



THE PATH TOWARDS REGENERATION

Analysing strategies for transforming Uganda's agricultural system

Isabelle Roosen

Master's Thesis Environment and Society Studies
Nijmegen School of Management, Radboud University
November 2020





Colophon

Title: The path towards regeneration - Analysing strategies for transforming Uganda's agricultural system

Author: Isabelle Roosen

Student number: s1012219

Nijmegen, the Netherlands 05.November 2020

Master program: Environment and Society Studies

Specialisation: Local Environmental Change and Sustainable Cities

Faculty: School of Management

University: Radboud University, Nijmegen

Internal supervisor Prof. Dr. Ingrid Visseren- Hamakers

Second reader: Dr. Sietske Veenman

Internship: Aidenvironment

External supervisor: Dr. Maarten Onneweer

aidenvironment

*Like a Phoenix from the ashes of
My old wrong state of mind
A new song had risen.
A song sang with gaiety of heart,
Body and soul!
A song of freedom from bias and firmness of mind
A song I have carried with me
From times long forgotten!
A song the world should join in
To sing along.*

from GENDER AND FREEDOM by Ronnie Mubiru & Collin Wambete,
1st prize in ON THE WINGS OF LOVE competition (2016)

In deep gratitude!

This master thesis was written to complete the Master's degree Environment and Society Studies, at the Radboud University Nijmegen. In social science, it is said that everything always depends on the context. Therefore, I want to introduce you to the context of my thesis to acknowledge everything and everyone who was involved in the process.

My thesis was written in 2020, a time overshadowed by the global pandemic of COVID-19. It has tremendously influenced the way our society works, and has also impacted work on my own thesis. For about a month, I had the chance to work in the office of my internship organisation 'Aidenvironment' in Amsterdam. I enjoyed the time a lot and want to say thanks to my colleagues there who are doing an amazing job all around the world to create systems considering our planet's and people's wellbeing. Later on, I was forced, like so many others, to work from home and to avoid as much social contact as possible. This gave me much time to work in my gardens (my own and my parents') and create my own tiny regenerative agriculture systems there.

Many say and believe that the way we live, in disharmony with nature, has created the possibilities for pandemics like the one we are experiencing. I don't know how much of this is true, but I strongly see the importance of creating regenerative systems which are able to deal with viruses or pests in a resilient way. The same can be said about our social and economic systems. To look at regenerative systems in depth was therefore a possibility I am incredibly grateful for. I want to thank Maarten Onneweer in particular for being flexible in letting me choose this topic and being patient during the process.

Furthermore, I was really grateful for our modern technologies during this time and for the flexibility of everyone involved in my thesis to work online. In particular, my supervisor Ingrid helped me with constructive feedback, ideas and guidance. Further, I enjoyed each conversation and interview I had about my thesis, both formal and informal. It broadened my horizon and gave me an incredible insight into other perspectives, not only as a scientist but also as a person. I tried to bring it all together in this thesis, which is why I took quite some time figuring things out in my head. Many thanks to everyone who made me listen and listened to me during the process. You don't know how much it gave me!

Last but not least, I want to express my gratitude for my incredible friends and family! My maternal grandparents helped to develop my passion for gardening with their self-sufficient garden. My paternal grandparents with their stories on traveling the world seeded my genuine appreciation of different cultures. My parents enabled me to always follow my dreams. My sister and friends supported me to keep my balance and motivation during the rather challenging moments and extremely helped me during the writing process.

From my heart, I say thank you for all the help and every minute of attention. I feel very honoured to have received it and hope you enjoy the result; find some inspiration in it or an invitation to reflect on how you personally want to transform our beautiful world. It really needs it; we don't have much more time!

Isabelle Roosen

Executive summary

In Uganda, there is a wicked situation concerning agriculture. Smallholder farmers are experiencing the effects of climate change and other sustainability crises that worsen their already problematic situation. This leads them deeper into unsustainable practices like slash-and-burn or the application of chemical fertilizers. The transformation towards regenerative agriculture can be a solution, as this form of agriculture is proven to tackle several problems simultaneously (improving ecosystems' resilience, enhancing biodiversity and, water availability while improving the livelihoods of farmers). It is, therefore, a way to escape the vicious circle smallholders are currently trapped in. However, there are several barriers to advance regenerative agriculture in Uganda which were previously researched by Isgren (2016). These are constraints at the farmer's level, of the agricultural knowledge system, in the political economy of agricultural development, and lastly, the discursive and ideological dimensions. In the framework of the thesis, I identify those barriers with the barriers to transformative change as defined by the IPBES (2019) and the WBGU (2011).

Using the case study of Uganda, my thesis aims to understand the existing strategies to advance RA and their relationship with those barriers. It aims to answer the research question: *"Do existing strategies to advance regenerative agriculture in Uganda address its barriers and thus have transformative potential?"* To answer this question, data was collected through semi-structured interviews, a WhatsApp group observation, and online research. The results are portrayed from a critical and constructive perspective in a format that includes academic writing but also creative forms of knowledge display aimed at contributing to the transformation of science.

In the analysis, I elaborate on the seven existing strategies I found: education, research, pilot projects, collective action, policy advocacy, publicity, and breaking financial dependencies. Then, I discuss that the previously researched barriers are still there, and impact the strategies to various degrees. Especially the barrier on the agricultural knowledge system and political economy are heavily impacting the strategies as they are deeply intertwined. Following that, I analyse if the strategies are addressing the barriers in return and, thus, have transformative potential. The main finding is that the political economy barrier is the most difficult to address but strategies are there to circumvent it such as breaking financial dependencies and policy advocacy. However, those need to be increasingly applied. Also, the agricultural knowledge barrier was challenging to address. In contrast, the barrier on the farmers' level seems to be the easiest to address and strategies have transformative potential in its regard. The impact of the discursive ideological barrier was debated and addressing discursive dimensions was done rather indirectly.

Generally, strategies need to be combined, precise enough, and collectively applied, also on an international scale. My research shows the interconnection of transformative change and regenerative agriculture and portrays that the local approach of RA is beneficial in bringing the change of values and worldviews TC requires.

Keywords: regenerative agriculture, Uganda, agricultural sustainability, development, transformative change, just transitions

Table of contents

Executive summary	4
1. Introduction	6
1.1 Problem statement, research aim and research questions	8
1.2 Societal and Scientific relevance	9
1.3 Reading guide	10
2. Theoretical framework	11
2.1 Literature review	11
2.1.1 Regenerative agriculture	11
2.1.2 Transformative change	14
2.2 Conceptual framework	19
3. Methodology	22
3.1 Research paradigm	22
3.2 Research strategy	23
3.3 Research methods, data collection and data analysis	24
3.4 Research ethics	27
4. Analysis	29
4.1 Subquestion 1: <i>What kind of strategies exist to advance RA in Uganda?</i>	30
4.2 Subquestion 2: <i>Do previously researched barriers to RA in Uganda still exist and how do they impact the strategies?</i>	37
4.3 Subquestion 3: <i>Are the strategies addressing the barriers and therefore have transformative potential?</i>	47
5. Ending	57
5.1 Conclusion	57
5.2 Discussion	57
5.3 Reflections	59
References	61
Appendix	70

1. Introduction

East Africa, Uganda, region Kapchorwa, Mt. Elgon.¹

Let's imagine that we are in the mountainous region of smallholder coffee farmers; tall trees are growing in between intercropped banana and arabica coffee trees on fertile volcanic soils. A mix of indigenous and fruit trees like mango or jackfruit provide an upper canopy and much needed shade from the African heat. Underneath grow smaller fertilizer trees like leucaena or sesbania, which are legumes and have the ability to fix nitrogen to the ground. Below those are some beds with cover crops like sweet potatoes, comfrey and mucuna, an indigenous variety of beans, protecting the ground from drought and providing further nitrogen to the coffee trees. In the shadow of the trees are also some animals: chickens and sheep, grazing peacefully, whose manure is directly integrated into the ground as fertilizer. Bees are busy flying around, pollinating coffee and other crops.

Biodiversity is flourishing here² and so is the human community, harvesting not only coffee and bananas but also nuts, fruits and wood from the cover trees, vegetables, animal feed and medicinal herbs as well as animal products like milk, eggs and honey. The people of the community work closely together and learn from each other, especially the women and youth. They share the



Figure 1: Water retaining landscapes with slopes and swales, Chikukwa Project, Zimbabwe

utensils for making honey and processing the coffee beans on the homestead. Therefore, no middlemen are needed anymore and the organic coffee can be directly exported giving the benefits directly back to the farmers. New livelihoods are created.

The community also shares facilities like a biogas installation and a water catchment system. Through this, many resources can be saved. The biogas installation provides energy for cooking and no expensive charcoal has to be used. The coffee pulp can thus be brought onto the land as a mulching layer without the risk of spreading the coffee berry disease, as the heat of the biogas installation destroys the virus. The water catchment system consists of tanks and terraces which have been installed, and provide enough clean water so that even in the dry season, there is plenty to water the plants. As the water is caught upstream, floods downstream can be prevented; this contributes not only to the welfare of the land upstream but also prevents people downstream from losing their homes and livelihoods. The community and its environment is truly regenerative, following nature's cycle and patterns resulting in healthy people, plants and animals living in harmony with nature on a healthy and thriving planet.

¹ My thesis starts with a story and is structured differently, in part, than the usual scientific paper. This form of writing is explained in-depth in the methods section [3.3.4](#).

² All figure sources are listed in the references section.

The above is an idealistic vision of how regenerative agriculture (RA) could look in Uganda, the main focus of my research. My thesis brings together strategies for a transformative change (TC) towards this vision and could help address barriers. Generally, there is much change happening in the whole East African region. It is characterised by a rapidly-expanding human-population, increasing urbanisation, changing socio-economic circumstances, and increasing expectations as the economic situation of the countries has continuously improved (UNECA, 2020). Still, the region experiences high poverty, inequality and unemployment (African Development Bank, 2019). Agriculture plays a crucial role in producing the gross domestic product (GDP), the 'mainstream' measure of a country's economic success, with ~27% coming from agriculture for Uganda³ (Actualitix, Data from the World Bank, 2014). It is the second main driver for growth from the supply side (African Development Bank, 2019). Most of this is due to peasants: farmers who only work on a smallholding share of land mixing subsistence farming with a few cash crops (quasi-subsistence). However, subsistence farming is hard and full of difficulties as farmers often do not have savings, access to finances, and lack opportunities. Therefore, many young people migrate from their rural homes towards the cities (Barrat et al., 2012; Serdeczny et al., 2017). The climate crisis plays a role for smallholders too. It is already impacting East Africa and will worsen their situation in the near future; the region is sometimes even referred to as the '*food crisis epicentre of the world*' (Kahsay & Hansen, 2016; Thornton et al. 2009; Scholes & Biggs, 2004).

The total situation in Uganda is complicated, a truly wicked problem. On the one hand, the smallholders' livelihoods need to be improved in tackling poverty, food insecurity, inequality etc. The conventional way of doing this is to increase productivity through introducing modern industrial agriculture techniques such as (large scale) monocultures, agrochemicals, and genetic modified crops (GMOs) (Isgren, 2016). On the other hand, humanity is increasingly realising that these practices are not the hoped-for solutions to these problems. Instead, they further harm the planet and its inhabitants through pollution, biodiversity loss, or the depletion of soil and water (Fowler & Rauschendorfer, 2019; Elver, 2020).

Agriculture, however, also both directly and indirectly impacts poverty, development⁴ and environmental resilience bringing together the social and environmental worlds. Thus, it plays a central role in addressing sustainability challenges. Certain approaches can strengthen ecosystems thus reducing the impact of climate extremes or biodiversity loss while simultaneously improving livelihoods and providing employment opportunities (FAO, 2018a).

RA is proposed as being one of those approaches, described as an integrative way to tackle issues of nature, human and animal welfare thus addressing several of the United Nations Sustainable Development Goals (SDGs) simultaneously (Rhodes, 2017; La Canne & Lundgre, 2018; FAO, 2018). The former UN Special Rapporteur on the Right to Food De Schutter (2010) reported on the key role of RA in achieving this basic human right in sub-

³ I focus on Uganda as an embedded case study; however, I initially looked at the broader region of East Africa. As the region and country are both facing similar challenges I partly discuss both dimensions while trying not to generalise the East African context.

⁴ Sarr (2016) discusses the term 'development' as unsuitable for the African context (p.21) as it is a Western perspective. However, as there is currently no proper alternative available I am using it in my thesis with much consideration.

Saharan Africa. 'Aidenvironment'⁵, the organisation hosting my thesis internship, is working to advance RA in East Africa. However, there are four internally interacting barriers to advancing regenerative practices in Uganda as Isgren (2016) researched. My thesis, therefore, examines the existing strategies for RA in Uganda and analyses whether they address those barriers from a TC perspective. For this, it looks at the proposed transformative potential of RA strategies through identifying the drivers of TC with the barriers found by Isgren (2016).

1.1 Problem statement, research aim and research questions

1.1.1 Problem statement

Farmers in Uganda are impacted by the tragedies mentioned above and, hence, trapped in a truly vicious cycle. It is crucial to break this cycle, and find innovative ways to tackle agriculture problems while, at the same time, allowing smallholder farmers to improve their situation in the long term. RA is proposed to do exactly this but advancing it has been difficult. Isgren (2016) researched the situation and found the following four types of interacting barriers to advancing agroecology, a synonym used for RA (Codur & Watson, 2018) for Uganda:

- (1) constraints at farmer level,
- (2) an agricultural knowledge system favouring conventional approaches,
- (3) adverse and intertwined political and economic interest, and
- (4) cross-cutting ideological and discursive pressures.

Due to these constraints, which are discussed in depth later on (see [4.2](#)), RA cannot live up to its complete (transformative) potential. This is the problem my research seeks to address, investigating the strategies to advance RA in Uganda employed by East Africans and international actors.

1.1.2 Research aim

RA appears to be a promising approach but needs to be better understood in context. The aim of my thesis is, therefore, to analyse critically and constructively whether existing strategies to advance RA in Uganda are impacted by the upper mentioned barriers. As I identify those barriers with the drivers of TC, I aim to understand whether they address them and, therefore, have transformative potential.

⁵ My thesis was written as part of an internship at the not-for-profit research, advisory and implementing consultancy 'Aidenvironment'. The project this thesis contributed to was the Green Future Farming project.

1.1.3 Research questions

**DO EXISTING STRATEGIES TO ADVANCE
REGENERATIVE AGRICULTURE IN UGANDA
ADDRESS ITS BARRIERS AND THUS HAVE
TRANSFORMATIVE POTENTIAL?**

- 1** WHAT KIND OF STRATEGIES EXIST TO ADVANCE RA IN UGANDA?
- 2** DO PREVIOUSLY RESEARCHED BARRIERS TO RA IN UGANDA STILL EXIST AND HOW DO THEY IMPACT THE STRATEGIES?
- 3** ARE THE STRATEGIES ADDRESSING THE BARRIERS AND THEREFORE HAVE TRANSFORMATIVE POTENTIAL?

1.2 Societal and Scientific relevance

1.2.1 Societal relevance

RA portrays itself as a win-win solution for feeding all people while simultaneously breaking the pressure currently put on the environment (Toensmeier, 2016). This system of multiple wins explores the individual, collective and planetary advantages created through systemic solutions (Wahl, 2016). These are interrelated and as they are used in 'regenerative' literature, I use them in this thesis to explain the societal relevance on various scales.

On a planetary level, looking at the strategies for advancing RA in Uganda might help to improve them. It can, therefore, help bring the various benefits of RA and reduce the above mentioned sustainability challenges and pressures placed on the environment. How exactly RA is doing this is discussed later on in the literature review ([2.1.1](#)).

On a collective level, my research benefits the work of actors in the field of RA in Uganda (like my internship organisation 'Aidenvironment') as it helps understanding the strategies for advancing it. Especially the current COVID-19 pandemic has revealed that alternative food systems like RA are urgently needed to bring more resilience to a place like Uganda (Jumba et al. 2020). Jumba et al. (2020), therefore, strongly argue for upscaling it. My thesis can hopefully contribute here and support improving livelihoods of the Ugandan population in the long term.

On an individual level, for a smallholder farmer, analysing the strategies to advance RA can help to make it more accessible for him/her. The benefits for them could consist of a higher income, better health or more resilience. These benefits, however, vary from case to case and it is hard to predict them generally. This is especially the case as some smallholders already use partly traditional regenerative approaches. For me, as an individual involved in this thesis, I gain an in-depth knowledge of RA while conducting research in a complex and much debated field. Further, I get the chance to understand sustainability challenges in another context in which the cultural and economic background is different from my personal upbringing.

1.2.2 Scientific relevance

As for the scientific relevance, my thesis will contribute to filling several gaps in academia. O'Brien (2012) discusses the need for a critical, integrated body of research on transformation. My thesis adds to it. Regarding RA and its transformative potential in Uganda, a clear overview on the various existing strategies is needed. There is an understanding of the barriers but thus far, the strategies to overcome these have not been analysed in-depth, especially in the context of TC. Isgren (2016) found that research is often focused on farm-level and barriers are not addressed on a broader scale. That is why I not only look at local strategies but also aim to understand the situation on a broader scale including political and international perspectives. The framework used here brings a perspective of TC to the topic of RA, which, to the best of my knowledge, has previously not been done in academia. My research, therefore, contributes to understanding the relationship between TC and RA. In addition to the topic itself, my research further tries to create 'transformative knowledge' through trying new forms of representing the findings (see [3.3.4](#)).

1.3 Reading guide

The general structure of my thesis follows the usual layout of a master's thesis. However, adaptations have been made such as adding storytelling elements to improve accessibility, readability and clarification of context (see [3.3.4](#)). Chapter [2](#) gives a deeper understanding of the context, explaining the key concepts of RA and TC, and then operationalises them and builds the framework. Chapter [3](#) presents the methodology and chapter [4](#) portrays the results following the sub-questions. The last chapter [5](#) includes the conclusion, discussions, recommendations and final reflections.

2. Theoretical framework

To place the thesis into context, the literature review first demonstrates a deeper understanding of RA especially in the specific context of Uganda. Next, TC literature is discussed. The second part introduces the framework and explains how this thesis operationalises the terms.

2.1 Literature review

2.1.1 Regenerative agriculture

The need for it

As discussed in the introduction, conventional agriculture techniques harm the planet and its inhabitants through mechanization and agrochemicals which densify the soil and kill all life except the wanted crops (Fowler & Rauschendorfer, 2019; Elver, 2020). Soil depletion, poisoned groundwater, health issues like food-borne illnesses, climate change, animal abuse, loss of species, habitats and natural beauty are among its many unpaid consequences (Kimbrell, 2002; Woodhouse, 2010). Therefore, a new integrated agricultural system is needed to address the above-mentioned tragedies as well as others such as poverty, malnutrition, hunger, environmental degradation and animal welfare. RA is seen as an approach offering exactly this (Rhodes, 2017; De Schutter, 2010) without leaving anyone behind. .



Figure 2: A conventional field of sisal in south eastern Kenya

Definition of regenerative agriculture

Worldwide, the term ‘regenerative’ is becoming increasingly popular while claiming to be a systemic and holistic approach to the world’s problems - the next wave of sustainability (Gibbons, 2020; Wahl, 2016; Hutchins & Storm, 2019; Hardman, 2010). The term ‘regenerative agriculture’ also seems to be part of this trend.

However, RA has various definitions; there is even a website offering the space to discuss it (Regenerative Agriculture Definition, 2020). Rhodes defines regeneration as ‘*the capacity to bring into existence again*’ (Rhodes, 2017, p. 104) which gives us an idea about the ideology of RA. It is seen as a ‘*holistic land management practice that leverages the power of photosynthesis in plants to close the carbon cycle and build soil, health, crop resilience and nutrient density*’ (Regeneration International, 2020). In contrast to sustainable or organic agriculture which has a neutral impact on the land, the RA approach is an active tool for mitigation and adaptation simultaneously. It restores ecosystems through rebuilding the soil and enhances its water storage capabilities (Anderson, 2019; White, 2020). Elevitch, Mazaroli and Ragone (2018) identify RA’s five core environmental concerns: soil fertility and health, water quality, biodiversity, ecosystem health and carbon sequestration.⁶ This is

⁶ According to Joyce Farms (2020), RA outcomes include besides those five, also animal welfare.

addressed through the following principles identified by LaCanne and Lundgre (2018) to unify regenerative farming systems:

- (1) abandoning tillage (or actively rebuilding soil communities following a tillage event),
- (2) eliminating spatio-temporal events of bare soil,
- (3) fostering plant diversity on the farm (through intercropping of often indigenous plants), and
- (4) integrating livestock and cropping operations on the land.

Figure 3 below tries to bring all RA aspects together, summarising them into four principles and twelve practices. In RA, the environment is understood as a living system and practices are often combined into an agricultural system which can naturally resist plagues and pests (Rhodes, 2012; LaCanne & Lundgre, 2018). For this, it considers the locality of a place and acknowledges various (traditional) farming practices (LaCanne & Lundgre, 2018). This makes it difficult to find specific overarching solutions, and, therefore, constant learning and adaptation is required (Rhodes, 2012). The initial implementation stage might particularly be more labour-intensive than industrial farming methods and needs an in-depth understanding of ecosystems (Hathaway, 2016; Isgren, 2016). Overall, the general knowledge is available but the previously mentioned aspects make it challenging to implement in practice.

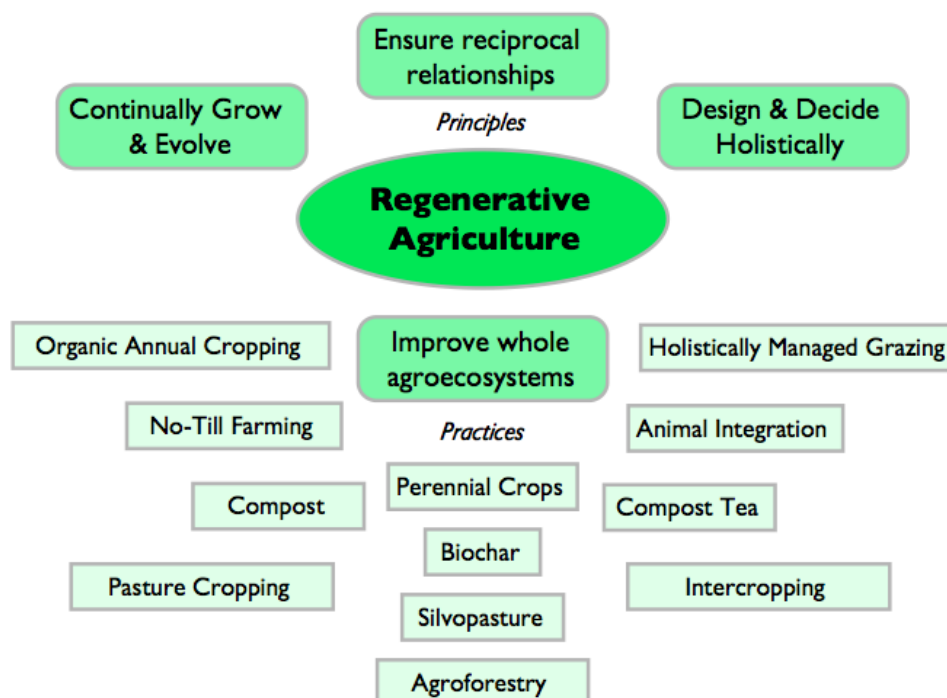


Figure 3: Regenerative Agriculture Definition with principles and practices (Source: Soloviev, 2017)

Agroecology and Permaculture

Much research has been done on agroecology and the term is also described as a synonym to RA; it is, therefore, used in my thesis as such (Codur & Watson, 2018). Agroforestry or permaculture can be seen as methods within this discipline (Ferguson & Lovell, 2014). In particular for this thesis, it is worth explaining the term permaculture further as some of the interviewees were explicitly practising it. Its vision is to build a *permanent* (agri-)culture, and it is currently defined by one of the two Australian originators as: '*consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an*

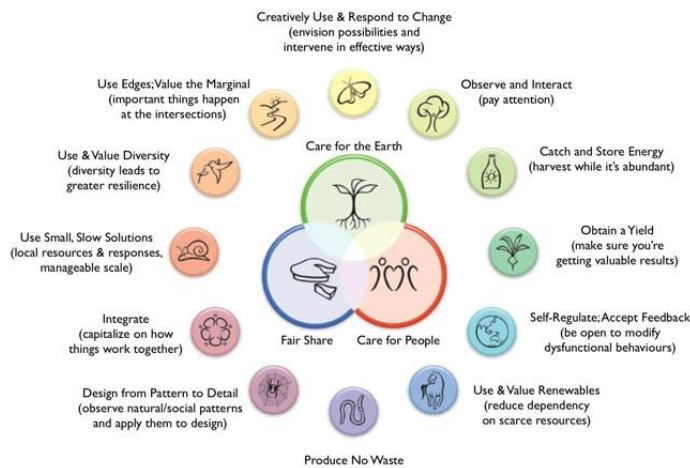


Figure 4: Permaculture Principles and Ethics
(Source: beetrooted.wordpress.com)

abundance of food, fibre and energy for provision of local needs' (Holmgren, 2007). It builds upon several principles and three main ethics, visualised in figure 4. Rhodes (2012) differentiates RA from permaculture as being more pragmatic while permaculture focuses on the design aspect. Still, the two are closely related and I interpret permaculture in this thesis as part of RA.

Agriculture in East Africa

As outlined in the introduction, agriculture plays a crucial role in Uganda providing employment for around 72% of Uganda's population with slightly more women involved in it (76%) than men (65%) (FAO, 2018b). The region is climatically and topographically very diverse and there is a broad range of crops grown in the region; maize, beans and bananas to cite a few. Cash crops like coffee or sugar generally account for less than 10% of the cropped area in Uganda and most production is for domestic markets (Gollin & Rogerson, 2010). Smallholders are already the poorest, the most vulnerable, and often perceive no other option than using linear agricultural practices like slash-and-burn or agrochemicals to improve their situation (Serdeczny et al., 2017). Furthermore, in Uganda, they are victims of a discourse that portrays them as a hurdle to progress, being unproductive, backward, and unable to benefit from interventions (Isgren, 2018b). There have been instances of resistance against this. However, these did not develop into coordinated rural social movements or a 'shared peasant identity', mostly inhibited by Uganda's colonial history and land conflicts (Isgren, 2018b).

Earlier, the tremendous impact climate change will likely have on agriculture in East Africa was mentioned. Water availability and mean annual temperatures are expected to change, and there will be more frequent extreme weather events and recurring pests (IPCC, 2019). Several studies looked at climate models, and found resulting agricultural output reductions with severe yield losses of coffee or wheat (Kahsay & Hansen, 2016; Bunn et al. 2015; Adhikari et al., 2015), for example. However, the severity of the losses depends on the type of crop itself, as root and indigenous crops (e.g. cassava, sweet potato or sorghum) will be less affected, and on the specific locality (Adhikari et al., 2015; Jones & Thornton, 2003).

Smallholders' local adaptive capacity to deal with this might be limited due to their earlier mentioned difficult situation with high dependencies on natural resources, insecure financial and institutional settings, and a lack of safety nets (Thomas & Twyman, 2005). They are known to adapt to environmental stress through diversifying their livelihood with off-farm strategies like small business ownership along with on-farm strategies like agricultural intensification (Eakin, 2005). This might work short term but in the long term, agricultural productivity and off-farm livelihood opportunities will eventually decrease (Call, Gray & Jagger, 2019). Serdeczny et al. (2017) find that this is a reason for the rate of rural-urban

migration being expected to grow. Taking all those issues into consideration, a business-as-usual approach is, therefore, definitely no option for Uganda (Thornton et al., 2009).

However, it seems like this is exactly what is happening on the ground. There is low public investment in agriculture, NGOization of services, a weak cooperative system, (semi) privatization of agricultural extension, gradual transition towards private land tenure, deregulation and proliferation of market actors, promotion of larger-scale farming, and biotechnologies such as tractor usage and agrochemicals (Nalere et al., 2015; Bayite-Kasule, 2009; Rugadya, 2009; Isgren, 2018b; Bahiigwa, Rigby & Woodhouse, 2005). At the moment, the usage rates of those technologies remain comparably low at 3% of all farmers adding inorganic nitrogen, phosphorus or potassium to their soil. Around 10% of all Ugandan farmers use any form of pesticides, fungicides, or herbicides, and less than 3% own or rent a tractor (Sheahan & Barrett, 2017). However, the Ugandan Ministry of Agriculture with its rather productivist mindset focuses on these techniques and states its vision: '*A Competitive, Profitable and Sustainable Agricultural Sector*' (Isgren, 2018b; MoA Uganda, 2020). Its mission is '*To Transform Subsistence Farming into Commercial Agriculture*' (MoA Uganda, 2020).

Regenerative agriculture in East Africa

RA offers the potential to tackle world hunger, climate change, and can increase profit, and, therefore, could be of great use in the Ugandan context. However, it has so far mostly been researched in a Western setting and still lacks a widespread application (Isgren & Ness, 2017; LaCanne & Lundgre, 2018). In 1986, Francis et al. wrote on its potential in the developing world and De Schutter (2010) notes that RA has nowadays entered mainstream development debates, and is highly relevant especially in sub-Saharan Africa. Still, the belief exists that RA does not work or that its techniques are already broadly applied in Africa (Mugwanya, 2019). This has been widely disproved, and social and environmental benefits have been documented in various contexts including the above-mentioned ones like rehabilitation of degraded land, raised ground water levels or reduced wind erosion (FAO, 2018a; Frison, 2016; De Schutter, 2010; Dogliotti et al., 2014; Reij, Tappan & Smale, 2009). Productivity can thus be boosted (by an average factor of 128% in East Africa), and income opportunities created. Rural poverty was reduced and human, social and political capital strengthened thus portraying the potential of RA in African regions (De Schutter, 2010). It, therefore, definitely seems to be a solution for the issues and worth exploring further in this thesis.

2.1.2 Transformative change

The need for it

This chapter places RA in the broader context of TC; there is a clear need for TC with the nine planetary boundaries by Rockström et al. (2009) as its starting point to avoid irreversible damages to global ecosystems (Lenton et al., 2008; Steffen et al., 2015; WBGU, 2011b). Raworth, through her doughnut economics approach (see figure 5 below), brings the approach of planetary boundaries together with social boundaries; '*the minimum standards for human wellbeing*' (Raworth, 2012; Raworth, 2017). She introduces it as a compass towards '*safe and just operating spaces*' to bring a '*transformation*' of the mainstream economic mindset currently applied by universities, parliaments and policymakers worldwide (Raworth, 2017). The red marker for boundaries already transgressed, demonstrates clearly

that we are currently on a misled path and should, therefore, change directions and transform systems.

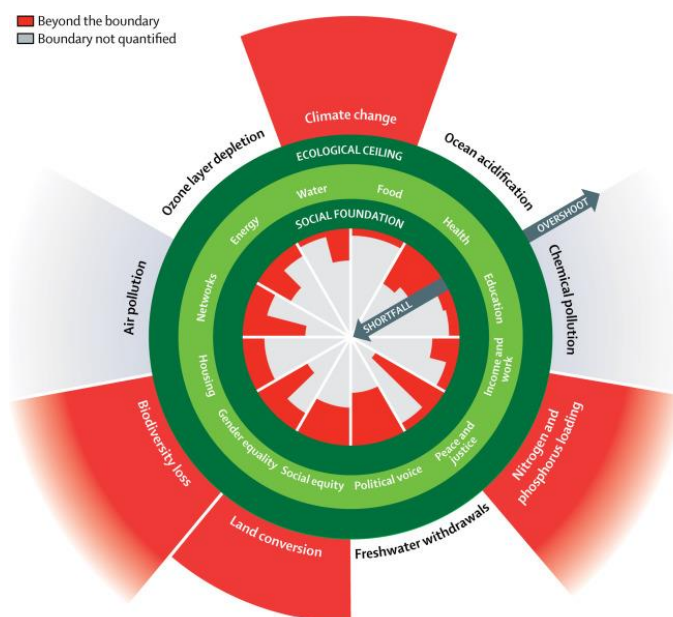


Figure 5: Shortfalls and overshoot in the Doughnut (Raworth, 2017)

Definition of transformations and the transformation we are facing now

Transformation has been approached from different viewpoints (O'Brien, 2012). It is often applied to large-scale changes in whole societies, by more than one stakeholder, on different scales such as global, national or local, and it involves interacting human and biophysical system components (Brand 2014; Folke et al., 2010; WBGU, 2011b). This is what differentiates it from the concept of transition which refers only to changes in societal sub-systems and not an overarching social change (Hölscher et al. 2018). Both concepts depend on perception, values, and cognition, and have a normative notion (Patterson et al., 2016; Hölscher et al., 2018). Hölscher et al. (2018) point out the key role of actors in transformation through transformative agency and governance influenced by the above-mentioned aspects (O'Brien, 2012). Building on that, de Haan and Rotmans (2018) proposed a framework for TC focusing on agency, pointing out different key actors like frontrunners, connectors, toppers and supporters.

This thesis mainly uses the German Advisory Council on Global Change's (WBGU) flagship report *World in Transition* as a starting point to understand great transformations, meaning imminent changes in politics, economy, and society (WBGU, 2011b). According to them, the great transformation we are facing now requires us to change lifestyles, consumption, and production patterns (WBGU, 2011b). However, only changing technologies or single practices won't be enough (WBGU, 2011b). The development of normative infrastructures in the international system, new welfare concepts, technology leaps, multifaceted institutional innovations, and flexible reform alliances will all be essential (WBGU, 2011b). The implications for agriculture and land management lie primarily in stopping deforestation and conserving biodiversity. As mentioned in the previous chapter, knowledge on restructuring agriculture in a sustainable way is already available (WBGU, 2011a).

TC has been recognised at the highest policy levels; the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019) discusses it as a solution for the sustainability challenges ahead: “Nature can be conserved, restored and used sustainably while other global societal goals are simultaneously met through urgent and concerted efforts fostering transformative change” (p.16). Their definition of TC is crucial in the context of this thesis: “Transformative change refers to a fundamental, system-wide change that includes consideration of technological, economic and social factors including (..) paradigms, goals and values.” (p.6). They explain the correlation between current structures which often inhibit sustainable development and act as indirect drivers for environmental challenges. To overcome these challenges, the IPBES mainly calls for a rapid and improved deployment of existing policy instruments encompassing more commitment to international goals, new frameworks for private sector investment, and innovation or inclusive and adaptive governance approaches (see figure 6). Moreover, the IPBES acknowledges that the transformation will look different in different contexts (IPBES, 2019), a relevant point for the discussion at hand (particularly in the East African context).

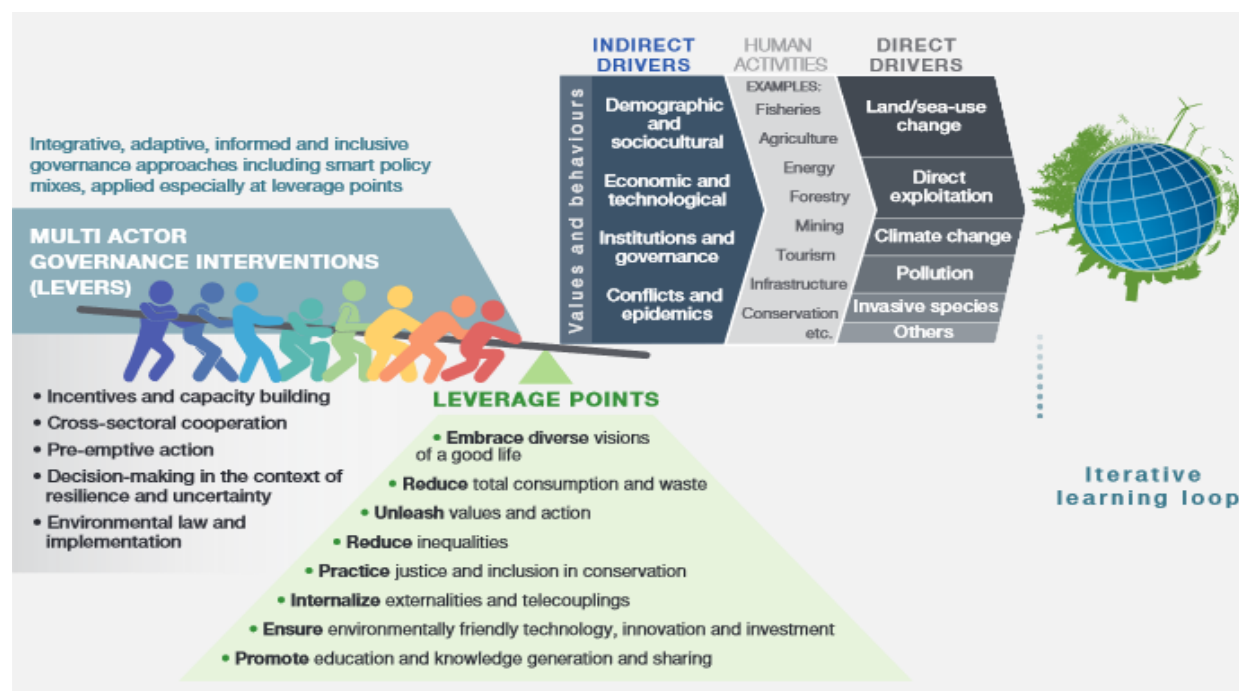


Figure 6: Transformative change in global sustainability pathways (Source: IPBES, 2019, p.40)

East African transformation processes

TC is mostly discussed and researched from a Western perspective (Bruns & Gerend, 2018) as also done through me (a German) in this thesis. A newer WBGU report *Humanity on the Move* (2016) is criticised for reproducing colonial and predominantly European perspectives of transformation especially on urbanisation (Bruns & Gerend, 2018). Developing the appropriate context for TC requires us to consider (environmental) justice questions on an international scale such as remaining aware of environmental determinism when discussing transformation (O'Brien, 2012). Also, Blythe et al. (2018) question how transformation is translated into an assemblage of normative policies and practices, and discuss five latent risks called ‘the dark side of transformation’:

- (1) Transformation discourse risks shifting the burden of response onto vulnerable parties,

- (2) Transformation discourse may be used to justify business-as-usual,
- (3) Transformation discourse pays insufficient attention to social differentiation,
- (4) Transformation discourse can exclude the possibility of non-transformation or resistance, and
- (5) Insufficient treatment of power and politics threatens the legitimacy of transformation discourse.

They highlight the importance of emphasising the politicisation and pluralisation of the transformation discourse, meaning being aware of the political nature of the term and including multiple framings. This ensures addressing the root causes of unsustainable practices, social inequality, and injustice (Blythe et al., 2018). Therefore, this thesis tries to consider those aspects and approach the topic from a perspective of justice to understand how TC in developing countries, particularly Uganda, could look. I argue for a reflective de-colonialist approach to transformation which incorporates different knowledge⁷ (Bruns & Gerend, 2018). In this regard, I want to wander off the main subject and reflect briefly on (neo-)colonialism and racism, definitely phenomena which changed politics, economy and society within the African continent in a disruptive way.

The region we call Uganda nowadays inhabited several rival kingdoms before the British arrived. In 1900, the British then created the Ugandan protectorate which Brett et al. (1995) discuss as the first of four stages of institutional transformation in Uganda:

- (1) the creation of a modern state and economic system under direct foreign control,
- (2) the Africanisation of these structures in the 1940s and 1950s,
- (3) the dissolution of the post-colonial state structure between 1964 and 1986, and
- (4) the attempt to create a democratic, open and rule governed system through the structural adjustment program.

Those structural adjustment programs started a neo-liberal restructuring of the economy urging governments to step back, and international companies and non-governmental organisations (NGOs) funded by foreign donors to partly take over the tasks of the state as done in the agricultural sector as well (Nalere et al., 2015; Brett et al., 1995). Even though the Ugandan government has nowadays committed to a somewhat 'new developmentalism', it is described as going back to neoliberalist ideas which are outdated and unsustainable (Islam & Iversen, 2018; Brett et al, 1995; Kiiza, 2012). Generally, broad structural transformation has remained markedly absent in East Africa. Nevertheless, regional integration would benefit the region, and advance intra-Africa trade, promoting sustainable economic growth and development in member countries (African Development Bank, 2019).

Considering what a just transformation could look like, the IPBES regional assessment report on biodiversity and ecosystem services for Africa discusses that '*Africa's transformation towards sustainability in line with the 2030 SDGs and Agenda 2063⁸ will depend on targeting multi-stakeholder, multi-level adaptive governance and requisite resource investment in transformative programmes*' (Archer et al., 2018, p.15). Additionally, they state that transformative outcomes can be achieved if financial resources are mobilized

⁷ Also including multiple forms of knowledge representation are crucial here.

⁸ Agenda 2063: The Africa we want is a set of initiatives by the African Union.

to build the capacity of African researchers, policymakers, and institutions (Archer et al., 2018).

Sarr (2016) discusses the key role of African intellectuals and thinkers but adds other dimensions. He also includes artists and describes transformation, such as balancing the economical, cultural and spiritual to open new horizons and create new relationships between subject and object, the old and the new, and mind and matter. He argues that this suits the diversity of African cultures better than the current underlying fixed mindset of the Western world (Sarr, 2016, p. 15). There is much more to discuss on this issue opening questions of self-determination, justice and historical conditions. However, this short overview will give us an initial understanding of TC in the Ugandan context relevant for the transformation towards RA.

Drivers, barriers and strategies to transformative change

As we have seen, transformation research brings all we know today together: how we, as individuals, are influenced by stories, norms, and discourses; what psychologically enables us to make changes; what role our values, cultures, traditions or learned behaviours play; and what the role of humans is in these processes of change. Besides discussing those direct and indirect drivers of TC, the IPBES also discusses its obstacles such as unequal power relations, lack of transparency, or unequal distributions of the costs, and benefits of actions (Diaz et al., 2015). Pelling and Manuel-Navarrete (2011) also discuss power, politics, and interests as formidable and often invisible barriers to transformation. Therefore, it can be concluded that the main barriers for TC are our present political and institutional path dependencies which, in turn, are based on an economic model reliant on fossil fuel building up power hierarchies over centuries.

Meadowcroft (2009) discusses that it is important to not get too *'hung up'* on big questions of system change and get back to solving societal problems, leading, therefore, to the question of how TC can be enabled strategically. In this regard, O'Brien (2012) discusses that it is not clear whether all the research upon transformation is sufficient to inform strategies for *'deliberate, ethical and sustainable transformation at the rate and scale that is deemed necessary to avoid danger to humanity'* (p.672). She calls for new questions to be asked and barriers between disciplines to be addressed (O'Brien, 2012). Several studies also mention the importance of changing the narrative as stories reduce complexity and help to create a common vision for current and future-oriented action plans (WBGU, 2011b; Massy, 2013; Wahl, 2018). In their framework on transformative social innovation, Haxeltine et al. (2016) provide another pragmatic approach to strategies actors use. They frame them into four different types:

- (1) enact an (existing) institution in a different way,
- (2) make (novel) choices about which (intersecting) institutions to enact,
- (3) use resources differently or use different resources or create new resources; and,
- (4) take advantage of contingency and context dependence (in resource accumulation)

Many sectors and activities are described as having transformative potential and influencing the previously mentioned factors such as partnership formation (Seitanidi et al., 2010), urban action (Romero-Lankao et al. , 2018), gender mainstreaming (Parpart, 2014), mindfulness (Bahl et al., 2016), compassion (Dutton et al., 2007) or education (Sterling, 2004), internationalisation of curriculum (Hanson, 2010), or action research (Price et al., 2001).

Also, RA is described as having such potential and be relevant for TC (De Schutter, 2010; Anderson et al., 2018; Hintz, 2015). However, Levidov et al. (2014) ask whether it can transform the system or will be conformed to the current one, a relevant question to keep in mind while reading this thesis.

2.2 Conceptual framework

The main research question is the following: “*Do existing strategies to advance regenerative agriculture in Uganda address its barriers and thus have transformative potential?*” The following part introduces the framework (see figure 7 below), first discussing the relationship between the key concepts RA and TC elaborating on that the frameworks’ connection to the sub questions.

Relationship between RA and TC

RA is used in this thesis as an overarching term for agroecology, permaculture and other similar approaches as they are often used as synonyms or can be seen as part of each other. The term ‘*regenerative agriculture*’ was chosen because it represents a holistic (living) system’s perspective considering the locality of a place (Rhodes, 2012; LaCanne & Lundgre, 2018). It can further be understood as part of a wider debate of regeneration (Isaacson, 2019) and as a value set for TC⁹. As previously described, it has transformative potential (see 2.1.1). In chapter 2.1.2, I deeply elaborated upon the two definitions of TC from the WBGU and IPBES used in this thesis. Figure 6 showed us the indirect drivers of change according to the IPBES: demographic, sociocultural, economic and technological factors, institutions and governance, and conflicts and epidemics. The four barriers to RA in Uganda: on the farmers level, on the agricultural knowledge system, on a political economical level, and on a discursive, ideological one (Isgren, 2016) are embedded in those drivers and dimensions of TC, see table 1 below.

Table 1¹⁰: Implications of the barriers to RA in Uganda identified with aspects of the two TC definitions and dimensions by the IPBES (2019) and the WBGU (2011)

Barriers to RA in Uganda (Isgren, 2016)	Implications (Isgren, 2016)	IPBES (2019)	WBGU (2011)
farmers’ level	-farmers interest and practicability -investment needed	-values and behaviour, -institutions and governance	-path-dependencies
agricultural knowledge system	-research focus -non-participatory approaches -low documentation -underfunded -contradiction	-institutions and governance	-lack of knowledge (p.78) -political economical institutional path-dependencies (p.64) -financing (p.64)
political economy	-weak implementation of national policies	-institutions and governance	-transformation requires strength of

⁹Similar to the stream in the earlier mentioned de Haan and Rotmans framework.

¹⁰ Table 1 broadly discusses how

	governing agriculture -propagation of 'modern' inputs and technologies -corruption -short-term political interest	-environmental law and implementation needed	politics and policies -long-term perspective needed (p.78) -political economical institutional path- dependencies (p.64)
discursive, ideological	-perception of modernity -agriculture perceived as backwards -underinvestment in the sector -low prestige	-values and behaviour	-value change towards sustainability (p.64)

As elaborated in the table 1, the two definitions match the barriers: just the farmers' level barrier is only indirectly embedded as it mostly discusses individual challenges and is also impacted by the other indirect drivers such as materialistic pressures, values, path-dependencies or discourses. Understanding this relationship between RA and TC, the following framework can be built including all three sub questions. Every question is elaborated upon below.

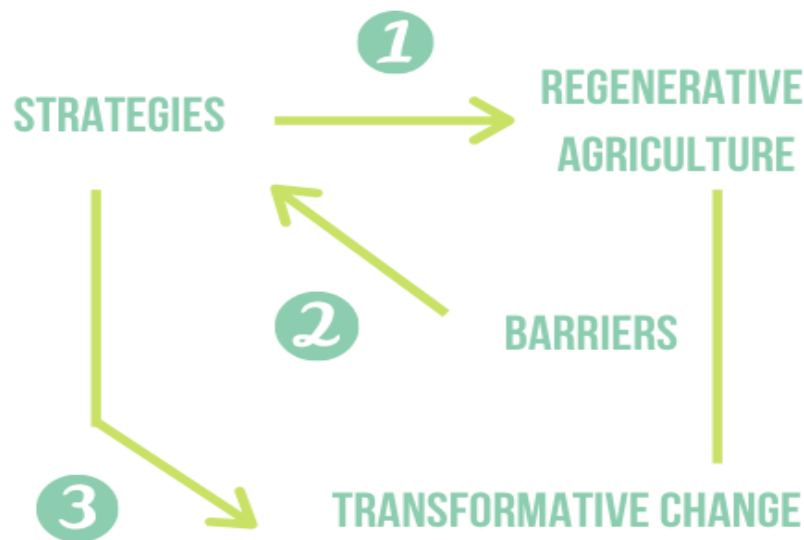


Figure 7: Conceptual framework, visualising the relationships between the main concepts of the thesis

Sub question 1 - What kind of strategies exist to advance RA in Uganda?

The first sub question focuses on arrow (1), analysing the *existing strategies to advance RA* in Uganda by various actors involved including farmers, local and foreign NGOs, donor organisations or the Ugandan local and national governments. The explicit types of actors interviewed for this thesis are listed in the methods section [3.3.2](#). I look in-depth at their work, categorising their activities, techniques, and ideas into strategies to advance RA. Thus, I am focusing on their agency to advance RA and bring TC.

Sub question 2 - *Do previously researched barriers to RA in Uganda still exist and how do they impact the strategies?*

As mentioned earlier, *barriers or constraints to RA* in Uganda are empirically researched by Isgren (2016). In sub question 2, I analyse if the barriers are still there and whether they impact the strategies focusing on arrow (2) of the framework.

Sub question 3 - *Are the strategies addressing the barriers and, therefore, have transformative potential?*

Outlying the relationship between TC and RA, those barriers were identified as aspects/barriers to TC (see table 1 above). The last sub question 3 analyses, therefore, if the strategies are addressing the barriers arguing that all of those need to be addressed to have transformative potential (see arrow (3)).

3. Methodology

We all view the world differently and our personal views, values, interpretations and context contribute to shaping our research lens and paradigm as seen in figure 8 below (Van Egmond & de Vries, 2011). A clear argumentation of methodological choices is, therefore, crucial. This chapter will, thus, firstly introduce the paradigm I follow, building on the strategy and methods used for this research.

3.1 Research paradigm

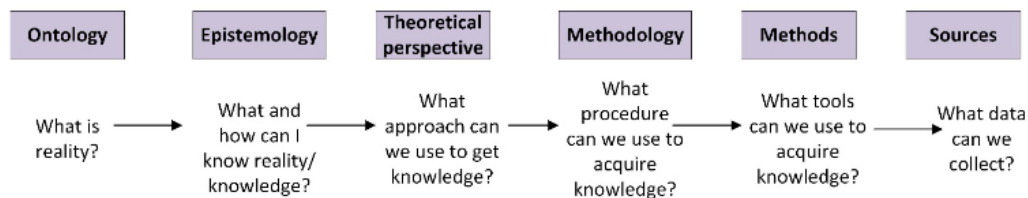


Figure 8: Research paradigms, (Source: Patel, 2015)

Paradigms can be seen as the basic belief systems and in particular, inquiry paradigms help researchers to define what falls within and outside the limits of research (Guba & Lincoln, 1994). Three fundamental questions are crucial in this regard: those of ontology, epistemology, and methodology. Ontology is the study of being and is concerned with what is the form and nature of reality (Guba & Lincoln, 1994). Epistemology concerns how we understand knowledge, and methodology of how knowledge can be gained. Each paradigm has answers to those questions (see table 2). However, it is important to understand that they are also human constructions and, therefore, not objective. This thesis for example uses a combination of two research paradigms, critical theory and constructivism/interpretivism.

Table 2: Critical theory and constructivism as an inquiry paradigm (From Guba & Lincoln, 1994, p.109).

Item	Critical Theory et al.	Constructivism
Ontology	historical realism- virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time	relativism - local and specific constructed realities
Epistemology	transactional/subjectivist; value-mediated findings	transactional/subjectivist; created findings
Methodology	dialogical/dialectical	hermeneutical/dialectical

Critical theory is a term covering a set of several alternative paradigms such as neo-Marxism, feminism, critical race theory, postcolonial criticism, materialism and participatory inquiry (Guba & Lincoln, 1994). It links philosophy closely to the social and human sciences through bringing together normative claims of truth, morality and justice with empirical social and interpretive social science. Its theories aim to explain and transform all the circumstances that 'enslave' human beings (Bohman, 2019) and are rooted in writings of Kant, Hegel and Marx, and the Enlightenment (Devetak, 2012). Horkheimer (1972) states

that critical theory seeks *'to create a world which satisfies the needs and powers'* of all humans (p.246). He gives it three definition criteria: explanatory, practical and normative at the same time (Bohman, 2019). Critical theory aims to (as the name already claims) critique and transform society into a consensual form of social life, becoming a 'real democracy'. Recognising that theories are never independent of society, as they are created within the very same context, is important and critical theory, by definition, acts as a self-reflective theory.

Habermas, one of the leading critical theorists, increasingly employed it to the field of international relations (Devetak, 2012) making it an appropriate perspective for this work. It also seems the most relevant as it critiques current racist, colonialist structures of our societies. Also, my own constant reflections on justice or righteousness helped me choose critical theory as one of the guiding paradigms of this thesis, helping to emancipate African smallholder farmers from the dominating system. TC and RA itself have a normative notion on how the planet and its inhabitant should be treated, and so do critical theory and my thesis.

However, constructivist ideas also contributed to my research as it focuses on strategies as human agency and their personal perceptions of the barriers. Therefore, they are understood as constructing their own reality according to their circumstances (Guba & Lincoln, 1994). Also the understanding that I, as a researcher, co-created the results and am interactively linked with them is a rather constructivist idea.

3.2 Research strategy

The most appropriate research strategy for this work is to do a qualitative case study, a valid form of inquiry to explore complex social issues. They help to analyse research problems which are diagnostic like the one at hand (Van Thiel, 2014; Mills et al., 2017). Diagnostic questions try to identify practical problems while looking at the success or failure of policies or, in this research, strategies (Van Thiel, 2014, p.18). I chose Uganda as a case after considering the main countries of Aidenvironment's Green Future Farming project: Kenya, Ethiopia and Uganda. This helped to narrow down the diverse contexts and allowed me to conduct an in-depth qualitative analysis of the Ugandan situation. The country was chosen as it is the location of Aidenvironment's office in East Africa helping me to find initial contacts. Case studies can include a broad scope of methods and interpretive practices including observations and interviews (Van Thiel, 2014).

Generally, a study needs to be internally and externally valid while being suited to the research matter and generalizable. Validity threats can occur from researcher's own bias or from interviewees giving 'socially acceptable' answers (Maxwell, 2008). I tried to reduce bias as much as possible, through regular conversations with fellow researchers and colleagues. This was challenging in COVID-19 times but an online meeting with fellow students who wrote their thesis on the topic of 'Good Food for all'¹¹ was conducted approximately every month. Following Van Thiel (2014), we peer-reviewed our drafts periodically. Further, I was frequently journaling my own views on the topic. A study should also be reliable, consistent, and accurate in the measurements. This was done through, among other things, developing an interview guide so that the study could be duplicated if needed.

¹¹ Thank you again for your help George & Eveline!

Coming to the reasoning underlying my research strategy, I mainly used a deductive approach as the concepts studied in this thesis were mostly known beforehand and were not necessarily the result of the research. However, I further followed Haxeltine et al. (2016) by using an abduction approach. While induction means reasoning from data to generality and deduction means reasoning from abstract theory, abduction stems from reasoning from immersion in the study of an empirical phenomenon (Haxeltine et al. 2016). Haxeltine et al. (2016) use abduction in their framework for transformative social innovation making it a method of reasoning used in transformation studies. It can address two common issues: 1) that of being blinded by theory, and 2) that of insufficiently engaging with social theory. It is a form of reasoning, grounded in critical social theory which reflects on issues of power and the role of marketization and utilitarianism as background factors (Haxeltine et al. 2016). It seemed appropriate in particular for a study of a non-Western context, allowing myself to orientate on theory while being open to a different and diverse situation.

3.3 Research methods, data collection and data analysis

3.3.1 Research methods

Multiple research methods were used for my case study to triangulate the data: an online research, semi-structured interviews and online participant observation in the form of a WhatsApp group analysis. In part [3.3.2](#), each method is explained in-depth.

3.3.2. Data collection

Online research

The data collection started with an initial exhaustive literature review and online document analysis. Besides documents provided by my internship organisation 'Aidenvironment', scientific articles or websites of the Ugandan agriculture ministry or NGOs working in the field of RA were used. Further videos, photos, and podcasts were used to also get a visual and aural insight into the situation.

Interviews

I conducted a total of nine interviews with experts and practitioners of RA to gather data for this research. Initially, two interviews were conducted informally to get an overview of RA in East Africa (I and II). A test interview (1) was conducted to make adjustments to the interview guide (see appendix 1), and the experiences were integrated into further design of the research. The test resulted in a rather narrative style and provided some questions beforehand to help respondents think more deeply about the answers if asked for. The first interviewees were found via my personal network, me being active in the field of permaculture myself (I and II). Via snowball sampling and the WhatsApp group '*Perma/Ecological Africa*' (see explanation below), further participants were found. Possible candidates were asked for a short description of their projects to see whether they might have relevant contributions to the research. To reduce the potential bias of snowball sampling, I further got in touch with experts and organisations I found online via 'Aidenvironment' or through fellow researchers. I aimed to balance the number of female and male interviewees to capture data which might differ depending on gender. However, this was difficult in the case of the Ugandan practitioners as they were mostly men and predominantly, the 'outsider' stakeholders I was able to talk to were women.

The interviews were done via (video) calls in a mix of semi-structured and narrative formats depending on what the interviewees found the most natural way of sharing their information while still enabling me to adapt to the answers given. Narrative interviews take a flexible and open format, and individuals are invited to tell stories about their experiences. This form of interview shows the importance of stories at both the individual and the community level (Paulson, 2011). It inspired me to use storytelling elements for this thesis (see 3.3.4). However, the interview guide helped to keep a certain structure in the conversation and also to keep track of which topics had been covered. Interviews ranged from 30 to 90 minutes according to the availability of the participant. Each interview was recorded upon permission, transcribed verbatim and sometimes a diary was kept to reflect upon the process of particular interviews. An overview of the interviews is shown in table 3.

Table 3: List of interviews and informal conversations

No.	Abbreviation	Function and Organisation
I	T	Slovenian permaculturist, Freelancer for an international foundation with a project in Uganda
II	CB	South African permaculturist working all over EA
1	C	Founder, permaculturist Ugandan NGO
2	N*	Freelancer, permaculturist several Kenyan NGOs ¹²
3	K	Country Director Ugandan NGO
4	P*	Permaculturist, Kenyan NGO
5	E	Researcher Swedish University
6	D	Consultant (foreign) NGO
7	U ¹³	Director German NGO
8	S	Director Ugandan Research institute

¹² I interviewed two Kenyans (marked with *) which were part of the group Perma/Ecological Africa as I initially focused on the three GFF project countries and only later on focused on Uganda. Because I was told that the situation is similar, I still used the data I gathered.

¹³ U was a German interviewee who I interviewed in my native language. The relevant parts of the interview were translated by me and reviewed by a bilingual German/English speaker.

Participant observation - WhatsApp group analysis

Thanks to interviewee CB, I was able to join the WhatsApp group 'Perma/Ecological Africa'. This group connects 169 practitioners of RA across Africa, including several from Uganda (as of 20.04.2020). As well as using this group to find further interviewees, I followed the discussion in the group and noted my observations. This was done for calendar week 21, year 2020. Conversations were then copied into word documents for each day including pictures, emojis, links and videos. The group was asked for permission and the participants reacted positively towards it. In agreement with one of the admins of the group, I waited 2 days for negative responses. However, the participants were open to it and gave me feedback on focusing on only one country, and asked for access to the research after completion.



Figure 9: Group picture 'Perma/Ecological Africa'

3.3.3 Data analysis

The recorded data from the interviews, WhatsApp group observations, and desk-research was processed using the program Atlas.ti. An initial coding phase occurred to get a deep understanding of the interviews' content. Later on, I worked with parts of the interviews directly, sorting them into the categories of this thesis: the strategies and barriers.

3.3.4 Data representation

Some parts of this thesis are slightly different from the usual style, and structure, of academic writing. The main reason for this is that science has started to recognise its limitations and calls for a more inclusive approach of different forms of knowledge, especially in the complex field of sustainability (Schneidewind & Singer-Brodowski, 2015; Isgren, Jerneck & O'Byrne, 2017).

The scientific form of knowledge has been the most dominant since the late 19th century and has enormous benefits. It is promoted as being the most objective, well-structured, clear and precise. With these perceptions, it is generally preferred by policy makers (Nelkin, 1979). This ignores the negative sides of scientific knowledge like its reductionist character or its accessibility issues (Kloppenburg, 1991). Martinez-Alier (2003) raises questions of justice regarding which knowledge and valuation system is used in policy making as it is currently mostly Western scientific knowledge. Arguing from a critical perspective, scientific knowledge should not be used to build knowledge hierarchies. Obviously, it is difficult to generalise scientific knowledge per se as there is not just one type and especially, the sustainability field is known for its interdisciplinary or even transdisciplinary character, combining knowledge from various actors (Isgren, Jerneck & O'Byrne, 2017). However, Wiek et al. (2012) highlight that even sustainability science is not living up to its potential to contribute to TC, and there is general agreement that it is supposed to take an integrated, comprehensive and participatory approach (Schneidewind & Singer-Brodowski, 2014). There are good examples such as the IPBES, which has started to integrate indigenous knowledge into their framework (Diaz et al., 2015). This is a crucial step, but it brings with it other difficulties as indigenous and Western knowledge are separated by their underlying worldviews or forms of knowledge production (Isgren, Jerneck & O'Byrne, 2017). Thornton et al. (2009) argue that in particular the field of agricultural research with its conventional

knowledge system needs to be complemented by another sort of wisdom. Also Kloppenburg (1991) asks agricultural science to bring the farmer back into the 'scene'. The world we live in is too complex and heterogeneous to rely on only one form of knowledge.

To contribute to this, I aim ambitiously to produce 'transformative knowledge'. As discussed in [2.1.2](#), a new storyline is needed for TC and regenerative cultures are discussed as such (WBGU, 2011b; Wahl, 2018). Ott (2017) illustrates how North-South collaboration across science and society can promote this type of knowledge. This is one of the reasons I initially aimed to collaborate closely with my interviewees. Eventually, this was a rather difficult task, especially while not being able to be in the country. To produce 'transformative knowledge', I then tried to include quotes and storytelling elements to engage not only the rational mind but also our emotional unconscious sides. This is done as Hardman (2010) argues that transforming to a regenerative world cannot only come from the rational approaches that have been used to date.

In addition to contributing to a different form of knowledge production, adding storytelling elements into a final thesis has also been shown to improve good feelings, motivation, and a positive attitude in the writing process. This leads to an improved quality of scientific student papers, increased satisfaction in writing them, and the pleasure of reading them (Birkenkrahe, 2014). However, I am also aware that there is critique on using storytelling approaches in scientific writing (Katz 2013; Dow, 2006). This critique consists mostly in distorting and misrepresenting the data thus making it not a universal judgement-free representation of reality any more. However, sustainability science is per se normative and, therefore, not free of judgement (Lafferty, 1996). Nevertheless, taking the critique into account, I aim to not just use a pure storytelling approach but instead combine it carefully with the standard scientific writing.

3.4 Research ethics¹⁴

With much consideration and respect, I accepted the challenge to write my thesis on RA in Uganda. I took this choice seriously as I would be writing about a context I have never yet experienced myself. Even the initial idea of staying in Uganda for a few weeks would not have been nearly enough to fully grasp the richness. I tried to read a lot about the culture and to make myself familiar with it through listening to its music (my favourite song is [Naogopa by Rayvanny](#)), and cooking native recipes such as Matooke (steamed and mashed green banana) or Posho, the Ugandan version of Fufu. Pictures of those activities are shown below. I further watched documentaries and movies about the history of the region.

¹⁴ This part is written in great detail purposefully to make two points: 1) to contribute to producing transformative knowledge as elaborated upon in part [3.3.4](#), 2) to actively portray my learning process elaborating also on my personal choice of the applied research paradigms.



Figures 10: taken by author and her sister of plantains, an Ethiopian recipe book and self-cooked Ugandan Food

However, my Western background clearly contributed to miscommunication. Through open culturally-sensitive language, I tried to avoid it as much as possible and to explain the purpose of the study, and our roles, clearly. As our conversations happened mostly online and were already written down, no additional consent forms for interviews were used. English is not my, or some of my interviewees', native language so that some misinterpretation occurred which I tried to prevent by letting my work be read through by a native English speaking friend.¹⁵

For me, this thesis is also a deeply ethical and normative work not only in the context of agricultural sustainability but also regarding (neo)-colonialism¹⁶ and (environmental) racism and justice. Phases of deeply looking inwards, to learn about these topics, were integrated in the thesis process. Parson et al. (2016) discuss environmental ethics with the call to recognise the influence of colonialism and environmental determinism on the perception of sustainability. Even though I tried to include as much of those considerations in the research design and representation as possible, I was not able to include all of them in their full complexity as it would have significantly impacted and altered the structure of the thesis.

However, especially after the murder of George Floyd in the United States, another tragic case of racial injustice, I considered how I can actively contribute to limiting the reproduction of the racial and colonial structures our societies are built upon. I, therefore, viewed my position as a researcher from a rather critical perspective and thus tried to be very careful of how I define, frame and represent the communities I do research for. I want to sincerely apologise if I was not able to do it appropriately. Lastly, I tried to see my Western perspective as simply looking from the outside on a situation while bringing empirical data and various voices together.

I want to highlight that in the end, we were all just passionate about RA as this was also how I introduced myself to most of the interviewees (see pictures below). Even though this made me feel closer to my interviewees, it also created a certain type of connection between us; making me a fellow practitioner, someone to ask for advice about making fruit wine, for

¹⁵ Thanks also to you Promit!

¹⁶ Regarding this issue, I can recommend the documentary [Stop Filming Us \(English\) Online](#) and the article on [Cash Crop colonialism](#)

example. Therefore, I clearly recognize myself as a constructivist who actively co-creates the reality researched.



Figures 11: taken by author of a regenerative farm in Stommeln, Germany; the radish harvest and the garden of the author in Nijmegen, the Netherlands

4. Analysis

Imagine farmer Sanyu who has 15 children. They all need to eat, want to go to school, and so, he needs to earn money. The climate crisis directly threatens his livelihood as droughts and heatwaves have become completely unpredictable. He works hard every single day; physical heavy work. He would love to have an easier, simpler way of working. His friend moved to the nearby town to work as a boda-boda driver¹⁷, and can now relax much more in the evenings. He is a bit jealous of him. He cannot afford the new fertilizers himself, but he saw that his yield doubled when he had used them previously. Back then, a microfinancing institute helped him out. But then, the prices just got too high and even cow manure became too expensive, and he does not have his own animals. He cannot afford all those workshops offered to provide him the knowledge he might need either. A few years ago, an international NGO came to his village to give some training and they also provided some equipment. But when the project was gone, the collaboration with the other farmers slowly faded and when the equipment broke a year later, nobody felt responsible to repair it. His crops are produced organically but what that really means is something he doesn't know, and he definitely doesn't get any extra money for it.¹⁸

Again, I present this story, so that you can imagine the situation in Uganda more clearly and relate to the farmers. The story showcases their daily problems and why they would not start with RA on their own. The following part, therefore, turns to the strategies applied to help (fellow) farmers with RA bringing together the main emergent themes from all of the data. We will be guided through it by following the sub questions. Firstly, we discuss the existing strategies (4.1), followed by looking at whether the previously found barriers are still there and impact the strategies (4.2). Lastly, it analyses if strategies are addressing the barriers and, therefore, have transformative potential (4.3).

¹⁷ Motorcycle taxi commonly found in EA.

¹⁸ This story is inspired through my interviews and some background information I gained through the online research. It generalises and amplifies the situation for making its point. The person described is a fictional character.

4. 1 Sub question 1: *What kind of strategies exist to advance RA in Uganda?*

"Do what you can, with what you have, where you are"

Theodore Roosevelt

As discussed in the theoretical framework, strategies are understood as actions of individuals or organisations. Through my interviews and online research, I could identify various activities and categorise them into seven common strategies to advance RA in Uganda. They are portrayed in table 4, listing strategies, activities and barriers which impact or are addressed by the strategies. Some activities overlap and belong to several strategies. In the following part, I will go through each strategy briefly, explain their purpose and give examples. Obviously, there is much more happening on the ground. The strategies nevertheless nicely summarise the main approaches.

Table 4: Strategies to advance RA in Uganda with exemplary activities and the barriers which are impacting them or are addressed by them

	Strategy	Activities	Barriers impacting the strategies	Barrier addressed
1	Education	-Apps or USSD technology -Workshops/trainings/PDCs -Providing adequate material -Agroforests at schools -University programmes -Changing curriculum -Personal empowerment	-Farmers level -Agricultural knowledge system -Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system -Political economy -Discursive/ideological dimension
2	Research	-Experiments -Research -Innovation hubs	-Agricultural knowledge system -Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system (-Discursive/ideological dimension)
3	Pilot projects	-Demonstration farms -Pilot projects -Design projects	-Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system (-Discursive/ideological dimension)
4	Collective Action	-WhatsApp groups -(Online) Conferences -Participatory approaches -Movement building -Pooling resources -Building cooperatives -International support -Farmer-to farmer training -South-South cooperation -Cooperating with neighbouring schools -collaborating with other NGOs -Social Support like mentorships	-Farmers level -Agricultural knowledge system -Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system -Political economy

5	Publicity	-Marketing articles -Newspaper -Exhibitions -Agrotourism -Conferences	-Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system -Discursive/ideological dimension
6	Policy advocacy	-Lobbying -Statement paper -Petitions -Knowledge brokering -International agreements	-Agricultural knowledge system -Political economy -Discursive/ideological dimension	-Agricultural knowledge system -Political economy (-Discursive/ideological dimension)
7	Breaking financial dependencies	-Shortening value chains, secondary products, localising -Initial investments from NGOs -Microfinancing -Certification schemes -Carbon trade -RA businesses -Practical help: saving seeds, bamboo usage, landscape improvement	-Farmers level -Political economy -Discursive/ideological dimension	-Farmers level -Agricultural knowledge system -Political economy (-Discursive/ideological dimension)

4.1.1 Strategy 1 - Education

All of my interviewees were strategically involved in educational work in one way or the other. Distributing knowledge to farmers is done through activities such as organising training and workshops (see figure 12), demonstration farms, handing out post-harvest material, giving permaculture design courses (PDC). There are different target groups for educational approaches: farmers, politicians¹⁹, school children, students or RA activists themselves. Knowledge brokers are important to translate knowledge from academia to those different target groups.

The agricultural research centre of interviewee S provides, for example, recent research in an understandable local language to the communities, acting as such a knowledge broker (Interviewee S). Also C and N told me about making their workshops more context-specific through translating it to local languages, which is important to make RA easily accessible. Another approach I found is that PDC participants train refugees in permaculture after their own course. This helps to increase accessibility and deepen knowledge while reaching a larger group of farmers. Interviewee P explained the farmer-to-farmer training to me. Also, C told me: *"I am taking on really quite bigger projects, (...) farmer communities where I can get 20 farmers, I train them, then they can train others. Each of them trains 10 then they come to 80, then they form a cooperative."* To reach farmers, apps are also developed to inform, for example, about market prices. Other

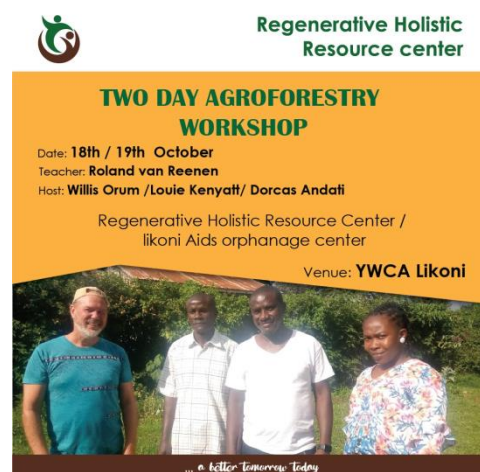


Figure 12: Flyer for an agroforestry workshop

¹⁹ I will discuss educational approaches towards politicians in strategy 7.

technologies, like the USSD technology, are used to give the farmers a space to ask their particular questions via text messages so that they can receive specific solutions.

Educational approaches help to develop the capacity of the Ugandan population. Interviewee C said: *“My major focus is to develop capacity of a society.”* With educating school children, he follows this idea and supports permaculture in 25 schools in Uganda. He said: *“Influencing the rural community schools is very powerful because 100% of these communities (..) are depending on natural resources, depending on farming, depending on using land for their survival. (..) When the parents come to see what their children learn,*



Figures 13: Permaculture projects with school children

there is a possibility to transfer that home (..) Then the teachers (..) can work with the parents to put permaculture projects in their homes. So it's a win-win (..) model where you can transform a large number of people, and the schools are the best spaces to tap the (..) majority of the population.” He explained to me that through educating school children, one can start an *“innovation hub”* at the school level, teaching from an early age creativity and innovative thinking. Other projects include the one of interviewee K's NGO which builds agroforests at schools. Doing this, they tackle several problems simultaneously, such as hunger which leads children to drop out of school. Recently, permaculture was also integrated as a non-obligatory subject into the school curriculum.

Regarding higher education, in 2010, the Uganda Martyrs University started an agroecology Master's program which was initially supported by the Swedish development agency (Sida) (Isgren, 2016). At the beginning of this year, the Mountains of the Moon University (MMU) also started an Agroecology Master's program, called *‘the first of its kind (..) using the most locally available and suitable solutions to meet the needs and demands of the local communities’* (Appear, 2020).

Further, the personal education of RA activists seemed to be part of this strategy and enormously contributed to their own empowerment. All of my interviewees were quite enthusiastic and ambitious, and were trying new ways of empowering and engaging themselves taking a range of courses, for example, to learn more skills on ecosystem restoration or on how to engage politically. I saw how crucial those personal empowerment moments were for some of them and to keep on developing themselves through education.

4.1.2 Strategy 2 - Research

Research is another important strategy related to knowledge so as to produce new or relevant knowledge for the Ugandan context. Principally, knowledge can be produced by the poor as well as by the rich (Ikard, 1993). This is so-called local knowledge; the knowledge which, according to Kloppenburg (1991), is the one bringing TC. Local knowledge is produced for example through small scale experiments on farmers' land, something principally everyone could do in some form.

Doing research and experiments was indeed done by various interviewees on different scales on small plots next to their houses but also in rather large-scale or academic approaches. An example for the first type is the organisation of interviewee K. They have their own plot where they do innovative projects and experiments like introducing a seed bank or using plastic trash to build beds. An example for the second type is the agricultural research center of interviewee S, which does larger projects, also in cooperation with partners such as the Eindhoven University of Technology. However, they try to bring the considerations of smallholders into the research, hereby focusing on not getting lost in the many problems: *"The challenges are a whole basket. And yet, when we are doing research, we are doing research at one specific challenge. One challenge at a time (Interviewee S)."*

Academic research is very valuable in the context of advancing RA in Uganda to obtain a larger perspective. Interviewee E acknowledges that locals know their situation much better but told me of new insights academia can bring: *"I think, for them [meaning a local organisation with which she works], what an academic kind of perspective on things can bring (..) is to also connect to what's happening in others places, and (..) give sort of a new (..) outsider perspective on what they are doing and what the limitations of that are and what that means for how they could rethink their strategies in the future."* Another WhatsApp group participant also described my academic work as helping to get an *institutional push*.

4.1.3 Strategy 3 - Pilot projects

Pilot projects are another strategy; they portray that RA works on a large commercial scale. They demonstrate the effectiveness for both farmers themselves and investors likewise. One example is the one of the Aga Khan foundation which invested in building a university and hospital in Uganda's capital Kampala. Next to it will be a five hectare permaculture garden, which will provide fruits and vegetables for the institutions (Interviewee T). Further, there will be water treatment facilities, composts for the kitchen waste of the hospital, and an education site. Thus, the garden plays a crucial element in making the institutions circular and independent and showing this to the city.

Another example is the one of interviewee C's permaculture arboretum, a large-scale pilot project to demonstrate the potential regarding permaculture's profitability. It is closely related to the previous strategy as he was first researching how to make permaculture commercial, in an entrepreneurial way, by adding new crops. He told me about his experiments, and the challenges he is facing, like transitioning from monocropping to a diversified system or the rather slow implementation process. Recently, he started with a *"very successful"* pilot project, telling me: *"I am adapting the new research (..), which is the permaculture arboretum, (..) [which uses] agroforestry and permaculture principles. It is the only way I have found efficient on how to do permaculture production on a commercial basis, and this is one of the biggest problems, (..) encountered in using permaculture; they couldn't attain a*

level of commerciality, or running commercial permaculture production and (...) it has been a big deal for me to invest my money to see that I can do a pilot project". He explained to me how crucial it is to design the pilot project properly; to make an extensive assessment of a farm's in- and outputs to understand which further elements are needed for a regenerative system: *"You have to study the market very well, understand it beyond (...) the region as well because some farmers operate depending on their regional scale you know? You find they've adjusted some of their local shops and they sell the surplus from their local shops, so basically you have to be keen to understand what mainstream crop are they currently dealing with, then other integrated crops into their system must serve their interests."* With this pilot project, interviewee C can demonstrate and visualise the benefits of RA clearly and show the capability of the approach to be profitable.

Also the common demonstration farms, where various agricultural techniques are shown, play an important role in this strategy. An example is the Uganda Green Incubation Programme, a 100 ha Songhai Model Farm. It was initiated in 2016 by the United Nations Development Programme in collaboration with the Ugandan Ministry of Gender, Labour and Social Development. The founder of the Songhai model professor Godfrey Nzamujo explains it as the 'new African man' being in harmony with nature using circular models of crop production, livestock, aquaculture, and bioenergy (UNDP in Uganda, 2018).

4.1.4 Strategy 4 - Collective action

Collective action means strategically working with other people together, and building networks, cooperatives or even international collaboration. In addition to sharing skills and knowledge, these collaborations can increase motivation, support and success. Many of the other strategies are combined with this one; for instance, collaborating on education or development projects. The United Nations also recognise the power of partnerships in their SDG 17 on global partnerships for sustainable development. In general, generating a movement seemed to be crucial, this aspect is discussed later ([4.3.3](#)) in depth.

An example is the earlier introduced WhatsApp group '*PermaEcologica Africa*'. As I heard from interviewee N, it was started after the Permaculture Design Course (PDC) in Sabina school in Uganda to stay in touch with other participants. As the group started after the course, it was mostly to connect people from Eastern Africa: from Uganda, Kenya, DRC, but there was a German in the group too. The group was first used for sharing relevant resources like petitions, YouTube videos, events or online learning tools with each other. The secondary aim was to share personal projects with each other, giving advice on techniques, proper local solutions or indigenous plants. I observed how people felt free to share their values, debated on GMO crops, and supported and encouraged each other in their work. Even further collaborations were started, and some people sent seeds to each other. While being part of the group, some participants organised a network event on Zoom to further build and strengthen the community.

Another pertinent example of collective action is the one of my internship organisation 'Aidenvironment'. In the '*Green Future Farming project*', they collaborate with 'Metameta' and 'Justdigg' for the projects' implementation, each focusing on their expertise area. Further examples of collective action are listed in table 4 and discussed through the analysis. However, worth mentioning here are definitely also corporations of farmers to pool

resources like land and labour or share facilities. Also, private collaborations to give social support can have a big impact as mentorship seemed to be relevant for interviewee C.

4.1.5 Strategy 5 - Publicity

One who sees something good must narrate it.

Ugandan Proverb

Giving RA a certain degree of publicity is another existing strategy. To what extent it is actually applied and how public RA really is, was, however, hard for me to tell from a distance. However, interviewee E told me that since 2016, the term 'agroecology' is much more widely known and she sees a "*kind of common language that's starting to emerge around. (...) There is [sic] conferences on it in the region. (...) It's (...) starting to become like a common language that binds different actors together and (...) shows them that they have common interest.*" This likely results from several activities done to increase awareness: marketing strategies, talking about RA publicly, newspaper articles or TV shows. Interviewee C was quite enthusiastic about public speaking and Emma Naluyima shared her regenerative story on the international platform TEDx. Further, I found many other YouTube videos on RA in Eastern Africa (see [BIOGI Kenya: Regenerative Farming Site](#), [Permaculture - By Kakuma PermaYouth](#), [Kakuma refugee settlement, Kenya](#), or [1st NATIONAL AGROECOLOGY ACTORS' SYMPOSIUM IN UGANDA](#)). Those frame RA in a certain way and help make it more visible. Conferences and exhibitions also help in this regard. Interviewee C was speaking of the idea of a permaculture museum and on an international scale, interviewee U's organisation organised the exhibition '*Strengthening Agroecology Worldwide*'. I further found at least two conferences in Uganda, the '*National Agroecology Actors Symposium*' and the '*East African Permaculture Convergence*' making the topic more public in general.

4.1.6 Strategy 6 - Policy advocacy

The market can often be guided by governmental regulations, making policy advocacy an important strategy. Making the government understand the value of RA is important and lobbying, knowledge brokering, petitions, or international agreements contribute to this. Interviewee N also reached out to politicians on Twitter to get their attention on a certain topic. However, politicians also require knowledge as mentioned in the education strategy. The organisation of interviewee S, therefore, doesn't act only as a knowledge broker for farmers but also for politicians. She said: "*It is the policymaker who is controlling everything: from what you are producing to the selling price, so you have to have them on board right from the beginning and then you talk to them and you tell them 'it is hurting the farmers to let it be just a free-market state, everyone who wants can come and buy. How do you manage to make the farmer gain from what they have grown?' They will not, however, understand this unless you have done the research with them right from the beginning and not going back at the end.*" Synergising the energies of policymakers and scientists is crucial for her.

Also, other organisations like 'Aidenvironment' or K's organisation were involved in policy advocacy. The organisation of interviewee K decided to work with the minister of education to get extra advocacy and get involved with neighbouring schools, while introducing agroforestry on a school's terrain.

4.1.7 Strategy 7 - Breaking financial dependencies

The last strategy is to break financial dependencies, increase farmers' economic standing and give them an incentive to switch to RA. Several activities constitute this which are worth discussing separately.

One strategy is to introduce farmers to the practical and easy applicable steps of RA, and give them social and financial support. Farmers are shown how to use manure or collect seeds. It allows farmers to save money which they can then invest in other necessities. Other activities include bringing in new components to their agricultural systems such as introducing bamboo or water harvest techniques. This gives them direct benefits like building material or irrigation water without much effort involved (examples given by Interviewee D). Interviewee D states that RA can be done within communities but that initial investment (in material or financial form) is needed to create a fully circular regenerative system. Those investments are strategically often brought through projects by NGOs like 'Aidenvironment'. Financial support could also consist of microfinancing loans.

Another activity to increase farmers' profit is shortening value-chains, as my interviewee C does for coffee. He explained to me: *"Starting my own brand, I am gonna read for you the motivation behind:(...) 'Fine robusta coffee gives an opportunity to support the permaculture scholarship for our local farmers in Central Uganda and the rest of Africa.' (...) Why I started a coffee brand is that I've been supporting farmers-training-farmers, and farmers have been challenged to find a better market. Then at the same time, there is a middleman who takes advantage of this group of farmers (...) so, supporting farmers to improve on their production, increases their food diversity and (...) abundance, without using chemicals and also reduces the expenses. But then after training these farmers we said: 'Okay every farmer who has coffee would bite on a better prize.' Then I made a partnership with a factory that does the production."* Also, 'Aidenvironment' was looking into the opportunity to shorten the coffee value chain. Currently, the market is one of the main drivers in society. Therefore, projects altering the market system like cutting out the middlemen or shortening the value chain, through producing jams or juices directly at the SONGHAI model farm, are crucial to break financial dependencies. Building RA businesses is relevant in this regard as well, which offer services instead of products like providing training on how to make your own fertilizer instead of selling it.

Then, there are various certification schemes like the new Regenerative Organic Certificate²⁰. While various certification schemes for organic agriculture or fair trade are already well established, this first regenerative certification program just started with its pilot phase in 2018 (Elevitch, Mazaroli, & Ragone, 2018). As organic products are not paid accordingly, including farmers into the certification schemes can help increase their profit. Interviewee CB shared some pictures of his products which were on their way to the organic market. Promoting organic products, and then finding a market for them, where a fair prize is paid, are necessary to gain directly from the benefits. The higher quality of RA products is thus considered. Also, other certification programs play a strategic role to help stop environmental destruction and increase farmers' livelihoods. 'Aidenvironment' tries to include

²⁰ To get a visual impression and feeling of how people described RA feel free to watch the ['Regenerative Organic Certification Introduction' video](#) (Patagonia, 2018).

farmers into the “*First Forest Foundation*” so that the trees they plant can get into the carbon credit scheme (Interviewee D).

The last activity involves market actors themselves and is closely related to the one described above. Recently, some companies such as Danone or Patagonia have seen the potential of RA and have addressed it in their CSR strategies (Danone, 2020; Patagonia, 2020). On their website, Danone recognises that agriculture is currently at the centre of major challenges like climate change and is committed to help overcome those. They focus on three main aspects: protect soils, empower a new generation of farmers, and respect animal welfare (Danone, 2020). Next to initiating the certification scheme, Patagonia also started a regenerative cotton line (Patagonia, 2020). Companies starting to take their responsibility and consciously decide to care is helping to advance RA from a different angle and helps farmers to get an appropriate prize for their products.

4.1.8 Concluding thoughts on the strategies

As we have seen, there are many strategies applied including various activities to advance RA in Uganda. All of those are crucial and contribute enormously to agricultural change, especially on a local level. They are often combined in projects or the activities are organised to act as several strategies at once. The stakeholders involved are mostly civil society stakeholders like NGOs or activists, but companies can also play a role as we have seen in the last strategy. Knowledge seemed to be particularly relevant for several strategies, either in distributing it, producing it or demonstrating it.

Due to my research's limitations, the strategies and activities I list here might not be complete or might also include activities which are not explicitly used for RA alone but to empower farmers in general. However, they definitely act as a starting point for our following discussion.

4.2 Sub question 2: *Do previously researched barriers to RA in Uganda still exist and how do they impact the strategies?*

In this section, I go through the four earlier mentioned barriers discussed by Isgren (2016) in depth emphasizing that they still exist through new examples from my own interviews. Occasionally, further dimensions were added to the barriers she found. After each barrier, I diagnose how the earlier outlined strategies are impacted by the barriers analysing possible dilemmas and limitations. To see an overview of which strategy is impacted by which barrier, the reader is referred to table 4.

4.2.1 Barriers at the farmer level

Farmers' needs

Isgren (2016) discusses that the constraints at the farmer's level consist of smallholders' productive assets and economic incentives. Indeed, farmers need those incentives due to all the pressures they are facing as illustrated in the story of the fictional farmer Sanyu. Interviewee N says “*Most farmers, (..) maybe they own something like 5 ha and below, (..) they have families to feed, maybe a family of 15 or a family of 10.*” C explained further: “*Which is a big deal because people wanna make money (..). And how do we support people to make money, (..) with sustainable or resilient ways, in terms of good practices on land use, good ethics: caring for people, caring for the land and fair sharing. How do we try*

to see that permaculture is a functioning model in economics, you know? Many people have no patience to get along with this idea because everybody wants to satisfy their problems, everybody needs money.” To feed their families and improve their livelihoods, farmers consider two crucial aspects: a certain level of profitability and of practicability which influence their attitude and openness towards RA. As we learned earlier, smallholders already do a similar form of farming, on a small amount of land with few inputs. Therefore, many principally do not reject RA ideas. However, there are contradictory messages communicated about how they actually perceive it (Isgren, 2016). This is obvious as farmers are not a homogenous group. Nevertheless, opinions are heavily influenced by the phenomena described below.

Profitability

Increasing productivity is currently portrayed as the only way to increase profit, and intensive farming practices are promoted as doing exactly this. Some farmers are attracted by this and, therefore, look for the easy but expensive solution of conventional agrochemicals. Interviewee N and D told me that some farmers get trapped in a vicious circle, and are consequently held captive by loans and fertilizer companies. Conventional practices are perceived as new, modern and more measurable than RA (Isgren, 2016) by many. Interviewee S told me: *“Organic fertilizers are not enough, organic fertilizers help the soil structure, irrigation and maybe stress resilience but when a plant needs 50 kg nitrogen per ha it has to get that. You can't keep it at 10 kg per ha and expect to get any yield”*. Even though those arguments are true if you only partly implement RA, this perception also has to do with the epistemic barriers to sustainable agriculture Carolan (2006) describes. The benefits of sustainable agriculture cannot always be directly perceived and materialised like an increase in beneficial soil microorganisms. At the same time, the drastic negative impacts of conventional agriculture are also not directly perceivable to individual farmers as they are externalised to society at large due to temporal extension, complexity/uncertainty, controversy, practice and epistemic ‘distance’ versus ‘nearness’ (Tegtmeier & Duffy, 2004; Carolan, 2006). Its benefits are thus much more visible short term as directly increasing yields. Interviewee N said RA practices first need to regenerate the soil before a purely organic fertilizer approach can bring the same amount of yields while interviewee C told me that permaculture implementation is generally slow. This, obviously, influences farmers' perception of RA as they need predictable and immediate income.

According to interviewee S, still, many Ugandan farmers do not want to use expensive fertilizers and prefer organic ones. This leads to a predominantly organic agricultural system in Uganda: *“In Uganda, many of the crops are organic not because it is intentional but because they cannot afford some of the things. But (..) with organic agriculture, the production is not a thing, (..) so most of the time they use manure cow manure but now because this is the only option now it has also become expensive (..).”* Despite this new difficulty for organic approaches, there are almost no benefits for farmers to actively get involved in sustainable agriculture: only a small group of farmers can charge a higher price for their products (Isgren, 2016). Middlemen and traders are known for exploiting smallholder farmers and making much more profit than the farmers themselves, further reducing the incentive to switch to organic or regenerative agriculture.

Practicability

Furthermore, there are many challenges regarding RA's practicability which influence farmers' opinions on RA. Interviewee E told me: *"There are practical challenges at the farm level that shouldn't be overlooked, (...) there are things like (...) pest management, and (...) there is [sic] a lot of practical challenges"*. Those could consist of labour, time which needs to be invested, and material equipment such as a biogas installation which is required to create a complete circular system. Interviewee D told me that RA is something which can be done on a community level pointing out, however, that: *"The only limitation that it has is the level of engagement, that only some people are doing it at subsistence level whereby you cannot see all the components interacting but where they are doing it on the higher level, you will find very few cases that are on the ground."* What he meant by this is that on a subsistence farm a complete circular system can barely be found due to the lack of initial investments, which is different from farms which had starting capital. Also, getting access to RA knowledge is limited and makes it rather impractical (Isgren, 2016). One more crucial factor acting as a practical barrier to RA on the farmer level is land ownership (Isgren, 2016). Long-term investment in land is not done as many people squat or land tenure is insecure (Kyomugisha, 2008). Also, land fragmentation is an issue as Naluyima explained in her TEDx talk: parents' land is split between children and they only inherit parts of it (Naluyima, 2018).

Community level barriers

Another barrier I identified is not necessarily on an individual farmer's level itself but rather on the community level. It consists of general infrastructure barriers in the community or the extent of community organisation (according to Interviewee C and D). Interviewee D told me of the positive attitude of the Bukwo district government being willing to work with them as the district is extremely hard to access. He said: *"Now they are working on the (...) road but before, (...), the chances of you traveling on that road to reach the last district from Kapchorwa you need like (...) minimum 4 hours. (...) They said most of the NGOs or stakeholders won't work with them when they don't reach the district because of the challenge of the terrain but through the support from the African Development Bank and the government, they have contracted the Chinese to construct a road network which is now almost at the border (...)"* So those factors, too, can act as a barrier for advancing RA.

Barrier impacting the strategies

This barrier impacts the earlier discussed strategies mostly through the aspect of farmers' openness and general attitude to engaging in RA. It, therefore, mainly impacts those strategies involved with farmers directly: education, collective action, and breaking financial dependencies. If farmers want modern, predictable and practical solutions, and RA is not perceived as such or does not offer those, they will not engage with the activities offered. However, as I heard controversial messages about farmers' attitudes, it is questionable whether this heavily impacts the above mentioned strategies. My interviewee C told me about the attitudes of farmers when he teaches them permaculture: *"They say: 'Oh my God! We have been so lost for so long. Why did I not know this earlier?'"* Also, interviewee N spoke about farmers' enthusiasm to learn about it and that they slowly started realizing that conventional agriculture is not economical, not sustainable, and that they need new options. She explained to me that communities are actively looking for new ways to be part of the solution. However, she also states that organisations should focus on bringing valuable information to the communities: *"There is no way that you can bring about change if the*

community you are bringing change to has not accepted (..) the change. And they are not accepting the change because of the value that is in the change, there is no value in the change, there is peanuts, there's a lot of nothing, and a lot of heavy work in the change. So until organisations start packaging the change to make these people realise that this is our own, (..) then that's when they will embrace the change." Interviewee E also highlighted the practical challenges of RA. All in all, it is clearly an issue that farmers do want to earn more and to have practical fast solutions.

Regarding the strategy of collective action (especially participatory approaches), the level of community self-organisation becomes essential. Working with the communities, doing educational projects or breaking financial dependencies is much more difficult if this is not satisfied. If they are not organised and are hard to access, no participatory approach can be conducted and the project cannot be of lasting effect (Interviewee C). Farmers really need to be part of the solution as interviewee C explained: *"You cannot successfully run a permaculture community project when the community is not organised because permaculture demands enough human resources in terms of work. (..) doing a base map of the whole village and a village will have more than maybe 300 people. (..) If you start measuring the land, without them knowing, it's like 'Oh my god! They are gonna steal our land! Who are these people? Why are they doing this?'"* Therefore, this aspect of the barrier at the farmer's level impacts the strategy of collective action immensely. However, development projects also address these issues and organise communities or build infrastructure as we have seen in interviewee D's comment above.

Summarising, it can be concluded that the farmers' level barrier is only partly impacting the strategies. As outlined in the literature review, RA has the potential to increase profit and rehabilitate ecosystems. If this is clearly demonstrated to the smallholders, this barrier appears to have a rather small impact on the strategies; smallholders seem to be enthusiastic about RA as the interviewees stated. Nevertheless, there are still issues impacting the strategies regarding the perceived modernity of the approach and its practicability.

4.2.2 Barriers agricultural knowledge system

Not to know is bad; not to wish to know is worse.

African proverb

The second barrier Isgren (2016) discusses is the one of the agricultural knowledge system. Looking in-depth at it, I categorize the issue into two main problems: that of knowledge production and its distribution. As we have learned earlier, RA in general requires intensive knowledge of ecosystems and all interviewees mentioned that the biggest problem is that people lack this. Knowledge is known to be the key to systems management (Ikard, 1993), and farmers often don't know which techniques to apply. Interviewee E told me in that regard: *"I mean the kind of agriculture we are talking about is not an easy thing, you know, it needs a lot of knowledge and experience."*

Knowledge production

Isgren (2016) found that current knowledge is often 'irrelevant' for smallholders or 'inappropriate', meaning non-participatory, with a focus on modern -often unavailable-

technologies. Interviewee S told me her research centre is doing a pilot phase to make nitrogen fertilizer out of air, a mind-blowing technology with its advantages but rather difficult to access for smallholders. Therefore, more knowledge needs to be produced especially suited to the African context. Interviewee S explained to me how difficult it is to acquire this knowledge: *"It is very difficult to do research in Africa. I can give you an example, from the time when I was in Wageningen. Everything is available; I just need to show up with my research problem. Whatever I need is there. But here, if you want to do research you start from scratch; you have to literally build the lab yourself (...), build everything that is supposed to be in there, you can even start building the structures (...). So, it is quite a slow process for us African researchers but we try."*

The focus of current research is primarily on increasing yields or single crops rather than RA practices (Isgren, 2016). This is because currently RA is not perceived as something investment-worthy as interviewee U explained: *"Ecological breeding (...); there is just no money in it, probably because they think you cannot make money with it. Often, it is also about product development (...) - agroecology is nothing new, this is all old stuff, and who can make money from this?"* She describes the vicious circle of the current funding system hindering an objective evaluation of RA: *"I would estimate that about 10% of all research funding goes to organic agriculture (...) and (...) if you would have the same amount of money like conventional agriculture, there would then be so much more progress.(...) With this, you can obviously guide development (Schrauben stellen). Where does the DFG [Deutsche Forschungsgemeinschaft= German Research Foundation] give its money (...)? They all collect external funding as well and from the industry, from Bayer, they don't give their money to advance organic agriculture. But yes, where there is the money, there it goes. It's always like that."*

This is also represented in the money-flow report co-developed by Biovision, IPBES-Food, and the Institute of Development Studies (IDS). It analysed the extent to which RA projects were financed and found that only a handful of donors recognised it as a key solution for sustainable food systems. In Kenya, only 13% of all research is focused on agroecological practices (see figure 14). Research pathways are highly resistant to change, and most incentives such as career opportunities or funding timeframes favour conventional approaches as they do not challenge the status quo of our economic system (Biovision & IPBES Food, 2020). This is also a definite contributor to the agricultural knowledge barrier for RA in Uganda.

Overview of the degree to which agroecology has been integrated in AgR4D projects in three case studies

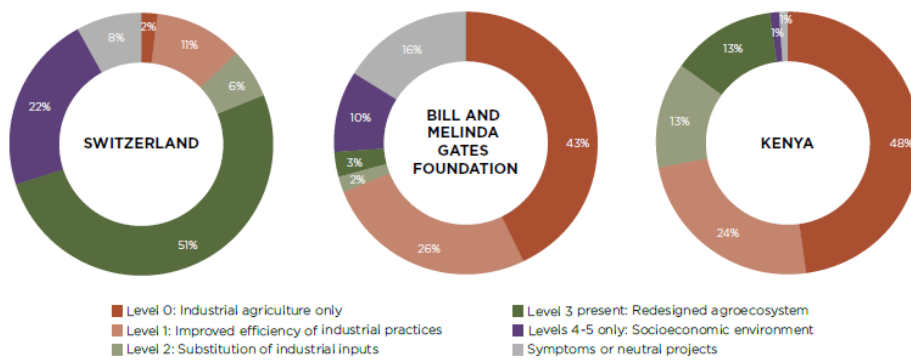


Figure 14: Overview of the degree to which agroecology has been integrated in Agricultural research for Development projects. (Source: Biovision & IPBES Food - Money Flows Report 2020)

Knowledge distribution

The other issue consists of distributing knowledge appropriately, and making it accessible for smallholders. Many of my interviewees claimed that African farmers need to get training where they see and try out things themselves, as against just learning from books. Interviewee S explained to me that a large part of the population, especially the farming population, is illiterate making it rather difficult to provide knowledge for them. However, I still heard that knowledge also needs to be documented properly and that books which explain the subject are needed. Interviewee C said: *“especially in Africa or in Uganda, there is a need for publications, supplementary materials, and textbooks.”* This has two reasons: to carry out proper advocacy and to make the knowledge more valid and acknowledged (Isgren, 2016). Then, interviewee C told me that permaculture expertise is lacking and that authentic African permaculturists are especially needed for advancing the approach in Uganda.

A last yet important issue regarding the distribution of agricultural knowledge is contradictory messages (Isgren, 2016). For example, the organisation PELUM is organising an agroecology conference but promoting the safe usage of fertilizers in their documents (VLSA Uganda, 2016). Giving seemingly opposite statements at the same time confuses farmers and they don't know what are truly 'good' practices. Being clear on what exactly RA means is crucial.

Barrier impacting the strategies

Most interviewees explained knowledge as the first and most important barrier to advance RA. General knowledge for doing RA seems to be available. However, more specific knowledge is needed; it needs to be better documented, and communicated to make it an easily applicable solution suitable to the Ugandan context. Looking at the upper described aspects of this barrier, we can identify that all strategies dealing with knowledge are thus impacted by it: education, research, collective action, and policy advocacy.

Interviewee K told me about the issue that RA techniques are not properly documented, and how this is impacting the strategy of policy advocacy: *“It is affecting the advocacy at the policy level because if something is not documented, even if it's good, the government can't just take it because they don't have a basis.”* Also, the strategy of education is impacted by

this aspect because, as interviewee C mentioned, proper school books are needed especially now that permaculture is integrated into the curriculum.

One key aspect is also that RA is quite diverse in what it encompasses. RA, permaculture, agroecology, etc. are seen to have a fuzzy meaning to people (Interviewee U and C). With a blurry understanding of what it actually means, it can be hard to find common ground to what agriculture should be transformed to. Interviewee S understood RA as Sustainable Land Management. Different perceptions of the problem's essence contribute to this issue thus making it hard to identify the core of the barriers and collaborate (Isgren, 2016). Also, interviewee C claims that permaculture is losing its meaning if everybody just uses the term without actually knowing it. At the same time, he says that, at present, many don't know about permaculture at all. This knowledge gap of the term plays an important role, impacting the strategies to advance RA. If it is not clear what RA's focus is, what exactly should be researched? However, this is even seen as a positive aspect by some. Interviewee U states: *"This is also the critique of the term: that it is hard to define and that it is different everywhere, and then everyone can claim they are doing it. But what is it exactly? This is the big critique that there is no definition. This is the critique and also the strength because it is local and adapted to the conditions. It doesn't look the same everywhere and many people don't know how to deal with it because you want a recipe for everywhere."* It is, therefore, not clear how much this is actually impacting the strategies. However, it definitely plays a role as it could be hard to find a common starting point.

To sum up, it can be stated that the barrier of the agricultural knowledge system impacts the following strategies: education, research, collective action, and policy advocacy. It impacts more strategies than the one on the farmer's level and seems to have a more drastic impact. We see here also the intertwining of the agricultural knowledge system barrier with that of the political economy because the key obstacle consists exactly of the question of what is incentivised to be researched and documented and what is not, which is a political question at its core.

4.2.3 Barriers regarding political economy of agricultural development

This part discusses the barriers stemming from the political and economical orientation of agricultural development, the barrier interviewee E labelled as *"the ultimate barrier"*. To illustrate this, interviewee S told me that even if farmers are knowledgeable of RA, it remains difficult for them: *"It is a very fragile ecosystem because it can be (..) disrupted by seed prizes, or crop prizes in that season.. (..) It requires continuous support."* Hence, the whole system is pretty much impacted by the (international) market and political situation. Isgren (2016) categorises these issues into three groups: 1) related to agricultural policy and politics, 2) the role of private agribusiness and 3) their intermingling.

Agricultural policy and politics

Looking at the first category, we can discuss agricultural policy and politics on different scales: the national, local and international. Definitely, how much a country is determined by the market and trade is a political question, what you incentivise, and what you allow to happen in your country. Interviewee U said about having too many foreign investors in the country: *"This is also national politics, do you want this or not?"* Politicians generally need to think further and act accordingly, as described by her but also shared through a YouTube

video in the 'Perma/Ecologica Africa' WhatsApp group as crucial for African leaders. This can be done directly through policies or indirectly through subsidies (Isgren, 2016). Interviewee S told me that there were material subsidies for farmers in the form of handing out seedlings. However, those seedlings were not suitable for the context of the farmer and the support was therefore useless. Regarding the policies, even though certain good ones are there, implementation lacks as Isgren discovered in 2016. And this is still the case as interviewee S stated: *"I think there is a need for (..) more policies but I hope not for the farmers! Policies that manage market prizes for instance (..). Some of these policies are there but they are not in effect. They are there, they are written but they are not being utilized."* A recent study by Kasimbazi (2020) confirms this, reviewing regulations, policies and laws for Uganda's agriculture sector. He found that there are major challenges of implementation due to lack of knowledge and awareness, gaps in the policies and laws especially incentives of smallholders and protection of their health and safety.

Reasons for this are, among others, corruption and the influence of powerful lobby organisations on the national government. This affects the support for RA on national scale; however, this problem does not exist on a local level (Interviewee D). Interviewee N experienced local leaders to be very perceptive for RA. For example the district Bukwo sent their full technical staff to a meeting showing that they were willing to welcome new partners (Interviewee D). Interviewee D further explained to me: *"The local government offices do the same as what we are talking about because they are within the community and they know the challenges (..) They are born from the same area (..) so they still don't want to mislead their own communities. In the camera they promote maybe what has to be promoted at national level but when you talk to them without a camera or without news reporters ..."* This seems sensible as RA is also a very localised approach and on a local level, political leaders are much more involved and connected to what is really happening.

Another issue I found occurs in the dilemmas between international agreements and development projects. On the one hand, much money is put into development projects and on the other hand, trade agreements are further exploiting smallholders. In particular, the economic partnership agreement (EPA) made between the European Union and African, Caribbean and Pacific Countries is critiqued because of its devastating effect on smallholders, even called *colonialism's new clothes* (GRAIN, 2017). Interviewee U explained to me: *"Exactly the trade agreements which promote this [conventional agriculture] - these are really dimensions where you feel uncomfortable, always more and more and this doesn't go together. We cannot say we do agroecology in development work or foreign aid but then at the same time agree upon trade agreements like Mercosur. This doesn't go together."* Interviewee C and N further claimed regarding foreign aid that donor money is often wasted through meetings ('teas') or administration costs and does not arrive at the communities where it is supposed to go.

A problematic aspect is also related to the current NGO-project based system and the general distribution of financial resources, meaning investment patterns, funding structures, etc. We have learned about this also in the previous part on what research focus gets funding and which one does not. Interviewee CB explained to me that the NGO mentality is often not really sustainable as projects or demonstration farms often depend on the donors financially. Much criticism can be found on this system but trends still go in the direction of having short time projects which often lack lasting effect. Farmer groups for example are

only going to be surviving as long as the NGO and projects are there and funding is available (Interviewee E).

Private agribusinesses

Regarding the market, interviewee D told me: *"It is the market that drives everything, whether it is in Kenya or in Uganda, it is the market that is holding everyone around. So people are either looking for what is an easier option of getting a lot of production or are doing the same things to make sure that they can achieve maximum."* Interviewee E discussed the current liberal, market-based approach as not in line with RA and described: *"You see that in my country [Sweden], in your country [Germany]: if you leave it up to the market you are gonna have 300 ha farms with one crop and that is not (...) possible within the kind of agriculture we are talking about. You're gonna have to put the economy (...) in its place (...) and have it operate within certain boundaries (...). and treat it (...) more as a human right. (...). And of course, that's very difficult to do in a place where the economy is so dependent on outside investment and aid that is then tied to (...) certain politics and economic policies (...) otherwise you don't get those aids and those loans."* Ultimately, this opens the question of which kind of interventions the state does and how much the private sector is regulated. Interviewee E said in African countries the government is very dis-sensitised to do this which has to do with the wish to collect donor money. For example, the national government promoting a certain type of conventional and industrial agriculture also has to do with the topic of corruption and where tax money is flowing to.

Intermingling of the two: Corruption

Conventional agriculture and its lobby industry were discussed as being particularly influencing political actors and thus the whole situation. Interviewee N stated for example *"The governments are promoting fertilizers and seed companies because they are paying a lot of taxes"*. Also, interviewee CB explained to me that farmers who are successful with RA are often smashed by 'higher powers' (meaning chemical companies). He said that there is much bribery making the whole problem political. As mentioned earlier corruption is indeed a crucial aspect related to this barrier. However, I don't want to go too deep into the sensitive topic of corruption in Uganda as I didn't speak about this with my interviewees. I am not trained or educated enough to know how to address it. Nevertheless, looking at Isgren's article (2016) and further literature on this topic I found that foreign aid is known to have contributed to elite corruption (Tangri & Mwenda, 2008), and as interviewee CB explained to me sitting fees for politicians to just attend meetings are sometimes the norm. Literature shows that corruption in Uganda plays a crucial role in why poverty reduction and economic development are not advancing (Sharpe, 2018). Although strong anti-corruption laws have been recently introduced, implementation is again weak (Sharpe, 2018).

Barrier impacting the strategies

It is quite clear how this barrier impacts the strategies. There is either no funding, making it hard to operate or policies and market structures are intermingling, favouring conventional approaches or are not implemented. As all strategies somehow are dependent on these aspects all of them are impacted by them to various degrees.

Giving a few examples, each interviewee mentioned the effort it needs to get funding for their work in one or another way, being heavily impacted by this barrier. And even if donors are found for example for an education project, there is still the issue that farmers are part of

a wider market system. Interviewee K lacked money for having further employees and documentate his work properly, doing pilot projects, research and education. Limiting here is also that certain topics are trendier one year and are preferred by the current funding systems (Interviewee E). Then, in temporary funded projects, especially the much-needed policy advocacy is not done sufficiently as it needs to be done continuously, sometimes intensified, in a rather flexible approach (Interviewee E and D).

Concluding it can be said that especially in this particular barrier to advance RA, the barriers for TC show as discussed in the theoretical framework: our current economic system with its occurring path-dependencies, power dynamics of politics and interest, and a lack of transparency.

4.2.4 Discursive and ideological barriers

The last empirical constraint Isgren (2016) found is the one of discursive and ideological character. As we have seen in the previous barriers, it is very closely interlinked with them. The main issue of this dimension is the perception of 'modernity' and 'backwardness' (Isgren, 2016). Agriculture as a whole is nowadays not necessarily seen as a modern prestigious field to work in and young people often sell their land to work outside of agriculture. Then, especially RA techniques are seen as backwards as they require more knowledge than conventional ones and are not using agrochemicals or mechanical techniques which are perceived as modern (Isgren, 2016). Interviewee N explained the issue: *"They are promoting that [meaning conventional agriculture] more than they can promote regenerative agriculture, so the mindset of the people is moved towards that. (..) And therefore, unless there is a paradigm shift and the mindset of the people (..) is changed back to the cultural ways of doing things, then regenerative agriculture will come back to life."* Also, interviewee CB told me about the peer-pressure farmers are facing and that there is much advertisement for chemicals for example in the radios, telling farmers to modernise. He said you need to actively step out of the box to try something different.

Barrier impacting the strategy

The earlier barriers show that the discursive/ideological barrier is underlying them: for example farmers want to be perceived as modern. Understanding discourses following Foucault, we can see the relationship between (political) power and the formation of the discourse. Discourses are always 'political', meaning that human interactions and relationships have implications for how 'social good' is or ought to be distributed (Wodak, 2006). This is crucial as social goods are here thought of as anything a group of people believes to be a source of power, status or worth (Wodak 2006). The discursive/ideological barrier to RA identifies conventional agriculture as the more dominant agricultural discourse in Uganda. This means it is shaping what is perceived as modern, backwards or investment-worthy and can be seen as a source of power. This barrier is therefore, like the previous strategy, impacting all strategies to different degrees, as it influences the general mindset of everyone involved.

However, the significance of discourses is debatable and it is not clear to what extent this barrier actually impacts the strategies and farmers' reality. Interviewee S told me: *"Actually many farmers don't want to use fertilizers because they have a wrong impression that fertilizers spoil the soil. I don't know where they got that from"*. But as we have seen many

farmers are still enthusiastic about RA and many strategies are successfully applied. To which extent farmers are influenced by the conventional discourses is therefore not clear as discourses are hard to fully grasp in general.

4.2.5 Concluding thoughts on the barriers

This part outlined that the four barriers still exist and are heavily impacting the existing strategies to advance RA in Uganda. Interviewee E told me to consider: *“It’s interesting, you mentioned that early paper that I did and of course that is quite empirical and (..) reports what people are saying pretty much. And over time I started to reassess that a little bit. (..) People tend (..) to overemphasize certain aspects and maybe are a bit more let’s say blinded to see certain other aspects”*. Thus, it is debatable how relevant each barrier is on the ground level.

Each barrier discussed by Isgren (2016) is embedded in a different body of literature, arguing from different perspectives such as *discourse theory*, *institutionalism*, or *rational choice theory*. As we have seen they are truly intertwined with each other, making it sometimes hard to differentiate between them. Important is to keep in mind that farmers' daily life first and for all depends on materialistic realities and is not only shaped by discourses. However, we have seen that all of the barriers are impacting the strategies to advance RA, some more than others like the agricultural knowledge system and the political economy one. Likewise, some strategies are also more affected by them like research and policy advocacy. Others like education or pilot projects are not so much impacted if donors can be found and enthusiastic people take the lead.

4.3 Sub question 3: Are the strategies addressing the barriers and therefore have transformative potential?

“We cannot solve our problems with the same thinking we used when we created them”
Albert Einstein

As outlined in the framework the concepts of RA and TC are closely related. Looking in depth at the barriers above this is clearly shown. RA requires not only a transformation of agricultural practices but also of political and economic structures. For example, in a system of RA, you produce different products than on a conventional farm for which the market needs to be adapted. Thus, a world which has its agricultural system completely built in a regenerative way has undergone large-scale changes of the whole society, including markets and political system. This might also be a reason why RA is discussed as having transformative potential. However, it is debatable if the existing strategies to advance RA in Uganda address the barriers for RA enough and therefore have this transformative potential. The following chapter analyses this last question. It is also portrayed in table 4, last column.

4.3.1 Farmer level

Farmers’ needs

Regarding the earlier discussed barriers on the farmer level, there are several strategies applied. Generally, it can be said that thematising farmers’ needs makes them realise the benefits of RA. It is thus initially the most important aspect done through strategies like education, pilot projects and publicity. If farmers are not interested in RA, they will never start implementing it. However, they are likely to have a positive attitude to RA if practicability and profitability questions are addressed and the barrier seems to be of little impact (see [4.2.1](#)).

The current strategies actively tell the farmers *“that it is cheaper to use alternative organic fertilizers which are within the community”* (Interviewee D). RA is thus presented to farmers as another option solving their problems, with easy understandable materialistic reasons. Elucidating the benefits of RA motivates communities therefore to transform towards RA themselves and the change is not forced upon them. This is crucial as otherwise questions of self-determination and imposing ideologies could be asked.

Profitability and practicability

Profitability and practicability are essential for farmers. For both, especially the strategy of breaking financial dependencies like shortening value chains or initial investments are needed to give them an incentive to switch. However, initial investments to improve the system need to be appropriate for farmers and entirely thought through as for example technical equipment is often not fixed when projects disappear. Planning them with a participatory approach lets communities be part of it and take responsibility. Regarding profitability and practicability also pilot projects show how commercial and practical RA approaches like permaculture can be. However, it is essential that the strategies fully consider remaining practical challenges like pest control or locust plagues for which more and better knowledge needs to be acquired (Interviewee U & E). Also, self-collected seeds might increase hybrids or not sprout easily and therefore bring new challenges if not collected correctly. Here the research strategy helps address this barrier and find practical, fast solutions which are easy to implement. However, here the agricultural knowledge barrier is a limiting factor. This relationship shows us how deeply the barriers are intertwined with each other.

What further was discussed by my interviewees as needed on a rather practical level for farmers were for example new measurement standards for success, not tons per hectare or GDP, but new tools to measure success holistically and represent the different underlying value systems. Interviewee U stated: *“So this is the model, (..) no matter what you read or listen to, the focus is on productivity (..), so success is measured in productivity so kg per ha or tons per ha. And this is always only for one crop. (..) and if you have such diverse systems [as in RA], if you practice this then the mass profit (Massenertrag) is much higher per ha but you need to measure it differently not like tomatoes per ha but then you have tomatoes and cabbage and trees and fruits and wheat and everything (..) on one field or on a small site (..) So the measurement standard is different, maybe you would need to measure calories per ha or biomass (..) but our measurement standard for success is still, no matter where you look tons per ha”*. Developing such a measurement tool is probably an aspect which should be addressed by research. Actually bringing it to the wider system requires the strategy of policy advocacy.

Community level

In her work Isgren (2016) suggests applying collective strategies like pooling resources, labour, and land to overcome the types of constraints at the farmers' level. Also, interviewee N explained the importance of the strategy of collective action like having seed or manure banks on a community level to gain a certain degree of independence. According to her, it makes communities self-sufficient, sustainable, and resilient. Participatory approaches are essential for the success of RA projects and its localised approach asks for it, building on people's understanding of their own ecosystem. I want to give a project example to illustrate how the strategies collective action and breaking financial dependencies, actually addressed

the farmer level barrier effectively. Interviewee D told me about the outcome of a project financed by the government of Norway: *"If you come to Uganda, (...) I'll take you to a group of farmers in the Mount Elgon region (...) There is a group of farmers who are doing (...) regenerative agriculture but (...) at a small scale level. (...) Their work is very interesting given that they have animals for zero-grazing and they have coffee, they have matoke, (...) and sometimes they have tree planting in their communities (...). If you look at crop farming, you have coffee as a cash crop, you have zero-grazing where they get milk and then they also get cow dung. The cow dung is now used as raw material into the biogas installation and then the biofiller that comes out of the biogas installation is used as organic manure in the gardens (...) for crops, or for putting in the Napier grass. When you put it in Napier grass it grows very fast and then you feed it back to the animals."* To start this project a financial incentive was needed. 10.000 US dollars were given to 10 community-based organisations around the Mount Elgon national park boundaries. Interviewee D explained: *"So they were able to use this money (...) as a community revolving fund so that you borrow (...), you buy a seedling or seeds and then after planting maybe cabbages, 3 months, they are matured, (...), so at the end of it they would sell and they put money back in the savings with 3% interest rate. (...) This 3 % is low for the communities and (...) it encourages them to have collective engagement working together as a team, members would supervise themselves in their community through their (...) community-based organisations so it made it easier for them to multiply the projects, multiply the results."*

Other issues of this barrier were infrastructure barriers, community organisation and the difficult situation regarding land ownership. While the first ones seem to be addressed by development projects and for example roads are built to access certain places, I have not found strategies regarding the problematic land ownership situation. This might have been due to a limited amount of research.

Summarised, it can be said that the strategies education, pilot projects, breaking financial dependencies and collective action are the ones mostly addressing this barrier. They seemed quite frequently applied: *"These kind of project-based very localised efforts (...) for example the network of NGOs that I studied a lot (...) was about (...) organising farmers into groups which are then training on different (...) alternative practices and often coupled with things like training coffee farmers to do (...) collective marketing, (...) community savings and loans groups. so combined with this (...) they are trying to organise farmers into groups that do these economic collective things and at the same time makes it easier for (...) experts to reach them, to provide training on different matters, with different degrees in self-determination (...) I think those (...) approaches are very common and (...) there is nothing wrong about them but they are often very, I mean I always come back to this you know in absence of broader change, this are going to be surviving as long as the projects are there and that's ultimately a limitation of them"* (Interviewee E). Having interviewee E pointing out these final aspects let us understand that finally, this barrier seems to be the easiest to address, but strategies are still impacted by other barriers.

4.3.2 Agricultural knowledge system

The agricultural knowledge system barrier consists of issues regarding knowledge distribution and knowledge production. Several strategies address those aspects.

Knowledge distribution

As we have seen, the knowledge provided is not often suitable for the Ugandan context because it is too theoretical or inappropriate. The strategy of education focuses, therefore, mostly on providing context-specific information. Interviewee D told me in this regard: *“That is what Aidenvironment, we are coming in, to provide that information and to make sure that it is practical not from theory to practice. So that they practice with what we're giving them because training them is not enough.”* They are thus addressing these aspects.

Also the strategy of pilot projects, in particular the common demonstration farms like the SONGHAI model farm, are meant to spread appropriate knowledge. However, interviewee D wanted to check out the SONGHAI model farm before the COVID-19 curfew happened and explained to me his plan to get access to it. Even though the farm is meant to show innovative agriculture, not everybody can enter the area easily as he explained to me. Making the site hard to access does not allow spreading the knowledge also to smallholders. I argue that this again makes many demonstration farms a place for higher-level farmers not for smallholders. Demonstration farms have also been described, in an informal conversation, as *‘agricultural museums’*. Speaking to my interviewees and observing the WhatsApp group, however, I identified that especially locally-initiated demonstration farms consider farmers’ realities and demonstrate knowledge accordingly. However, those projects were often limited as they needed funding and interviewee N and C both told me that their projects (or part of their projects) still need to be implemented. We can differ here between locally initiated and foreign projects. Locally initiated grassroots farms, even though struggling with funding themselves, can demonstrate the knowledge which smallholders need much more effectively.

Another strategy to bring appropriate knowledge is collective action. It is often combined with other strategies such as education. However, a difficult phenomenon regarding international collective action occurs with PDCs which interviewee C described: *“So many permaculture teachers (..) come from different parts of the world (..) to teach in Africa but there is a very big challenge (..) because the perspective they think about African people is totally different, you know? (..) African people don't need a chalkboard, the farmers, the community, they don't need anything like classwork, they need hands-on things directly. They can easily learn visually by teaching them how to do something and most of these people, some of the other teachers of permaculture, organise this permaculture courses as workshops into the hotels, nice places”*. He even had a conflict with a British permaculture teacher about this. Although cultural and personal differences might have contributed to those problems, excessive foreign intervention impacts the strategy of collective action negatively as knowledge for the Ugandan context is needed. Once again, I point out that even though (international) collective action is an important strategy, action should be deeply rooted in local perspectives.

Looking at the strategy of (higher) education we see that the issue of having too theoretical knowledge is addressed. The MMU project coordinator explained that the development of the curriculum was done through extensive stakeholder consultations and stated *“What makes this program special is the recognition that farmers are not mere recipients of innovations but are rather an integral part of innovation development”* (Appear, 2020). The program, therefore, includes local perspectives and is thus not too theoretical, another crucial aspect for educational approaches.

Knowledge production

Knowledge production requires some sort of capital (financial, material or time). Therefore, the current system makes it difficult as the powerful have the capital to invest and are not investing in RA. Research is still the most important strategy to produce new knowledge whether it is experiments to produce local knowledge or academic research. Policy advocacy and publicity can here help to create more awareness of the topic and therefore enable the production of knowledge focusing on RA in the long term. While academic research on RA is right now limited, many local experiments were conducted.

Interviewee C explained to me how he strategically focused on research to break financial dependencies. He developed his own capacity by getting the proper infrastructure, the proper land to build his business upon to then do research. He said: *"When I got my first grant my company moved into a very good space office in the middle of the city, then, I have a mentorship profile, I have a boardroom, I have facilities to run a business, really, to have my meetings much more professional"*. Next to having this sort of infrastructure he also focused on getting land to do experiments on and do production. Also, interviewee K's organisation needed to have land to then do experiments on it. Therefore, first focusing on one strategy, while later on focusing on the next one seems to be relevant, thinking step-by-step and long-term.

The barrier on the agricultural knowledge system consisted also of contradictory messages portrayed in society. Interviewee D raised this issue: *"We cannot fight the government programmes of encouraging the use of fertilizer but we want to tell them that it is cheaper to use alternative organic fertilizers which are within the communities;"* Interviewer: *"Mhmm but the government is promoting chemical usage?"* D: *"Yeah they promote but because they don't provide for farmers some of this chemicals (..) the communities are just left with the information (..) so if we give them the cheaper option, alternative organic then they will be able to impress more than being told that you can actually use fertilizers to maximise on the output. But those who know the benefits of using organic manure tell you that organic manure once you use it, it is more sustainable than if you use inorganic fertilizers because the chemical fertilizer you need to keep using it and when you are misusing it then you cannot harvest anything. So those are the advantages we have."* Not much can be done about other people spreading contradictory messages as they will always be opposing opinions in society; however it is crucial that organisations are consistent in their own messages.

To sum up, while the farmers level barrier was easier to address through the strategies, the constraints at the agricultural knowledge system are already harder to tackle. Strategies addressing the issues at hand were education, research, pilot projects, collective action, while sometimes focusing on other strategies first such as breaking financial dependencies. Also publicity and policy advocacy can play a role here as it can help long term to bring a shift of research focus.

4.3.3 Political economy

You can't turn the wind, so turn the sail.

African proverb

The barrier at the level of the political economy of agricultural development is, by far, the most complicated barrier to overcome. Interviewee E said in this regard: *"I think that's the one that's gonna take the most (..) strategizing (..). It needs effort and it is not gonna be done (..) in a heartbeat."* And it is indeed a tricky barrier, thinking of all the implications it brings with it looking at the intertwined economic and political structures. Several strategies were directly or indirectly addressing this barrier. Let us first look at the market system while later on, looking at strategies addressing the political system.

Market

Interviewee S told me that many actors and strategies address the market system, especially helping farmers: *"There are those who are developing apps, explaining where the markets are, what are the prizes at the market. There are those who are trying to reduce the number of middlemen, on a certain commodity, because the more middlemen the less money the farmers get for their produce. We are also trying to make cooperatives, where farmers can market together as a bulk and also trying (..) to give the farmers more knowledge about markets. (..) It's a decision-support system, then they are able to decide by themselves."* These kinds of strategies (education, breaking financial dependencies and collective action) are needed no matter how the market should look like in the future. Interviewee E explains: *"I mean farmers have to operate within the market as it is now (..) regardless of what we would want it to be in hundred years (..) and I think finding ways to increase let's say your economic standing, your bargaining power for example in that market, being able to get a larger share of the final prize of what you produce is not a bad thing."* Indeed, it is challenging to find strategies to transform the market while operating successfully in it, but creating more localised markets and shortening the value chain are activities that enable exactly this. Regarding the international market, I want to point out another of interviewee E's statements: *"Achieving that [RA] (..) does not have to mean that we don't have any markets or any trade. I think that is certainly possible within that but (..) it is a market and a kind of trade where farmers are(..) incentivized and given a premium for producing the right thing (..) and one way to do that is definitely to have farmers for example (..) collaborating more and (..) cooperative development (..)"* With this statement she highlights the importance of collective action as a means to break financial dependencies.

Breaking financial dependencies and making RA investment worthy is indeed an essential strategy to get out of the circle of constantly applying for funding. Interviewee C was pitching, applying for scholarships, and mentor programs during the entire beginning of his career and got even bankrupt once. That is why he is now restructuring his business to be revenue-end, not grant-end anymore, making it therefore strategically independent from grants. Regarding this strategy, he also told me the importance of creating jobs and businesses building upon RA: *"We are coming to a point, that now we need to use permaculture to create jobs. We are going to create green jobs, opportunities, it's possible. And if it's possible we also have to empower our students to start businesses or we have to convince investors to invest in resilient permaculture projects, so these are very important opportunities."* He further is planning to invest money from richer schools towards the not so privileged ones, finding new systems to finance his work: *"I am thinking in having the permaculture working in*

international schools then I invest the money from international schools into local schools, that's one of the models I am trying to assess, to see if (..) maybe five international schools can subscribe to our service then their payment, we can get a profit that we can support maybe two schools in a rural area." This tries to distribute the money from wealthier parts of the population to poorer parts, balancing economical gaps and reaching a large group of people at the same time. All in all, regarding the market, breaking financial dependencies was highlighted as the most important strategy to have a truly sustainable effect in the long term without depending on external funding.

Political level

Lastly, several interviewees state that it all comes back to addressing the political level to choose an economy which is not built on foreign donor money or growth as resources are limited (Interviewee S, D, E). For this the development of strong African leadership figures is needed which know how to engage supporters and what is best for their country and their people (Sarr, 2016). This does not only count for African countries as the barriers for RA cannot be overcome locally. Also international support needs to be redirected from industrial to alternative agriculture (Isgren, 2018b). Interviewee U, the representative from the German NGO stated: *"In general, we cannot expect that [thinking further] from anyone but from the people who do our politics. I expect that they are intelligent enough and can think long-term and if they can't then they don't belong there (..) Because every decision that is made, no matter in which field is also a decision for the future and that's why we have a "leader", in a sense that they decide on something, and so it is my expectation that things are decided also for the future and the next generation and not only (..) that I am elected again or whatever. I expect this from such people and if they cannot think further, then they don't belong there and this is maybe not always easy under the given conditions, I admit this."* To address the political sphere education, policy advocacy and collective action are strategies applied.

Foreign actors also apply these strategies; the organisation of interviewee U is a case in point. Their policy advocacy is focusing on Germany or the EU for financing more agroecological projects, and fairer trade agreements. They are part of a bigger cooperation of NGOs which came together to write a statement paper on strengthening agroecology. This paper addresses *"mainly the German Development work or the European agricultural policy. We say, this [agroecology] should be the aim or the standard of development projects."* Also other foreign NGOs are quite active with advocacy work such as Via Campesina, the international peasant's movement. International support generally focuses on strengthening international governance structures like adapting trade agreement accordingly or scaling up certification schemes.

Movement building

As we have seen collective action is a common strategy and many different stakeholders are cooperating with each other. It was stated that more of this is needed (Interviewee E, D, N, C). Starting with farmers building cooperatives till collaboration of other actors to strengthen bargaining power and helping to make their voice heard. To further push the government I heard that Uganda needs a movement and that *'people need to speak with one voice'* (Interviewee N). Interviewee D told me that Uganda is in the process of building it: *"Sometimes when the idea is still new, people tend to do it in isolation, but when it becomes common knowledge then people start grouping themselves to move together as a team. (..)*

Initially, (..), it's a private farmer (..) but when he realises that he cannot support the market demand for everything that is needed, then that farmer, (..) starts to recruiting all the other neighbours (..) because he says I have a huge market potential, but I cannot satisfy, and that is when it becomes a social movement. (..) Soon it is happening because I have seen some of the products, people are recruiting others, in order to do that," Further he explains that all the other strategies like publicity or research are contributing to this purpose: *"The way we are talking about regenerative is a comprehensive, way of farming, an integrated plan (..) whereby you have all aspects of the community, put together, all the different segments of the farm, all integrated into one, (..) and they are doing it in that format, so we are going to be there and given that we have people doing this type of linking knots and challenges bringing them together like you. I'm pretty sure, when your product comes out, people will be able to use it as another way of marketing it and making others understand that actually working together is more beneficial than working in isolation".* Also interviewee C was interested in combining various strategies and bringing more awareness to the topic by republishing my work and bringing the story to the media.

Interviewee E told me how envisioning a common agenda can help formulate further strategies: *"Now it's a lot of different actors doing their own thing and coffee farmers are doing their thing (..) and NGOs working on regenerative-agroforestry, doing their thing. (..) To get to that next level a lot of that has to do with building alliances between those different actors. I mean they are all working on their particular issues and they are gonna keep doing that but they also have this common (..) agenda that I think they would see, there is more of a dialogue between them and (..) if they can envision some (..) future situation where the (..) things that they are doing would be more encouraged and easier to do, if they can develop a vision of what that would look like then you can also from that derive what are the strategies that we need to employ to make that more likely to happen whether it is about you know developing support for organic agriculture or if its about strategies for better control of pesticides (..) and a better market sector (..) or if it's about putting pressure on the government to organise the extension system in a different way or investing in different kinds of agricultural research (..) you know so many different actors are gonna be able to take charge of different things but this (..) kind of sense of working towards a common goal, I think it's important and I think I see that happening a little bit."*

Summarising it can be said that the political economy barrier is definitely the hardest one to address as it is also related to other aspects outside of agriculture. To what extent the strategies are therefore having an impact on it is debatable. Strategies applied were mostly education, policy advocacy, breaking financial dependencies and collective action. Generally, the strategy of breaking financial dependencies, empowers farmers through making communities self-sufficient and restoring their capacity. Highlighted here was mostly building a movement through collective action to back up policy advocacy and finding a common vision to build strategies from.

4.3.4 Discursive and ideological

As we have seen earlier, for RA to flourish in Uganda it is crucial to move away from the current discourse focused on conventional modern techniques. Reasons for this are among others that values, stories, discourses, world views, etc. are drivers for TC. A new discourse is needed bringing for example an understanding that multiple crops together create a

complete productive system. It is deeply intertwined with changing the mindset and ideas of the growth- focused economic structures towards abundance and interconnection instead of scarcity as farmers are somewhere part of that system, (Wahl, 2016; Kimmerer, 2013). Understanding this and acting accordingly generally requires a certain level of empathy and value-orientation as well. For me as a consumer, for example, it means that I drink organic, fair trade coffee with organic (oat) milk because I am aware that conventional cappuccino is exploiting the coffee farmers, the planet as well as the cows held for milk production.

Value-orientation

My interviewees discussed no real strategies addressing the ideological and discursive barrier per se. However, understanding discourses we can see that all strategies can contribute indirectly to create a new one. Although, education and publicity are strategies addressing this barrier more directly as they can help create a new narrative or teach values. Analysing my interviewees' language I found partly this different understanding focusing on values. U for example mentioned ideology and further explained to me regarding values: *"I think this is basically a question of values and also (..) if we know that we cannot continue like this, what is stopping us from following the consequences? Everyone knows it's not possible to have growth forever. Everyone knows there is climate change Everyone knows that the species are dying but everyone thinks as long as I live it will be fine, and (..) it is also a question of justice (..) for the next generation."* However, if the existing strategies are capable of spreading this values and a different understanding widely enough is questionable. The current strategies to advance RA, however, help with it as education can teach new values (Iijambo, 2017) and publicity can spread them more widely. For example, as shortly discussed in the strategy part on education, the education of my interviewees contributed enormously to their empowerment. They explained how crucial it was to have their personal empowerment moments and to keep on developing themselves.

Various narratives on RA

Analysing my conversations in-depth I could identify several different narratives portraying RA. One of them labelled RA indeed as something bringing purpose, value and a new understanding. Some of the interviewees engaged in this through telling in-depth their personal story how they got introduced to RA. I, therefore, argue that RA is something they really believed in themselves, following ethics. This was especially done in the field of permaculture. Interviewee P for example highlighted several of its principles: Fair share, people care and earth care. Interviewee C found meaning in his life by doing permaculture and being able to help others with this. And interviewee U portrayed RA as a lifestyle: *"It (..) is also seen as a movement in which people engage personally and they want to engage and this is not at all the mainstream"*.

Other narratives included portraying RA as something to help reconnect to their roots, as traditional African techniques, explaining how unhealthy agrochemicals are. Also, a Mongabay article portrays how returning to agroforestry gives Kenyan indigenous communities wide-ranging benefits like improving livelihoods and environmental resilience (Mbugua, 2018). Another one portrayed RA as exactly the opposite as something 'elite' coming from abroad. For example, interviewee T explained to me the implications of starting a permaculture garden next to the new university and hospital funded by the Aga Khan Foundation, making permaculture something new, exclusive and modern. Contributing to this story is also that interviewee C told me that the initial fans of permaculture were expat

communities or people from embassies. Although, also conventional agriculture is seen as something modern and it stays debatable what is really perceived in which way.

Regarding discursive strategies focusing on environmental protection interviewee E analysed some of its limitations: *"I think there are aspects about farmers' realities where people want to not only protect the soils and improve the quality of their local environment, they also want to become better off (..) and (..) that is not always captured in these strategies of NGOs. (..) I think there is too much hope to the idea that we can change (..) people's minds and cognition."* She also discussed the discourse on returning to traditional techniques as not resonating with the ambitions farmers have for themselves. Therefore, stakeholders should be careful how much they focus on framing RA as beneficial for the environment or as returning to the roots.

Summarised it can be said that regarding the abstract barrier of discursive and ideological dimensions, the following strategies are applied: education and publicity. They portray RA as something different, however, there are several storylines told as seen above. Especially, education, teaching (children) different values and worldviews seems to be an effective tool for that, as seen through the personal experience of my interviewees. However, E also highlighted some mismatches, pointing out that the focus of some strategies is too much on changing the discourse which does not always resonate with farmers' realities.

4.3.5 Concluding thoughts on the strategies and their transformative potential

If you wish to move mountains tomorrow, you must start by lifting stones today.
African proverb

We have seen that many strategies address the barriers and have therefore a certain degree of transformative potential. Many strategies developed out of the need to address the barriers described earlier, focusing on one or several aspects simultaneously. For example education addresses the knowledge gap of the agricultural knowledge barrier and the discursive, ideological barrier. However, some strategies as defined here are very unspecific. Education for example on its own is not enough, it has to be the right form of education, appropriate for Uganda, not too theoretical etc. Also pilot projects can show good examples, however, can also show unavailable technologies.

The farmers' level barrier is easiest to address strategically and project examples show that transformative change previously occurred. The other three barriers are more difficult to address separately especially due to their deep interconnection. What limits the transformative potential of the strategies is their financially weak standing and little influence on policy level, making them unsustainable in the long term. The strategies of policy advocacy and breaking financial dependencies therefore seem to be the most powerful as they directly address those issues, rethinking current political and funding structures. If those two strategies are sufficiently included it empowers the other strategies and they have much more transformative potential. This can be done through linking strategies with each other. For this collective action is crucial, that different stakeholders on different scales start working together extensively. Also a common vision is essential so that energies can be synergised and movements can be built.

5. Ending

For tomorrow belongs to the people who prepare for it today.

African proverb

This part sums up all results (5.1) and discussion points (5.2), looking at the topic again from a broader perspective. It provides recommendations for policies and further research (5.2) as well as final reflections (5.3).

5.1 Conclusion

To conclude we will look back at the research question “*Do existing strategies to advance regenerative agriculture in Uganda address its barriers and thus have transformative potential?*”

To answer the question, I first identified seven main strategies that currently exist to advance RA in Uganda: education, research, pilot project, collective action, publicity, policy advocacy, and breaking financial dependencies. Those strategies consist of various, sometimes overlapping activities. However, they are impacted by four barriers earlier found by Isgren (2016) on the farmer level, at the agricultural knowledge system, on the political economy, and discursive/ideological level. I found that those barriers still exist and impact the strategies to different degrees, some more heavily such as the political economy and the agricultural knowledge barrier. The other two seemed to have a lesser impact on the strategies or there were contradictory opinions about their impact. I, then, looked if the strategies thus address the barriers. As the barriers were in the framework of this thesis identified with the barriers to TC, the last question analysed simultaneously if the strategies have transformative potential. On a farmers level the strategies indeed were able to bring transformation, however, the other three barriers, even though being addressed by various strategies, seemed more difficult to tackle, limiting the potential of the strategies. Many strategies also developed out of the need to address the barriers. Especially the strategies policy advocacy, collective action, and breaking financial dependencies were highlighted as crucial for addressing all four of the barriers and should thus be increasingly applied. In general governing RA is tricky, as the strategies on their own are not enough but need to be combined, precise enough and collectively applied, meaning also on an international scale.

Regarding the transformative potential of the strategies, it can be said that RA in general, has transformative potential: TC means a change to RA, and changing to RA means TC. However, general TC cannot only happen in one sector as it consists of large scale changes of whole societies on a global, national, and local level. However, agriculture being at the nexus of, among others, food, water and landscape management and especially RA with its focus on local, context-specific solutions and working with nature can play a key role in changing also other aspects of society. Agriculture is known for being multifunctional and, thus, definitely brings with it the potential to bring positive impact to several fields if done regeneratively. As RA has this potential, also strategies to advance it certainly have it.

5.2 Discussion

RA is a completely different approach to agriculture and people are working hard to advance it worldwide. In Uganda, we have seen there are various strategies applied focusing on projects which educate smallholders and materially improve their situation. The strategies,

therefore, highlight the smallholders' agency for breaking out of the political and market structures. General TC is driven by changing underlying values and worldviews of societies. As societies consist of individuals, I see the relevance of focusing on agency as changing values requires working on the individual as much as on the collective. This helps individuals to align themselves with their values and follow their beliefs and desires, the drivers for TC. Therefore, I personally believe in agency, however, analysing the intertwined barriers in-depth led me to understand how much more also the structures need to be addressed directly. That interviewees discussed the need for political leaders taking responsibility is therefore interesting. The strategies helping to advance this like policy advocacy and breaking financial dependencies can here be of great relevance.

RA as a local approach seems to be a promising concept also in the context of just transformations. Earlier, I discussed the need for them especially regarding historical phenomena such as (neo-)colonialism and their influence on situations nowadays. The focus of RA on local knowledge, empowerment, and bottom-up solutions seems very relevant considering this. The specific aspects of the strategies focusing on how to teach particularly Ugandans or on local experiments, participation, shortening value-chains, can here shift power relations. This can help move towards the goal of just transformations, regenerating thus not only the planet but also communities.

Regeneration is being discussed as the new sustainability, in 'participating with' the environment instead of doing 'less damage' to it (Reed, 2007). Also, TC is thematised as having this as a starting point. In a society like Uganda that is still very closely connected to agriculture and over half the population employed in it, transforming the agricultural sector regeneratively might help to bring transformation to various fields simultaneously. In the Western world, for example, people are more distant from it and just buy their food in the supermarkets. However, the change won't be easy anywhere and there will be different challenges in Uganda than in Europe. Even though the path-dependency on an ideological level might be the same, just materially speaking of for example land distribution or practical agricultural experiences it might be easier in East Africa.

As Isgren's work built the foundation of my research, my findings confirm to her work on RA in Uganda and also suit other previous research by for example Sherwood and Uphoff (2000) that research, practice, and political action have to be linked to improving agriculture. I also highlight participation, collaboration, small steps and local leadership/initiatives like Larrea and Sherwood (2000) do for more effective rural development. My research, therefore, contributes to the wider field, while adding critical and TC perspectives as I aimed to.

Recommendations for further research

As just mentioned a few, much research has been done on agricultural transitions worldwide. However, much has been researched also on societal transitions in general, looking at social movement development, windows of opportunities, etc. It is relevant to explore how these researches can be transferred to the Ugandan context. Then also, looking in-depth at single strategies, collective action, policy advocacy or breaking financial dependencies would help us to understand where those are limited and how this can be overcome. For this, case studies of single organisations might be interesting. Another aspect worth exploring deeply is the political situation regarding agriculture in Uganda to understand

where policy advocacy can tackle the issue at hand. We have seen that many strategies are currently limited through their little influence on the policy level.

Earlier in the agricultural knowledge barrier, I discussed that much research needs to be done to advance RA. I tried to bring various perspectives into this work, coming from a natural science background, writing this thesis as a final work of a social science program. However, I understand little about the controversy on technical, and very specific questions on RA. Enabling research in that direction seems crucial to strengthen RA's position, thus helping find concrete solutions for issues related to practicability or profitability.

Policy recommendations

It feels ambitious for me to recommend policies that might be needed to address all barriers in Uganda as I am still an 'outsider' and am only able to understand societal problems on a surface level. Therefore, I want to point out that I can only give a theoretical perspective on the topic and bring the empirical data together.

Those data showed clearly the need for broader support for RA from an institutional governmental side including regulating the Ugandan market, foreign investments, and trade agreements, and breaking financial dependencies in that regard. Further support should then definitely cover more investment into researching and implementing RA. This can be done through financially supporting farmers during initial transitions. As implementing policies is difficult due to corruption etc, involving local leaders seems important as they focus on local problems and solutions.

5.3 Reflections

Writing this thesis enabled an enormous learning process for me by looking in-depth at a broad range of interconnected barriers that hinder not only RA but general sustainable development. I indeed discuss not only agriculture per se but raise several of the world's wicked problems created through historical phenomena and developments such as (neo-) colonialism and foreign aid. For me, it helped to understand that it is not only the problems that are interconnected but also the solutions. If you tackle one problem, you are solving several others at the same time like bringing independence to farmers, and reducing (neo-) colonial tendencies, while enabling the protection of the environment. The four barriers are actually powerful to investigate to understand a number of the sustainability challenges we are facing and inspired me to get more politically involved myself in the future.

Despite being a huge learning process for me personally, this research was rather limited in its set-up due to the small number of interviews, and the little insight I could gain into the real-life situation as I wrote this thesis online from the Netherlands without having ever been to Uganda. In a time without this global pandemic, we are experiencing now, discovering Uganda first hand would have greatly benefited my research. COVID-19, however, made it impossible to travel and conduct a field study, and also reduced the amount of time I was able to spend in the Dutch office of 'Aidenvironment' to receive input from the experts there. If I would have to write my thesis in these circumstances again, I would try to gain much more knowledge from those experts. Generally, my research would have been of greater relevance with a larger number of interviews including governmental actors to understand much more how they see the situation. Also focusing more on the information shared in the

WhatsApp group or conduct an online discussion with participants might have added relevant information.

Limiting in scope was also that the interviewees I found were mostly from the same circle as they were predominantly permaculturists. Permaculture has three main ethics and can be described as a deeply ethical approach. Although I tried to diversify my interviewees and sources as I discuss RA generally and not only permaculture my work might have been influenced through those specific permaculture approaches. Being engaged in permaculture myself might have further increased these biases.

As raised earlier, my own European background made me question several times if I was the right person to write this thesis as I personally believe a real TC should not be influenced by underlying colonial power structures in which foreigners judge the processes of other countries. I, therefore, carefully chose abduction as a rather flexible research approach and do not discuss any brand-new strategies and solutions. Instead, I tried to bring together what is happening on various grounds. Social structures and movements are always different and context-specific, which made it impossible for me to fully portray the situation in Uganda. The specific paper by Isgren (2016) enormously helped me to understand the situation and built the framework; however, my research was also very much guided by it and would have improved through diversified sources.

Looking back at the research process, it took me quite some time to narrow down the focus of my thesis and I lost myself for weeks in ethical considerations without being able to move forward. Even though I consider this time as not being completely unproductive as it started many personal processes, I would now approach the topic from a more solution-oriented pragmatic angle. However, ending with a positive note on that, uncovering those issues also contributes to free myself from them. Sustainability as a per se normative topic needs to allow these processes. For me, writing a thesis in it should lastly include those considerations for a successful process.

References

- Actualitix - World Atlas. (2014). Uganda Statistics Agriculture. *Data from the World Bank*. Retrieved from: <https://en.actualitix.com/country/uga/statistics-agriculture-uganda.php>
- Adhikari, Umesh A., Pouyan Nejadhashemi, and Sean A. Woznicki. (2015). Climate change and eastern Africa: A review of impact on major crops. *Food and Energy Security* 4 (2): 110–132. <https://doi.org/10.1002/fes3.61>
- Africa Agriculture Status Report. (2013). Africa Agriculture Status Report: Focus on Staple Crops. *Nairobi, Kenya: Alliance for a Green Revolution in Africa (AGRA)*. Retrieved from: [Untitled](#)
- African Development Bank. (2019). East Africa Economic Outlook 2019: Macroeconomic developments and prospect - Political economy of regional integration. *African Development Bank Group*. Retrieved from: [East Africa Economic Outlook 2019](#)
- Ahearn, L. M. (2001). Language and agency. *Annual review of anthropology*, 30(1), 109-137.
- Anderson, C. R., Maughan, C., & Pimbert, M. P. (2019). Transformative agroecology learning in Europe: building consciousness, skills and collective capacity for food sovereignty. *Agriculture and Human Values*, 36(3), 531-547.
- Anderson, S. (2019). *One Size Fits None: A Farm Girl's Search for the Promise of Regenerative Agriculture*. University of Nebraska Press.
- Appear (2020, 20 April). MSc programme in Agroecology successfully launched at Mountains of the Moon University, Fort Portal, Appear. Retrieved from: [Article](#)
- Archer, E. R., Dziba, L. E., Mulongoy, K. J., Maoela, M. A., & Walters, M. (2018). *The IPBES regional assessment report on biodiversity and ecosystem services for Africa*. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).
- Bahiigwa, G., Rigby, D., & Woodhouse, P. (2005). Right target, wrong mechanism? Agricultural modernization and poverty reduction in Uganda. *World Development*, 33(3), 481-496.
- Bahl, S., Milne, G. R., Ross, S. M., Mick, D. G., Grier, S. A., Chugani, S. K., ... & Schindler, R. M. (2016). Mindfulness: Its transformative potential for consumer, societal, and environmental well-being. *Journal of Public Policy & Marketing*, 35(2), 198-210.
- Barratt, C., Mbonye, M., & Seeley, J. (2012). Between town and country: shifting identity and migrant youth in Uganda. *The Journal of modern African studies*, 201-223.
- Barrett, C. B. (2010). Measuring food insecurity. *Science*, 327(5967), 825-828.
- Bayite-Kasule, S. (2009). *Inorganic fertilizer in Uganda: Knowledge gaps, profitability, subsidy, and implications of a national policy*. International Food Policy Research Institute (IFPRI).
- Bernard, B., & Lux, A. (2017). How to feed the world sustainably: an overview of the discourse on agroecology and sustainable intensification. *Regional Environmental Change*, 17(5), 1279-1290.
- Biovision Foundation for Ecological Development & IPES-Food. 2020. Money Flows: What is holding back investment in agroecological research for Africa? Biovision Foundation for Ecological Development & International Panel of Experts on Sustainable Food Systems <https://www.agroecology-pool.org/moneyflowsreport/>
- Birkenkrahe, M. (2014, August). Using storytelling methods to improve emotion, motivation and attitude of students writing scientific papers and theses. In *2014 IEEE 13th International Conference on Cognitive Informatics and Cognitive Computing* (pp. 140-145). IEEE.
- Bohman, J. (Winter 2019 Edition). Critical Theory. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), Retrieved from: <https://plato.stanford.edu/archives/win2019/entries/critical-theory/>
- Brand, U. (2014). Sozial-ökologische Transformation als gesellschaftspolitisches Projekt. *Kurswechsel*, 2(2014), 7-18.
- Brett, E. A. (1995). AND SOCIAL CHANGE IN UGANDA. *The new institutional economics and Third World development*, 200.

- Brown, Gabe. (2018). *Dirt to Soil: One Family's Journey into Regenerative Agriculture*. White River Junction, VT: Chelsea Green Publishing.
- Bruns, A., & Gerend, J. (2018). In Search of a Decolonial Urban Transformation. *GAIA-Ecological Perspectives for Science and Society*, 27(3), 293-297.
- Bunn, C., Läderach, P., Rivera, O. O., & Kirschke, D. (2015). A bitter cup: climate change profile of global production of Arabica and Robusta coffee. *Climatic Change*, 129(1), 89-101.
- Call, M., Gray, C., & Jagger, P. (2019). Smallholder responses to climate anomalies in rural Uganda. *World Development*, 115, 132-144.
- Carolan, M. S. (2006). Do you see what I see? Examining the epistemic barriers to sustainable agriculture. *Rural sociology*, 71(2), 232-260.
- Codur, A. M., & Watson, J. (2018). Climate smart or regenerative agriculture. *GDAE Climate Policy Brief*, 9.
- Danone (2020) Website <https://www.danone.com/impact/planet/regenerative-agriculture.html>
- Devetak, R. (2012). Vico contra Kant: The competing critical theories of Cox and Linklater. *Critical theory in international relations and security studies*, 115-26.
- de Haan, F. J., & Rotmans, J. (2018). A proposed theoretical framework for actors in transformative change. *Technological Forecasting and Social Change*, 128, 275-286.
- De Schutter, O. (2010). Agroecology and the right to food. In *Proceedings of the Human Rights Council 16th Session Agenda Item 3. A/HRC/16/49, United Nations General Assembly, New York, NY, USA*, 20 December 2010; Available online: [anglais](#)
- Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., ... & Bartuska, A. (2015). The IPBES Conceptual Framework—connecting nature and people. *Current Opinion in Environmental Sustainability*, 14, 1-16.
- Dogliotti, S., García, M. C., Peluffo, S., Dieste, J. P., Pedemonte, A. J., Bacigalupe, G. F., ... & Rossing, W. A. H. (2014). Co-innovation of family farm systems: A systems approach to sustainable agriculture. *Agricultural Systems*, 126, 76-86.
- Dow, J. W. (2006). The evolution of knowledge systems: Narrative knowledge versus scientific knowledge. *Cross-Cultural Research (SCCR)*, 1-32.
- Dutton, J. E., Lilius, J. M., & Kanov, J. M. (2007). The transformative potential of compassion at work. *Handbook of transformative cooperation: New designs and dynamics*, 1, 107-126.
- Eakin, H. (2005). Institutional change, climate risk, and rural vulnerability: Cases from Central Mexico. *World development*, 33(11), 1923-1938.
- Elevitch, C. R., Mazaroli, D. N., & Ragone, D. (2018). Agroforestry standards for regenerative agriculture. *Sustainability*, 10(9), 3337.
- Elver, H. (2020). Critical perspective on food systems, food crises and the future of the right to food. - Report of the Special Rapporteur on the right to food. In *Proceedings of the Human Rights Council 43th Session Agenda Item 3. A/HRC/43/44, United Nations General Assembly, New York, NY, USA*, 21 January 2020 Retrieved from: <https://undocs.org/en/A/HRC/43/44>
- Fausti SW, Lundgren JG. 2015. The causes and unintended consequences of a paradigm shift in corn production practices. *Environmental Science & Policy* 52:41–50
DOI 10.1016/j.envsci.2015.04.017.
- FAO, I., & Unicef. (2015). WFP. *The state of food insecurity in the world*, 46.
- FAO. (2018a). FAO's work on agroecology - A pathway to achieve the SDGs. *Rome: Food and Agriculture Organization of the United Nations (FAO)*, Retrieved from: <http://www.fao.org/documents/card/en/c/I9021EN>
- FAO. (2018b). Country- Gender Assessment Series - National gender profile of agriculture and rural livelihoods: Uganda <http://www.fao.org/3/i8436en/I8436EN.pdf>
- FAO. (2020). Helping Uganda's agriculture grow in a changing world. <http://www.fao.org/in-action/helping-ugandas-agriculture-grow-in-a-changing-world/en/>
- Ferguson, R. S., & Lovell, S. T. (2014). Permaculture for agroecology: design, movement, practice, and worldview. A review. *Agronomy for Sustainable Development*, 34(2), 251-274.
- Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience

- thinking: integrating resilience, adaptability and transformability. *Ecology and society*, 15(4).
- Fowler, M., & Rauschendorfer, J. (2019). Agro-industrialisation in Uganda. International Growth Center. F-IH-UGA-006-2
- Francis, C. A., Harwood, R. R., & Parr, J. F. (1986). The potential for regenerative agriculture in the developing world. *American Journal of Alternative Agriculture*, 1(2), 65-74.
- Frison, E.A.; IPES-Food. (2016) From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems. Louvain-la-Neuve (Belgium): IPES, 96 p. Retrieved from: <https://cgspace.cgiar.org/handle/10568/75659>
- Gadgil, M., F. Berkes, and C. Folke. 1993. Indigenous knowledge for biodiversity conservation. *Ambio: Journal of the Human Environment* 22:151–6.
- Gerber PJ, Steinfeld H, Henderson B, Mottet A, Opio C, Dijkman J, Falcucci A, Tempio G: *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*. Rome: Food and Agriculture Organization of the United Nations (FAO); 2013.
- Gibbons, L. V. (2020). Regenerative—The New Sustainable?. *Sustainability*, 12(13), 5483. <https://www.mdpi.com/2071-1050/12/13/5483>
- Gollin, D., & Rogerson, R. (2010). *Agriculture, roads, and economic development in Uganda* (No. w15863). National Bureau of Economic Research.
- GRAIN (2017 21 Aug). Colonialism's new clothes: The EU's Economic Partnership Agreements with Africa. Retrieved from: <https://www.grain.org/en/article/5777-colonialism-s-new-clothes-the-eu-s-economic-partnership-agreements-with-africa>
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, 2(163-194), 105.
- Gubrium, J. F., & Holstein, J. A. (2001). *Handbook of interview research: Context and method*. Sage Publications.
- Hammersley, M., & Atkinson, P. (1995). *Ethnography: Practices and principles*. New York: Routledge. Retrieved December, 2, 2008.
- Hanson, L. (2010). Global Citizenship, Global Health, and the Internationalization of Curriculum: A Study of Transformative Potential. *Journal of Studies in International Education*, 14(1), 70–88. <https://doi.org/10.1177/1028315308323207>
- Harding, S. G. (Ed.). (1987). *Feminism and methodology: Social science issues*. Indiana University Press.
- Hardman, J. (2010). REGENERATIVE LEADERSHIP: A Model for Transforming People and Organizations for Sustainability in Business, Education, and Community. *Integral Leadership Review*, 10(5).
- Hathaway, M. D. (2016). Agroecology and permaculture: addressing key ecological problems by rethinking and redesigning agricultural systems. *Journal of Environmental Studies and Sciences*, 6(2), 239-250.
- Haxeltine, A., Avelino, F., Pel, B., Dumitru, A., Kemp, R., Longhurst, N., ... & Wittmayer, J. M. (2016). A framework for transformative social innovation. *TRANSIT working paper*, 5, 2-1.
- Hintz, C. M. H. (2015). "Soil in My Blood:" *Women Farmers, Transformative Learning, and Regenerative Agriculture* (Doctoral dissertation, Prescott College).
- Holmgren, D. (2007). *Essence of permaculture*. Hepburn: Holmgren Design Services.
- Hölscher, K., Wittmayer, J. M., & Loorbach, D. (2018). Transition versus transformation: what's the difference?. *Environmental Innovation and Societal Transitions*, 27, 1-3.
- Horkheimer, M., 1972. *Bemerkungen zur Religion*, Frankfurt: Fisher Verlag
- Hutchins, G., & Storm, L. (2019). *Regenerative Leadership: The DNA of Life-affirming 21st Century Organizations*. Wordzworth Publishing [.
- Iijambo, T. C. (2017). Democratic values, norms and education in post-colonial societies. *Democracy and Education in Namibia and Beyond: A Critical Appraisal*, 51.
- Ikerd, J. E. (1993). The need for a system approach to sustainable agriculture. *Agriculture, Ecosystems & Environment*, 46(1-4), 147-160.
- IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and

- ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.
https://ipbes.net/sites/default/files/2020-02/ipbes_global_assessment_report_summary_for_policymakers_en.pdf
- IPCC (2019). Summary for Policymakers. In: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.
- Isaacson, L. (2019) What's in the wrd: Regeneration, personal blog, retrieved from: <https://laraeisaacson.wordpress.com/2019/09/12/whats-in-the-word-regeneration/>
- Isgren, E. (2016). No quick fixes: four interacting constraints to advancing agroecology in Uganda. *International Journal of Agricultural Sustainability*, 14(4), 428-447.
- Isgren, E. (2018a). *Between Nature and Modernity: Agroecology as an alternative development pathway: the case of Uganda*. Lund University.
- Isgren, E. (2018b). 'If the change is going to happen it's not by us': Exploring the role of NGOs in the politicization of Ugandan agriculture. *Journal of Rural Studies*, 63, 180-189.
- Isgren, E., Jerneck, A., & O'Byrne, D. (2017). Pluralism in search of sustainability: Ethics, knowledge and methodology in sustainability science. *Challenges in Sustainability*, 5(1), 2-6.
- 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.
- Islam, S. N., & Iversen, K. (2018). *From "Structural Change" to "Transformative Change": Rationale and Implications*. United Nations, Department of Economic and Social Affairs.
- Jonas, M. (2016, November). Transition or Transformation?. In *Beyond Transition? Understanding and Achieving Sustainable Consumption through Social Innovation. Proceedings of the SCORAI Europe Workshop, 17 Noember 2015, Vienna, Austria. Sustainable Consumption Transition Series, Issue 5*.
- Jones, P. G., & Thornton, P. K. (2003). The potential impacts of climate change on maize production in Africa and Latin America in 2055. *Global environmental change*, 13(1), 51-59.
- Joyce Farms, (2020). Regenerative Agriculture, 15.04.2020 retrieved from: <https://joyce-farms.com/pages/regenerative-agriculture>
- Jumba, F. R., Tibasiima, T., Byaruhanga, E., Aijuka, J., Pabst, H., Nakalanda, J. M., & Kabaseke, C. (2020). COVID 19: Lets act now: the urgent need for upscaling agroecology in Uganda (2020). *International Journal of Agricultural Sustainability*, 1-7.
- Kahsay, G. A., & Hansen, L. G. (2016). The effect of climate change and adaptation policy on agricultural production in Eastern Africa. *Ecological Economics*, 121, 54-64.
- Kasimbazi, E. (2020). Legal and Regulatory Framework for the Agriculture Sector in Uganda. In *Legal Instruments for Sustainable Soil Management in Africa* (pp. 55-78). Springer, Cham.
- Katz, Y. Against storytelling of scientific results. *Nat Methods* 10, 1045 (2013).
<https://doi.org/10.1038/nmeth.2699>
- Kimbrell, A. (Ed.). (2002). *The fatal harvest reader: The tragedy of industrial agriculture*. Island Press.
- Kimmerer, R. W. (2013). Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants. Milkweed Editions.
- Kiiza, J. (2012). New Developmentalism in the Old Wineskin of Neoliberalism in Uganda. In *Developmental Politics in Transition* (pp. 211-232). Palgrave Macmillan, London.
- Kloppenburg Jr, J. (1991). Social theory and the de/reconstruction of agricultural science: Local

- knowledge for an alternative agriculture 1. *Rural sociology*, 56(4), 519-548.
- Kyomugisha, E. (2008). Land tenure and agricultural productivity in Uganda. *IFPRI Brief. Washington DC: International Food Policy Research Institute (IFPRI)*.
- LaCanne, C. E., & Lundgren, J. G. (2018). Regenerative agriculture: merging farming and natural resource conservation profitably. *PeerJ*, 6, e4428.
- Lafferty, W. M. (1996). The politics of sustainable development: global norms for national implementation. *Environmental politics*, 5(2), 185-208.
- Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. *Proceedings of the national Academy of Sciences*, 105(6), 1786-1793.
- Massy, C. J. (2013). Transforming the Earth: a study in the change of agricultural mindscapes. *Australian National University*
- Martinez-Alier, J. (2003). The Environmentalism of the poor: a study of ecological conflicts and valuation. Edward Elgar Publishing.
- Maxwell, J. A. (2008). Designing a qualitative study. *The SAGE handbook of applied social research methods*, 2, 214-253.
- Mbugua S. (2018, 24.May). Agroforestry gives Kenyan indigenous community a lifeline. *Mongabay*. Retrieved from: <https://news.mongabay.com/2018/05/agroforestry-gives-kenyan-indigenous-community-a-lifeline/>
- Meadowcroft, J. (2009). What about the politics? Sustainable development, transition management, and long term energy transitions. *Policy sciences*, 42(4), 323.
- Mills, S., White, M., Brown, H., Wrieden, W., Kwasnicka, D., Halligan, J., ... & Adams, J. (2017). Health and social determinants and outcomes of home cooking: a systematic review of observational studies. *Appetite*, 111, 116-134.
- MoA Uganda (2020). Ministry Vision and Mission. *Uganda Ministry of Agriculture, Animal Industry and Fisheries*. Retrieved from: <http://www.agriculture.go.ug/the-ministry/#Vision&Mission>
- Mugwanya, N. (2019). Why agroecology is a dead end for Africa. *Outlook on Agriculture*, 48(2), 113-116.
- Nalere, P and Yago, MA and Kenny, O (2015) The contribution of rural institutions to rural develop-ment: Study of smallholder farmer groups and NGOs in Uganda. *International NGO Journal*, 10 (4).37 - 51. ISSN 1993-8225 DOI: <https://doi.org/10.5897/INGOJ2015.029>
- Naluyima, E. (2018, March). *Emma Naluyima: How I turn a profit on an acre of land* [Video file]. Retrieved from: https://www.ted.com/talks/emma_naluyima_how_i_turn_a_profit_on_an_acre_of_land
- Naluyima, E. (2020). Emma Naluyima Website: About Emma. Retrieved from: <http://emmanaluyima.com/about-us/>
- Nelkin, D. (1979). Scientific knowledge, public policy, and democracy: A review essay. *Knowledge*, 1(1), 106-122.
- O'Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography*, 36(5), 667-676.
- Ott, C. (2017). Enabling Transformative Research: Lessons from the Eastern and Southern Africa Partnership Programme (1999-2015). *Challenges In Sustainability*, 5(1), 15-23. doi:10.12924/cis2017.05010015
- Parpart, J. L. (2014). Exploring the transformative potential of gender mainstreaming in international development institutions. *Journal of international Development*, 26(3), 382-395.
- Parsons, M., Fisher, K., & Nalau, J. (2016). Alternative approaches to co-design: insights from indigenous/academic research collaborations. *Current Opinion in Environmental Sustainability*, 20, 99-105.
- Patagonia (2018). Regenerative Organic Certification. *YouTube Video*. Retrieved from: https://www.youtube.com/watch?time_continue=149&v=a0OZi44FLtM&feature=emb_logo
- Patagonia (2020). Why Regenerative Organic. Retrieved from: <https://eu.patagonia.com/nl/en/contentsearch/?fdid=regenerative-organic>

- Patel S., (2015). The research paradigm - methodology, epistemology and ontology - explained in simple language, Retrieved from: <http://salmapatel.co.uk/academia/the-research-paradigm-methodology-epistemology-and-ontology-explained-in-simple-language/>
- Patterson, J., Schulz, K., Vervoort, J., Van Der Hel, S., Widerberg, O., Adler, C., ... & Barau, A. (2017). Exploring the governance and politics of transformations towards sustainability. *Environmental Innovation and Societal Transitions*, 24, 1-16.
- Paulson, S. (2011). The use of ethnography and narrative interviews in a study of 'cultures of dance'. *Journal of Health Psychology*, 16(1), 148-157.
- Pelling, M., & Manuel-Navarrete, D. (2011). From resilience to transformation: the adaptive cycle in two Mexican urban centers. *Ecology and Society*, 16(2).
- Polanyi, K., & MacIver, R. M. (1944). *The great transformation* (Vol. 2, p. 145). Boston: Beacon press.
- Pretty JN. 1995. Regenerating agriculture: policies and practice for sustainability and self-reliance. Washington, D.C.: Joseph Henry Press.
- Price, J. N. (2001). Action research, pedagogy and change: The transformative potential of action research in pre-service teacher education. *Journal of curriculum studies*, 33(1), 43-74.
- Raithelhuber, E. (2008). Von Akteuren und agency—eine sozialtheoretische Einordnung der structure/agency-Debatte. *Vom Adressaten zum Akteur: Soziale Arbeit und Agency*, 17-45.
- Raworth, K. (2012). A safe and just space for humanity: can we live within the doughnut. *Oxfam Policy and Practice: Climate Change and Resilience*, 8(1), 1-26.
- Raworth, K. (2017). A Doughnut for the Anthropocene: humanity's compass in the 21st century. *The lancet planetary health*, 1(2), e48-e49.
- Regeneration International <https://regenerationinternational.org/about-us/>
- Regenerative Agriculture Definition Website (2020). Retrieved from (April 2020): <http://www.regenerativeagriculturedefinition.com>
- RegenOrganic (2020). Farm like the world depends on it - Our story. Retrieved from: <https://regenorganic.org/#our-story>
- Reij, C., Tappan, G., & Smale, M. (2009). Agroenvironmental transformation in the Sahel. *Food Policy, IFPRI Discussion Paper*. <http://www.ifpri.org/sites/default/files/publications/ifpridp00914.pdf>
- Rhodes, C. J. (2012). Feeding and healing the world: through regenerative agriculture and permaculture. *Science progress*, 95(4), 345-446.
- Rhodes, C. J. (2017). The imperative for regenerative agriculture. *Science Progress*, 100(1), 80-129.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Nykvist, B. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*, 14(2).
- Romero-Lankao, P., Bulkeley, H., Pelling, M., Burch, S., Gordon, D. J., Gupta, J., ... & Tozer, L. (2018). Urban transformative potential in a changing climate. *Nature Climate Change*, 8(9), 754-756.
- Rugadya, M. A. (2009). Escalating land conflicts in Uganda. *A Review of Evidence from Recent Studies and Surveys. The International Republican Institute, The Uganda Round Table Foundation*.
- Sarr, F. (2016). *Afrotopia*. Editions Philippe Rey 2016, Deutsche Übersetzung von 2019, Matthes & Seitz Berlin
- Schneidewind, U., & Singer-Brodowski, M. (2015). Enabling the great transformation: transdisciplinarity as individual and institutional challenge. Published in: *Schmidt, Falk/Nuttall, Nick (eds.): Contributions towards a sustainable world: in dialogue with Klaus Töpfer*. - München: oekom Verlag, 2014 pp.189-200. Retrieved from: https://epub.wupperinst.org/frontdoor/deliver/index/docId/5815/file/5815_Schneidewind.pdf
- Scholes, R.J., Biggs, R., (Eds.), 2004. Ecosystem Services in Southern Africa: a Regional Assessment. Millennium Ecosystem Assessment. Available from: <http://www.millenniumassessment.org>.
- Seitanidi, M. M., Koufopoulos, D. N., & Palmer, P. (2010). Partnership formation for change:

- Indicators for transformative potential in cross sector social partnerships. *Journal of Business Ethics*, 94(1), 139-161.
- Sen, A. (1982). Poverty and famines: an essay on entitlement and deprivation. Oxford university press.
- Serdeczny, O., Adams, S., Baarsch, F., Coumou, D., Robinson, A., Hare, W., ... & Reinhardt, J. (2017). Climate change impacts in Sub-Saharan Africa: from physical changes to their social repercussions. *Regional Environmental Change*, 17(6), 1585-1600.
- Sharpe, R. (2018) Uganda: Overview of corruption and anti-corruption. *U4 Anti-Corruption Resource Centre, Chr. Michelsen Institute (U4 Helpdesk Answer 2018:26)*
<https://www.u4.no/publications/uganda-overview-of-corruption-and-anti-corruption-2018>
- Sheahan, M., & Barrett, C. B. (2017). Ten striking facts about agricultural input use in Sub-Saharan Africa. *Food Policy*, 67, 12-25.
- Sherwood, S., & Larrea, S. (2000). Looking back to see ahead: Farmer lessons and recommendations after 15 years of innovation and leadership in Güinope, Honduras. *Agriculture and Human Values*, 18(2), 195-208.
- Slingo, J., Spencer, H., Hoskins, B., Berrisford, P., & Black, E. (2005). The meteorology of the Western Indian Ocean, and the influence of the East African Highlands. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 363(1826), 25-42.
- Soloviev, E. (2017). Regenerative Agriculture Redefined. *Medium*. Retrieved from:
<https://medium.com/@ethansoloviev/regenerative-agriculture-redefined-1e998d591ee6>
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Folke, C. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223).
- Steinfeld, H., Gerber, P., Wassenaar, T. D., Castel, V., Rosales, M., Rosales, M., & de Haan, C. (2006). *Livestock's long shadow: environmental issues and options*. Food & Agriculture Org.
- Sterling, S. (2004). An analysis of the development of sustainability education internationally: Evolution, interpretation and transformative potential. *The sustainability curriculum: The challenge for higher education*, 43-62.
- Tangri, R., & Mwenda, A. M. (2008). Elite corruption and politics in Uganda. *Commonwealth & Comparative Politics*, 46(2), 177-194.
<https://www.tandfonline.com/doi/full/10.1080/14662040802005336>
- Tegtmeier, E. M., & Duffy, M. D. (2004). External costs of agricultural production in the United States. *International Journal of agricultural sustainability*, 2(1), 1-20.
- Thomas, D. S., & Twyman, C. (2005). Equity and justice in climate change adaptation amongst natural-resource-dependent societies. *Global environmental change*, 15(2), 115-124.
- Thornton, P. K., Jones, P. G., Alagarswamy, G., & Andresen, J. (2009). Spatial variation of crop yield response to climate change in East Africa. *Global Environmental Change*, 19(1), 54-65.
- Thornton, P. K., Jones, P. G., Alagarswamy, G., Andresen, J., & Herrero, M. (2010). Adapting to climate change: agricultural system and household impacts in East Africa. *Agricultural systems*, 103(2), 73-82.
- Toensmeier, E. (2016). The carbon farming solution: a global toolkit of perennial crops and regenerative agriculture practices for climate change mitigation and food security. *Chelsea Green Publishing*.
- UNDP in Uganda. (2018). The Uganda Green Incubation Programme (UGIP) - Songhai Model. *Youtube video*. Retrieved from: <https://www.youtube.com/watch?v=bk6pzXejtNY>
- UNECA (United Nations Economic Commission for Africa) (2020). Macroeconomic and Social Developments in Eastern Africa 2020: Benchmarking Performance towards National, Regional and International Goals. ©2020 United Nations Economic Commission for Africa.
https://www.uneca.org/sites/default/files/PublicationFiles/macroeconomic_social_uneca_sro-ea_feb24.pdf
- Van Egmond, N. D., & De Vries, H. J. M. (2011). Sustainability: The search for the integral worldview.

- Futures*, 43(8), 853-867.
<https://www.sciencedirect-com.ru.idm.oclc.org/science/article/pii/S0016328711001340>
- Van Thiel, S. (2014). *Research methods in public administration and public management: An introduction*. Routledge.
- VLSM Uganda (2016). Best agronomic and post harvest handling practices for soybean – an illustrated guide for smallholder farmers. Retrieved from:
<https://www.pelumuganda.org/download/2016-best-agronomic-and-post-harvest-handling-practices-for-soybean-an-illustrated-guide-for-smallholder-farmers/>
- von Wehrden, H., Luederitz, C., Leventon, J., & Russell, S. (2017). Methodological challenges in sustainability science: A call for method plurality, procedural rigor and longitudinal research. *Challenges in Sustainability*, 5(1), 35-42.
- Wahl, D. (2016). *Designing regenerative cultures*. Triarchy Press.
- WBGU (2011a). Factsheet no.4: The transformation towards sustainability. *German Advisory Council on Global Change*. Retrieved from:
<https://www.wbgu.de/en/publications/publication/factsheet-the-transformation-towards-sustainability>
- WBGU (2011b). Flagship Report: World in Transition: A Social Contract for Sustainability. *German Advisory Council on Global Change, Berlin* Retrieved from:
https://issuu.com/wbgu/docs/wbgu_jg2011_en?e=37591641/69400200
- White, C. (2020). Why Regenerative Agriculture?. *American Journal of Economics and Sociology*, 79(3), 799-812.
- Wiek, A., Ness, B., Schweizer-Ries, P., Brand, F. S., & Farioli, F. (2012). From complex systems analysis to transformational change: a comparative appraisal of sustainability science projects. *Sustainability science*, 7(1), 5-24.
- Winkler, H. A. (2009). *Geschichte des Westens: Von den Anfängen in der Antike bis zum 20. Jahrhundert*. München: CH Beck.
- Wodak, R. (2006). Dilemmas of discourse (analysis). *Language in Society* 35, 595-611
- Woodhouse, P. (2010). Beyond industrial agriculture? Some questions about farm size, productivity and sustainability. *Journal of agrarian change*, 10(3), 437-453.

Figures

Titlepage: Dr. Mwatima Abdalla Juma. Director of Practical Permaculture Institute Zanzibar and owner of Msonge Organic Family Farm in Zanzibar, retrieved from the WhatsApp group.

Figure 1: Retrieved from: <https://www.permaculture.co.uk/articles/how-permaculture-can-restore-ecosystems-communities>

Figure 2: © Joan Egert/Dreamstime.com, Retrieved from: <https://www.britannica.com/place/Kenya/Agriculture-forestry-and-fishing>

Figure 3: Soloviev, 2017

Figure 4: beetrooted.wordpress.com

Figure 5: Raworth, 2017

Figure 6: IPBES, 2019, p.40

Figure 7: conceptual framework made by author

Figure 8: Patel, 2015

Figure 9: retrieved from the WhatsApp group.

Figure 10: taken by author or her sister Natascha Roosen

Figure 11: taken by author

Figure 12: retrieved from the WhatsApp group.

Figure 13 above: Dr Silke Bollmohr, CEO of Hamana and EcoTrac Consulting, retrieved from the WhatsApp group.

Figure 13 below: Paul Mollel, retrieved from the WhatsApp group.

Figure 14: Retrieved from: <https://www.agroecology-pool.org/moneyflowsreport/>