic of the idea. What is central in this strategy is the ability of marginalized groups to use, control and benefit from technological change (though 'benefit' can include many aspects; incomes, cultural survival, environmental integrity etc.). This tends to result in an "apparently strange mix of means and ends" (Bebbington, 1993p. 275) that must be understood in light of the broader context in which development is pursued. Simply put, reality is often too complex for everything alternative/traditional/local to be *good*, and everything conventional/modern/non-local to be *bad*. There are three key tendencies in how agroecology is understood and employed Uganda that led me to this conceptualization:

- 1) They take a critical stance on, but rarely categorically reject, conventional modernization technologies.
- 2) They search for inclusive agricultural commercialization rather than favoring subsistence-oriented production.
- 3) They problematize the notion of traditional agriculture and its role in agroecology.

These tendencies are mainly implicit in practices and strategies, rather than explicit positions. I will explain each in greater detail below. There are some important limitations and tensions in employing agroecology in this manner, but I will wait with elaborating on these until the next sub-chapter. I should also restate

that the initiatives studied have no shared agenda in the formal sense, thus it should come as no surprise that they sometimes diverge in their views and practices.

Navigating technological change

If any generalization can be made about how agroecological initiatives in Uganda relate to technological change, it is that they consistently champion practices which involve efficient use and enhancement of local resources, rather than purchased inputs. Although environmental considerations always feature as part of the rationale, the *necessity* of low-capital methods for development to include poor farmers is pivotal. The following statement by a representative for a national-level NGO is a good example of the logic often seen around agroecology and organic practices:

The small scale farmers you are researching on are predominantly poor people who cannot manage to buy seeds, inputs... so subsequently the only model that can work, or concept, is organic agriculture. Show them for instance to make organic herbicides, organic fertilizers, and they will manage. But if you provide a system that requires them to buy inputs it will collapse (national CSO, 2017-02-22)

But this does not mean categorical rejection of conventional technologies, for example in regards to improved varieties and synthetic fertilizers. An example from paper II is the concern of SATNET member organizations about how extension services seem to encourage farmers across the board to shift from local to exotic cattle breeds. They were concerned not by the introduction of new breeds per se, but by the apparent lack of attention to diverse climatic conditions (see figure 11) and the cultural role of livestock in pastoralist communities⁴⁰. In other cases, participants also voiced concerns about farmers being given ‘modern’ livestock without having the resources (e.g. stables, veterinary drugs, knowledge) to care for them, or improved seeds without them first being tested with farmers under local conditions. Another example is the partial acceptance of synthetic fertilizers. Actors like SATNET and PELUM promote organic soil management in their work with farmers, but have simultaneously participated in lobbying for more affordable fertilizer. When I brought up the matter with SATNET staff, they did not see it as contradictory; organic agriculture “is not a religion”, one would joke. Fertilizer is no panacea and is problematic, but it can be a part of more holistic

⁴⁰ I would have to triangulate this with other data to say with more certainty that problematic promotion of exotic cattle is really occurring, but several workshop participants in the Bundibugyo workshop agreed about having observed this problem. Importantly, though, their concerns tell us something about their reasoning around the role improved breeds and varieties.

solutions and should thus be accessible to smallholders. Conventional technology is no monolith, and some technologies are more strongly opposed to – for example, chemical pesticides and herbicides that are associated with ‘killing soils’ and health risks (especially since poor farmers often lack protective gear). There is also resistance to GMOs, although outside the national level CSOs that have engaged in advocacy around the Biotechnology and Biosafety bill⁴¹, many find the issue difficult to form a clear opinion about and the issue rarely came up in the workshops or interviews with local CSOs or farmer groups.



Figure 11 Left: Cow of the African breed Ankole in Bundibugyo district. Right: Cattle of exotic breeds in peri-urban Fort Portal, Kabarole district. Both photographs are taken in the vicinity of the northern foothills of the Rwenzori mountains, showing the very diverse climatic conditions that can be found even within this region. There is concern amongst actors promoting agroecology that such heterogeneity (and associated cultural differences) is not adequately considered by mainstream actors in agricultural extension and research (e.g. NARO, NAADS).

Agroecology for inclusive commercialization

If the approach to technological change in agroecological initiatives is complex but generally quite critical, I found the approach to agricultural commercialization to be surprisingly uncritical⁴². Terms like ‘farmer-driven agri-business’ and ‘agriculture market development’ abound in mission statements and strategic objectives. In the SATNET case, many farmers mentioned learning ‘farming as a business’ (skills like record keeping, but also the ‘mindset’) as an important

⁴¹ The bill was introduced in 2013 and finally passed in October 2017, making way for large-scale field testing and commercialization of GMOs (Bendana, 2017). I return to this topic in 4.3, where I discuss CSOs’ advocacy around the bill.

⁴² I say ‘surprisingly’ due to the prevalence of market-critical views in scholarly literature and activism around agroecology; see Agarwal (2014). At the very least, there is usually emphasis on local and national markets over global/international; see Rosset and Martínez-Torres (2012).

outcome of participating in the network. While the network originally focused only on production methods, there has been a shift towards marketing issues, as improving productivity only goes so far in improving farmers' economic situation when problems related to market access and bargaining power remain. Efforts have focused on collective strategies like marketing associations, joint investments in processing equipment, and sharing of market information, along with a more long-term cooperative ambition. This market-oriented approach is mirrored in other agroecological initiatives. At the St Jude training farm in Masaka, farmers can learn commercially oriented enterprises like fish-farming. The farm itself, they emphasize, is commercially successful and has an adjacent farmer-owned fruit processing enterprise. NOGAMU, the National Organic Movement, sees growing consumer demand (mainly abroad but increasingly also in Kampala) as a major appeal of organic agriculture. In other words, agricultural commercialization can be said to be equally central in agroecological initiatives as in government discourse, and opportunities for smallholder farmers are sought wherever they can be found (whether locally, nationally, or internationally).

Although some see market dynamics (specialization, short-term planning) as a constraint for agroecology (see paper I), I encountered few initiatives that work to explore or develop new kinds of market relations that are more conducive to agroecological development. Much hope is placed in collective and cooperative strategies to improve smallholders' terms of market participation, which can lessen the constraints to agroecological approaches but do not actually *favor* them (I return to this in section 3.4). An exception in the case study is the attempt at Participatory Guarantee Systems, which build more on linking producers and consumers than conventional third-party certification systems do (see FAO, 2016). However, this had to be abandoned due to insufficient local demand⁴³. This example points to the tension that actors face in weighing farmers' immediate needs and aspirations (which requires opportunities to be sought in existing markets) against devoting resources to more long-term strategies for *transforming* markets and market development. It also suggests that commercialization remains a relatively unproblematic aspect of agricultural modernization compared to technological change.

What about traditional agriculture?

Finally, agroecology as 'modernization from below' is signaled by the *absence* of an intrinsic link between agroecology and 'traditional' farming, 'peasant'

⁴³ However, successful initiatives have been reported elsewhere, such as the outskirts of Kampala which has a growing market for organic produce (Nakalanda & Kugonza, 2016)

agriculture, and similar identity-based notions. For example, in a booklet about their work, SATNET explains their approach by saying:

Organic farming should not be confused with traditional farming. Traditional farming is often based on indigenous knowledge – and much of this knowledge can also be used in organic farming. Organic farming, however, is not the same as traditional farming. In organic farming, the farmer constantly aims to feed the soil and leave the land more fertile for the next generation. This is not always the case in traditional farming (Vaarst, Nalunga, Tibasiima, Dissing, & Dissing, 2012)

This positioning is unusually explicit, but not exceptional; the notion of the traditional appears very rarely in my fieldwork material, compared to its centrality in agroecology literature (Altieri et al., 2015). Some participants (both in papers I and II) spoke of ‘revalorizing’ traditional practices and knowledge that have been forgotten/discouraged, but there was only one instance where this was really central: the ‘learning exchange’ held in Uganda by AFSA and international organizations in 2016⁴⁴. It is important to acknowledge that there is a prevalent discourse in Uganda that frames ‘peasants’ and ‘traditional farming’ very negatively (see 2.2, and paper I for further examples) which agroecological initiatives are not immune to perpetuating. In the curriculum workshop, for example, one university teacher referred to traditional farming as backward, although several other participants opposed this characterization.

That said, the Ugandan case raises critical questions regarding the relevance of categories like traditional/peasant/local. The historical narrative in chapter 2 reveals many decades of outside interference in smallholders’ production systems. In the ‘peasant economy’ of colonial Uganda, smallholders were encouraged (or straight out forced) to grow new crops and apply ‘modern’ methods (Carswell, 2007; Martiniello, 2015). Later, economic collapse and rapid liberalization again fundamentally transformed the conditions faced by smallholder farmers. The idea that smallholder farming has been shaped only by local environmental conditions and customs is thereby a serious distortion of history. There is no doubt that there is an array of diverse farming practices and knowledge that can reasonably be called ‘traditional’ in Uganda, that these have an important role to play in agroecological development, and that they must be actively defended from undue dismissal. However, its particular role must be understood contextually and historically, without blanket assumptions about what ‘smallholder farmers’ do and want⁴⁵.

⁴⁴ AgroEcology Fund and Centre for Learning on Sustainable Agriculture (ILEIA). In the report from the event, the importance of traditional knowledge and practices is repeatedly emphasized.

⁴⁵ The reason I emphasize this point is that the notion of traditional farming is sometimes employed rather carelessly in agroecology literature. For example Altieri (2004), an authority in the field,

Towards principles of agroecological development

At this point, it would be useful to be able to offer a succinct definition of agroecological development that adequately captures the complexity described above. Without clear definitions there's a risk of ending up in a situation where 'anything goes' and also opens up agroecology for cooptation (Sanderson Bellamy & Ioris, 2017). This is perhaps especially true in the development arena, which is notorious for buzzwords (Cornwall, 2007). Ambiguity can also cause confusion and miscommunication, something I witnessed in the curriculum workshop, where discussions repeatedly got stuck on basic definitions. Referring to the debate on 'participation', a much-discussed development buzzword, Cohen and Uphoff (1980) famously argued for 'clarity through specificity'. But in the context of agroecology, it has also been pointed out that overly narrow definitions (e.g. at the level of practices and technologies) threaten agroecology's transformative potential (Giraldo & Rosset, 2017). Indeed, as shown in 3.1, agroecology is best understood at the level of principles. Based on my interviews with Ugandan agroecologists (paper I) and case study presented in paper II, I propose a set of principles in figure 12, which helps establishing common ground for agroecological initiatives in a development context.

Agreed-upon principles of this kind make it possible to ascertain what it means to implement agroecology across different contexts, without reverting to overly simplified definitions and fixed tool-sets. There are of course associated challenges, especially in regards to communication. This includes communication in the context of commercial production; agroecology cannot be certified, at least not with the kind of systems that have been created around organic agriculture. However, as shown in that discussion, this is a necessary tradeoff if agroecology is to play a more transformative role. But it does raise an important question: if application of agroecological principles is to be 'scaled up', how is this to happen? If the goal is to *transform* rather than to *conform*, what is it that ought to be transformed? This takes us to the structural constraints to agroecological development.

frames the majority of African farmers as practitioners of traditional agriculture simply because they are smallholders engaging in 'low-resource' farming. As argued by Bernstein (2014) capitalist globalization (here, not least in the form of imperialism) has transformed most farmers into petty commodity producers, making the 'peasant' category misleading. Since such transformation alters farmers' practices as well as knowledge systems, assumptions like Altieri's are highly questionable.

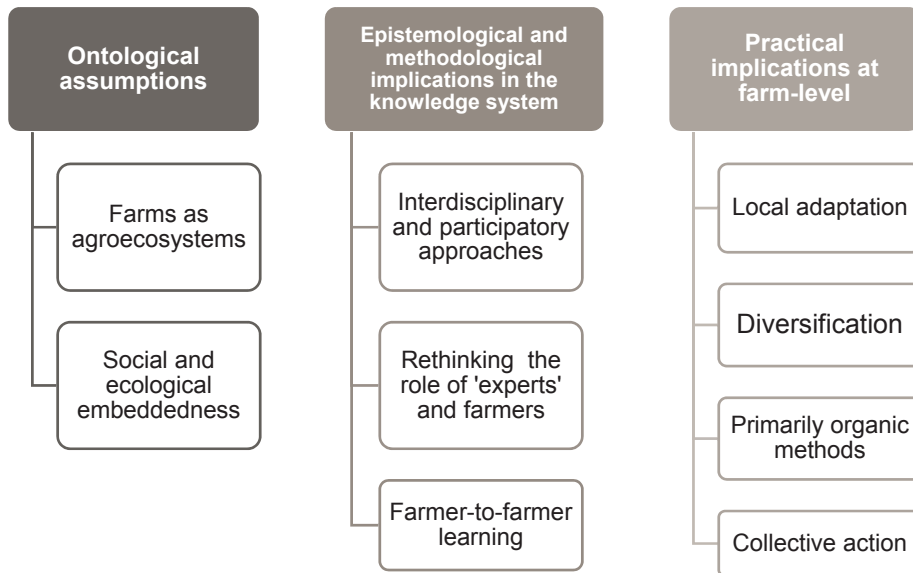


Figure 12 Agroecology is often conceptualized as principles for how to design and manage farms, rather than as specific practices, as shown in 3.1. Agroecology in the context of agricultural development can (and should, I argue) also be thought of as principles, starting at the level of ontology where farms are seen as agroecosystems embedded in wider social and ecological systems. This has epistemological and methodological implications for all actors – including researchers, extension agents, educators, development practitioners, and farmers. At farm-level, practical outcomes are contextual but there is consistent emphasis on local adaptation, diversification, primacy of organic methods, and collective action. Adapted from paper I.

3.4 Encountering structural constraints to agroecology

My empirical work in Uganda has focused on actors within agroecological initiatives, but I caution (in both papers I and II) that under present circumstances, their impact is likely to be ephemeral or at least very localized due to various constraints that are structural in nature. I use this term broadly, in line with Stinchcombe’s work on organizations where he treats social structure as “any variables which are stable characteristics of the society outside the organization” (Stinchcombe, 1965). Social structures constrain and enable activities and decision-making within the initiatives listed in table 6, while being beyond their individual control. I will present and discuss how these manifest in two areas: in farmers’ practices and decision-making, and in the formal agricultural knowledge system. Due to the types of constraint I identify, I end by returning to the arena of agricultural policy and politics. It is worth pointing out from the outset that there are both material and ideological dimensions to these constraints, as shown above all in paper I, but the role of ideology and discourse is not something I have

systematically studied. Below, I devote most attention to material relations. That said, it is clear that ideology and discourse can be powerful in producing and reproducing particular material relations⁴⁶.

The appeal of agroecology at a farmer level

Although I spent limited time on farms when conducting this research, the interactions I had with three farmer groups in different parts of the Rwenzori region in 2015 were extremely important for getting a small glimpse into the conditions under which smallholder farmers live and work. What it showed, most crucially, was the importance of acknowledging the many barriers (whether material or ideological) that can exist in any given local setting, rather than assuming that agroecology has automatic appeal to smallholder farmers. One observation that led to this was seeing how uneven the uptake was of various practices both between and within the groups. The starkest differences were seen when comparing most farms to the ‘demonstration farms’ that a few farmers had developed with support from different NGOs (see figure 13). This in itself is not surprising, and most participating farmers engaged in some practices they had learned about through trainings or from other farmers in the group.

Variation in what practices farmers adopt and to what extent they do so should of course be expected; different communities and individuals have their own particular challenges, constraints and characteristics. But even in regards to rather fundamental and widely applicable practices like mulching, contouring, and composting adoption was sometimes remarkably patchy. Based on a synthesis of findings presented in papers I and II, I see this as having two main roots; the issue of available productive assets, and the issue of market dynamics. Poverty can make it difficult for farmers to adopt even ‘low-capital’ practices like livestock integration and rainwater harvesting. Of course, low-capital approaches are still feasible to more farmers than capital-intensive approaches, but it is still important to recognize that poverty remains a challenge in agroecological development and that like any ‘pro-poor’ development model, it necessitates public investment and sometimes other kinds of interventions ‘from above’. Sometimes, this gets

⁴⁶ In the case of paper I, I mainly point to the role of ideas and discourses about what constitutes ‘modern’ and ‘backward’ agriculture, capacities of ‘peasants’, and about environment/sustainability concerns. As shown in chapter 2, though, there are many other ideological aspects of relevance which become visible when looking at other societal spheres, not least the free market ideology of the ruling elite (Kiiza, 2012)

obscured by the notion that agroecology is about farmers developing ‘local solutions’⁴⁷.



Figure 13 Components of the 3-acre farm of Mugisa Deo, Kabarole, also functioning as a training and demonstration farm for the Bamugisa farmer group. Top row: Hedge of nitrogen fixing *Calliandra* (nitrogen-fixating, provides protein-rich fodder and attracts bees); pineapples; cow stall enabling easy collection of manure. Middle row: Banana wine production for local markets; beans intercropped with matooke (cooking) banana; calf feeding on matooke peels; elephant grass bordering the matooke; nasturtium (a nutritious and pest repellent plant); stall-bred broilers (improved breed), mulched potatoes.

On top of this, there are also asset-related factors like land tenure insecurity and intermittent labor scarcity that can more specifically disfavor agroecology⁴⁸. Market dynamics meanwhile come into play in several ways; one is that lack of market access and/or low prices can make farmers less motivated to invest time, effort, and money into (laborious) practices like weeding, integrated pest management, and contouring. The other is that engaging in markets encourages

⁴⁷ This can get dangerously close to a ‘pulling oneself up by the bootstraps’ discourse. This was an observation from the agroecology curriculum process, where discussions focused on how to facilitate local innovation, experimentation, and co-operation but very little on broader political and economic aspects.

⁴⁸ For a more detailed description of how such constraints play out, see paper I.

specialization, as larger volumes mean better prices. It can also incentivize production of crops that fetch high prices, grow quickly, and are male-controlled – even if this necessitates use of pesticides and/or fertilizer.

The Rwenzori region case suggests that farmer collective action (such as joint marketing, labor pooling, etc.) can mitigate some constraints⁴⁹ but not remove them as such. Market dynamics in particular are likely to be an increasingly influential factor in farmers' decision. To borrow a term from Jansen (2014), the limits of local strategies point to the necessity of efforts to 'socialize' the wider economy.

Knowledge for agroecological development: Barriers in research and extension

All forms of agricultural development require investment in agricultural research and extension (Evenson, 2001), but agroecology is known to be particularly 'knowledge intensive' in the sense that translation of agroecological principles into practice requires place-based understanding of complex agroecosystem processes and interactions. This calls for interdisciplinary, participatory, and experimental forms of knowledge production and dissemination (Dalgaard et al., 2003; Francis et al., 2003). Furthermore, public investment in the knowledge system is crucial, as agroecology reduces reliance on commercial inputs and typically focuses on enhancing public benefits that are difficult to privatize and commodify (Miles, DeLonge, & Carlisle, 2017).

There are aspects about the organization, funding, and governance of major institutions in Uganda's agricultural knowledge system⁵⁰ that give rise to important constraints. Limited institutional capacity and incentives for participatory approaches in both research and extension have been documented previously, and my empirical findings suggest that such challenges remain⁵¹. As described in chapter 2, agricultural extension has gone through a number of radical transformations over the past few years, the last of which signals a worrisome tendency of politicization (and militarization). In practice, extension has reverted

⁴⁹ For more detail on how collective action mediates constraints at the farm level, see paper II. See also Andersson (2014) on the merits of farmers' collective action in tackling problems with soil fertility loss in Uganda, but also on the dangers of uncritically promoting this as a simple remedy.

⁵⁰ I focus here on research and extension; in paper I, I also present some findings on education. These largely mirror the findings on research, but offer interesting insights into how prevalent ideas about agricultural 'modernity' are in Ugandan society, and their perpetuation through education (including early-years education).

⁵¹ See paper I; also see Hall and Nahdy (1999) and Isubikalu (2007).

towards technology transfer (Danielsen et al., 2014) – a model that was allegedly abandoned decades ago, as it was found to be ineffective (Semana, 1999).

Within research, an important barrier is the way that research is divided along crop and/or disciplinary lines, creating challenges for interdisciplinary research on diverse farming systems. Although research ‘silos’ are not unique to Uganda, here it is partly due to the historical legacy of agricultural research stations being established around colonial cash crops (Hall & Nahdy, 1999). There has been diversification since then, especially in the 1990s (Beintema & Tizikara, 2002), but compartmentalization and commodity focus is still reflected in research programs (see for example NaCRRI, 2017) and some branches remain specialized on traditional cash crops, such as the tea research station established near Fort Portal in 1960 (figure 14).



Figure 14 A 69-hectare tea research station in Kabarole district, established at the end of the colonial era (1960) and now part of the National Agricultural Research Organization (NARO).

Furthermore, Bahiigwa argued in 2005 that:

agricultural research resources have yet to be refocused on the needs of poor farmers and [...] there is little capacity to generate technical advice that departs from traditional extension “messages” that focus on the use of purchased inputs (Bahiigwa et al., 2005, p. 491).

A researcher (and agroecology graduate) at the NARO tea research station in Fort Portal reflected on similar dynamics during a focus group discussion in 2014; that public research in the public system is not sufficiently oriented towards smallholder systems⁵², and assumes use of conventional inputs as the norm.

⁵² It should be remembered that in many ways, failure to focus on the needs and constraints of smallholders also undermines conventional agricultural modernization. For example, when it

Research funding is another serious concern. There is overall a low level of domestic public funding going into agricultural research, a level that is considerably overshadowed by external funding (see figure 15). Many participants have voiced concerns about foreign corporations' influence over research agendas via funding.

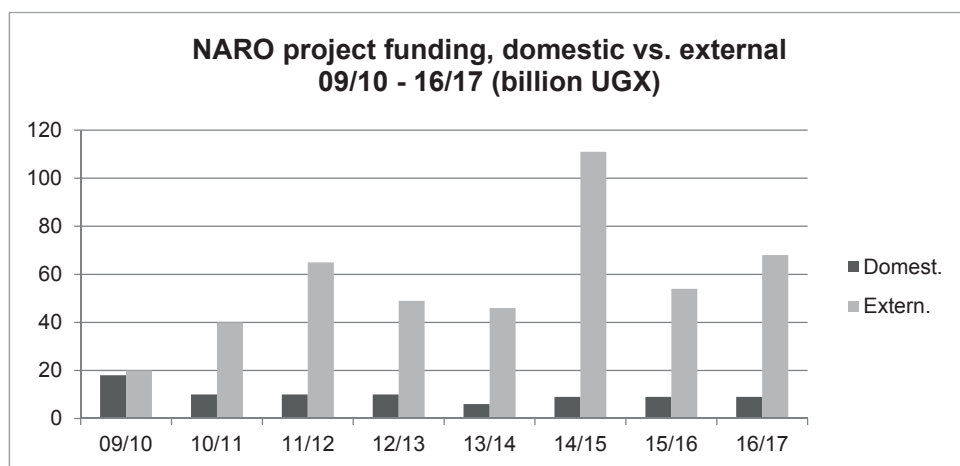


Figure 15 Project funding for the National Agricultural Research Organisation (NARO) between financial years 2009/10 – 2016/17 (excludes 'wage' and 'non-wage recurrent' costs). These figures show the prominent role of external funding in the research activities of NARO, at least during the past seven years. Figures for each fiscal year are based on 'Approved budgets' as specified in National Budget Framework papers of the subsequent year (GoU-MFPED, 2015a).

Although I have not been able to access reliable data on who provides 'external' funding, this is certainly a valid concern when it comes to research on GMOs, which has been conducted in Uganda since the early 2000s. Influence occurs not primarily through direct corporate presence (although this has occurred) but often via actors like USAID and third-party intermediaries, and not only by funding research but also through activities that aim to foster consensus around GMOs amongst researchers and policy makers (Schnurr, 2013; Schnurr & Gore, 2015). During the past few years, the funding model linking NARO to foreign actors has furthermore shifted from one where funding supports institutional 'capacity building' to one that funds specific projects, making the research driven by external supply rather than domestically identified demand (Schnurr & Gore, 2015).

comes to tea (one of Uganda's 'strategic commodities') smallholders are assessed to have the most potential for 'unlocking' growth in the sector (Munyambonera, Lakuma, & Guloba, 2014).

Back to (neoliberal) modernization from above

This brings us, finally, back to politics. The previous sections have pointed to many problems that necessitate action at a policy level – but how likely is such action to be taken? A critical insight from chapter 2 is that a key problem for those promoting agroecology in Uganda is not only one of *policies*, but of *politics* in a broader sense. During my first fieldwork period, I would ask agroecology graduates about their views on existing policies and to my surprise would often get responses along the lines of policies being ‘fine’:

The policies are there, they are very good, but it’s all about... because now we are in multi-party system, government wants everyone to say that we’ve done well so... most of the statistics would be more praise than the actuals. But me in the field, I see something different (agricultural consultant, 2014-04-07)

There are undoubtedly existing policies that are not conducive to agroecological development, but far more apparent to this participant (and several others) was the mismatch between policy and practice. In light of chapter 2, I now understand this as an outcome the neoliberal logic of ‘market-led’ development that underpins the government’s approach to agricultural modernization, at times disrupted by the interventions motivated by short-term political interests (essentially, the politics of staying in power). Both are problematic for agroecology. The former makes the government unlikely to make the substantial investment in public goods that agroecology necessitates (De Schutter, 2010; De Schutter & Vanloqueren, 2011), and instead opens up for the interests of foreign capital to steer agricultural development. It also prevents the government from taking the active role in developing and regulating markets that is also needed (FAO, 2016). Instead, even blatant problems like widespread fraud amongst traders and input suppliers gets met by officials with the attitude that “we have liberalized the economy – we cannot intervene in the market anymore” (Wiegratz, 2016, p. 135). The latter, meanwhile, has been most importantly manifested in the agricultural extension system, which in recent years has become largely reduced to a top-down system of input provision – the very *opposite* of the type of system that agroecological development calls for. Clearly, agroecological ‘modernization from below’ will remain elusive unless ‘modernization from above’ is confronted.

3.5 Implications: The necessity of political agroecology

As a model of agricultural development, agroecology has two major appeals: the potential to avoid the kind of escalating sustainability problems seen in

conventional modernization, and its conduciveness to improve incomes and food security in an inclusive (or ‘pro-poor’) model of agricultural development. In the Ugandan context, an argument of particular importance is that agroecological approaches are effective or even sometimes necessary to raise productivity of degraded soils, and that diverse agroecological farming improves resilience to climate change. Though generalization is difficult for a number of methodological reasons, one being that agroecology is not *one* specific farming system, there is evidence that agroecological approaches can generate productivity increases in tropical smallholder farming that are sufficient to consider agroecology a viable alternative to conventional agricultural modernization in Uganda.

Today, agroecological initiatives in Uganda are mainly located within donor-funded civil society organizations and academic institutions. Much like organic agriculture a decade earlier, agroecology emerged in the wake of neoliberal reforms as a practical strategy to increase productivity in resource-constrained smallholder farming, in an effort to work towards ‘modernization from below’ rather than an explicit questioning of modernization as such. I base this characterization on three tendencies: agroecology is seen as partly compatible with technologies associated with conventional modernization (e.g. modern breeding, synthetic fertilizer) but emphasizes adaptation to local socio-ecological conditions and favors organic methods; agricultural commercialization is largely embraced and is often sought through collective strategies; and ‘traditional’ farming does not feature as a key goal per se, something that must be understood historically. Guiding principles help actors determine how production systems should be designed and managed across different settings, and how knowledge should be produced and disseminated to contribute to agroecological development. While conceptualizing agroecology as principles – rather than standardized practices, as is occurring with organic agriculture – brings its own set of challenges, this is nonetheless how agroecology has potential to constitute a transformative development alternative.

Although agroecological initiatives have emerged through the ‘cracks’ of neoliberal development, there are strong reasons to doubt that agroecology can be achieved at a broad scale under present conditions, above all because they require the state to play a very different role than it does today. The many constraints to developing, disseminating and practicing agroecology will more likely confine it to localized (and probably ephemeral) phenomena. Confronting these constraints – or rather, the neoliberal logic and political interests that lay beneath them – calls for very different kinds of strategies than those described in this chapter, and leads us to the question of political mobilization in Ugandan civil society.

4 Mobilization for agroecological development in Ugandan civil society

In the early twenty-first century the movements of the rural poor have nonetheless, to the surprise of many, emerged as a laboratory that is richly productive of transformational and emancipatory ideas and experiments. As French farm activist José Bové once asked, what if the peasant world, supposedly so archaic and conservative, turned out to be the incarnation of true modernity?

-Edelman (2012, p. 442)

Any serious search for alternatives must sooner or later face the question of transformation. To paraphrase Wright (2010, p. 273), even if one accepts the vision of agroecology we have been exploring as both desirable and viable, how could this possibly be achievable? This requires theories, and strategies, of social change. Having identified constraints to agroecological development in Uganda that are structural in nature, this chapter focuses on agroecology as a political challenge that requires particular kinds of strategies in civil society. This is not to say that achieving agroecology is solely a political challenge or that civil society is the only sphere of interest – for example, many call for attention to the role of the state (De Schutter, 2010; Gonzalez de Molina, 2013; Sanderson Bellamy & Ioris, 2017), as do I in the previous chapter. However, having a *role* in change and being a *likely agent* of change are very different things. Considering the drivers of current modernization strategies in Uganda, change is unlikely to come from within the state. Liberalized market dynamics, meanwhile, are clearly not prone to spontaneously foster agroecology. Barring a sudden (and unlikely) paradigm shift in the strategies of major donors and financial institutions, the potential for an agroecological shift seems to lie in the hands of Ugandan civil society. The central research question in this final substance chapter therefore is:

- What are current trends and challenges in regards to political mobilization around agricultural development within Ugandan civil society, and how have these come about?
- How can existing civil society actors contribute to broader mobilization for agroecology in the future?

4.1 Civil society to the rescue? Theoretical considerations

The notion of civil society has a troubled history in the development context, as its use exploded in the 1980s almost to the point of becoming a “catchy advertising slogan” (Keane, 1998). Among many possible conceptualizations, civil society was often understood and treated as an inherently benevolent, progressive sphere of non-state actors reflecting a (western) liberal ideal (Mercer, 2002). Paradoxically, NGO-centered development in the neoliberal era tended to generate outcomes that had very little to do with this liberal ideal, instead causing a proliferation of organizations with weak grassroots linkages preoccupied with filling gaps in service delivery created or exacerbated by structural adjustment (Whaites, 2000). Recognizing these important overarching critiques (which abound and remain relevant; see Banks et al. (2015)), my analysis departs from a critical Gramscian perspective (see Bebbington & Hickey, 2006; Mitlin et al., 2007), which emphasizes the complex nature and blurry boundaries of civil society. From this perspective, civil society is a heterogeneous, contested sphere of competing interests, not wholly separable from the state (or market). But while being inherently problematic, civil society still holds important potential for progressive social change:

[Civil society] is where the state seeks to persuade people of the legitimacy of its economic and social project. At the same time, civil society provides scope for counter-hegemonic movements: site of resistance, challenge to social structures, and articulation of alternative forms of economic and social projects (Bukonya & Hickey, 2014, p. 314)

As there are no guarantees that civil society actors engage in the pursuit of transformative social change (such as socially just and environmentally sustainable agricultural development alternatives), one must look at ‘actually existing’ civil society and its contextual, historical formation (Mamdani, 1996) to understand if and how such a role can be played, and by whom.

It should also be made explicit that the notion of *social movements* looms on the horizon throughout this chapter. It is frequently argued that agroecology in its ‘real’ form can only come about through social movements. Characterizing agroecology as a “territory in dispute”, Giraldo and Rosset (2017, p. 4-5) distinguish between:

two radically different ways of conceiving agroecology: one that is technical and technocentric, scientificist and institutional, and the other, a ‘peoples’ agroecology’, that is deeply political and champions distributive justice and a profound rethinking of the food system.

The latter – overtly political, transformative agroecology – has mainly been pursued by social movements led by marginalized rural groups, sometimes in alliance with NGOs and academic institutions (Giraldo & Rosset, 2017; Holt-Giménez et al., 2010). There appears to be broad consensus in favor of this assessment in the field (Sanderson Bellamy & Ioris, 2017). In Holt-Giménez’s and Shattuck’s (2011) typology of responses to contemporary food crises (introduced in chapter 3), the authors also pointed to the importance of rural social movements in pushing for the kind of radical rethinking of agri-food systems that agroecology requires. Sevilla Guzmán and Martínez-Alier (2006) speak of the ‘new rural social movements’ that represent ‘agroecological antagonisms’ to neoliberal globalization and the agricultural modernization models it favors, arguing that these movements constitute a worldwide phenomenon. But it is often difficult to ascertain exactly what is meant by social movements (and thus what to look for empirically), in part because the arguments have surprisingly little grounding in social movement theory. The findings of chapter 3 suggest that agroecology in Uganda does, in many important regards, indeed represent an ‘antagonism’ to neoliberal modernization. But it does so *implicitly* more so than explicitly. Social movements can be defined in many ways, but crucially involve explicit claims-making (Diani, 1992; Tarrow, 2011). This claims-making furthermore should be collective (building on shared identities and interests), directed at power-holders, and involve contentious politics⁵³. This provides useful analytical signposts for understanding, because if social movements are to be possible, there must be sufficient conditions for such claims-making to emerge.

4.2 The changing landscape of Ugandan civil society

Just like history matters for contemporary dynamics of agricultural development, history shapes contemporary civil society dynamics. I will therefore revisit the historical overview provided in chapter 2, but now turn my attention to the implications for civil society development⁵⁴ with special attention to farmers and rural areas. This is followed by a brief account of contemporary state-civil society relations.

⁵³ Contentious politics is “what happens when collective actors join forces in confrontation with elites, authorities, and opponents around their claims or the claims of those they claim to represent” (Tarrow, 2011, p. 4). Importantly, collective action becomes contentious “when it is used by people who lack regular access to representative institutions, who act in the name of new or unaccepted claims, and who behave in ways that fundamentally challenge others or authorities” (p. 7).

⁵⁴ I obviously cannot do full justice to this subject; for more detailed analyses, see Oloka-Onyango and Barya (1997), Muhumuza (2010) and Mamdani (1995).

The formation of an NGO-ized civil society

After colonization, associational development in the Uganda Protectorate above all emerged around trade and commodity production, alongside religious and professional organizations. Due to limited space for political action by ‘Africans’, these organizations also functioned as political organizations. Land issues spurred political action by dispossessed peasants and marginalized clan-heads, including several uprisings (Oloka-Onyango & Barya, 1997). Furthermore, the colonial era saw the emergence of informal community associations engaging in anti-poverty activities like infrastructure improvements and credit schemes, and the implementation of social programs in marginalized rural areas by religious organizations (Muhumuza, 2010). Starting from the 1920s, peasants notably organized into a vibrant cooperative system as a response to economic exploitation by state-controlled monopoly buyers (Mamdani, 1984). Thus Oloka-Onyango and Barya (1997) point out that non-state associational activity in Uganda largely “stemmed from the rural and peri-urban sectors of society” rather than urban areas as often assumed in the western liberal tradition of civil society theory.

It is crucial to recall that the territory that became Uganda was not a unified one; in the 19th century, it contained at least 63 distinct languages and more than 200 political entities (Jørgensen, 1981). As noted in chapter 2, the colonial administration did not strive for unity but instead perpetuated or even deepened divisions – not least by ruling via local elites (Mamdani, 1976). These divisions fuelled Uganda’s post-colonial turmoil (Mamdani, 1984). Although prolonged crisis did foster new types of informal associations, like lending schemes, burial societies, and parent-teachers associations (Muhumuza, 2010), existing civil society was ‘largely decimated’:

Civil society activity outside the accepted arenas of state supervision and control was completely proscribed. Under the slogan ‘One party; one nation; one people’, alternative forms of political and civil expression were frowned upon and actively discouraged. This left behind activities of a mainly welfarist or developmental character, with organizations such as the YWCA, Save the Children Fund and the like dominating the scene. Activists who in any way presented a serious challenge to the status quo were crushed or incorporated into the framework of the ruling party (Oloka-Onyango & Barya, 1997, pp. 119-120)

The agricultural cooperative system had already begun to be controlled and co-opted already under the colonial administration, both to undermine resistance and ensure high quality production, but was further weakened during Uganda’s period of crisis (Flygare, 2006). Under Amin (1971-79), state repression became particularly violent, with systematic abductions, disappearances, and political murders.

Past decades' historical and structural legacy has, according to Dicklitch and Lwanga (2003), "created a culture of political apathy and fear amongst the general population". The NRM era has brought significant improvements in stability and reversal of "institutional terror and decay" (Hickey, 2005), but has nonetheless been a complex story in terms of civil society development. Oloka-Onyango and Barya (1997) argue that the NRM has "sometimes allowed the enhanced growth and evolution of civil society, and at others operated as a barrier to its free expression and development". Of crucial importance is that the NRM's ascendancy coincided with the era of Structural Adjustment Programs and the rise of civil society-centered development⁵⁵. Together with greater state tolerance, this spurred a rapid proliferation of civil society organizations (CSOs) in the form of donor-funded NGOs⁵⁶, primarily engaged in apolitical service delivery (Brock, McGee, & Ssewakiryanga, 2002). Donors' narrow lens on civil society tended to privilege certain organizational forms (urban-based, formal, professional) that they saw as having potential to mobilize support for economic and political liberalization, but overlooked other dimensions of African associational life (Tar, 2014). By the mid-1990s, some very problematic consequences of 'NGO-ization' were apparent:

On the positive side, the proliferation of hundreds of NGOs has liberated middle class entrepreneurial talent; but on the negative side, it has left NGOs wholly unaccountable to the people at home. An NGO is not like a cooperative. In a cooperative, members have the right to hold their leaders accountable. The intended beneficiaries of an NGO are not its members. They receive a charity, not a right. An NGO is accountable not to the people it intends to benefit, but to those who finance it, the overseas donors (Mamdani, 1995, p. 94).

Such issues of accountability and weak 'grassroots' links, along with over-professionalization, project-orientation and technocracy (which are all at least partly attributable to funding models) are widely recognized as factors that undermine civil society actors' role in social transformation (Banks et al., 2015).

⁵⁵ See paper III for an elaboration on the civil society-turn in development, and for further reading on the subject.

⁵⁶ The terms CSO/NGO are sometimes used interchangeably, although CSO is often considered a broader term. In this chapter, like in paper III, I refer to organizations that are not directly farmer-based as NGOs (or traditional NGOs for extra emphasis), whereas CSOs can include both.

Shrinking space to engage: State-civil society relations in today's Uganda

In the early 2000s, observers described Ugandan civil society with terms like 'weak', 'compliant' and 'gap-filling' (Brock et al., 2002; Hickey, 2005). However, it was also noted that role of CSOs had expanded from apolitical service-delivery, and that many had begun to engage in 'advocacy' to some extent (Brock et al., 2002). More and more CSOs have been observed to actively make efforts to shape public policy, including on politically sensitive issues. Some even openly criticize the government's development agenda (Devlin-Foltz, 2012; Freedom House, 2016). At the same time, the government is showing lower tolerance for diverging views, something that Reuss and Titeca (2017) argue must be understood in light of the fact that popular support for the NRM is declining after 30 years in power. Particularly since 2006, the year of the first multi-party election, there have been growing authoritarian tendencies in the state's relationship with civil society (Freedom House, 2017; Muhumuza, 2010). One important way that this has been happening is the narrowing of legal space for CSOs. The latest step to date is the 2016 Non-Governmental Organizations Act (NGO Act), which according to ICNL (2016) "poses a threat to the right to freedom of association" (see paper III for more detail on the implications). A notable formulation (under section 44) is that organizations shall "not engage in any act, which is prejudicial to the interests of Uganda and the dignity of the people of Uganda". As cautioned by Global Rights Alert (2017), this is a vague formulation that could be used to silence organizations working on politically sensitive issues.

Co-option is a subtler but equally important mechanism through which states can shape civil society, for example by actively including certain actors while excluding others (Dryzek, 2000). The NRM has long engaged in practices that suggest such tendencies, e.g. partnering with some CSOs in policy processes and implementation of programs while shutting out organizations engaged in activism (Brock et al., 2002; Muhumuza, 2010). There have also been more overtly co-optive strategies in the form of attempts to sponsor or initiate government-friendly CSOs, such as a state-supported credit and savings associations (Muhumuza, 2010).

Finally, it should be noted that civil society is not *only* shaped by the state – and when it is, it is not always done *deliberately*. B. Jones (2009), for example, points to how neoliberal development has made the Ugandan state fairly invisible as a source of social change in rural areas, beyond a few project villages and other "islands dotted about the place" (B. Jones, 2009, p. 9). This influences the relationship between citizens and the state in ways that are not necessarily intentional. As seen in chapter 3, it can also give rise to actors pursuing various alternative agendas. Historically generated divisions along class, cultural, and

ethnic lines furthermore has consequences for what kinds of agendas and alliances form. Uganda's rather radical decentralization policy, which the NRM began implementing in 1993, improved national level stability but exacerbated local level conflict, for example through proliferation of new districts (Green, 2008) interestingly. Several other factors like population growth, (im)migration, and historical injustices also continue to cause tensions that often involve control and use of land (KRC & RFPJ, 2012; Mwesigye & Matsumoto, 2016).

4.3 Politicizing agriculture? Current trends in CSO strategies

It is against this complex backdrop that trends and challenges in contemporary civil society must be analyzed. I focus here on formal CSOs, and among them mainly NGOs that are not primarily farmer-based. This may seem contradictory to the argument about NGO-ization, but I do this for the simple reason that they play an important role in 'actually existing' civil society. Thus, what they do matters. This is true not least for agroecology, where NGOs currently have a prominent role in the Ugandan context. I approach these organizations not as *ideal* agents of change, but in line with Banks et al. (2015) idea that they can serve as 'bridges to the future' – that is, they have *potential* to facilitate civil society development that is more likely to foster transformation than they themselves are.

In paper III I identify two trends in CSOs' efforts to 'politicize' their work, and the challenges of these processes. I summarize these below, staying brief on aspects that I cover in the paper and expanding on points that I did not have enough room to make there⁵⁷.

The rise and limits of CSO-led policy advocacy

I note above that Ugandan CSOs have become more politically active in recent years, and issues around land and environment are no exception. For example, there have been instances of civil society groups mobilizing against government-supported land-acquisitions on basis of social justice and/or environmental impacts

⁵⁷ Note that the sample of organizations I interviewed and observed for this part of the thesis included several of the agroecological initiatives listed in chapter 3, but also some agriculture-oriented organizations that do not have an agroecological profile. This was justifiable since I sought to understand trends in civil society which have implications for potential future mobilization for agroecology. See table 1 in paper III for a list of organizations.

(Human Rights Watch, 2012; Hönig, 2014)⁵⁸. But, as should be expected given the conditions outlined above, the process is far from straightforward.

The six national-level CSOs I interviewed for paper III all reported that they have devoted more resources to policy advocacy in recent years. In addition, a number of organizations and coalitions with explicit focus on advocacy and lobbying on agri-food related issues have formed during the last decade – such as Eastern & Southern Africa Small Scale Farmer's Forum (ESAFF), Food Rights Alliance (FRA) and Alliance for Food Sovereignty in Africa (AFSA). CSO representatives pointed to two drivers for this trend: a kind of natural evolution (after having experienced barriers to further progress in their practical work, which require policy change) and growing donor interest in advocacy. But as noted by Cornwall (2007), 'advocacy' by CSOs doesn't guarantee critical engagement with the state. The extent to which the advocacy turn represents a shift towards the kind of contentious claims-making necessary for achieving agroecology should not be overstated, neither in terms of *how* advocacy is done nor *what* is advocated for. There are some policy areas of crucial importance for agroecology, such as governance of agricultural research and lack of market regulation, which have received little attention. That said, considering the broader context it remains an important finding that, in general, CSOs increasingly approach agricultural change as a political question rather than merely a technical one.

One of the most crucial issues for agroecology (and for inclusive agricultural development at large) is public investment in agriculture. All the CSOs interviewed mentioned this as a priority issue. But while there has been some success in getting money allocated to specific areas such as irrigation infrastructure, higher allocations in relative terms remain an elusive goal. Despite this, there are no signs of CSOs attempting other strategies than participation in invited spaces, and interviews reflected a sense of resignation about this goal. For example, when asked about budget allocations in policy and practice, one participant reflected that they are:

Totally mismatched. But this is a political problem. Priority seems to be a little bit elsewhere, there is a lot of priority in security because if you overstay in power you tend to assume that everybody hates you, so you need a large budget to protect yourself in power (national CSO, 2017-02-22)

This assessment, while speculative, finds support in past decades' budgets (figure 16) and points to the problem that some of the real drivers behind resource

⁵⁸ However, upon analysis of the Save the Mabira Forest campaign where protected forest was to be cleared for a partly state-owned sugar plantation, Hönig (2014, p. 53) cautions that "ecological and social justice concerns are mixed up with identity politics and exclusionist agendas", signaling a trend of social fragmentation even if the campaign achieved its goals.

allocation are beyond the influence of CSOs, at least through the ‘non-confrontational’ strategy that has become largely normalized, as reflected in the following quote:

I think civil society actors are now beginning to realize that the confrontational approach won’t take you too far. And the fact that we’re here to bridge a gap, you can’t bridge when you are quarreling with your neighbor all the time (national CSO, 2017-02-20)

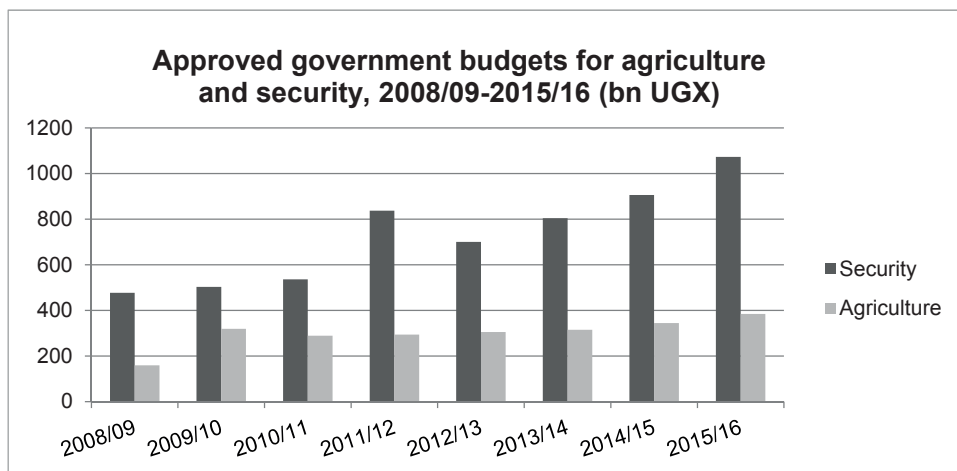


Figure 16 Agriculture sector budget allocations compared to security budget allocations, 2008/09 – 2015/16. As some research participants speculated, these figures imply that security spending has increased in priority in recent years, whereas agriculture spending has not. Diagnosing the problem in this manner can have an effect on how CSOs perceive their possibilities for affect change, and how. The graph is based on figures from Annual Budget Performance Reports for respective fiscal year (GoU-MFPED, 2015b).

There *have*, however, been instances where some CSOs have engaged in more contentious claims-making, particularly around two issues: farmers’ land rights in association with government-facilitated land-grabs and the long-debated and now passed Biotechnology and Biosafety bill. These also represent the clearest example of CSOs making claims on a combined basis of social justice and sustainability, and some have overtly questioned the government despite otherwise being committed to being ‘non-confrontational’. In both cases, organizations received letters threatening them with deregistration on account of hindering government programs. Although the interviewees who had been involved asserted that the experience had not discouraged them, they do take precautions against legal repercussions. When asked about their reaction to the letters, one stated:

Nothing, we did nothing, we just kept on. Of course it is very threatening, but we were many who received those letters because we were a coalition, so we could not be picked as the one spreading. They just got the members of that coalition and not individual letters, so somehow we have strength in numbers (national CSO, 2017-02-21)

In the case of the Biotechnology and Biosafety bill, the organizations in question believed that their activities influenced the parliamentary debate by raising new questions and delaying the process⁵⁹. However, over time they had adopted a more limited agenda. This was not because of intimidation, they argued, but for pragmatic reasons. It became increasingly clear that stopping commercialization of GMOs was not realistic, because it was ‘a government agenda’, so it made more sense to focus on making the regulation as strong as possible. Attention thus shifted towards labelling, transparency, and protection of the organic sector.

Overall, I argue that these views and experiences signal that CSOs in the agricultural arena certainly differ in their level of political orientation, but can no longer be said to be apolitical as a general rule. However, a number of factors limit their ability to affect substantial change. Most importantly, CSOs perceive they must be ‘non-confrontational’ in order to affect change, as this is how they get taken seriously and invited into policy processes. While my research participants argued that the state’s intimidation measures had not held them back, it is likely that some individuals and organizations think twice before speaking up about contentious issues. Three additional limitations that I elaborate on in paper III deserve brief mentioning:

- Donor dependency. Although donors want ‘partners’ to engage in advocacy, funding models remain largely project-based and many emphasized that advocacy cannot be conducted as a project with set deadlines and fixed criteria for evaluation. To some extent CSOs are responding by ‘sharing’ funding through coalitions, but it is nonetheless experienced as an important limitation.
- Unpredictable and non-transparent decision-making enabled by the significant concentration of power in the office of the president⁶⁰. A primary example is Operation Wealth Creation (OWC). OWC was

⁵⁹ This idea has support from Wedding and Nesseth Tuttle (2013), who assessed that the opposition (led by NOGAMU and PELUM) was gaining some parliamentary support, that they had come to have more of an impact on the debate than it first had seemed, and that the process had become more contentious than anticipated. Although the bill was passed in October 2017, in January 2018 the president declined to sign it, calling for clarifications on some issues including “patent rights of indigenous farmers and sanctions for scientists who mix GMOs with indigenous crops and animals” (Tajuba, 2018). These are issues that CSOs like PELUM and FRA have been raising.

⁶⁰ See Rubongoya (2007), especially chapter 5, for an analysis of the return of presidentialist politics in Uganda.

introduced in the style of a military program, without input from (or even awareness of) CSOs. It also occurred during a politically tense period, and CSOs were cautious about voicing critique until well after the 2016 election.

- Issues of legitimacy. CSOs that are donor-funded can be framed as representing the views of donors rather than farmers. This may sometimes be partially valid, but can also be a way to delegitimize critical voices⁶¹.

Organizations that are farmer-based, such as ESAFF and UNFFE (figure 17), are not necessarily exempt from these limitations. They too rely on donor funding, and may for various reasons be unlikely to engage in contentious claims-making⁶². This is an important point in the context of this chapter, because as noted in the beginning, it is sometimes assumed that farmers and farmer organizations are at the forefront of social movements for agroecology, rather than NGOs. This is an overly simplistic dichotomy, both because the distinction is not always clear-cut, and because not all farmer organizations are well-positioned in their social and political context to play such a role.



Figure 17 Material posted at the office walls of UNFFE and ESAFF in Kampala. UNFFE's wall contains information about pest control and weed management (for example, to the right an instruction for efficient and safe pesticide use) and commodity specifications. ESAFF's contains messages like 'no to GMO bananas', 'my land is my life' (reflecting their participation in advocacy around biotechnology and land rights), a news clipping about the Ugandan military supplying farmers with fake seeds, and a guide to local government budget processes. These very different walls reflect these organizations' divergent identities and political orientations, which in turn can be traced to their different histories (explained in paper III).

⁶¹ In the case of GMOs, such critiques are conveniently silent about the fact that the push for GMOs has not come from "from farmers or even public representatives but rather as a result of a large volume of investment and support from external interests" (Schnurr & Gore, 2015).

⁶² See paper III for a more detailed analysis of these two organizations. In particular, UNFFE's history and links with the government gives the organization a very particular character.

Broadening political engagement: Fostering farmer mobilization in a divided countryside

Even if the dichotomy of NGOs and farmer-based organization is too simplistic, there are good reasons for devoting special attention to the issue of farmer organization and mobilization. For spurring social transformation of the kind that agroecology necessitates, NGOs have many limitations in comparison to broader social movements (Mitlin et al., 2007), and this chapter has pointed to several examples in the Ugandan context. The second trend I observed in CSOs is therefore of great interest: ambitions to ‘build capacity’ for farmer-led advocacy. Also here, motivations include several factors such as the aforementioned problems with legitimacy, the decentralized government system (which makes local-level advocacy important), and the fact that greater numbers makes for more forceful claims-making. One local CSO representative explained:

I’ve been trying to read up on farmer movements in Latin America, where you find one farmer group comprising of so many farmers, and these farmers have power. You will find they have caused policy change and other things. [...] for me I believe we need to first of all empower the [farmer] groups themselves, to increase their numbers because I know in advocacy numbers also matter a lot (local CSO, 2017-02-08)

In addition, I noted that the discourse of ‘rights-based approaches’ (RBA) was strongly present in some organizations. RBA became something of a new development paradigm in the early 2000s (Uvin, 2007), and appears to be an additional factor contributing to this trend in CSOs’ work with farmers.

However, interviews and observations showed that there are many competing views within CSOs regarding how this goal of ‘advocacy capacity’ should be approached. Many pointed to specific gaps in terms of farmers’ knowledge and skills that CSOs can address through ‘advocacy training’, e.g. about different repertoires of engagement and how to identify ‘issues’. But many also pointed to deeper challenges – such as a culture of idolizing leaders rather than view them as elected officials with particular responsibilities, lack of confidence due to low status in society, NGO/aid-dependence (requesting support from NGOs rather than directing claims at leaders), and prevalence of local-level conflicts⁶³. For many farmers that I interviewed in the Rwenzori region groups, the prospect of

⁶³ I provide more detail on the issue of conflict and social tension in paper III. It is important to note that there are many different sources of local conflict throughout Uganda and that the situation in the Rwenzori region is not reflective of the whole country. Nonetheless, local-level conflict is a problem in many regions (see Green (2008) and Kandel (2016)). Land-related conflicts are particularly widespread and are more often ‘small-scale’ (e.g. within clans, communities, or even families) rather than the result of large-scale acquisitions by external actors (Kandel, 2015).

approaching local leaders with claims or concerns seemed like an unfamiliar and rather intimidating idea. Some referred to being ‘just farmers’, and explained that they fear being perceived by leaders as needy or demanding. What Dicklitch and Lwanga (2003) called a ‘legacy of political apathy and fear’ thus seem to linger. In workshops with local NGOs and community organizations (described in paper II), I also observed that many participants struggled to identify responsible authorities, and instead looked for interventions from NGOs, religious institutions, or from within communities themselves⁶⁴.

Some CSOs representatives believed that they should help farmers ‘learn by doing’ – that is, engage in projects that actively spur farmer groups to approach leaders with claims (however modest), and thus see for themselves that collective action can yield results. One participant pointed out that several farmer groups in the Rwenzori region had, after involvement in such a project, successfully lobbied local government actors for road improvements. On the other hand, this logic is called into question by the most notable case of farmer mobilization in the region to date, when farmers in Bundibugyo opposed the government’s plan to use the pesticide DDT to fight malaria. Despite having no such ‘training’ or experience from similar situations, organic cocoa farmers mobilized resistance in time to stop the planned DDT spraying. The case provides a number of important insights. First, lack of experiences and ‘skills’ is not necessarily a barrier – or at least, it can be overcome through support *during* engagements. CSOs like NOGAMU and SATNET played only a supporting role, which they argued also contributed to the campaign’s legitimacy. Second, the farmers in this case were relatively well organized in producer groups and cooperatives, pointing to the importance of institutional conditions for collective action. Third, as is well-known from social movement theory, it is *perceived* threats (and opportunities) that matter for mobilization (Tarrow, 2011). The proposed DDT spraying constituted an unusually obvious and acute threat to farmers’ livelihoods. This occurred in 2011; according to one of the campaign’s leaders, they have not organized for other objectives since. From this perspective, strategies such as ESAFF’s efforts to train farmers in ‘public expenditure tracking’ are interesting, since they can make subtler but more systematic forms of marginalization more visible to farmers.

The different strategies that CSOs employ reflect different underlying logics (see the typology in table 7), but had often been arrived at without much deliberation within or amongst organizations. The strategies are not necessarily contradictory, but call for different prioritization of resources, and may not always be suitable. For example, in a meeting between three local NGOs and their donors, a

⁶⁴ B. Jones (2009) observed a similar tendency in rural Teso, that is, that many perceive non-state actors (like the church and NGOs) as the primary drivers of social change compared to the comparatively invisible state.

discussion arose when one participant presented the idea of establishing a ‘platform’ to foster farmer-led advocacy, which others thought was premature. There is a risk that NGOs ‘projectify’ mobilization and movement-building, given their tendency to work in project-form and the need to report to donors (Banks et al., 2015). I observed this especially in one case, where an NGO aimed for a specific number of advocacy engagements within the boundaries of a project, and even to establish a farmers’ movement within a given time-frame. While such projects can certainly produce local outcomes, the long-term effects are questionable in light of the deeper challenges discussed above.

Table 7 CSOs employ a variety of approaches with the goal to contribute to emergence of farmer-led advocacy, which implicitly build on different logics about what is currently preventing it and how it emerges. I argue for greater reflection and dialogue within and between organizations (and donors) around these strategies and assumptions, in order to make strategies better informed by theory and practice elsewhere in the world. Adapted from paper III.

Approach	Examples	Underlying logic
Provide rights-based advocacy training	Informing about political/civil rights, providing advocacy trainings, arranging meetings between farmers and leaders, establishing advocacy platforms	Farmers lack specific knowledge/skills/arenas for claims-making; NGOs can actively seek to provide and improve these
Facilitate socially and economically oriented cooperation	Supporting formation of farmer learning groups, producer groups, savings and credit groups, marketing associations, cooperatives and unions	Institutions for identification of shared identity and interests are lacking; NGOs should support socially and economically oriented farmer cooperation and political mobilization will follow
Support farmer-initiated advocacy ‘from behind’	Providing farmer-led initiatives with evidence, helping farmers identify appropriate targets/allies and mobilize resource, generating publicity	NGOs should seek to support farmer-led initiatives with resourcesmaterial and non-material resources that farmers have difficulties accessing, but without taking active part in identifying or making claims

Finally, there are risks that must be considered by both CSOs and their donors, especially in areas like the Rwenzori region. Talk of farmer-led advocacy and ‘movements’⁶⁵ may raise suspicion from elites and start rumors that feed ongoing conflicts. During fieldwork in 2017, I observed how setting up even seemingly mundane meetings between famers and local leaders was done very cautiously due to a recent clash. One such meeting, held next to a pile of tin sheets that would be used to rebuild houses that had been destroyed, made for a particularly glaring reminder of the challenges faced in areas with a volatile history.

⁶⁵ The (English) term ‘movement’ is especially loaded in the Rwenzori region due to the history of a separatist movement (Ruwendzururu). It can also evoke *the* Movement (the NRM), as reflected in this anecdote: “I was telling someone that I was working here at National Organic Movement and they quickly asked me, does it have anything to do with the National Resistance Movement?” (Interview NOGAMU, 2017-02-20)

4.4 Implications: Making agroecology achievable by making agroecological social movements possible

I end this chapter with a somewhat longer implications section compared to the previous two chapters, since this is where I must bring the main body of the thesis to an end. The findings of this chapter will remain in focus, but I also revisit some arguments made in previous chapters where appropriate. Overall, I will end on a forward-looking note, and with a more *optimistic* tone than what has characterized the chapter so far. After all, as pointed out by Wright (2013, p. 21, underlining added):

Pessimism is intellectually easy, perhaps even intellectually lazy. It often reflects a simple extrapolation of past experience into the future. Our theories of the future, however, are far too weak to really make confident claims that we know what *cannot* happen. The appropriate orientation toward strategies of social transformation, therefore, is to do things now that put us in the best position to do more later, to work to create institutions and structures that increase, rather than decrease, the prospects of taking advantage of whatever historical opportunities emerge.

For moving towards a position where *more* can be done to achieve agroecology in Uganda, then, I discuss implications in three broad areas: 1) enabling and politicizing collective action, 2) engaging in strategic policy advocacy, and 3) countering hegemonic modernization. Most obviously these implications are aimed at domestic civil society organizations, but also at educators, researchers, and donors.

Enabling and politicizing collective action

Civil society organizations in Uganda are currently struggling with the question of how to best approach the objective of farmer-led mobilization. This is understandable; it *is* an extremely difficult question. As is likely the case in most contexts, there are complex, historically produced barriers that cannot be dissolved by individual organizations. Nonetheless, I argue based on the findings of this chapter that the following three tasks are key:

1. (Re)building institutions for farmers' economic cooperation. As described in chapter 2, historically Uganda had a well-developed agricultural cooperative system, which has since been largely destroyed (partly intentionally). Because of the promise of cooperatives to contribute to poverty reduction, the issue of 'cooperative revival' is already on the political agenda (Andersson, 2014). However, counter-sentiments will likely come from the political elite, since farmer

organization may not only strengthen smallholders' economic power in markets but also form a political threat (Flygare, 2006). Like Flygare, I have encountered perceptions (in my case, within CSOs) that the government is ambiguous about cooperative revival because it *wants* to keep poor farmers disorganized. Furthermore, the 'old' cooperative system developed problems with mismanagement, corruption, and nepotism before its collapse (Mrema, 2008) and left some farmers and policy makers alike with negative attitudes towards cooperatives (Flygare, 2006). Despite being on the political agenda, then, there are significant challenges both politically and at a community level. Cooperative development is also no panacea; it does not, for example, automatically erase inequalities and tensions along class, ethnic, gender, and political lines, it can be co-opted by the state or local elites, and it can remain focused on narrow economic issues rather than engage in wider social change (Bijman, 2016). There is nonetheless compelling evidence that economic associational activity is key for smallholder farmers to accumulate the economic and political power necessary for them to challenge structural inequalities (Agarwal, 2010; King, 2015). For the same purpose, it is worth looking beyond the idea of cooperation as a marketing strategy; collective use of land, labor and other assets can also be highly beneficial for smallholders (Agarwal, 2014) and also facilitates agroecology by, for example, enabling more integrated use of productive resources.

2. *Tackling root causes of local conflict, especially around land.* Conflicts between different communities and groups, such as those between Batooro and other groups in the Rwenzori region⁶⁶, form an obvious barrier to the kind of 'shared peasant identity' that characterizes many contemporary rural social movements (Edelman, 2012). These conflicts also hamper the work of CSOs in this (and other) regards, as the organizations are understandably concerned about inadvertently exacerbating conflicts. While my main fieldwork region has a particularly troubled history, similar challenges can be seen in some other regions⁶⁷. Land-related conflicts of varying severity and scale are particularly common throughout the country (Mwesigye & Matsumoto, 2016). This is of relevance well beyond the Ugandan context, since "socially corrosive and economically deleterious" land conflicts at the local level have been observed in several other African countries (Deininger & Castagnini, 2006). There is clearly no quick fix; root causes are multiple and complex, but policies do matter. Recent years' policy interventions in Uganda have eliminated traditional institutions that dealt with land conflicts without adequately replacing them with new ones

⁶⁶ See Syahuka-Muhindo (1995) for an in-depth analysis of the historical roots of conflicts in the Rwenzori region. Today's problems can be traced back to the oppressive 'double colonization' by the colonial administration and Batooro elites that some groups endured.

⁶⁷ See paper III for specific examples.

(Deininger & Castagnini, 2006). As noted in chapter 2, the government places much emphasis on formal titling but it's questionable whether this is the most salient approach to making land tenure more secure (Munk Ravnborg et al., 2013) and it does not address the many unresolved and politically thorny historical injustices around land. Finally, Oloka-Onyango and Barya (1997) make an important point about the role of religious and cultural institutions which is of relevance for conflict resolution. There is a tendency in western liberal conceptualizations of civil society to ignore such institutions, which leads to important oversights in the Ugandan context. Indeed, it is difficult to envision how the issue of local-level conflict in the Ugandan context could be effectively addressed without considering (and actively working with) institutions like churches and traditional kingdoms.

3. Shifting responsibility back towards the state. This final point has to do not with the possibilities for collective action as such, but the direction in which farmers turn once they identify shared interests that warrant attention from outside the community. In contexts where the state has neglected rural service delivery for a long time (farmers in the study had, for example, interacted significantly more with NGOs than with NAADS), it can hardly be assumed that farmers turn to state actors with grievances, even aside from the considerable challenge of knowing which state actors at what level to target. The discourse of 'rights-based approaches' (RBA) that has been picked up by some organizations has both potentials and pitfalls, but seems to have helped CSOs, at least on a basic level, to think about how to approach farmers as potentially political actors rather than as aid recipients. But as has been pointed out in regards to RBA, its value ultimately comes down to the extent to which it helps transforming power relations (Cornwall & Nyamu-Musembi, 2004). I would caution against placing too much faith in supply-driven 'sensitization' of farmers and local development practitioners about abstract civil and political rights, and rights-based advocacy in project forms. As shown in this chapter, there are many causal mechanisms behind low levels of organization and mobilization that are unlikely to be effectively tackled through such strategies alone. What *does* seem like a valuable contribution of CSOs in regards to direct impact is their ability to assist farmers in identifying relevant power-holders in *specific* situations (such as the DDT case mentioned previously) where farmers have begun to mobilize, but do not know who to target with their claims.

In chapter 3, I argued that the rather diverse range of actors representing agroecological initiatives are relatively disconnected from each other. The strategies discussed in this chapter are decidedly collective ones, which calls for closer dialogue between them. There is also a need for more systematic learning about social movement dynamics. As reflected in the above quote from a local CSO representative, seeking insights from movements in other parts of the world

is a good starting point. Furthermore, donors that wish to support CSOs in the three tasks discussed here need to seriously rethink the nature of project-based funding, because they all lend themselves poorly to short-term projects.

There are important implications here not only for CSOs and their donors but also for educational initiatives, which have played an important role for agroecology in Uganda. If they are to educate change agents, an ambition that project leaders and teachers expressed at the curriculum workshop at MMU in Fort Portal, students must learn to analyze the broader political-economic landscape within which agricultural development is pursued, and the role of collective strategies for changing it. My experience from interviews with graduates and observations from the curriculum workshop signal that this is a challenge today. Although I made attempts to introduce these perspectives as important parts of the curriculum, the conversation quickly turned back to the individual, interpersonal, or community level. As cautioned in chapter 3, there is a tendency in agroecological initiatives to veer towards the ‘local’, probably as a result of the centrality of locally developed and adapted solutions. These dimensions are vital, but must not come at the cost of depoliticizing agroecology.

Policy advocacy: Keeping agroecological pathways open and anticipating opportunities

If NGO-led advocacy ought to ultimately be replaced with broader farmer-led mobilization, does this mean that NGOs should simply abandon policy advocacy and focus all their efforts on fostering collective action? Is this what it means for NGOs to ‘take a back seat’ (Wilson, 2010)? This would be a reasonable argument if NGO-led advocacy was actively stifling the emergence of farmer-led advocacy. However, there is nothing in my findings that suggests that this is the case in Uganda today. I did point to the problem of farmers turning to NGOs for support rather than directing their claims at decision makers – something that Kandel (2015) has also observed in eastern Uganda – but this is a result of NGOs’ presence in rural areas as *service providers*, not because they engage in advocacy.

Meanwhile, decisions are being made that can result in path dependencies and lock-ins, as often pointed out by institutional theorists and transition scholars alike. Further, agricultural change is not only institutional and technological, but also biophysical. If changes in society can make certain futures more difficult to achieve, for example by concentrating power in the hands of a few corporate actors, changes in nature can make them downright *impossible*, for example through loss of genetic variety, severe soil degradation, and crossing of climatic tipping points. Thus, even if farmer-led advocacy is the long-term objective, there is still a strong case to be made for supporting actors in ‘actually existing’ civil

society with realistic capacity to influence decision-making. Perhaps they cannot *achieve* agroecology, but they can help keep agroecology *achievable*.

In the context of policy advocacy, it is also important to look beyond the present political landscape. Recently, space for non-state actors to engage in critical dialogue with the state has unfortunately been narrowing rather than opening up (Christensen & Weinstein, 2013; Human Rights Watch, 2012). But while the prospects for pushing through major changes in favor of agroecological development appear quite bleak today, this may not always be the case. For one, as we are reminded of by recent events in Zimbabwe, no regime lasts indefinitely. A majority of Uganda's young population has never experienced the pre-NRM turmoil and are increasingly dissatisfied with the economic conditions in the country, especially unemployment, and the president's status as 'liberator' is waning (Reuss & Titeca, 2017). In the 2016 election the government deployed a wide range of strategies to stay in power, and while it succeeded then, Golooba-Mutebi and Hickey (2016, p. 614) argues that political order rests on a:

personalised and multi-levelled set of bargains negotiated and held in place by the current regime. Any clarity regarding whether such a settlement can be sustained beyond the reign of the current leader seems unlikely to emerge until after the 2021 elections.

In other words, the future is highly uncertain, and not only in terms of who sits in the presidential chair. A change in political order will give rise to new challenges, but it is imaginable that developments that seem impossible today move into the realm of possibility. As argued by Wright (2010, p. 22) "there are so many uncertainties and contingencies about the future that we cannot possibly know what the limits of achievable future alternatives are". CSOs would therefore be wise in trying to anticipate changes in political opportunity structures (Meyer & Minkoff, 2004; Tarrow, 2011), and perhaps become a little more utopian in the agendas they formulate. If and when opportunities open up, the kind of critique elaborated in this thesis – with its focus on internal tensions and contradictions in prevailing modernization strategies – may prove useful⁶⁸.

Countering hegemonic modernization in discourse and practice

Throughout this chapter I have drawn some cautiously optimistic conclusions about current trends of politicization around agriculture in Ugandan civil society.

⁶⁸ This of course implies that researchers, including myself, should seek to make our research accessible to social movement actors. I will not expand on this subject here, but hope to do so in the years to come. For a discussion on the relationship between science and social movements in times of economic, social and environmental crises, see Faran and O'Byrne (2016).

But a question that remains is: can we be sure that improved conditions for farmer mobilization results in mobilization for *agroecology*?

Agroecology's role in contemporary rural social movements is not coincidental, but has emerged within a particular context of struggle. For example, Rosset and Martínez-Torres (2012) notes in the Latin American context:

Social movements such as LVC are taking agroecology very seriously. One reason [...] is that when land is acquired through struggle, it is often degraded land. When peasants have used industrial farming practices, the land has also incurred significant degradation.

This land degradation, caused by 'indiscriminate use' of GR technologies, combined with the high cost of agrochemicals has left peasants with agroecology as the only option, the authors continue. Sevilla Guzmán and Martínez-Alier (2006) also build mainly on evidence from Latin America when they frame agroecology as a worldwide antagonism to neoliberal globalization. But it would be a fallacy to assume that certain kinds of mechanisms will give rise to the same responses in all contexts⁶⁹. As shown in chapter 2, agroecology is not the *only* alternative to neoliberal modernization, and my fieldwork has consistently led me to suspect that mobilization for more inclusive, yet still conventional, agricultural modernization may well be more likely amongst many Ugandan farmers. Dominant perceptions of 'modern' agriculture that presume that these technologies are superior to other agricultural methods forms one key barrier to agroecology that was highlighted in paper I. This finding also applies to farmers. UNFFE's position on GMOs (paper III) is a reminder that farmers – for understandable reasons – may well demand access to modern technologies in the face of mounting pest problems and climate change, rather than demand agroecological alternatives.

In line with this, a crucial final task for proponents of agroecology is to demonstrate its appeal to Ugandan smallholder farmers, on their terms, and thereby make it a more likely focal point for potential rural social movements than it currently seems to be. This is both a practical and a discursive challenge. The practical process – of continuing to develop and improve agroecological approaches and familiarizing an increasing number of farmers with these approaches through, for example, farmer field schools, farmer training centers, demonstration farms, and education of 'change agents' – is in a sense the easy part, because this is what CSOs such as PELUM, SATNET, St Jude, and others have done for decades. Discursively, however, it is not yet certain if the visions of 'food sovereignty' and 'repeasantization' that agroecology is now embedded in are

⁶⁹ Critical realist thinking on causation helps making this point, as causal mechanisms interact with others found within the same context, making many phenomena 'emergent' and not reducible to discrete causes (See Sayer, 2000, chapter 1).

sufficient to capture the imagination and aspirations of Ugandan farmers, or if other framings are needed that have more mobilizing power in this context. This is a question that Ugandan actors must collectively take on in the years to come – ideally in dialogue with counterparts that face similar dilemmas in other African countries.

5 Concluding discussion

I begin this concluding chapter by briefly summarizing my key arguments from the three substance chapters. I then discuss how the thesis makes contributions in regards to its two aims, and point to fruitful directions for future research in each of them: in theorizing agroecology within a critically modern perspective on development, and in promoting the critical problem-solving agenda of sustainability science.

5.1 Summing up the arguments

Taking seriously growing calls for a paradigm shift in agriculture, this thesis sought to understand the potential of agroecology as an alternative to conventional agricultural modernization. Through an internal mode of critique, I pointed to limitations and contradictions of conventional modernization which are both ecological and socio-economic in kind, and which agroecology has a plausible potential to overcome. Not all viability questions surrounding agroecology are fully resolved here, but there is sufficient basis for arguing that much more serious commitment to agroecology within agricultural development and research is warranted. This is especially the case in contexts of degradation and in the face of climate change, where conventional modernization has particularly serious shortcomings. However, when it comes to achieving social change, identifying models that are theoretically better is not necessarily sufficient. It is also crucial to understand what mechanisms are really at play in shaping outcomes in specific contexts. In Uganda, agrarian politics are significantly shaped by the persistence of a neoliberal development logic, and the short-term political interests of an increasingly insecure regime. Together, these produce a *particularly* problematic form of agricultural modernization.

Agroecology has emerged through the ‘cracks’ of neoliberal development, and is today mainly pursued and promoted by donor-funded NGOs and academic programs which are relatively disconnected both from each other and from transnational social movements. For these actors, agroecology generally fits into broader strategies of modernization from below, which I argue based on how they

position themselves on technological change, commercialization, and the role of ‘traditional’ agriculture. For the concept to remain meaningful – and potentially transformative – agroecological development must be conceptualized at the level of principles, shared amongst those pursuing it. Ultimately, however, agroecology is unlikely to be realized on a broad scale without agents who develop more overtly political collective strategies for confronting the many structural constraints that currently exist.

For historical and political reasons, the types of rural social movements that many scholars believe are essential for transitions towards agroecology are largely absent in Uganda. In particular, I point to the problematic effects of ‘NGO-ization’ of civil society and persistence of complex local-level conflict, often involving land. There are also worrying developments in the state’s interaction with civil society, which discourage practices that may be perceived as ‘confrontational’ and ‘too political’. Even so, there are some encouraging trends of politicization in Ugandan civil society. Although NGOs are far from ideal agents of social transformation, I argue that they have several important roles to play in enabling and politicizing farmers’ collective action, engaging in strategic policy advocacy, and countering the hegemony of conventional modernization. Looking ahead, it is also crucial to consider the possibilities – indeed even likelihood – for political opportunity structures to change. This might enable more substantial shifts towards agroecological development pathways than appears realistic today.

5.2 Contributions and future research

Agroecology within critical modernity

This thesis makes an important contribution to the growing body of literature around agroecology by conducting a systematic inquiry into the rationale of, and possibilities for, achieving agroecology in a specific geographic and social context. Doing this at country-level, albeit with evidence from local cases/sites, enables an understanding of the mechanisms that hinder and facilitate agroecology at a broad scale – including the role of the state, which is a gap in the literature (Sanderson Bellamy & Ioris, 2017). The study’s Ugandan setting brings much-needed attention to a part of the world that has been greatly under-represented in the debate. Agroecology has global relevance, but the challenges faced in agriculture vary greatly around the world, as do the conditions for social change. Thus, I hope this work will inspire further research on agroecological transition in other contexts.

I explicitly position my contribution within a critically modern perspective on development, which insists on the emancipatory *potential* of development and the *possibility* to apply scientific reason to generate social arrangements with more just and more sustainable outcomes. This contribution is timely, as some scholars perceive agroecology to be ‘at a crossroads’ (Altieri et al., 2017) between actors who may, implicitly or explicitly, start from fundamentally different viewpoints. Giraldo and Rosset (2017) argue that agroecology is becoming a ‘territory in dispute’ between the social movements that pursue agroecology as a political project, and the corporations and institutions that try to reframe it as a mere techno-fix. NGOs, they add, are often found on the wrong side of this divide. Their response is a post-structural one which calls for rejection of the ‘toxic’ notion of development, where, to mention a few problematic aspects, poverty is dismissed as mere framing, productivity hardly gets a mention, and ‘institutionalization’ is shunned. While I share the authors’ concern that agroecology can get co-opted into uncritically modern projects, which only serve to deepen inequality and unsustainability, their response is not the only valid recourse. It is also not necessarily the one espoused by rural social movement, or farmers more generally. After analyzing the history and strategies of La Via Campesina, Desmarais (2002) for example emphasized that their agroecology and food sovereignty agenda “does not entail a complete rejection of modernity, technology and trade accompanied by a romanticized return to an archaic past steeped in rustic traditions”. Of course, others have pointed to tendencies among some scholars and activists doing exactly that (Bernstein, 2014). Agroecology may be a territory in dispute, then, but the territory is complex and the dispute has more than two (opposite) sides. I argue that critical modernity provides a fruitful entry point for engagement with agroecology, whether in the ‘developing’ world or in the industrialized North. There is no doubt that hegemonic discourses around modernization and development can erode the transformative potential of agroecology, and that these can be perpetuated even by well-meaning NGOs (Mitlin et al., 2007). But it must not be forgotten that the transformation desired by farmers may also include aspects like better material living conditions and greater choice of livelihoods. A critically modern perspective on development helps navigating this difficult territory.

The Ugandan case raises a number of more specific questions that call for further research. One is how to resolve tensions between commercialization and agroecological farming, not least in contexts where export-oriented commodity value chains (including organic) currently seem to be farmers’ best chance at improved incomes. Another crucial question for the achievability of agroecology in places *not* characterized by strong rural social movements is the relationship between smallholders’ economic cooperation and collective claims-making. The former appears to be an important foundation for the latter, but the relationship is

not a simple one, and the role of different actors is not clear. Finally, the spread of transnational civil society coalitions (e.g. La Via Campesina) into new territories with very different histories and social dynamics raises a range of important and interesting questions. Will this foster new trends in how agroecology is pursued, perhaps more radical ones? Will it strengthen cooperation and dialogue between agroecological initiatives, or will problems with exclusion and division observed in some places⁷⁰ emerge? And how can lessons be transferred – to the extent this is appropriate – between ‘old’ and ‘new’ movements?

Towards emancipatory sustainability science

My thesis is in sustainability science, a young and rather eclectic interdisciplinary field that has an explicit ambition to contribute to understanding and *solving* society’s sustainability problems. As explained in chapter 1, I join those within the field who insist that problem solving must be informed by critical social science, including analysis of how outcomes like environmental degradation and inequality are generated at a *social* level. There are many valid ways of doing so, but this thesis makes an important contribution by demonstrating how emancipatory social science can enrich sustainability science in this regard. Wright’s (2010) approach gives equal weight to critiquing existing institutions and practices, the exploration of alternatives, and questions of transformation – all call for systematic scientific inquiry, even if more attention may be required to certain questions at particular points in time. As such it is flexible and widely applicable, and dissolves the dichotomy of critical and problem-solving research. Something that is implicit in the approach, but deserves to be made explicit, is the importance of historical perspectives for understanding the conditions for social change within a given context, and how ‘new’ sustainability challenges interact with ‘old’ social problems (Jerneck et al., 2011).

My research provides several theoretical and methodological insights regarding how to operationalize this framework, especially within sustainability science. First, a practical consideration is that the different tasks may require different *kinds* of attention from researchers. In my case, critiquing agricultural modernization warranted little fieldwork; plenty of evidence already existed, and the challenge was rather how to combine different kinds of evidence into a clear, systematic critique that showed the limitations of conventional modernization even when viewed in a generous light. Second, the three tasks should not be thought of as a linear process where one has to be completed before the next one is tackled.

⁷⁰ Borras Jr. (2004, p. 17) notes that the principal LVC member in India “has had a strong tendency to exclude other movements in the region, and/or perhaps other organisations have been reluctant to join due to KRRS’s key position”.

Questions of transformation may warrant attention even if fully-fledged alternatives are not yet developed, because promising alternatives can get stuck in a dead-lock where no resources get devoted to trying to answer remaining questions of viability. For example, very little funding is typically devoted to agroecological approaches in agricultural research (Miles et al., 2017; Vanloqueren & Baret, 2009). In such cases, it is important to consider what kinds of strategies can make necessary experiments and investigations more likely to be carried out. Third, I make an important modification of Wright's approach in that I use a more internal mode of critique, based on social objectives expressed in society⁷¹ rather than criteria decided by the researcher at the outset. While both are scientifically valid and may well yield similar insights, the former has potential to offer a more convincing critique and is particularly appealing for sustainability science given the ambition to contribute to societal problem-solving.

Finally, in the context of sustainability science I must emphasize that the original framework *does not* provide guidance on how to deal with natural dimensions of sustainability. Wright (2013) has later proposed adding sustainability as one of the moral principles against which institutions and structures are to be assessed, as he sees sustainability as linked to intergenerational justice. Aside from the fact that an internal mode of critique does not presuppose such principles, it does not align well with an understanding of the biophysical world as something that enables, limits and interacts with society in very real ways⁷². I argue for sustainability to come in not as a normative principle that one justifies on moral grounds, but as an essential part of understanding viability of existing arrangements and alternatives alike. In practice, this means bringing in appropriate theories and perspectives from the natural sciences. In the case of agricultural modernization, agriculture's ecological dynamics are essential for understanding the limitations of this model, also from a social perspective. In other cases, researchers must seek insights elsewhere – such as in bio-geomorphology when seeking viable alternatives to manage coastal erosion (see Boda, 2018), or in thermodynamics when searching for sustainable energy solutions (see Harnesk, forthcoming)⁷³.

⁷¹ This does not mean uncritically accepting *all* objectives expressed by actors in society. It should go without saying that the role of a sustainability scientist is not to help a polluting company keep polluting. Again the *social* is a crucial distinction, and as always, researchers must make deliberate choices about what kinds of interests to serve.

⁷² Thus the problem with treating sustainability as a normative principle is not anthropocentrism, which Wright (2013) acknowledges and justifies. The approach I suggest is also highly anthropocentric, but treats sustainability as something that we *must* consider (for viability reasons), not 'only' that we *should*.

⁷³ Harnesk (forthcoming) is also using Wright's framework within sustainability science, and we will present a joint paper at the upcoming American Association of Geographers conference in New Orleans, April 2018, titled "Envisioning Real Sustainability: Enriching sustainability science with 'emancipatory social science'".

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