ARE THE ROOTS DEEP ENOUGH?

A transnational social-ecological system analysis of the Great Green Wall implementation

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Master's Thesis for the Environment and Society Studies programme
Nijmegen School of Management
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December 2021

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Summary

As we slipped into the Anthropocene, one of the greatest challenges humans are facing is tackling the climate crisis. The inadequacy and mismanagement of environmental governance systems feeds climate crises. Deserts are expanding around the world. Crucial to managing these crises is finding ways to improve environmental governance, across local and global scales. This research aims to do so by applying a Transnational Social-Ecological System (TSES) framework to the GGW implementation in Nigeria.

The occurrence of desertification is a natural process, however, its presence is also man-made. The Great Green Wall is an initiative attempting to curb the desertification coming from the Sahara. The plan was to create a vegetation barrier along the Sahel region that would be 7000 km long and 15 km wide. This gradually evolved into an integrated ecosystem management approach, leading to a patchwork of different land management, conservation, restoration and regeneration practices.

Nigeria is one of the 11 member countries of the GGW. In 2015, Nigeria set up the National Agency for the Great Green Wall (NAGGW). It represents the country's collaborative effort in addressing desertification, land degradation and ecosystem management. The NAGGW is the case study of this research. The lack of transboundary communication and knowledge sharing systems between the GGW members as well as between national, state and local levels in Nigeria creates obstacles. It restraints coordination and collaboration between project developers which disables the ability to capitalise on the positive experiences, avoid the negative developments and in this way incorporate the lessons learned to make the GGW a success.

From a theoretical perspective, the use of institutional work allows for a better understanding of how processes of transnational to local sustainability transformation, executed by environmental governance, can actually be pursued. Having an approach that exceeds merely a structural or actor-oriented perspective, places a central focus on the dynamic interplay between actors and institutional structures. This viewpoint on institutions matches a problem identified in this research through the use of applying the TSES framework.

Many of the environmental problems we are currently facing are composed of all sorts of interdependent collective action problems. Traditional top-down government approaches seem to be inefficient when managing ecosystems that cross socioeconomic boundaries (Bodin, et al., 2016). According to Bodin "environmental problems are inevitably tied to the complex structures and processes of boundary-spanning ecosystems" (Bodin, 2017, p.2). To collectively create long-lasting solutions to environmental problems, one needs to incorporate the ecosystem characteristics that are being governed (Bodin, 2017). The

effectiveness of these multi-actor collaborations will depend on the level of alignment and interconnectedness between the social and ecological layers. The SES framework highlights how humans (social) are embedded in ecosystems (ecological) due to the multiple interactions between the social and the ecological layers in the system.

The combination of the SES framework and a transboundary focus led to the creation of the TSES framework. The SES framework indicates the limits of its social reach when managing (transboundary) ecological connections. Adding a transboundary lens is relevant since it displays where the social reach is restricted in the TSES.

The problem identified in this research is that there exists a gap in the connection between the social nodes, meaning who is managing the GGW implementation in Nigeria, and the ecological nodes, meaning what is being managed. This gap obstructs TSES alignment. TSES alignment is the preferred situation in transnational environmental governance in which social nodes (actors) are easily connected across national boundaries or levels, when managing ecological nodes (ecological resources) that also cross the national boundaries or levels. This applies for the implementation of the NAGGW as well as to the GGW.

The question of how to get specific NAGGW location data online was bugging the researchers mind for a long period while writing this thesis. Data availability, the COVID-19 and other challenges led to adjustments in the subjects and approaches of this research. Whereas previously, it was planned to choose a specific NAGGW geographical location, now the NAGGW and how it operates in Nigeria as a whole were chosen as the case study for the study. To answer the research question "*How does the social-ecological system connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria?*" the following methods have been applied. Firstly, a scientific literature review was performed through desktop research. This included i.a. an analysis of policy and media documents. Secondly, semi-structured qualitative interviews were held. The interviewees were chosen with the purpose of creating a diverse selection of perspectives. Sampling the interviews this way enabled the author to research the NAGGW and GGW from a multitude of perspectives. The NAGGW and GGW is operating at a big scale and it involves a broad range of different stakeholders including international organisations, national governments, NGOs, civil societies, educational systems and local communities. Thirdly, after collecting the data from the interviews, they were coded. In the first coding phase, the codes were descriptively coded. In the second coding phase, axial coding was applied in ATLAS.ti

As an additional perspective and countercase to the transnational governance and regime focus, the Peace park framework, described by Bram Büscher is presented as a conceptual idea in chapter five. It allowed the researcher to better understand

the powers at play at the transnational level of the GGW and NAGGW according to the 3 modes of political conduct defined by Büscher. This is relevant as it sheds light on the ideologies and elements that influence the structures of the NAGGW and the GGW while operating on a transnational level for environmental conservation. In combination with the appliance of the TSES, it showed that within the neo-liberal arena of GGW implementation in Nigeria, power and hierarchy are influencing the institutional structures and who is part of the conversation. Elements of anti-politicking reinforce the status-quo of disproportional social node involvement. As long as the social nodes, within this neo-liberal arena, obtain benefit from their sole involvement, there is no incentive to create a more holistic multi-stakeholder approach.

This had led to the following key insights. In chapter 6.1 and 6.2 it was concluded that what is what is presented at the national and the transnational level does not align with what is executed on the local level. This applies to the social impact, but especially to the ecological impact. The appliance of the TSES framework showed which actors and ecological factors are missing, involved and connected. It displayed a gap in TSES alignment in management of the GGW in Nigeria which is created by the absence of particular links.

In chapter seven it was concluded that the inclusion and recognition of local communities and governments, as essential stakeholders, provides positive benefits for GGW implementation in Nigeria. It improves the social institutional connectedness of actors involved and their connection to the local implementation. Firstly, because local and grass-root communities are directly dependent on the initiative and are therefore internally motivated to contribute to its success. Secondly, local communities hold valuable local knowledge and have traditional and native ways in which to curb desertification. Top-down implementers lack this information which resulted in an overall GGW failure. Implementing local knowledge can prevent such mistakes. Thirdly, when an initiative crosses multiple levels, its stakeholders should represent these levels. The only level not taken into account in the GGW implementation in Nigeria is the local level. Involvement of local government and Civil Society Organisations as recognized stakeholders is crucial for the success of the NAGGW. In order to alter these institutional structures, to create TSES alignment and a holistic multi-stakeholder approach in which the most pivotal social nodes are involved, change needs to come from outside the existing structures.

Preface

In July 2019 I finished my Bachelor's in International Relations and International Organisations. During those years the urge to contribute to a better world for the future became undeniable. After taking a gap year exploring the different branches of sustainability, the next step became clear. I enrolled for the Masters Environment and Society Studies with a specialisation in Corporate Sustainability.

I wanted to write my thesis on a combination of my favourite topics. Food security, climate change, international and social relations, sustainability, climate justice and the role of corporations or institutions in the sustainable transitions were written down on a paper. By chance I stumbled upon the Great Green Wall. After meeting with Lothar Smith, a research idea was crafted. The COVID-19 pandemic did not allow for fieldwork to be conducted in Nigeria, however, through the internet I have felt deeply connected to my case study.

In the next decade, the importance of achieving sustainable goals set is unsurpassed. The tipping points of the planetary boundaries are in sight. The scientific, social, natural and corporate world must join forces to prevent the next decade turning into a black page in human history.

To Lothar Smith, my supervisor, thank you for your guidance through this tough and exciting process. Your enthusiasm, inspiring suggestions, mind-blowing amount of knowledge and feedback inspired and helped me in making progress every time. To the interviewees who remain anonymous, a tremendous thank you! Without the knowledge provided by you this research would have not been the same.

I present this thesis as a personal contribution to the creation of a better world.

Enjoy reading!

Jacobien ter Brugge, December, 2021

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List of Abbreviations

- GGW = the Great Green Wall
- CPR = common-pool resources
- ES = Ecosystem Services
- SES = Social-Ecological System
- TSES = Transnational Social-Ecological System
- IFAD = International Fund for Agricultural Development
- WB = World Bank
- IAEA = International Atomic Energy Agency
- CIDA = Canadian International Development Agency
- GEF = Global Environment Facility
- UNDP = United Nations Development Programme

- UNEP = United Nations Environment Programme
- UNIDO = United Nations Industrial Development Organization
- FEPA = Federal Environment Protection Agency
- SEPA = States Environmental Protection Agencies
- NAT. GOVs = National Governments
- AUC = African Union Commission
- PAGGW = Pan-African Agency of the Great Green Wall
- CENSAD = Community of Sahel-Saharan States
- ECOWAS = Economic Community of West African States
- LCBC = Lake Chad Basin Commission
- NNJC = Nigeria-Niger Joint Commission
- NSAP = National Strategic Action Plan
- GGWSAP = Great Green Wall Strategic Action Plan
- AMCEN = African Ministerial Conference on the Environment
- CILLS = Permanent Inter-State Committee on Drought Control in the Sahel
- JICA = Japan International Cooperation Agency
- DFID = Department for International Development (UK)
- AfDB = African Development Bank
- EU = European Union
- FAO = Food and Agriculture Organization
- USAID = United States Agency for International Development
- UNCED = United Nations Conference on Environment and Development
- UNCCD = United Nations Convention to Combat Desertification
- DDA = Department of Drought and Desertification Amelioration
- FDF = Federal Department of Forestry
- IUCN = International Union for Conservation of Nature and Natural Resources

Chapter 1: Introduction

We are facing nothing less than the collapse of the living world. The very thing that gave birth to our civilization. The thing we rely upon for every element of the lives we lead. No one wants this to happen. None of us can afford for it to happen.

Sir David Attenborough, [1]
A life on our Planet.

All over the world, initiatives are mushrooming to combat climate change. One of those initiatives is the Great Green Wall. In January 2021, a press release stated that the "Great Green Wall receives over $14 billion to regreen the Sahel – France, World Bank listed among donors" (UNCCD, 2021). This Great Green Wall financial accelerator will help the Great Green Wall (GGW) during its second decade in order to achieve its ambitions for the year 2030.

The GGW is a Pan-African initiative focusing on restoring and sustainably managing land. After gaining momentum in 2007 in the African Union (AU), the 11 Sahel states south of the Sahara that are being crossed by the GGW created the Pan-African Agency of the GGW to coordinate its implementation. Initially, the plan was to create a vegetation barrier along the Sahel region that would be 7000 km long and 15 km wide to curb the desertification coming from the Sahara. Recently the GGW's vision evolved from creating a vegetation barrier into an integrated ecosystem management approach, including a mosaic of different land management, conservation, restoration and regeneration practises (UNCCD, 2020). Desertification is the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture (Martello, 2004 and UNCCD, 2020). "The Sahel is among world's regions most severely affected by land degradation and desertification, having experienced recurrent severe droughts and deterioration of soil quality and vegetation cover in the last decades" (UNCCD, 2020, p.6). It is stated that around 45% of Africa's land area is impacted by desertification. This has a major influence on the livelihoods of the 135 million people that are dependent on the degraded land in the Sahel. By combating desertification, both land degradation and poverty are addressed (UNCCD, 2020).

The Pan-African Agency of the Great Green Wall (PAGGW) is the overarching organisation that is responsible for the mobilisation of resources as well as for the coordination and monitoring of the implementation of the GGW (Pan-African Great Green Wall, 2018; National Agency for the Great Green wall - Establishment Act no 3, 2015). The operationalization and monitoring of the GGW are taking place at three different levels. At the transnational level, the PAGGW influence is passed on to each GGW member state by incorporating a national GGW structure. At the

[1] Attenborough, D., & Hughes, J. (2020). A life on our planet: my witness statement and a vision for the future. Unabridged. [New York]: Hachette Audio.

national level, this GGW structure supervises and coordinates the implementation of their own national GGW prioritised actions. At the local level, the PAGGW is passed on "through a core community entity, the Integrated Sustainable Development Community Unit (ISDCU), administrated by the Local Sustainable Development Committees (LSDC)" (UNCCD, 2020, p.13).

The implementation of the GGW should be tailored to the specific needs of each country. However, collectively it should contribute to the prevailing goal, being restoring land to a certain quality and quantity level which allows for an increase in food security, improvement of economic development, reduction of migration and improvement of the overall resilience to climate change (Pan-African Great Green Wall, 2018; UNCCD, 2020). The success of the GGW relies on the ability to overcome this geopolitically infused management challenge.

1.1 The Research Problem identified in the GGW and the NAGGW

The GGW is faced with challenges regarding the implementation of a transnational plan to fit country-specific profiles while also fostering cooperation of the GGW members. It can be argued that the main challenges are being created by governance issues ranging from: "lack of coordination and engagement with other relevant sectors"; "lack of high level political support for the environmental policy agenda"; "difficulty for GGW national agencies to endorse a 'landscape approach' – an inter-sectoral approach that goes beyond jurisdictional borders and usual sectors"; "lack of mainstreaming environmental management practises into the respective sector strategies, policies and action plans and programmes to reach the local levels" and "lack of coordination, exchange and flow of information and knowledge at the regional and national levels and between the respective GGW structures" (UNCCD, 2020, p.30 & p.31).

The lack of transboundary communication and knowledge sharing systems between the GGW members as well as between national, state and local levels creates obstacles. It restraints coordination and collaboration between project developers which does not enable the ability to capitalise on the positive experiences, avoid the negative developments and in this way incorporate the lessons learned (Goffner et al., 2019; UNCCD, 2020).

In order to decipher the communicational issues that obstruct the flourishing of the GGW, it is pivotal to look at the power structures at play. By applying a social-ecological system analysis the relations within and between the social and ecological layer become clear. The social layer encompasses the actors that make a decision on the use of resources and their relationships with each other. The ecological layer includes any ecological concept (Bodin, et al., 2016). As Goffner argues, "such an analysis can highlight power relations that need to be addressed to obtain equitable distribution of ES [ecosystem services] from the actions, as well as to obtain broad participation and learning, which are among the identified principles for resilience" (Goffner et al., 2019, p. 1426). The focus on analysing

structures does not exclude room for agency within a social-ecological system (Westley et al., 2013). Social-ecological system analysis will be further explained in the conceptual model.
It is argued that to strengthen the PAN-African GGW governance it is beneficial to incorporate knowledge from different knowledge systems. Incorporating the social-ecological system analysis will shed light on all the stakeholders involved at every level of governance, such as local communities, women and youth who are often not incorporated in the decision-making process (Goffner et al., 2019).

Apart from analysing if all the relevant stakeholders are involved, the SES analysis also highlights the alignment, or lack thereof, between the social and ecological layers. This is relevant because traditional top-down government approaches seem to be inefficient when managing ecosystems that cross socioeconomic boundaries since "environmental problems are inevitably tied to the complex structures and processes of boundary-spanning ecosystems" (Bodin, 2017, p.2) and connectedness between social institutions often stops at socially constructed boundaries (Bodin, et al., 2016). This negatively influences a lot of transnational environmental governance issues that we are currently facing.

Nigeria is part of the GGW. In 2015 it set up the National Agency for the Great Green Wall (NAGGW). It represents the country's collaborative effort in addressing, amongst others, the issues of desertification, land degradation and ecosystem management (Globe). The NAGGW will be the case study of this research.

The need for a successful GGW implementation in Nigeria is very high. Unfortunately, this does not translate into a successful implementation. The devastation caused by desertification feeds into other crises ranging through the country. Due to the well-documented set up of the NAGGW, it appears that matters are under control, however, this perception vanishes when looking at the data of what is achieved over the last years. What becomes clear is that there exists a discrepancy between what has been presented at the transnational and national level and the reality at the local level.

According to Dr. Bukar Hassan, CEO of the NAGGW, one of the challenges Nigeria faces in implementing the GGW is to clearly communicate the advantages of joining the GGW projects at the local level. Farmers are more inclined to migrate when their land becomes degraded than to buy into a GGW project (Etcetera Production, 2020, YouTube).

The cooperation with the International Fund for Agricultural Development (IFAD) is part of the solution to the gap identified in this research. After 6 years of existence, the NAGGW recognizes and acts on their gap in implementation, in which pivotal actors are not taken into account as stakeholders. The focus on cooperation with IFAD is essential, both for translation of the initiative to the local level and for incorporation of all the stakeholders.

1.2 The relevance

The goal is to have successfully implemented the GGW by 2030 (Pan-African Great Green Wall, 2018). However, the GGW and the NAGGW are failing to keep up with that trajectory, as will be further explored in chapter 6. Honestly, as pointed out by Attenborough and Rockström, we do not have the luxury of time anymore to see significant initiatives with great potential fail (Rockström et al., 2009). The successful implementation of the GGW will not only have a local effect but will be felt globally (Pan-African Great Green Wall, 2018; UNCCD, 2020). Therefore, the need for a clear analysis of i.a. the management structures and roadblocks is essential for its way forward. Who is involved and who is missing? Which cooperation should be set up? How are these social actors connected to the ecological level? What is the gap in connection and how can it be solved? The Transnational Social-Ecological System (TSES) analysis applied to the social and ecological layer of the GGW implementation in Nigeria will give answers to those questions. It reinforces the argument to involve the local communities and their ability to play a crucial role. For centuries local communities have been overlooked in multi-stakeholder governance applications, while most often they would experience the direct effects, and would hold the most valuable information (Sirolli, 1999).

As argued by Beunen and Patterson (2019) a central focus should be put on the challenging political realities influencing institutional change. Applying institutional work will help better understand how processes of multi-stakeholder environmental governance can better be pursued. There is a great diversity of disciplines related to studying decision-making in multi-stakeholder environmental governance. Disciplines like communication, psychology, anthropology, social psychology and network science all offer their insights in examining the content, sentiment, and structure of decision-making practices (Gluesing et al., 2017). This variety of insights fits the complexity of the research subject. The main goal for development projects is to integrate the principles of sustainable development into country policies and programs. This creates major challenges in the development field. To create cross-sectoral integrated planning and to achieve multi-stakeholder consensus for collaborative joint projects, is complex. This increases the complexity of the multi-stakeholder interaction in decision making and requires enhanced mechanisms for stakeholder participation, coordination and commitment. Transparent scientific analyses in a multi-stakeholder governance context offers a new source of information to assist responsible decision-making regarding participation, coordination and commitment, so this is not solely based on actors' own interest (Thabrew et al., 2009).

The scientific literature on the implementation of the GGW fails to generate new literature on the application of the social-ecological system framework (Goffner et al., 2019). The epistemology of the Social-Ecological System framework "places an

institutional and anthropocentric lens on the analysis of natural resource use in the commons through suggesting the need to understand how and why cooperation (via collective action and institutions) influences governance arrangements and their ability to achieve sustainable outcomes" (Partelow, 2018, p.2). This focus that is put on humans or actors, and how or why cooperation may or may not lead to sustainable outcomes, is at the heart of this thesis. Furthermore, in order to appropriately navigate future uncertainties on how to govern the diverse social-ecological systems (SES) within Nigeria, any other member or GGW, investigating and identifying the current common barriers and difficulties that need to be overcome in the process of reaching the GGW vision is crucial. Knowledge gaps remain in how to successfully collaborate when confronted with environmental problems spanning geographical scales. Actors often tend to act in own interest or merely act collectively for the symbolic meaning. A clear outline on how to manage these situations does not exist, and is not useful due to the context-specific nature of these problems (Bodin, 2017). However, a way in which to approach these challenges is through the lens of the participating actors. Who are they, how do they relate to others, what are their interest and motives, are they part of a collaborative network? In light of the increased interest in studying collaborative management or multi-stakeholder environmental governance, the potential and use of the social-ecological system framework are of great significance for this field of study. The framework can be applied at a local or global scale (Bodin & Tengö, 2012). The independence of scale makes the framework applicable to specific contexts for studying the management and operation of ecosystems around the world. By addressing above mentioned gaps, this research will contribute to the creation of new knowledge on how to approach transnational environmental governance. The matters at hand in the world that we live in become more intertwined. The scientific relevance of interdisciplinary research becomes more fitting to study these matters, be it multi-stakeholder environmental governance or applying a framework to a social-ecological system. This thesis contributes to the study of multi-stakeholder governance by applying the social-ecological system framework to the specific context of the NAGGW and the GGW. Similar studies are already of relevance for the science of sustainability, but will become even more relevant in a world that is increasingly becoming more interconnected and interdependent.

1.3 Objective and Research Question

The objective of this research is to better understand the management of the GGW in Nigeria and to draw lessons from it for the whole of the GGW. Certain obstacles are defined in this research. The appliance of the TSES will show which actors are involved, the links between them, the ecological factors that are being managed and the links between them. Within the SES the aim is to achieve alignment of the social actors and the ecological factors they manage. The focus on alignment shows the gap and at the same time, the potential for new links to be created in the TSES applied to Nigeria.

Particular interests for this master thesis are I) GGW implementation in Nigeria; II) transnational environmental governance, and III) transnational social-ecological system analysis. The main research question, therefore, is the following:

"How does the social-ecological system connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria?"

To answer this question, the following sub-questions are asked:

1. *What are the social and ecological impacts of the Great Green Wall in Nigeria?*
2. *What are the current social-ecological system connections within the NAGGW that focus on the implementation of the Great Green Wall in Nigeria?*
3. *How does the social institutional connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria?*

These three questions capture different aspects of the main research question to give a well-researched overview of the GGW implementation in Nigeria and how the social institutional connectedness, highlighted by the appliance of TSES to the NAGGW, can have an impact on the implementation. The first question is posed to assess the status quo of the GGW implementation in Nigeria. This is important to get familiar with the case discussed. This question will be answered in chapter 6.1. The second question applies the TSES to GGW implementation in Nigeria. This displays the relevant social and ecological nodes and the existent links between them. Doing so also calls attention to the potential links and identifies the so-called 'gap'. This question will be answered in chapter 6.2. The last question works from the answers given in the first two questions, and assesses the potential of improved social institutional connectedness and the impact this can have on the local implementation. This question will be answered in chapter 7. By answering these sub-questions, it will be possible to find a relationship between these three sub-questions and to answer the main research question.

1.4 Thesis structure

In this section, I will briefly explain what you can expect in the following chapters. After presenting my research objectives and research questions in this chapter, the next chapter will describe different ideas, theories and concepts related to these objectives and questions and will present the theoretical and conceptual frameworks. Theoretical ideas about Institutionalism, institutional work, transnational environmental governance and governing the commons will be

explored. This accounts for the scientific justification for this research. A conceptual framework is derived from the theoretical basis given. The conceptual framework builds on the SES but is adjusted to fit the focus of this research. The conceptual model is the visual representation of the importance of TSES alignment. The use of these concepts and definitions will provide a solid foundation for the next chapters. In chapter three it is explained how the research has been conducted and what methods have been used and why. At the end of this chapter, more attention is paid to the influence of the outbreak of COVID-19 during this research. Following this, in chapter four, the research field will be analysed. The chapter contextualises Sahelian desertification and the design of the institutions in place fighting desertification. Furthermore, it gives an overview of the case study, being the NAGGW. It is important to first know more about the context before getting into the analyses of this research. Without a good knowledge of the context in which multiple crises are erupting, results can be interpreted differently. Chapter five focuses on the transnational focus of the research and how it collides with ecological conservation. These results will be presented in chapter six and seven. Finally, in chapter eight all the results will be considered, a conclusion will be formulated based upon this, to answer the research question. While reflecting on the study, recommendations for further research will be presented.

Chapter 2: Theoretical and Conceptual Framework

The first section of this chapter explains the theoretical framework that will be applied throughout this research. Institutionalism, institutional work, transnational environmental governance and governing the commons are the concepts that will be explored. The relevance of all these concepts will become clear at the end of this section when discussing institutional work in transnational environmental governance. The second section of this chapter explains the conceptual framework. The Transboundary Social-Ecological System Framework forms the basis of this research. Before continuing, it is relevant to clarify how the terms 'government' and 'governance' indicate two different things. Stoker argues that 'government' refers to the "formal institutions of the state and their monopoly of legitimate coercive power" and "which operate at the level of the nation state to maintain public order and facilitate collective action" (Stoker, 1998, p.17). Whereas 'governance' refers to "the development of governing styles in which boundaries between and within public and private sectors have become blurred", "The essence of governance is its focus on governing mechanisms which do not rest on recourse to the authority and sanctions of government" (Stoker, 1998, p.17). To answer the research question and get more acquainted with the theoretical framework and focus of this study, additional and related concepts to the design of the GGW and NAGGW will be explained in chapter 4.

2.1 Structuring Structures

2.1.1 Institutionalism: formal, informal, old and new

Tackling the environmental governance crisis is arguably one of the biggest challenges humans are facing in the Anthropocene (Rockström et al., 2009). Crises like climate change and biodiversity loss, among others, are deteriorating due to the mismanagement and inadequacy of environmental governance systems (Patterson & Beunen, 2019). Crucial to managing these crises is finding ways to improve environmental governance, across local and global scales. This requires central attention on institutions, and in particular on how institutions flourish and change (Vijge, 2013). To successfully manage climate change, a constantly changing condition, institutions need to be flexible and adaptable to new situations and evolving sustainability objectives.

Young defines institutions as referring to clusters of rules and rights, decision-making procedures that give rise to social practises and allocate roles to the individuals in these practises and lead interactions among occupants of these roles (Young, 2008). North argues that institutions are ''humanly devised constraints that structure human interaction'' (North, 1994, p. 8). Furthermore, institutions are believed to interact with other elements like cultures, belief systems and a sense of community (North, 2005; Young, 2008).

There is a difference between formal and informal institutions. Formal institutions refer to the general government bureaucracies, like laws, constitutions, policy, rights and regulations, while informal institutions refer to socially shared rules or discourses, like social norms and values. Both are not separate entities but interact with each other, e.g. formal institutional rules shape the behaviours and actions of the actors in it (Pahl-Wostl, 2009).

Old institutionalism focused on organisational strategies for effective organisations, how the organisations constrained individuals so they do not act in their interest, group conflict and examined how the informal structures influence the formal structures of the organisation. Old institutionalism theorists believed that to attain legitimacy and acceptance from society, organisations had to follow a set pattern of rules. New institutionalism theorists critiqued old institutionalism for not taking into account the influence of cognition and learning in human behaviour and motivation. Meyer, Rowan and especially Powell and DiMaggio led to the development of new institutionalism (Powell & DiMaggio, 2012). Central to new institutionalism is the acknowledgement of all types of individuals interacting within socially organised environments, set by rules, regulations, norms and definitions that constrain action. There are four differences between old and new institutionalism. Firstly, compared to old institutionalism, the role of the environment is more prominent in new institutionalism, one considers the whole organisational field. Secondly, new institutionalism emphasises the cultural and cognitive basis of organisational behaviours. Stakeholders within the environment have a set of cultural norms that are standard so they learn the behaviours in that environment. Thirdly, old institutionalism examines group conflict whereas new institutionalism focuses on the stability of the organisation, necessary for its legitimacy. Lastly, old institutionalism considers the informal interaction within organisations, while new institutionalism looks at inter-organizational interaction and the formal structures in the environment (Powell & DiMaggio, 2012).

2.1.2 Institutions and Transnational Environmental Governance

Transnational environmental governance is a complex mix of priorities and preferences due to the evolving nature of the environmental challenges and the multitude of actors or stakeholders involved. Within the environmental governance realm, scholars have highlighted the central role of institutions. Ostrom has created a strong argument regarding the role of institutions in managing common-pool resources, as will be explained later in this section. Whereas, Young and Mitchell depicted the role of the multi-level and transnational institutional regimes in global environmental governance (Ostrom, 1990, 2005; Young et al., 2008; Mitchell, 2006).

Meanwhile, institutionalism developed different approaches, such as rational-choice, sociological, historical (Hall and Taylor, 1996; Hall, 2010) discursive (Schmidt, 2008) and critical institutionalism (Cleaver and De Koning, 2015). Most approaches view institutions as fixed structures made up of a combination of formal and informal rules and norms that guide human and organisational behaviour. However, the dependence on continuous human endeavour for institutional stability and change is coming to the fore (Mahoney and Thelen, 2010). The concept departed from the idea that institutions influence human and organisational behaviour. There appears to be a dynamic interaction between actors and institutional structures in which institutions can be altered, maintained, contested, rejected and replaced through the continuing actions and interactions of actors within a governance system (Lawrence and Suddaby, 2006). This highlights the role and influence of actors within institutions.

The definition of institutions as ''constellations of rights, rules, and relationships that define social practises and guide interactions among those who participate in them'' by Young & Underdal (1997, p. 1) is associated with historical institutionalism. Hall and Taylor's (1996) Historical institutionalist school of thought links organisation with institutions and the rules that are set by formal organisations. Path dependency and unintended consequences are perceived as the constituents of institutional development by historical institutionalism theorists (Hall & Taylor, 1996). Vijge argues that historical institutionalism, through its notion of path dependency, "explains how the self-reinforcing cycle of a rather diffused development of the IEG [International Environmental Governance] system, characterised by incremental changes, has made the system more complicated and prevented substantial institutional change" (Vijge, 2013, p.153). Pierson (2000) argues that path dependency is being caused by a dynamic of increasing returns, meaning that a particular path of institutional activity and rewards is being reinforced by positive feedback processes. Over time, this path becomes increasingly challenging to change (Pierson, 2000). When looking at institutional stability and change, one often focuses on inertia, path-dependence, reproduction or radical change due to or exogenous shocks (Mahoney and Thelen, 2010).

2.1.3 Institutional Work in Transnational Environmental Governance

Institutional work allows us to look with a different lens at institutional stability or change in transnational environmental governance and the role of actors in it, as for example in the NAGGW. Lawrence and Suddaby defined the concept as "the purposive action of individuals and organisations aimed at creating, maintaining and disrupting institutions" (2006, p.215). It is an actor-centred approach and is concerned with a variety of possible behaviours and actions "to cope with, keep up with, shore up, tear down, tinker with, transform, or create anew the institutional structures within which they live, work, and play, and which give them their roles, relationships, resources, and routines" (Lawrence et al., 2011, p.53). It is relevant because it offers a focus for researching the dynamic interplay between actors and

institutional structures, influencing institutional behaviour. In our quest into the GWW and NAGGW, the focus will mostly be on the role of actors in these structures.

Analysing institutional work in an environmental governance context is demanding. Environmental governance generally operates at multiple scales simultaneously, it needs to recognize and cooperate with a broader range of actors, it often operates without clear boundaries regarding the scope of action and without the knowledge of whom the decision-makers are that one needs to influence. Furthermore, due to its urgent focus it engages with a higher level of politics. The higher level of unpredictable dynamics and consequences calls for a distinguished political and contextual awareness in order to strategically engage and integrate with environmental governance (Mahoney and Thelen, 2010; Van Assche et al., 2013). Institutional work analyses the context-specific interplay between the multiple factors influencing institutional change.

It is quite challenging to fully understand an actor's real intentions. Both purposive action and non-purposive actions are able to influence institutional structures. The intentional maintaining forms of institutional work are joined by non-conscious behaviour that also influences institutional structures. Greif argues that often institutions are self-reinforcing since actors rely on the underlying assumptions made previously in decision-making rather than to constantly reconsider them. This way actors are non-consciously upholding institutional structures (Greif, 2014). Habitus is the term used for behavioural regularities that create and maintain institutions, it often refers to the durability of institutional structures. However, without an actor purposefully influencing, the meaning of an institution can shift due to the evolving logic of the actor's practice (Bourdieu, 1977; Hillier, 2002).

As discussed above, environmental governance in itself is already complex. Institutional work, within this transnational, multi-level, multi-actor context, is highly political in that institutional change and maintenance is concerned with a competition of diverging interest, different perspectives on problems, solutions and decision-making procedures, biased intent and collectively-binding effects that can have a reach far wider than the institutional boundaries. Mouffe called the variety of these competing perspectives the 'political', being the inextricable part of the world, which is being distinguished from 'politics' being the manner in which societies deal with the different understandings of the world (Mouffe, 2005). Institutional work within this political complexity is also expected to be connected to changes and dynamics in other parts of a governance landscape. González and Healey (2005) argue that through a variety of active struggles, encounters, contradictions and conflicts institutional structures evolve in politically, geographically or historically situated ways. Within a particular part of a governance system, institutional changes can be influenced by exogenous factors that are separated horizontally, for example when local governance is influenced by the circulation of ideas from other local governance contexts. It can be

influenced by exogenous factors that are separated vertically, such as mandates, policies and interests at local, national or international levels. Lastly, it can also be influenced by exogenous factors that are separated temporally, in that past decisions affect the possibility of decision-making in the present. Governance paths taking place in a particular context influenced by time, place and scale can unfold in parallel, become integrated, or co-evolve in multiple ways (Van Assche et al., 2013).

The concept of institutional work has its origin in organisational studies. It strengthens and flows from the focus of neo-institutionalism on understanding how relationships establish beliefs and rules within an institutional structure. The focus of institutional work on the individuals' behaviour intensified the discussion started by neo-institutionalism regarding the relationship between agency, being individual action, and institutions, being social structures (Zarpelon et al., 2019). Institutional work focuses on the strategies and practises of individuals and groups of individuals intentionally shaping the institutional patterns in which they operate (Dover & Lawrence, 2010). It seeks propositions for the maintenance, disruption and the dynamics of institutions by the intentional agency of individuals (Lawrence et al., 2011). The dualism of agent and agency within institutional work brings to the fore the main elements of this theoretical perspective, being institutions, actors and practises (Willmott, 2011). The use of institutional work allows for a better understanding of how processes of transnational to local sustainability transformation, executed by environmental governance, can actually be pursued. Having an approach that exceeds merely a structural or actor-oriented perspective, places a central focus on the dynamic interplay between actors and institutional structures. This viewpoint on institutions matches a problem identified in this research. The problem is that there exists a gap in the connection between the social nodes, meaning who is managing the GGW implementation in Nigeria, and the ecological nodes, meaning what is being managed. Within the context of the GGW implementation in Nigeria and the functioning of the NAGGW, the focus on institutional work assists in analysing the role of actors that are and should be involved to make the GGW implementation in Nigeria a success.

2.1.4 Governing the Commons in Transboundary Areas

In her book, Governing the Commons, (1990) Ostrom showed her research on the types of institutional arrangements applicable for governing common-pool resources (CPR). Which arrangements would enable actors to collaborate and solve social challenges in the CPR systems? Ostrom's work is positioned opposite of Hardin's notion of the Tragedy of the Commons (1968) by arguing for the collective action theory, which is the ability of resource users to develop self-organised institutions to govern the commons (Hardin, 1968).

The commons, and how they are governed, are the subject of the social-ecological system (SES) analysis. According to Berkes and Folke, SES offers a perspective that highlights how humans (social) are embedded in ecosystems (ecological) due to the multiple interactions between the two layers in the system (Berkes & Folke, 1998).

According to Folke, resilience thinking "addresses the dynamics and development of complex social-ecological systems (SES)" (Folke et al., 2010, p.1). The three core aspects are resilience, adaptability and transformability. These aspects are interrelated across multiple layers. Resilience is the capacity to continually adapt and change while remaining within the critical threshold. Adaptability is the capacity to adjust responses to changing internal processes and external drivers. Adaptability is part of resilience. Transformability is the capacity to break out of or cross thresholds into new development directions. The ability to transform at smaller scales improves the level of resilience at larger scales (Folke et al., 2010). Goffner argues that multi-stakeholder approaches are central in contributing to resilience building "by creating a shared systems vision that encompasses complex adaptive systems thinking, enabling broad and strategic participation, and identifying relevant governance arrangements" (Goffner et al., 2019, p. 1425). The GGW has multiple stakeholders, ranging from international organisations, national governments, the private sector and civil society who all collaborate under the Pan-African initiative to halt land degradation (UNCCD, 2020). The relevance of this for the GGW is that 'resilience' offers a useful lens for analysing how different actions have changed feedback loops in a system and how this could achieve changes in system outcomes (Goffner et al., 2019).

There are multiple ways in which the social can interact with the ecological, the global can be translated to the local and the social and the local can participate in caring about and for the commons. One of these ways is through the use of communities of practice (CoPs). Wenger defines it as "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2011, p.1). A CoP can evolve naturally or be created deliberately with the goal of gaining knowledge through processes of sharing information with the community. CoPs have existed since individuals have been learning and sharing their experiences through storytelling (Lave & Wenger, 1991). "The role of communities within governance systems arises clearly in terms of decision-making about desired responses to environmental and natural resource challenges that can have a negative impact on local ecosystems and livelihoods" (Berdej et al., 2015, p.6). Community conservation and care for their commons concerns grass-root or bottom-up actions that deal with cross-scale relations (Berkes, 2004). The limits of state-centred policy and its reach are pointed out by advocates for CoPs and community-oriented conservation. Furthermore, they also advocate for the integration of indigenous and ethnic stewardship (Berdej et al., 2015). As stated in the problem statement, the translation of the transnational GGW plan to a successful local implementation in Nigeria is not

satisfactory. In chapter 7, the possibilities of integrating communities or using CoPs in the NAGGWs implementation will be explored.

2.1.5 Transfrontier conservation: Peace Park Framework

As a countercase and additional perspective to the transnational governance and regime focus, the Peace park framework, described by Bram Büscher is presented as a conceptual idea. In his book, Transforming the Frontier: Peace Parks and the Politics of Neoliberal Conservation in Southern Africa, Büscher focuses on the Maloti-Drakensberg Transfrontier Project. He presents the complex nature of transnational and cross-border conservation initiatives. Büscher offers a compelling argument that will be added to the conceptual framework.

Peace Parks are often perceived as a symbol for biodiversity conservation, diplomacy and human development. Büscher critically analyses the simplistic presentation of peace parks as the panacea for South Africa's conservation challenges. Often this presentation is promoted by a neoliberal agenda. Büschers analysis of transfrontier conservation is based on three elements, being 1) *consensus*, 2) *antipolitics*, and 3) *marketing*. These so-called "modes of political conduct" (Büscher, 2013, p.18) are the tools that Büscher uses to explore the complex reality of the simplistic presentation of peace parks. Firstly, the discourse of consensus was used to establish a specific form of representation in conversations about development and conservation. Secondly, Büscher noticed that the focus and presentation of consensus and inclusiveness while managing the peace parks was suppressing the political debate and thereby the democratic process they were intending to achieve. This disclosed, what Büscher calls, the outcomes of antipolitics. Büscher defines politics as "the mediation and contestation of different interests and power struggles" (2013, p. 20) and anti-politicking is defined as the "political act of doing away with politics" (2013, p. 21). Büscher highlights that the current state of affairs regarding conservation and neoliberalism is strengthened by the tools of antipolitics. It is important to keep in mind that the "abstract dominance of neoliberalism and its propensity to maintain and increase inequality" (Büscher, 2010, p. 48) leads to the experience that within a neoliberal arena or setting, neoliberalism works in favour of those that act from a powerful, advantageous position (Büscher, 2010). In most cases, locals who know the land start from an inferior position. This keeps the neoliberal inequality and discrepancy in conservation in place. This is relevant to the GGW and NAGGW because it creates a bigger picture of the powers at play. If within a neoliberal arena, elements of hierarchy, power and their discrepancy are predominantly influencing the chain of events within the GGW, then what is the use in focusing on local and grass-root inquiries? Finally, the role of marketing is explored in organisations' quest for legitimacy. In this marketing effort, consciously or unconsciously, conservation is being commodified. Marketing is important when selling a certain idea. Büscher argues that by using certain images or discourses, projects can be reconstituted in neoliberal terms. To facilitate these peace park projects, institutional ties are strengthened. By using the ties with institutional

actors, neoliberal ideologies, processes and outcomes are becoming embedded in the projects. An example of a neoliberal conception of nature is the aim for 'win-win ideals', however, this gets more challenging as the scale of the project increases. It is argued that it is inherent to neoliberal conservation discourses to increase the scale they are operating on. This leads to more institutions, governments and actors to be taken into consideration. It is believed that the assembly of all these different actors with diverging ambitions can be managed by reconstituting conservation into marketized, commodity environments (Büscher, 2010). The persuasiveness of these neoliberal representations is dependent on the dominance of the actor. Powerful actors are able to legitimise neoliberal representations. According to Büscher, it creates a "bubble of neoliberal conservation" (Büscher, 2013, p.225). It exacerbates the representation and creates a discrepancy between the representation and the reality. To prevent these discrepancies, Büscher calls for political ecologists to critically apply a multi-level, institutional and stakeholder focused analysis in which to conceptualise the politics lying at the core of these projects. Büscher argues that at the core of the establishment of the Maloti-Drakensberg Transfrontier project lay the neoliberal processes and policies. Highlighting them is essential for creating a broader context around the construction and implementation of transfrontier conservation projects (Büscher, 2013).

Concluding, it can be argued Büscher's peace parks, just like the GGW, do not merely aim to establish transboundary ecological structures, but use it as a tool for cooperation between actors - in line with Pan-African sentiment - in managing the environment. The relevance of this institutional analysis for the GGW is that it explores the same elements - consensus, anti-politics and marketing - in the institutions that govern conservation. It highlights the uneven distribution of capacity and power across actors. The neoliberal discourse around conservation and the way it is embedded in politics serves as an explanatory context to the way conservation is managed. This focus of analysis reveals the same underlying structures at play with the GGW and NAGGW. How is the image of the GGW portrayed? What is the role of marketing in creating the image? How does this affect the selling process of goods needed? What does the image mean for attracting international donors and governments? Does a discrepancy exist between the image or representation and the local reality? According to Büscher, it is essential to ask these questions since the struggle of conservation and development is exposed where the sold representation clashes with the lived reality (Büscher, 2013).

Governing the commons is demanding. Especially in a situation with multiple actors, as is the case with GGW. The social-ecological system highlights the structures that are in place. The resilience of the system is the degree to which it is capable of self-organisation and governance. All these elements are essential for understanding the status quo and level of implementation of the GGW and the NAGGW. How and by whom are the commons managed? To answer this question,

the social-ecological system framework will be used, as will be explained in the following section. The appliance of the SES and the focus on institutional work disentangles the current structures that influence the NAGGW management behaviour. Additionally, it indicates possibilities on how to break these structures.

2.2 Transboundary Social-Ecological System

Based on the theories, concepts and theoretical framework discussed in the previous section a new conceptual framework will be presented in the following sections. At the basis is the social-ecological system framework. However, as will be explained, this framework is incomplete for the research question. Therefore, the element of Büscher is added, which integrates transboundary governance into this research. Altogether, this conceptual framework, coined the Transboundary Social-Ecological System (TSES) framework, sets the foundation for the following chapters. The TSES highlights the transboundary nature of the research problem while zooming in on the connectedness, or lack thereof, of the social and ecological nodes at the national and local level.

2.2.1 The Social-Ecological System Framework

The conceptual idea presented is the social-ecological system framework. To answer the research question, a social-ecological system (SES) framework will be adjusted and applied. The SES is a conceptual framework that uncovers a set of relationships that may be interacting and influencing outcomes in the SES (Ostrom 2007, 2009 & Poteete et al., 2010). The framework continues from previous work done on related concepts such as the commons, institutions and collective action (Ostrom, 1990).

According to Berkes and Folke, SES highlights how humans (social) are embedded in ecosystems (ecological) due to the multiple interactions between the two layers in the system. Or it highlights the opposite where the social is not properly embedded in the ecosystems, which leads to gaps in interaction and lack of communication. The SES framework has created a new field of research in which the focus is on how the interdependent linkages between the layers influence the achievement of sustainability goals (Berkes & Folke, 1998).

Many of the environmental problems we are currently facing are composed of all sorts of interdependent collective action problems. Traditional top-down government approaches seem to be inefficient when managing ecosystems that cross socioeconomic boundaries (Bodin, et al., 2016). According to Bodin “environmental problems are inevitably tied to the complex structures and processes of boundary-spanning ecosystems” (Bodin, 2017, p.2). To collectively create long-lasting solutions to environmental problems, one needs to incorporate the ecosystem characteristics that are being governed (Bodin, 2017). The effectiveness of these multi-actor collaborations will depend on the level of alignment and interconnectedness between the social and ecological layers.

Within the SES framework, there are two layers. The social layer encompasses the social nodes, the actors that make decisions on the use of resources and their relationships with each other. Actors could represent organisations, individuals or another social establishment. In the case of the GGW and NAGGW, this could include all the individuals representing and acting in the power of the organisation. Such as people with authority and decision-making power related to the implementation and functioning of the GGW and NAGGW. The ecological layer encompasses the ecological nodes which include any ecological concept such as species or ecological communities (Bodin, et al., 2016). This could be a GGW communal garden or a shelterbelt. Using a collaborative and multilevel network approach, as the SES framework, in which both layers are presented as separate but interconnected has multiple benefits. It highlights the 'horizontal' and 'vertical' dimension of the SES. The horizontal dimension is concerned "with how well social and ecological network ties are aligned across the layers", the vertical dimensions are concerned "with how the different social and ecological layers are interconnected" (Bodin, 2017, p.4). As shown in figures 1 and 2, it gives a conceptual overview of actor's ability to solve certain types of environmental challenges by showing which actors are involved, with whom they collaborate and in what ways they are tied to the structures of the ecosystems (Bodin, 2017). This will increase the ability to develop successful institutional arrangements for NAGGW governance since it highlights the interdependence between the social and ecological layers.

This research analyses the social and ecological layers of the NAGGW. For the visualisation of analysing the SES, see figure 1. For a visualisation of the appointment of the different interdependencies between the nodes, see figure 2. While analysing the interdependencies or lack thereof, one can hypothesise that specific challenges will be faced in governing the GGW in Nigeria.

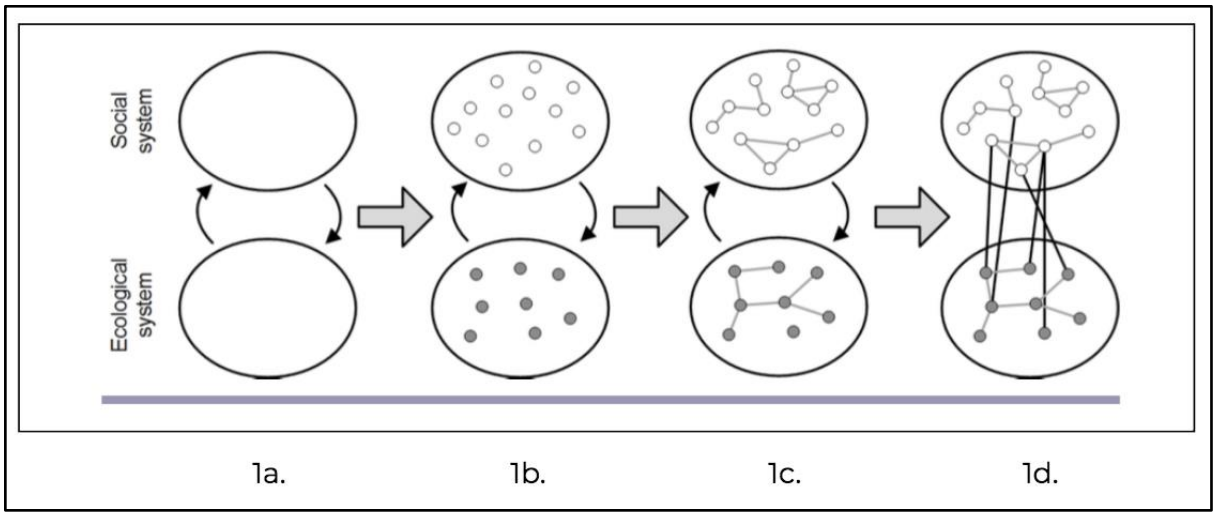


Figure 1. Visualisation of SES analysis (Bodin et al., 2016)

In 1a, all the details about the social and ecological nodes are unknown. In 1b, the social and ecological nodes are appointed. In 1c, the relations and interdependencies within the social (social-to-social (SS) or actor-to-actor) and ecological (ecological-to-ecological (EE) or resource-to-resource) system are shown. In 1d, the relations and interdependencies between the social and ecological system (social-to-ecological (SE) or actor-to-resource) are shown.

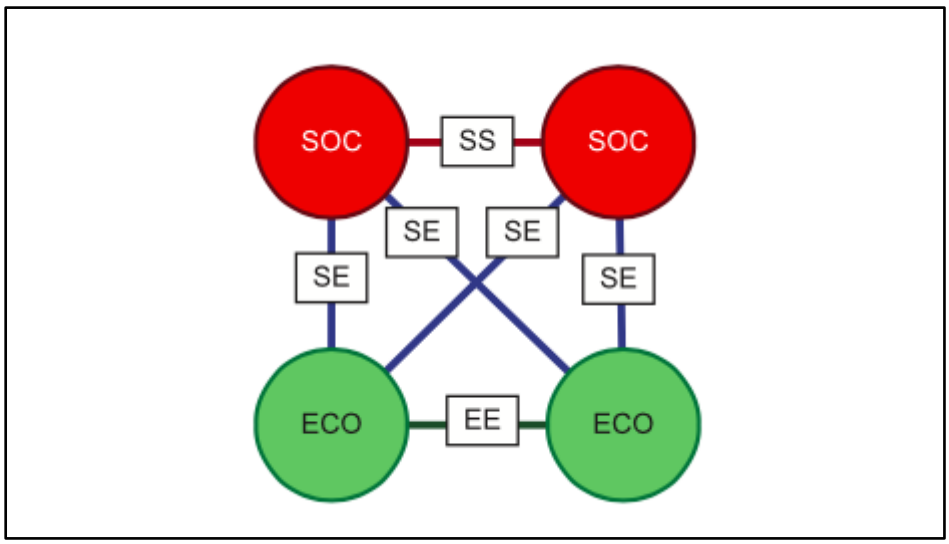


Figure 2. Three types of interdependencies (Bodin & Tengö, 2012).

Figure 2 simplifies the three types of interdependencies or relations in which the red nodes represent social actors (SOC) and the green nodes represent ecological resources (ECO).

2.2.1.1 Social-Ecological System Scale Mismatches

As argued by Cumming, Cumming and Redman (2006) many of the challenges in managing natural resources arise from a mismatch between the scale of management and the scale of the ecological environment being managed (Cumming, Cumming & Redman, 2006). Scale mismatches occur "when the scale of environmental variation and the scale of the social organisation responsible for management are aligned in such a way that one or more functions of the social-ecological system are disrupted, inefficiencies occur, and/or important components of the system are lost" (Cumming, Cumming & Redman, 2006, p.1). Three forms of mismatches, a spatial, temporal or functional mismatch are explored. The spatial mismatch will arise when "spatial scales of management and the spatial scales of ecosystem processes do not align appropriately", the temporal mismatch will arise when "the temporal scales of management and the temporal scales of ecosystem processes do not align appropriately" and the functional mismatch will arise when "the functional scales of management do not align appropriately with the functional scales of ecosystem processes" (Cumming, Cumming & Redman, 2006 p.3) The functional scale of management could be the

rate of a process like production. The SES framework can be used as a tool to analyse the scope of the scale mismatches.

2.2.2 Transboundary Social-Ecological System Framework

For the purpose of this research, the SES framework is modified. The difference in the conceptual ideas described above, lies, amongst others, in their focus. A focus on a socio-political premise or a social-ecological system premise. The combination of the SES framework and a transboundary focus led to the creation of the Transboundary Social-Ecological System (TSES) framework. The SES framework indicates the limits of its social reach when managing (transboundary) ecological connections. Adding a transboundary lens is relevant since it displays where the social reach is restricted in the TSES. Furthermore, it allows one to not lose sight of the transboundary nature of the problem, while at the same time zoom in on the connectedness between the social and ecological nodes at the local level.

The TSES framework is shown in figure 3. The TSES shows the multitude of social nodes influencing the SES framework. The social nodes can be positioned in different locations within the demarcated arena, ranging from the transboundary level to the national level and the local level. This is within the social layer. The squares represent the ecological nodes, being any ecological concept such as ecological resources, communities, species or spatially explicit resources or ecosystems (Bodin & Tengö, 2012). The ecological nodes are able to flow over any socially constructed border. This is within the ecological layer. The triangles represent the social nodes, being the actors that rely on or make decisions on the use of resources and their relationships with each other. The direct relation between social nodes is presented with a line between them. The absence of a relation or an indirect relation is presented without a line between them. It is hardly impossible to analyse and conclude that there does not exist an indirect relation or influence from one actor to another operating in different arenas. Doing so would entail defining all the elements that could be of influence from one actor to another, as well as which of those influences could be interpreted as a direct relation. In the case of transnational environmental governance, many obstacles are being created due to the incapacity to communicate and cooperate over borders. This is the case for the GGW where many member countries experience a lack of information sharing and cooperation and therefore feel like they need to reinvent the wheel over and over again (UNCCD, 2020). However, that is not the same as saying that there is no possibility of actors in other arenas influencing other actors. Financial aid or pushing for a global agenda could be determined as indirect influences.

Throughout the research, the squares and triangles will be appointed to certain actors and ecological factors playing a role in the NAGGW and GGW.

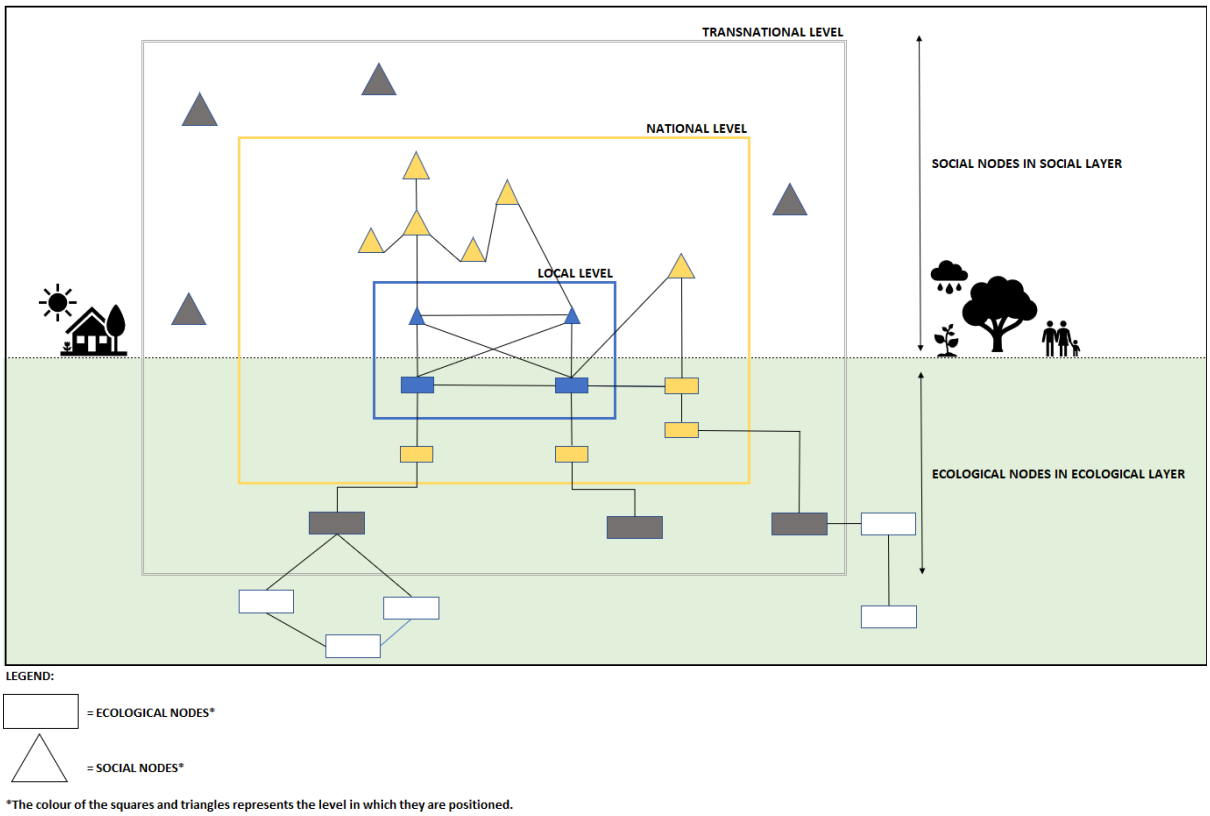


Figure 3. The Transboundary Social-Ecological (TSES) Framework (Author, 2021).

For effective natural resource management, it is essential to focus on the interconnectedness of the social and the ecological nodes, as well as the focus on transboundary cooperation, since ecological nodes and their interconnectedness does not stop at national nor at transnational borders, whereas often social systems do (Bodin, et al., 2016). As is argued by Cumming, Cumming and Redman, "Human actions are influenced by institutions, by perceptions of how ecosystems function, and by perceptions of future change" (2006, p. 2) this highlights the relevance of focusing on the interconnectedness of social and ecological nodes and the institutions that are involved in managing it. Büschers focus on examining how a transboundary initiative - like the GGW - came into place and how it is embedded in certain ideologies, enables one to analyse the influence this has on communication and interconnectedness, or lack thereof, between the social and ecological nodes within the NAGGW. The TSES framework will be applied in the following empirical chapters to shed light on the links between, and the functioning of the social and ecological at transboundary GGW level, national NAGGW level and local level. This way the TSES is able to point out the weak parts in the transboundary environmental governance of the NAGGW and GGW.

Chapter 3: Methodology

3.1 Introduction

The question of how to get specific NAGGW location data online was bugging the researchers mind for a long period while writing this thesis. The reality was that the COVID-19 situation was not ending anytime soon. Over the course of time, these challenges led to adjustments in the subjects and approaches of this research. Whereas previously, it was planned to choose a specific NAGGW geographical location, now the NAGGW and how it operates in Nigeria as a whole were chosen as the case study for the study. How to offer multiple perspectives on an initiative that operates nearly 4718 km from the Netherlands? While several obstacles led the researcher to do research on distance, thankfully we can connect through the internet with whomever we want. As will be explained in this chapter, doing research on distance has its pros and cons. The field of study cannot be merely described as an environmental issue, almost every aspect of life for the people located in the case study is influenced by it. So how can one present multiple perspectives of a situation that is linked to multiple crises? As there were many stumbling blocks in setting up a multitude of interviews, a different, rather 'simplified' approach has been chosen to decode the puzzle of actors and factors at play within the GGW and NAGGW.

In this chapter, the focus is on the methodology and methods of data collection for this research. This research relies on primary and secondary data. The primary data originates from the interviews taken. The secondary data is sourced from reports on the GGW, the "grande muraille verte", the PAGGW, the NAGGW, United Nations Convention on Combating Desertification (UNCCD), policy documents of the Nigerian Federal Department of Forestry, existing academic works of literature, web information and other relevant documents such as reports from the International Centre of Investigative Reporting (ICIR). In this research Atlas.ti is used for coding and analysing the data.

3.2 Methodological choices

3.2.1 Epistemology

To answer the research question, a combination of data collection methods was used. To analyse the structure of the TSES means that the research was inherently interdisciplinary. Due to the COVID-19 pandemic, the researcher was not able to collect data in Nigeria. Therefore, the research methods used were desktop research and conducting online qualitative interviews. For this, web-based technology, online video calls and emailing questions were used. When there was a spatial distance between the interviewer and the interviewees, qualitative online interviewing became a common alternative for data collection, facilitated by internet usage (Mirick & Wladkowski, 2019). By using the NAGGW as the case study, contextual knowledge about a specific subject existing in the real world was

provided (Creswell & Poth, 2016). The TSES framework created an interdisciplinary research, including social and natural science and consequently qualitative and quantitative data (del Mar Delgado-Serrano, Ramos, 2015). However, this research is mostly qualitative, since the qualitative methodology is a "form of social action that stresses how people interpret and make sense of their experiences to understand individuals' social reality" (Mohajan, 2018, p.2). The “interpretive approach” describes the social reality of the individual lived experience. Desertification management in Nigeria is at the core of this research. The epistemology of the SES framework offered an institutional and anthropocentric perspective on the analysis of natural resource use and management (Partelow, 2018). It attempted to understand how and why interconnectedness between the social and ecological nodes influences the management and therefore the ability to achieve sustainable outcomes of the management at hand. To explore by who and how this was managed, this research required information from individuals who are knowledgeable on the implementation process or from the actors' lived experience in doing so. Further explanation of the choices made regarding the mixed-methods strategy can be found in chapter 3.3.

3.2.2 Case study (short description)

The methodological justifications for choosing to analyse the NAGGW, the GGW implementation in Nigeria as the exploratory case study of this research were the following. When analysing the members of the GGW, it became clear that Nigeria has had a period of ‘trial-and-error’. Over the years adequate data on its implementation process has been collected. Compared to the other members, Nigeria has a high number of GGW country participation in large transboundary programmes (UNCCD, 2020). The GGW implementation in Nigeria is a pressing matter due to the level of social unrest that is linked to environmental degradation. In Nigeria, the Nigerian English language is used. This allows greater access to literature on the topic. A more elaborate description is presented in chapter 4.2.

3.3 Data collection methods (Research strategy)

The total number of interviews held for this research is 5. The interviewees were chosen with the purpose of creating a diverse selection of perspectives. Sampling the interviews this way enabled the author to research the NAGGW and GGW from a multitude of perspectives. The NAGGW and GGW is operating at a big scale and it involves a broad range of different stakeholders including international organisations, national governments, NGOs, civil societies, educational systems and local communities. This multitude of actors has been represented in the sampling of the interviews.

The first sub-questions, ‘*What are the social and ecological impacts of the Great Green Wall in Nigeria?’* aimed to gain insight into the status quo of the GGW in Nigeria, managed by the NAGGW. This question provided the background

knowledge that was needed for the case study. Scientific articles and policy reports about the effect of the GGW in Nigeria as well as reports on the NAGGW implementation process were able to help answering this question. For more information on how desertification in Nigeria is experienced on a personal level, and any other gaps in the scientific literature on the subject, semi-structured interviews were conducted online with local academics, familiar with the topic. Altogether, this research answered the first sub-question by conducting a thorough literature study and semi-structured interviews on the subject, where needed.

The second sub-question, '*What are the current social-ecological system connections within the NAGGW that focus on the implementation of the Great Green Wall in Nigeria?*', explored the nodes and linkages of the SES. In order to answer this, the first step was to locate the social and ecological nodes. This data was collected through desktop research that analysed newspaper and policy documents. To gain a better understanding of the connections between the social nodes, semi-structured online interviews were conducted regarding the actors. To gain a better understanding of how these social nodes are linked to the ecological nodes, a semi-structured interview was conducted with a researcher on the topic. The collected data was analysed through coding with the coding software Atlas.ti and the application of the TSES framework structured the data into a conceptual model (Schlüter et al., 2014).

The third sub-question, '*How does the social institutional connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria?*', aimed to gain insight into the obstacles in the SES of the NAGGW, either being missing linkages or node mismatches. Additionally, it analysed the potential of correct TSES interconnectedness for the NAGGW and the GGW implementation in Nigeria. This was done by analysing the conceptual model that has been created in the second sub-question, being the TSES. These suggestions were presented in a semi-structured interview to triangulate the data.

SUBQ1 - SOCIAL	Scientific literature review (i.a. policy analysis) Semi-structured online interviews	Atlas.ti
SUBQ1 - ECOLOGICAL	Scientific literature review	
SUBQ2 - SOCIAL-ECOLOGICAL LINK	Scientific literature review (i.a. policy and newspaper analysis) Semi-structured online interviews	Atlas.ti
SUBQ3 - SOCIAL INSTITUTIONAL CONNECTEDNESS	Scientific literature review Semi-structured online interview	Atlas.ti

Table 1. Research strategy per sub-question (Author, 2021).

Semi-structured interviews were held with 5 interviewees. Semi-structured interviews were chosen to gain a better understanding of the interviewee's perspectives. It allowed the interviewee to elaborate as much as needed and at the same time, it allowed the interviewer to engage with this new information. A semi-structured interview is flexible, it allows for open-ended responses, it offers both parties comfort in terms of privacy, time and space (Mirick & Wladkowsk, 2019). In hindsight, it was clever to choose semi-structured interviews for two reasons. Firstly, semi-structured interviews enabled the researcher to adjust to the knowledge and in-depth information presented by the interviewee. At the beginning of the qualitative data gathering period, there was still a lot to discover and one did not know what one did not know yet, having semi-structured interviews made it easier to adjust to new information when needed. Secondly, because the interview felt more like a conversation instead of an interrogation, this allowed the researcher to really listen to the interviewee and created an atmosphere of trust (Raheim et al., 2016). The level of trust established, also empowered the interviewees to express critical reflections on the topics discussed. The aim of the first four interviews was to collect different expert opinions on the functioning of the GGW and NAGGW. In every interview, the interviewees have been asked a couple of the same questions to facilitate comparison. After the fourth interview, different perspectives were gathered, creating a collection of discourses that either acknowledged or challenged the other.

The findings of the first four interviews were tested during the fifth interview. Data triangulation, as part of the mixed-method strategy, was used to enhance the reliability and validity of the data, as well as to check the sufficiency of the data collected (Van Thiel, 2014).

It was very challenging to locate interviewees, the degree of simplicity in finding one's contact details, as one is used to in the Netherlands, did not apply to the search of contact details in Nigeria. The research was done at a distance due to COVID-19. This implied that all the interviews were held online, which presented disadvantages as well as advantages. Being at a distance presented its challenges with responses to the interview invitation. Once a potential interviewee mentioned that the fact that the researcher was not on location made him question if it was even useful to do the interview. He felt that doing research on distance did not suffice as one needed to be on location to fully emerge in the data and context. As will be presented in this research, this has not been the case. When being on location, the number of respondents might have increased, however, the guess is that this did not have a direct correlation with the amount of the perspectives gathered. The sample size is justified because the aim of collecting the data is to present multiple perspectives, form different interviewees, on the GGW and the NAGGW. The GGW and the NAGGW are multi-stakeholder approaches, choosing a smaller sample size that gives a voice to the stakeholders involved, becoming involved and wishing to be involved holds sufficient information power, is valid and

is in line with the purpose of this research (Malterud et al., 2016). Furthermore, this is thought to be true since after the first four interviews, aside from their expert specific perspective, a clear delineation of the different perspectives and an overlap was established on the functioning of the NAGGW. Some of the interviewees are located in areas that are being terrorised by Boko Haram activities and military responses. The hostility of these areas restricts any physical presence of research teams. Residing in online connection, instead of physical in real-life connection, made it possible to have these interviews.

The identity of the interviewees remained anonymous, therefore they were numbered 1 to 5. The first interview was with an international investigative journalist. The interviewee was able to provide some critical reflections on the GGW plan and the actual implementation of the NAGGW in Nigeria. The second interviewee was a former member of the Federal Department of Forestry (FDF). The interviewee was part of the FDF when the NAGGW was born out of the Federal Ministry of Environment's Drought and Desertification Amelioration (DDA) department and the FDF. Through various actions, the interviewee and his colleagues supported the National Strategy and Action Plan. The interviewee was able to provide a lot of inside information on the institutional set up and functioning of the NAGGW. The third interviewee is part of the International Fund for Agricultural Development (IFAD). The interviewee was able to critically reflect on, and specify the gaps in the implementation of the NAGGW in Nigeria. Starting in the beginning of 2022, IFAD will cooperate with NAGGW to ensure its implementation is effective throughout the local communities involved. The fourth interviewee is a researcher on the Nigerian environment, desertification and the initiatives taken to stop further deterioration. The interviewee presented a lot of knowledge on the functioning of the NAGGW and GGW. The final interviewee is a researcher, knowledgeable in GGW, NAGGW, its implementation in Nigeria, Nigerian ecological policy implementation and local community involvement in environmental initiatives in Nigeria. This interviewee proved to be useful for data triangulation since the interviewee had a lot of scientific knowledge on the issues discussed with the previous interviewees. The data collected from these interviews provided this research with enough information to answer the sub-questions. This point of view was also strengthened by the feeling that the same answers were given to the same questions by the different interviewees, this gave the researcher a feeling of data saturation.

3.4 Data processing (Data analysis)

All the interviews were transcribed and coded. In the open coding phase, certain categories are distinguished from the data found by applying descriptive coding practises to the transcribed data (Boeije, 2010). Descriptive coding assigns one or more labels to a piece of data. These labels are often nouns or short phrases summarising the topic of the specific section of qualitative data (Miles, 2014). Furthermore, a content analysis was applied to the qualitative data. It allows one

to examine the content of the data in great detail in order to identify certain themes, biases of patterns (Mohajan, 2018).

In the second coding phase, axial coding was applied. Axial coding distinguishes the main themes and determines their relevance. In the axial coding phase, the open coding of the first phase is analysed and discussed (Boeije, 2010). The primary and secondary data gathered were assessed, the codes became the building blocks of the themes created. The themes were inductively created and helped in answering the sub-question and research question. According to O'Leary, when applying thematic analysis to qualitative data, it is suggested that one needs to follow the "generated data inductively to identify pattern and interconnectivity" (O'Leary 2017, p.384). The computer program ATLAS.ti was used to apply and analyse the coding on the transcribed documents that were uploaded. Examples of these codes can be found in Appendix 1: Code Book.

3.5 Methodological reflection (Limitations)

Every research has its limitations, this research does not dodge that notion. One of the methodological limitations is that the researcher was unable to go to the research site due to the COVID-19 pandemic, so the research had to be executed on distance. The insurgency of Boko Haram also hindered travelling to NAGGW sites. As earlier mentioned, at the moment one could talk of compounding crises in Nigeria. This is further elaborated upon in section 4.1.1.2. The combination of the COVID-19 pandemic, the clashes between the Fulani and the farmers, the Boko Haram insurgencies and the ongoing deterioration of the livelihoods of people due to the environmental crises created a challenge for this research. In places where people are being tormented with such existential crises, directly influencing their lives, responding to a researcher from the Netherlands is understandably not high on their priority list.

Another challenging factor to this research regards the difficulty of getting specific NAGGW location data online. In the beginning, it was a challenge to find out where the actual GGW sites were located in Nigeria. After the interviews, the researcher concluded that it was not only challenging it was rather impossible. The specific locations of GGW sites in Nigeria were not published. Arguably, this is quite in line with the problem defined in this research, being that there exists a discrepancy between what is planned on a transnational and national level and what is actually implemented on a local level and how one would be able to check that.

This has led to a change in the topic of the case study. Initially, it was planned to choose a specific NAGGW geographical location. However, due to the lack of data, the NAGGW and how it operates in Nigeria as a whole were chosen as the case study for the study on the GGW and the NAGGW.

In order to create a high quality semi-structured qualitative interview, the interviewer needs a good skill set. Extensive research on the topic as well as on the interviewee's involvement or knowledge is needed to prevent that precious interview time is wasted on certain matters, while it could be used to highlight matters that are unclear yet. However, identifying gaps of data and wanting to elucidate them, one could be, unconsciously, posing biased questions. This is a slippery slope that reinforces the need to carefully draft the semi-structured interview. After finishing the data collection and writing the thesis, the discussion in chapter 8 will further elaborate on research limitations.

Furthermore, with a background in International Relations and International Organisations, the researcher was aware of the irony of being a white western woman, questioning an African initiative aiming at creating a better world. The knowledge that the Northern hemisphere is greatly responsible for the environmental crises we are facing around the world (Baatz,2013), combined with the irony of who is questioning who made it at times feel a bit uncomfortable for the researcher to discuss certain matters in the interview. Overall, this awareness has led to some extra precaution in the choosing the proper words in while being in conversations with the interviewees.

Ethical considerations were taken into account in this research. Information and consent forms were attracted to the invitation to adhere to the confidentiality and participation agreement consented on. The information form displays a brief introduction regarding the researcher, the research and its objectives, the procedure for interviewing, the possibility to give consent and the permission to record and film the interview for the purposes of analysing the data collected. The researcher pledged its confidentiality regarding the information obtained and the anonymity of the interviewees. After the interviews, the interviewees agreed to offer help by clarifying or elaborating on matters discussed if the need arose.

As the researcher has been conscious of the professional ethics of conducting research, concepts of plagiarism, conflicts of interest and falsification of data are very much prevented.

Chapter 4: High & Dry - Desertification Then and Now

This chapter provides elaborate background information that is connected to the research questions introduced in chapter 1. First, the context in which the case is positioned is explained, followed by an explanation of the case itself. This will allow for a greater understanding of the case, which is crucial for the following empirical chapters.

4.1 Contextualisation

4.1.1 Contextualising the Sahelian desertification in Nigeria

4.1.1.1 A history of desertification in Nigeria

The concept of desertification has evolved throughout history within the academic and scientific community. Its definition has been debated, as did the policies and approaches trying to curb it (Batterbury, 2002). Early experts illustrate the phenomenon of desertification as an encroaching, moving or advancing desert. Lamprey even stated that the Sahara was moving at a rate of 5.5 kilometres per year (Lamprey, 1975). Grainger refuted this expansion theory due to a lack of evidence (Grainger et al., 2000). During the Earth Summit in Rio de Janeiro in 1992, the most well-known definition was created, being: land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variations & human activities. The UNCCD has adopted this definition (Mainguet, 1999; Martello, 2004).

The ecological system of the Sahel is considered one of the most sensitive and delicate in the world due to the increased desertification in combination with long periods of drought. The fragile land of the so-called 'frontline states' of Nigeria, the states that share borders with the Sahelian Niger Republic, are under great pressure. Transboundary environmental governance is a challenging task in itself. Especially when aiming for maintenance of social and environmentally sustainable development in a region where both elements are further deteriorating (Gadzama, 2016).

Over the last century, desertification and initiatives to halt its encroachment has been present in Nigeria. In the 1970s and 1980s, the focus of these initiatives shifted from forest reservation to the development of shelterbelts (Gadzama, 2016). In the 1980s the Consultative Committee on Desert Encroachment was set up by the 11 northern states of Nigeria to assess the extent of desertification and to make recommendations on how to fight it. Tree planting campaigns, like creating shelterbelts, were used as an instrument to create awareness about the negative effects of desertification and the need to combat it (Olagunju, 2015). The UNCCD defines shelterbelts as 'Belts of trees, planted in a rectangular grid pattern or in strips within, and on the periphery of, farmland to act as windbreaks', they are a

type of ‘agroforestry system that help reduce natural hazards including sandstorms, wind erosion, shifting sand, droughts and frost’ (United Nations Convention to Combat Desertification: Shelterbelts, n.d.). Shelterbelts can improve the microclimate by reducing wind speed, temperature and soil water loss. This is crucial for improving crop production conditions that are negatively affected by desertification (United Nations Convention to Combat Desertification: Shelterbelts, n.d.). In Nigeria, the implementation of shelterbelts was greatly appreciated by local communities as it improved crop yields and increased the number of harvests a year (Gadzama, 2016). After the Nigerian government signed the United Nations Conference on Environment and Development (UNCED), it established the Federal Environment Protection Agency (FEPA) in 1988 and the States Environmental Protection Agencies (SEPA) in 1996 (Olagunju, 2015). In 1997 Nigeria ratified the United Nations Convention to Combat Desertification (UNCCD) (UNCCD, The Great Green Wall Initiative, n.d.). In 1999 the Department of Drought and Desertification Amelioration was created to strengthen the above-mentioned institutional arrangement for effective coordination of the activities of the Nigerian Government towards the implementation of the UNCCD (Olagunju, 2015). In 2006, a Forestry Policy was published that created a new shift in the existing paradigm. The focus shifted from monoculture plantations to incorporating the local population for planning and implementing forestry projects to fight desertification (Gadzama, 2016). Aside from the environmental benefits, it was also expected that the programme would generate economic benefits by creating jobs and the possibility to commodify some food crop produce (Olagunju, 2015). As previously mentioned, a multitude of initiatives has been created over the last couple of years. Ranging from sectoral programmes, legislative frameworks and national policies to collaborations and partnerships with local and international actors. Nigeria receives aid in forms of capacity building, technical and financial assistance from partners like IFAD, World Bank, IAEA, CIDA, GEF, UNDP, UNEP, UNIDO and national governments (Olagunju, 2015; UNCCD, 2020).

At this point, one could argue that the occurrence of desertification is a natural process, however its presence is also man-made (Gadzama, 2016). After all the initiatives and assistance received, desertification remains a pressing matter to be managed. Without efficient management, desertification remains a destabilising factor in a country that is in dire need of stability. It is too straightforward to solely blame it on the failing management and control of desertification in Nigeria. As will be explained in the next section, many different factors are influencing the current situation.

4.1.1.2 Social unrest: Desertification adding fuel to the fire in Nigeria

Other than the environmental impact, desertification is also causing social unrest. Prior to the 19th century, the Fulani were more confined to the Northern regions of Nigeria, due to the presence of pastureland to manage their animals (Olagunju, 2021). Current desertification in the North of Nigeria is leading to migration. Farmland and pastureland are becoming scarcer. In search of pasture land and water resources, the Fulani herdsmen and their animals migrate to the south. At the same time, the amount of pastureland is decreasing due to an increase in the amount of cultivated farmland since the 2000s (Gadzama, 2016). The fight over land is leading to clashes when the Fulani cattle start eating and damaging the crops on the farmlands. Clashes between the Fulani herdsmen and the farmers are increasing in severity and quantity over the last two decades (Olagunju, 2021). The battleground of these clashes are the so-called middle belt states of Nigeria. These states are the birthplace of current terror. The pressure that is being put on these states due to the migration of people and cattle from the north and the migration of people from the south, due to rising sea levels, creates perfect conditions for chaos (Olagunju, 2021). This chaos is being fed by a combination of economic fragility, extreme poverty, drought and environmental degradation, all providing a fertile ground for extremist groups like Boko Haram to flourish (Nett & Rüttinger, 2016).

Uneducated youth that migrate to the middle belt states in the hope of a better livelihood and economic prosperity fall victim to the recruitment of groups like Boko Haram (Olagunju, 2021). Boko Haram's origin can be found around Lake Chad, a region that has been subject to severe droughts which caused the shrinking of Lake Chad and the shrinking of the livelihoods of millions of people that were dependent on Lake Chad (Nett & Rüttinger, 2016). Since 2003, Boko Haram has been present in Nigeria. It originated as an opposition to the more tolerant Islam of northern Nigeria, the non-violent sectarian Islamic movement radicalized when they were faced with suppression of their uprising. In 2009 Boko Haram started its insurgencies against the Nigerian government (Nett & Rüttinger, 2016). It is estimated that since 2009, Boko Haram has killed over 350.000 people in northeast Nigeria (Council on Foreign Affairs, 2021). Through Boko Haram’s rejection of the Nigerian government, its provision of loans, marriages and meals it particularly attracted poor people. Their means of destruction are brutal, relatively new to it is the use of resources as a strategy of violence (Nett & Rüttinger, 2016). In areas where Boko Haram has been dislodged by state troops, they contaminated water sources, which made using water threatening for humans and livestock. This highlights the role of natural resources. In recent years, the way environmental deterioration has evolved reveals the integral part environmental deterioration plays in other crises. In the case of Nigeria, it is not merely in the interest of the natural environment to prevent any further fragilization of the ground. Fragilization of the ground has become fuel to the social fire that is raging through the country, causing conflict and chaos.

Mentioning Nigeria's desert management history and current social unrest adds more context to the environment in which the NAGGW is operating. To critically examine the status quo, it is important to be aware of previous desert management approaches that were applied in Nigeria. One needs to know the history to understand the present. Furthermore, the increasing level of social unrest created by Boko Haram and the conflict between the Fulani and farmers can both be seen as a negative or positive influence of the NAGGW operations. Negative in the sense that one could question the durability and effectiveness of NAGGW project applications in areas prone to devastation to be caused by Boko Haram. Positive in the sense that the stability resulting from NAGGW project applications might be killing two birds with one stone. It creates social, economic and environmental stability which at the same time is an antidote to the recruiting practice of the vulnerable by Boko Haram. Striving for social harmony is an extra motivator for the NAGGW project applications. In Nigeria, climate change and its interconnectedness with social conflict reinforce the challenging nature of managing it (United States Institute of Peace, 2011).

As with the changing definition of desertification, critics have regularly debated the best approach of the GGW to curb desertification. Some state that the GGW has unrealistic ambitions and argue that creating a barrier in itself is counter-productive, others state that the desert is a healthy and natural ecosystem that should not be limited (Laestadius, 2017). The NAGGW created many initiatives and received much help, yet success is still to be achieved. This might be due to managerial inadequacy but is also complicated by all the compounding crises causing havoc in the country. The distress caused by ecological deterioration, Boko Haram, the conflict between the Fulani and the farmers all influence and build on each other.

4.1.2 Design of the institutions

4.1.2.1 Design of GGW

In 2007, at the 8th Summit of the African Heads of States in Addis Ababa, Ethiopia, African heads of states adopted the "Great Green Wall" initiative. The summit was initiated to put more focus on the environmental, social and economic effects of land degradation throughout the region (PAGGW, 2018).

Member states of the AU were urged to facilitate the initiative by domesticating it and implementing it at multiple levels. Institutions to aid the implementation process of the GGW arose at national, sub-regional and regional levels. In 2010, The Pan-African Agency of the Great Green Wall (PAGGW) was created for regional coordination and implementation. Pan-Africanism evolves around the idea that peoples of African descent should be unified because they have common interests. In the early days of this concept, it was mostly seen as a political or cultural movement. Nowadays, there are many varieties of Pan-Africanism, the general sentiment being that people of African descent have a great deal in common,

which is a fact that deserves notice and even celebration (Kuryla, 2020). In the context of the GGW, it means that the implementation of the GGW, which is monitored by the overarching PAGGW, is a unified effort of the countries on the African continent and relatively independent of the countries outside of it (Kuryla, 2020). Currently, the PAGGW has been ratified by Burkina Faso, Chad, Djibouti, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Senegal and Sudan (PAGGW, 2018). As stated in the special edition of Les Echos de la Grande Muraille Verte, "With the creation of the PAGGW, the Heads of State and Government wanted to provide the Initiative with an appropriate legal, organisational, and institutional coordination mechanism to ensure that the GGW Initiative has the necessary visibility and monitoring expected by the Member States" (PAGGW, 2018, p.33). The PAGGW is responsible for the implementation, coordination and development of the set plans and strategies, as well as for the mobilisation of resources for these developments in coherence with the Member States (PAGGW, 2018). The PAGGW functions as an inter-state organisation, it has legal capacity and management autonomy, while remaining under the supervision of the African Union and Community of Sahel-Saharan States (CENSAD).

The scale of the GGW is also what makes it complex. Multiple countries, all with their separate political structures and ecosystems, are supposed to form a piece of a bigger puzzle. The scale of the GGW does attract a lot of attention from international organisations and donors. At the same time, it is the transboundary character of the GGW that is causing a lot of obstacles. For a transboundary initiative of this scale to properly function, efficient communication is required between the different countries, but also between the national, state and local levels within that country. The lack of communication and translation of ideas, as mentioned in the problem statement creates a discrepancy between the ideas created at the transnational level and the implementation at the local level (a, Adanikin, 2019 & b, Adanikin, 2019). Furthermore, environmental problems do not respect national borders (Bodin, 2017), so cooperation and therefore communication is requisite.

4.1.2.2 Design of NAGGW

Nigeria, as a member of the PAGGW, created the National Agency of the Great Green Wall (NAGGW) to continue with the efforts of the PAGGW on national soil. In May 2015, the NAGGW was established through the federation of Nigeria's laws and under Act No 3 of the Federal Government of Nigeria (National Agency for the Great Green wall - Establishment Act no 3, 2015).

Prior to its initiation, the start of the GGW was managed by the Federal Ministry of Environment's Drought and Desertification Amelioration department. After its initiation, the implementation process of the GGW in Nigeria became the NAGGWs greatest responsibility.

The NAGGW is structured into five departments and five operational units. The five departments are the 'Afforestation & Land Management Department', the 'Finance & Administration Department', the 'Planning, Policy & Coordination Department', the 'Resource Mobilization & Partnership Building Department' and the 'Rural development & extension services' (National Agency for the Great Green Wall, n.d.). The operational units are the 'Press Unit', the 'Procurement Unit', the 'Reform Unit', the 'ICT Unit' and the 'Internal Audit Unit' (National Agency for the Great Green Wall, n.d.). Furthermore, the NAGGW consists of a governing council providing policy direction, a state implementation committee coordinating NAGGW initiatives at the state level and a local government implementation committee translating national initiatives to the local government and community level (National Agency for the Great Green wall - Establishment Act no 3, 2015). Act No 3 is the legal backbone that demands certain acts from the NAGGW. The main focus is on the formulation of an implementation strategy, the monitoring of other organisations causing desertification, the sharing of related skills and knowledge throughout all governmental levels and the restoration of degraded ecosystems and land by creating a mosaic great green wall of shelterbelts or trees, ranging from northwest to northeast Nigeria. All should be in compliance with the overarching focus and rules of the GGW (National Agency for the Great Green wall - Establishment Act no 3, 2015). According to the UNCCD, by 2020 Nigeria has produced 7.6 million plants and seedlings, reforested 2 801 hectares of land, created 373 hectares of multipurpose gardens, created 709 km of windbreaks, trained 1 205 people and created 1 396 jobs (UNCCD, 2020).

Cooperation with the top as well as the bottom is of vital importance to make the NAGGWs ambition a success. The top being the overarching institutions like the PAGGW, the bottom being the local communities. It is written in the DNA of the NAGGW to incorporate local communities, it is key when aiming for the long-term success of the NAGGW and overall GGW. Local communities can be involved in the implementation and identification of appropriate restoration activities (IUCN, 2017). Degradation of land is closely linked to the migration of people. People tend to migrate when land is getting degraded because it directly influences their ability to survive, which will even further degrade the land (Van Reisen, 2020). Furthermore, the possibility of joining the regional decision-making regarding the program will enhance the sustainability and long-term involvement of the program. A sense of ownership is essential when creating community involvement (Dyer, 2014). Dyer argues that community involvement creates an environment of informed decisions, trust, equity, fairness and achievable outcomes which can feed into a sense of ownership for sustainable outcomes (Dyer, 2014). This way, local community involvement can act as a catalyst for the success and sustainability of the program. Nevertheless, as will be further discussed in this research, even though the NAGGW aims for creating community involvement, it is often lacking.

4.1.2.3 Political structure

Prior to the initiation of the NAGGW, the National Strategic Action Plan (NSAP) for the implementation of the GGW in Nigeria was developed in 2012. Recently, NAGGW reviewed it to see if it was in line with their vision (Oyema-Aziken, 2021). In support of the NSAP, Nigeria has set up an institutional arrangement to enable the implementation of the national plans aligned with the plans set out on the transnational level. The institutional arrangement exists out of three levels:

- National Council on Great Green Wall (The Council is the Governing body for the Agency, i.a. it provides policy direction for the programme implementation);
- State Implementation Committee;
- Local Government Implementation Committee (Globe).

The NAGGWs logic of implementation follows Nigeria's political division into smaller sections. The Federal Republic of Nigeria comprises the federal capital territory and 36 states. The states are further divided into local government areas (LGAs), a total of 774 LGAs, each being administered by a local government council. The LGAs are further divided into wards. Furthermore, numerous indigenous, pre-colonial states and kingdoms are part of Nigeria. The so-called 'traditional rulers', often maintaining the monarchical titles of their ancestors, do not have formal political power, however by commanding the respect of their people they can exert significant influence (Onah, 2014).

It can be argued that to understand the problems that the NAGGW is facing, it is important to recognize the institutional structures they are extracted from. This research is focusing on the social and ecological nodes. To understand the role of the social actors involved, one needs to be aware of the arena they are operating in. Therefore, the design of the political structures involved is mentioned. The GGW led to the PAGGW and the NAGGW. For the context, it is pivotal to highlight the Pan-African sentiment which evolved into the transboundary character of the GGW and NAGGW. Furthermore, the transboundary character of the NAGGW is relevant because it sheds light on the complexity of the multiple levels involved. This makes the NAGGW even more prone to communicational flaws.

4.2 Case Explanation

The focus of this study is on the GGW. Nigeria is one of the 11 members of the GGW. Initially, it was planned that the case would focus on a local GGW site In Nigeria, preferably close to the border with the neighbouring country and GGW member Niger. Due to the lack of geographical data and information of actual GGW sites in Nigeria, this plan was adjusted. The case of this research is the National Agency of the Great Green Wall, Nigeria's GGW implementation organisation.

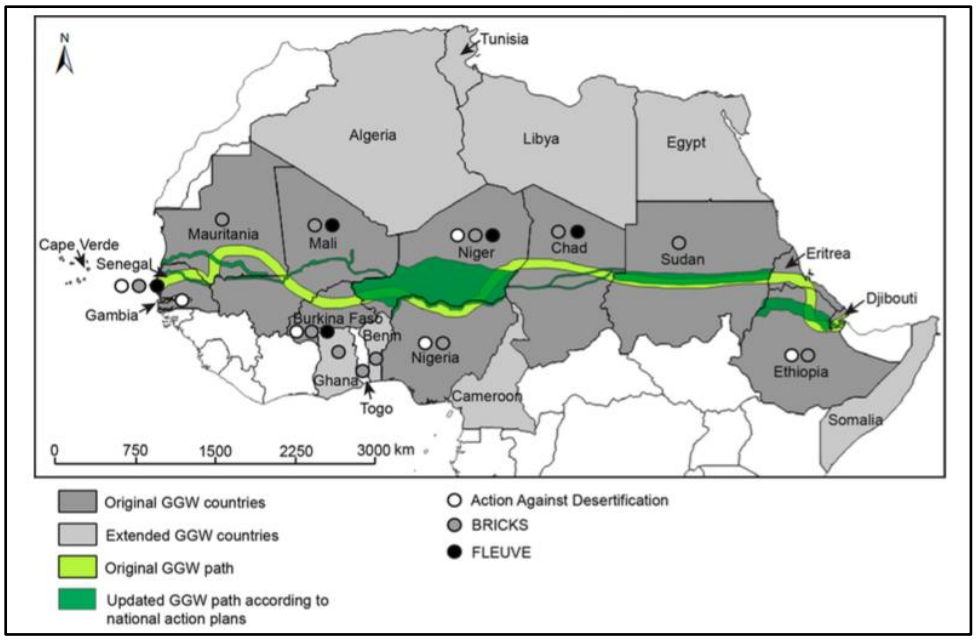


Figure 4. The Original and Updated GGW Path (Goffner et al., 2019).

Figure 4 highlights the original and updated GGW path through the 11 original GGW countries (Goffner et al., 2019). The establishment of Nigeria's National Agency of the Great Green Wall in 2015 made Nigeria an interesting country for the case study. This enables research into the policy documents and offers a clear overview of the actors involved and their objectives. As presented in the figure 5, the path of the GGW will cross the northern states of Nigeria (FAO: The Great Green Wall

Program - National Agency for the Great Green Wall n.d.).

Figure 5. Proposed Great Green Wall Route (source: FAO: The Great Green Wall Program - National Agency for the Great Green Wall (n.d.).

In the case study the TSES framework will be applied to the NAGGW to see how the SES is integrated within it. It will shed light on the position of the social nodes in the GGW and NAGGW, and their connection to the ecological nodes. Analysing

the institutional set up and the - missing - links within it will make it easier to understand why the NAGGW is failing and will allow for suggestions to be made.

When looking at the design of the GGW and the NAGGW it seems to be up for success. The structure of how it should be implemented is well documented. Yet, updates on its progress are lacking behind and critics even speak of a failure (Cernansky, 2021). There appears to exist an astonishing degree of discrepancy between what is planned and propagated by the GGW and NAGGW, at the transnational and national level, and what is actually achieved at local level after 14 years of GGW and 6 years of NAGGW existence. Analysing the NAGGW management is therefore highly relevant for the successfulness of the GGW.

As earlier mentioned in this chapter, many factors influence the failing management of desertification in Nigeria. It remains challenging to find an approach that brings a halt to further ecological deterioration and desertification in Nigeria (Jalam et al., 2021). Since ecological systems do not stop at national borders and the GGW involves multiple members, all with different political structures and ecosystems, communication and cooperation are pivotal for the success of the NAGGW and GGW. For successful implementation of the GGW goals, cooperation with the top as well as with the bottom is recommended.

A chain is only as strong as its weakest link. The case study is on the NAGGW but also includes its transboundary character. This is relevant because it is one of the reasons for its complex nature. Following this holistic proverb, it makes researching the functioning of the NAGGW beneficial for the functioning of the GGW as a whole. To gain better insight into the institutional set up that is causing problems for the NAGGW in managing desertification, the research is focusing on the social and ecological nodes within this set up. What are their roles? Is there an interconnection between them? Who is involved? These are some of the questions answered in the following chapters.

Chapter 5: Transboundary Conservation

This chapter aims to better understand the powers at play at the transnational level of the GGW and NAGGW according to the 3 modes of political conduct defined by Büscher. This is relevant as it sheds light on the ideologies and elements that influence the structures of the NAGGW and the GGW while operating on a transnational level for environmental conservation. This chapter comes prior to the chapters answering the sub-questions of this research as it allows us to focus on the outer edge of the TSES, the transnational level before we start zooming in on the case at the national and local levels. Throughout the research, the focus will become more specific.

To clarify, the transnational element and how it relates to Büschers modes of political conduct is what will be discussed in this chapter. Yet, the transnational level is not excluded from the other empirical chapters as it is an integral part of the TSES framework.

5.1 Consensus

As explained in section 2.1.5, according to Büscher the first mode of political conduct is the discourse of consensus. A representation of consensus is aimed for when discussing topics of development and conservation (Büscher, 2013). To effectively cooperate with 11 different countries on the same goal, one could argue that a certain level of consensus has to be achieved. Aigbokhaevbo advises that to prevent the ineffective patchwork style effort that characterises GGW implementation, a harmonised effort should be implemented (Aigbokhaevbo, 2013). In the National Strategic Action Plan (NSAP), it is argued that ”there is now a general consensus that a coherent and well-planned multisectoral management approach to natural resources is imperative to tap into the opportunities that sustainable land management in the desertification prone areas of Nigeria provide” (Federal Republic of Nigeria, 2012, p.9/10). The need for harmony and consensus is pivotal for the success of the NAGGW, this same logic applies to the GGW. The Great Green Wall Strategic Action Plan (GGWSAP) is the transnational version of the Nigerian NSAP. The NSAP reveals that the development of the GGWSAP was also ‘carried out‘ along similar lines, with the main focus on harmonisation, participation and consensus being reached within and between the member states and on the concept of the GGW, its implementation vision, priority areas for intervention, responsibilities and roles for certain actors and monitoring and evaluation mechanism for its implementation (Federal Republic of Nigeria, 2012).

5.2 Anti-politics

The second mode of political conduct is anti-politics. Büscher defines politics as "the mediation and contestation of different interests and power struggles" (Büscher, 2013, p. 20), while anti-politicking is defined as the "political act of doing away with politics" (Büscher, 2013, p. 21). By empowering the strong actors in the conservation arena, anti-politics reinforces the status quo of neoliberalism in conservation. This further increases the inequality between actors in the arena. The aforementioned focus on reaching consensus is actually what is often suppressing the possibility to have a political debate and democratic process between the actors involved.

In the case of the GGW and the NAGGW, critics have pointed out that important stakeholders are not consolidated on a general basis. The interviewees pointed this out by stating:

> *"But they won't view it as a federal matter no matter how many beautiful plans you have if it is not connected, then it is nowhere granted, it is nowhere anchored at the state and the local" (Interviewee 5, November 8, 2021).*
>
> *"The success of the program is small, actually it is the federal government is much involved, but there is a need for more state, state government and local government buy-in " (Interviewee 2, June 24, 2021).*
>
> *"The trees that are planted are supposed to be planted in partnership with the state government. So the federal minister of environment ought to have a talk with the state minister of environment to exhibit the project at the project site, so at some point, take for instance the Adamawa state government. The Adamawa state government, through the state minister of environment, was actively involved in the initial stage at the project inauguration. But thereafter, they were left out. So the contractors continued with the project and did not carry the state government along in the project execution" (Interviewee 1, June 16, 2021).*

It is the common experience that stakeholders at the state and local level have not been invited to join the discussion on how to best approach the GGWs implementation (Chechina, 2011). Doing away with the possibility to join the conversation regarding matters that have a tremendous influence on the stakeholders' life, role and job is doing away with politics. It deprives their ability to voice their interest, knowledge and play an active role in, amongst others, the implementation of the GGW in Nigeria. It shelters and reinforces the position of actors that are already operating in the arena, such as GGW or NAGGW internal actors, while it negatively reinforces the position of locals as cheap labour forces (Chechina, 2011). As stated in chapter 2, power and hierarchy are influencing who is having a seat at the table. This influences the chain of events and feeds into the discrepancy of what is planned at the national level and what is implemented at the local level, as will be shown in chapter 6.1.

5.3 Marketing

The third mode of political conduct is marketing. Büscher argues that in the organisations' quest for legitimacy, conservation is often commodified. The GGW tries to convince people to participate and join the movement with an argument that if people care for the fruit trees planted, these trees can add nutritional value as well as economic value. IFAD, the fund that is going to join forces with the NAGGW, is focusing on ensuring investment into locally created rural projects and facilitates local buy-in of projects or land. One of the interviewees further elaborated on the role of IFAD:

> *"we [IFAD] are trying to secure financing for activities either for adaptation or mitigation and the farmers can present their business plan and show that they have their activities that require funding so they get access to funding through the banking system but at zero interest rate" (Interviewee 3, June 29, 2021).*
>
> *"So our role for IFAD is to support the farmers on the technical level to develop those proposals for funding and then we support them in the implementation to make sure that it is really aligned with what they propose in their business proposal" (Interviewee 3, June 29, 2021).*

Critics of the GGW have pointed out that the GGW could be a helpful initiative to combat desertification, however, only if it is "viewed as an exercise in adaptation, rather than as an opportunity for climate change mitigation and making money from CDM/REDD carbon offsets as presently envisioned" (Chechina, 2011, p.464). The marketing efforts of the NAGGW do tie in with the overall marketing efforts of the GGW. Marketing is essential in selling an idea. In order to do this, certain discourses, images or projects can be reconstituted in neoliberal terms. One way to do this is by strengthening the ties with institutional actors. This facilitates the adoption of neoliberal ideologies within the GGW projects. The GGW does this by cooperating with the World Bank, the FAO, the IUCN, the UNCCD, the GEF, the EU, the UNDP, the UNEP (UNCCD 2020). Other cooperations with institutional actors are further elaborated upon in chapter 6. Another way to do this is incorporating a 'win-win ideals' conception of nature. However, aiming for win-win ideals gets more challenging when the scale of a project is significantly increasing, which is also inherent to neoliberal conservation discourses (Büscher, 2010; 2013). Also, anti-politicking creates an unequal playing field, in which it is even harder to create 'win-win ideals'. The GGW expanded its scale even beyond the 11 member states. It now also involves the extended GGW countries, as can be seen in figure 4 (Goffner et al., 2019). Yet, this also makes it more challenging to create 'win-win ideals', since too many men, too many minds. Even though they are trying to reach a consensus on implementation approaches, 'win-win ideals' seems to be something for the future when the GGW is flourishing.

5.4 Conclusion

This chapter showed how the 3 modes of political conduct influence the structures of the NAGGW and the GGW while operating on a transnational level for environmental conservation. The GGW serves as a cooperating tool between actors in managing the desertification in Northern Africa. Examining how a transboundary initiative - like the GGW - came into place and how it is embedded in certain ideologies, enables us to analyse the context in which a discrepancy between the representation and the reality, and the lack of communication and interconnectedness exists between the social and ecological nodes within the NAGGW.

It is stated that in order for the GGW and NAGGW to succeed, consensus is essential. However, stakeholders at the state and local level have not been invited to join the discussion on how to best approach the GGWs implementation. It reinforces the position of actors that are already operating in the arena, creating an unequal playing field. This is counterproductive when aiming for consensus between all the parties. The bubble of neoliberal conservation exacerbates the representation of the GGW which distorts its representation and reality. This can be seen in the discrepancy between what is presented at the transnational or global level and what is implemented at the local level. In the next two chapters, the lack of interconnectedness between the social and ecological nodes and overall discrepancy within the NAGGW will be at the centre of attention.

Chapter 6: The Social and Ecological nodes in the TSES

Chapter 6 is divided into two sub-chapters. Both sub-chapter 6.1 and 6.2 are concerned with the social and ecological nodes in the TSES and the connections[2] between them. Chapter 6.1 will answer the first sub-question "*What are the social and ecological impacts of the Great Green Wall in Nigeria*" and chapter 6.2 will build on the answers provided and answer sub-question two "*What are the current social-ecological system connections within the NAGGW that focus on the implementation of the Great Green Wall in Nigeria?".*

6.1 What are the social and ecological impacts of the Great Green Wall in Nigeria?

This chapter provides the reader with background knowledge regarding the case of this research. Additionally, it is the crucial first step in delineating the social and ecological nodes. In order to shed light on the social and ecological impact of the GGW in Nigeria, a short description will be given of the situation prior to the start of NAGGW activities. The described contrast between the circumstances will define the impact the GGW has in Nigeria.

6.1.1 What is the social impact of the Great Green Wall in Nigeria?

The implementation of the GGW in Nigeria is having a profound social impact on the affected lives, subject to the GGW implementation in Nigeria. As has been described in chapter 4.1.1.1, prior to the inauguration of the NAGGW and prior to the implementation of the GGW, people faced with desertification were living in cruel conditions without any alleviation. As stated in the UNCCD report on the Great Green Wall implementation status and way ahead, "In Nigeria, the economies and livelihoods of communities living in [the] dry region depend largely on soil, water, and vegetation cover. As these are increasingly threatened by desertification and recurrent droughts, the socio-economic development of the country's dry region is jeopardized" (UNCCD, 2020, p.64). The Food and Agriculture Organization (FAO) held a survey in 2015. The survey was held in communities' part of the GGW in Nigeria. According to the survey, in 44% of the households, 1 or 2 members had out-migrated for work or had been gone for more than six months; 90% were facing issues of food insecurity; in order to feed their families, food shortages are handled by eating the leaves harvested in forests, fuelwood collection and sale, forest harvesting, sale of livestock and gardening; 38% had experienced conflict over natural resources in the last 5 years; 45% had access to tap water, 82% had access to a borehole; 90% were able to obtain water from open wells. ; 92% reported that agricultural land had encroached on forests, and 52% reported that livestock had encroached on agricultural land. Leaving the communities with less food, less

[2] To clarify, throughout this research the words 'links', 'connection', 'relationships', 'influence', appear to be used interchangeably when referring to relation between two or more nodes. However, these words have been selected to fit the specific contexts in which they are applied.

arable land, less stable access to a water supply (Sacande et al., 2018). Social conflict, displacement and migration are consequences of resource scarcity due to drought and desertification caused by climate change (Olagunju et al., 2021). As argued by Olagunju et al., "Nigeria has been facing the secondary impacts of its changing climate, though exacerbated by ethno-religious divergence, which are manifested in violent conflicts, internal displacement of people and forced migration" (Olagunju et al., 2021, p.8). One can conclude that the alarming rate at which desertification is encroaching is likely to leave far more destruction behind than solely the desert.

The situation described above stresses where it leaves room for improvement. Implementation of the GGW in Nigeria allows for certain Sustainable Development Goals (SDGs) to flourish. It creates a safe and just space for humanity to thrive between the social foundation, identified as the SDGs and the environmental ceiling as set by Rockströms planetary boundaries (Rockström et al., 2009; Raworth, 2017; Goffner et al., 2019). This is relevant because the GGW directly contributes to six SDGs, but benefits all 17 SDGs.

The first social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 1 'No Poverty'. The NAGGW improves the resilience of the local population to poverty through the creation of income-generating opportunities. Fruit trees and crops are planted to create an economic benefit for the communities. Aside from the fruits being part of their diet, the fruits can also be sold to others (a, Adanikin, 2019). Another income-generating opportunity is the valorisation of local products such as gum Arabic (Onuoha, 2009; Schleeter, 2013; UNCCD, 2020). The second social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 2 'Zero Hunger'. The NAGGW improves the development of agropastoral boundaries for livestock farming and crops production, development of market gardening and fruit crops, implementation of sustainable land management practises (a, Adanikin, 2019; Schleeter, 2013). Planting trees that are fruit-bearing helps to combat high levels of malnutrition. Often these trees are first grown in the nurseries, otherwise, they are at risk of being cut down and commodified into the wood of the tree might be commodified into firewood. As also seen in Mali, and as said before in 5.1.1.2 improving the social-economical livelihoods of the people serves as an antidote to the recruiting practice of the vulnerable by terrorist groups (Schleeter, 2013; Federal Republic of Nigeria, 2012; Cheri, et al., n.d.). The third social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 8 'Decent Work and Economic Growth'. The implementation of the GGW in Nigeria created permanent and temporary jobs. In 2020, it was estimated that 1396 jobs were created. An example is the creation of the forest guards job (a, Adanikin, 2019; UNCCD, 2020). The fourth social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 12 'Responsible Consumption and Production'. Through the forest guards or the persons put in charge of the nurseries, the NAGGW provided training on sustainable production techniques. In 2020, it was estimated that 1205 people were

trained (a, Adanikin, 2019; UNCCD, 2020). The fifth social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 13 'Climate Action'. The NAGGW directly aids mitigation and adaptation to climate change by combating desertification, planting trees and increasing carbon dioxide sequestration. In 2020, it was estimated that the NAGGW had produced 7.6 million plants and seedlings (UNCCD, 2020). The final social positive impact of the GGW in Nigeria is that the GGW directly contributes to SDG 15 'Life on Land' by implementing landscape and biodiversity restoration activities. In 2020, it was estimated that the NAGGW has created 2801 hectares of restored lands, 709 kilometres of windbreaks and 373 hectares of multipurpose gardens (UNCCD, 2020).

A social negative impact is a high level of scepticism towards the federal government that is fed by implementation failures. Many NAGGW projects in Nigeria lack continuous involvement or guidance of the government with the implementation after the initial steps have been taken. At the community level, people do not know who is responsible. The federal government hires fake contractors, neglects nurseries, ignores and disregards local authorities and does not pay nor engage the forest guards. This has led to a general consensus of distrust towards the federal government and NAGGW, both being a regulatory and executive body, and has created a negative social impact (a, Adanikin, 2019; Cheri, et al., n.d.).

6.1.2 What is the ecological impact of the Great Green Wall in Nigeria?

As is appearing to be the general gist of the implementation of the NAGGW, there exists a discrepancy between the ecological impact that is propagated and the actual reality. The NAGGW planned to establish a contiguous shelterbelt of 1,358.62 kilometres from the northwest to the northeast along the frontline states. Shelterbelts main purpose is that it serves as windbreaks. Additionally, it initiates a positive ripple effect that halts the Southward advancement of the Sahara Desert, it rehabilitates degraded lands which improves and protects the quality of farmlands, this improves vegetation cover which increases biodiversity, it combats climate change, which eventually protects and enhances rural livelihoods by stabilising the sands (Pan-African Great Green Wall, 2018). The NAGGW aimed at contributing to sustainable ecosystem-based integrated land management for greater ecosystem stability and to make agriculture "the main lever for rural development, economic and social growth" (Federal Republic of Nigeria, 2012, p.41). The NAGGW has a positive ecological impact by focussing on the ecological aspects of restoring the production capacity of existing forest plantations, restoring rainfed agriculture, using perennial forage species to re-vegetate abandoned or bare range areas, controlling erosion systems, saltating sand dunes and enhancing silvopastoral systems (O'Connor & Ford, 2014; Federal Republic of Nigeria, 2012). However, the question remains whether the achievements amount to what was initially planned (Pan-African Great Green Wall, 2018).

In order to establish the shelterbelts, community orchards and woodlots, about 6,032,015 seedlings of various species were produced from 2013 till 2016. Additionally, 200,000 improved seedlings were produced and distributed to local farmers. Table 2 highlights the number of seedlings produced per state in between that time period (Pan-African Great Green Wall, 2018).

S/No	State	Quantity of seedlings Produced	Species
1	Kebbi	1,153,871	Neem, Eucalyptus, Mango, Cashew, Citrus, Date palm and Guava
2	Sokoto	866,74	"
3	Katsina	876,526	"
4	Jigawa	834,170	"
5	Yobe	818,756	"
6	Zamfara	392,812	"
7	Borno	647,687	"
8	Kano	849,133	"
9	Bauchi	350,494	"
10	Gombe	593,032	"
11	Adamawa	413,761	"
Total		**7 610 532**	

Table 2. 2013 -2017 Production of Seedlings by States (Pan-African Great Green Wall, 2018).

Community nurseries were established to create a decentralised production and distribution of the seedlings in 92 communities. The nurseries that have a high capacity, a production of 50,000 tree seedlings per year, are provided with solar-powered boreholes as a source of water and are fenced (Pan-African Great Green Wall, 2018). From 2013-2017, around 642.46 km shelterbelt has been created using Neem, Azadirachta Indica, Acacia Senegale and Eucalyptus along the frontline's states, as is seen in table 3 (Pan-African Great Green Wall, 2018).

S/No	States	Shelterbelts (km)					Total (km)
		2013	2014	2015	2016	2017	
1	Kebbi	42	22	30	-	22	116
2	Sokoto	10	22	31	-	22	85
3	Zamfara	10	5	25	-	14	54
4	Katsina	34	10	30	-	20	94
5	Jigawa	28	22	30	-	20.5	100.5
6	Yobe	37	22	27	-	15	101
7	Borno	20	7	21.66	-	15.3	63.96
8	Kano	6	22	-	-	-	28
Total		187	132	194.66	-	128.8	642,46

Table 3. Shelterbelt Establishment (Pan-African Great Green Wall, 2018).

One of the priorities of the NAGGW has been the development of woodlots. As mentioned by (Olagunju, 2015), often trees are being cut down to serve as

fuelwood. The development of woodlots can provide fuelwood, other forestry products, it further increases the total vegetation cover of the GGW operational area and its soil carbon content and rehabilitates degraded lands (O'Connor & Ford, 2014; Pan-African Great Green Wall, 2018). From 2013 till 2017, a total of 269.7 ha community woodlot has been established in 4 states as seen in table 4 (Pan-African Great Green Wall, 2018).

S/No	State	Established Woodlot (ha)					Total (ha)
		2013	2014	2015	2016	2017	
1	Adamawa	20	20	33	-	35	108
2	Gombe	15	10	20	-	15	60
3	Bauchi	-	20	4	-	35	59
4	Kano	-	-	17,5	-	25,2	42,7
Total		35	50	74,5	-	110,2	269,7

Table 4. Community Woodlot Establishment (Pan-African Great Green Wall, 2018).

From the start of the GGW implementation in Nigeria, a strong focus has been on the improvement of water security. From 2013 till 2017 around 156 solar and wind-powered boreholes have been constructed. These boreholes provide water to over 40,000 people and 150,000 livestock (Pan-African Great Green Wall, 2018). The security of water allows for a multitude of positive consequences for the land and the people.

Analysing the above-mentioned numbers, it seems like progress has been made. Although the actions planned are widely celebrated and reported on, the same does not hold true for the data regarding the implementation. Primary data and sources containing local statements allow for a more critical perspective on the advances made.

Primary data reveals response that enables a complete depiction of the status quo. According to interviewee 1:

> *"I was able to track the level of work done by the contractors, because it was discovered that some of the contractors were not actually registered as contractors with experience in that area, some were into road construction or printing, and yet you find them planting trees and doing nurseries and all that. So at that point it gave me a kind of a school that, something must be wrong somewhere, so I went into the field. So it was at that point that I realized that some of the projects were not executed. In the way it should, you know? So in some locations, the trees, the nurseries were prepared, the nurseries were planted, but they were not undone to the local governance, to the rural dwellers to continue from where they stopped." (Interviewee 1, June 16, 2021)*

Finding out that contractors were hired who were unqualified for the job made him feel like something must be wrong. When he continued his research, he found

out that in some locations nurseries were prepared, but were not handed over to local governance authorities, nor rural dwellers, to continue the project.

How can one expect to have an ecological impact when the companies hired to create it are not skilled nor adequate in doing so? Even though this and the following statements are of social and institutional nature, the effect is felt at the ecological level. Adanikin reveals similar experiences, “However, trees at open spaces are cut down at free-will for domestic purposes” & “As you can see, the nurseries have died because they are not being taken care of” (a, Adanikin, 2019)

> *“it also depends on the knowledge of the people managing the process because sometimes you have beautiful plans, and I can tell you there is always the talent of the developing world, especially with grassroots criteria, there are always beautiful plans, there is always a disconnect between the people, the plans and the projects on the ground. I think what we need to do in this case is that for the GGW to approach the right kind of people” (Interviewee 5, November 8, 2021).*

Either trees that are planted are at high risk of being cut down, due to social economic pressures, or projects are initiated but not continuously carried out.

The following statement highlights the urgency to create a multi-stakeholder approach and get all the relevant state levels involved to create an ecological impact. According to interviewee 5:

> *“the government has already taken the role and then so many resources have been deported to the GGW so the states minister of environment is waiting for the GGW to come to talk to them, for partnership and synergies. There are so many initiatives and activities that you cannot do without the involvement of the state. But that does not mean you declare those resources for the state, because the state already has their own politics, when you give them the resources, for tree planting etc. so at the state level they could really play a role of project implementer” (Interviewee 5, November 8, 2021).*
>
> *“I think what we need to do in this case is that for the GGW to approach the right kind of people that know how to work with little resources, there are also international organisations working in this space, I mean, that are getting better results in environmental resource management. So one thing about Nigeria is that we discovered that when an agency of the government is doing something and spends so much money and the results are only getting worse. But once we include an NGO or a community-based organisation, IO, they have the better management and the better money management and organisation they do better because they are spot on when it comes to where things are getting difficult, they know what still can be done” (Interviewee 5, November 8, 2021).*

It shows that in order to have an ecological impact, all crucial parties should be involved along the institutional and social path towards it. Simply planting a tree to have an ecological impact, does not cut it.

6.1.3 Conclusion

The social impact of the GGW in Nigeria can be summarised along the SDGs that are impacted. The SDGs with regards to No Poverty, Zero Hunger, Decent Work and Economic Growth, Responsible Consumption and Production, Climate Action and Life on Land are impacted by GGW implementation.

The ecological impact of the GGW in Nigeria is difficult to *pin down due to lack of documentation*. Indications of how many trees are planted, hectares of degraded land are restored, shelterbelts, woodlots, orchards or nurseries are created and seeds are distributed scratches the surface. At the same time, it does depict the effort put into curbing desertification. When looking at the progress of ecological impact so far, many great plans are created, but implementation is lacking. In order to reach the target of 2030, the implementation process should be drastically adjusted. Suggestions on ways in which this can be done will be discussed in the following chapters.

Lastly it can be argued that the social and the ecological impact of the GGW in Nigeria are not two independent factors. They influence each other. When the positive ecological impact increases, the services provided by the ecosystem will flourish too. When positive social impact increases, human well-being will flourish too. It is pivotal to acknowledge the interplay between human well-being (the social) and ecosystem services (the ecological), because it challenges the idea that the social and ecological impact are two separate factors in the analysis. When security and health, amongst others, are provided by ecosystem services it directly influences human well-being (MEA, 2003).

6.2 What are the current social-ecological system connections within the NAGGW that focus on the implementation of the Great Green Wall in Nigeria?

This chapter will focus on the social and ecological nodes. What are the connections between the social and the ecological nodes? And how do they relate to each other? It is relevant to have more context on the social nodes mentioned in this chapter as it might add to the explanation of why certain connections are or are non-existent. The data collected to answer these questions is either sourced from primary data sourced from the interviews or from desktop research.

6.2.1 Who or what are the social nodes?

This section aims at displaying the wide range of social nodes involved in the GGW in Nigeria. The social nodes will be roughly arranged from transnational level to local level, however, the location of the social nodes within the TSES will be covered in the next section.

The political leadership of the GGW is taken on by the African Union Commission (AUC) (Federal Republic of Nigeria, 2012). The GGW in Nigeria involves many different social nodes. Social nodes can be actors that are part of the GGW, the NAGGW, or any other relevant social establishment, that possess authority and decision-making power related to the implementation and functioning of the GGW in Nigeria and NAGGW (Bodin, et al., 2016). This way they are able to influence decision-making on the use of the ecological nodes, such as resources, and their relationships with each other.

When looking at the transnational level different social nodes are influencing the GGW in Nigeria. From the research, it became clear that often this influence is defined by financial aid, hierarchical power, monitoring, capacity building, and technical assistance. Examples of these social nodes are partners like the GGW, World Bank, IAEA, CIDA, GEF, UNDP, UNEP, UNCCD, UNIDO and national governments (Olagunju, 2015; UNCCD, 2020). Additional development partners that play a role are the AUC, PAGGW, CENSAD Secretariat, ECOWAS, Lake Chad Basin Commission (LCBC), Nigeria– Niger Joint Commission for Co-operation (NNJC), AMCEN, Permanent Inter-State Committee on Drought Control in the Sahel (CILLS), JICA, DFID, AfDB, EU, FAO, USAID, IUCN (the Federal Republic of Nigeria, 2012).

At the national level, social nodes that are involved with the implementation of the GGW comprises government at the federal, state and local level, the private sector, NGOs and local communities (Federal Republic of Nigeria, 2012). An example of the involvement of the private sector is companies that are responsible for the growing and planting of trees (a, Adanikin, 2019). As pointed out by Chechina (2011) and the interviewees, State and Local government involvement have been unwillingly left out.

"Let me first say that a project like this should be brought to the grass-root. And you hear many of these projects are being talked about at the federal government level without transmitting to the state. More importantly, to the local government" (Interviewee 4, July 16, 2021).

The assigned role for the Federal, State and Local Governments of Nigeria, their relevant Ministries, Departments and Agencies and decentralized offices is to be the principal partner in the GGW implementation (Federal Republic of Nigeria, 2012). Yet, a basic requirement for this is to be involved. State and Local Governments have expressed the need to be involved to make the GGW implementation in Nigeria a success (Gadzama & Ayuba, 2016; own data).

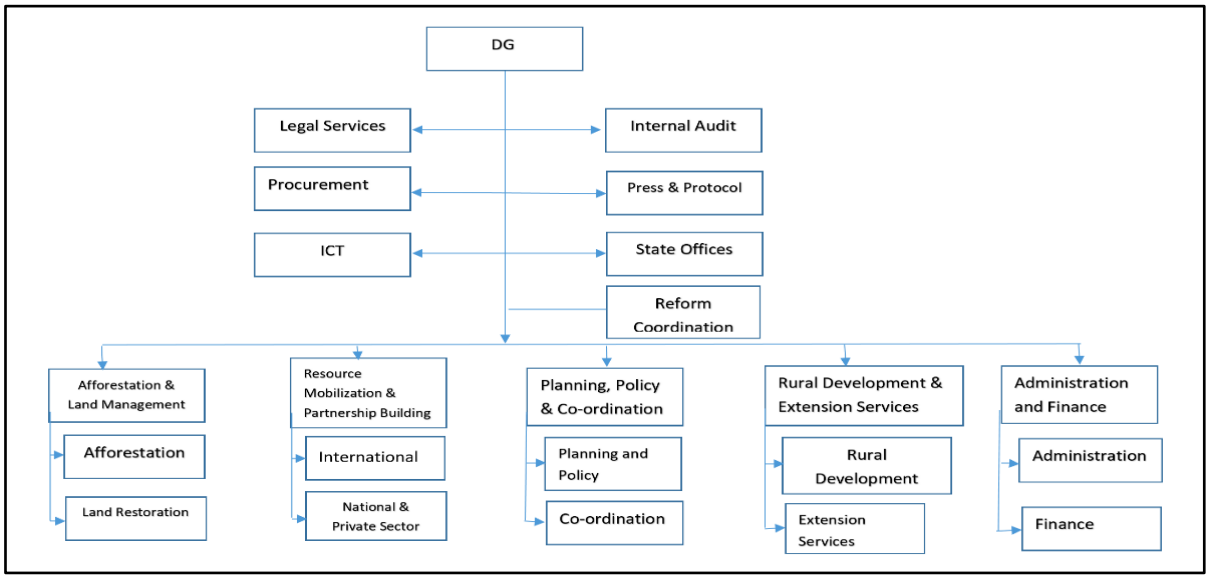


Figure 6. Organogram ("Organogram" - The Great Green Wall, n.d.).

The NAGGW is the agency that has been created to implement the GGW in Nigeria. Before it came into being, the GGW was managed by the Federal Ministry of Environment's Drought and Desertification Amelioration department. The official website of the NAGGW published its organogram, as seen in figure 6. It displays the roles, departments and units of the agency. Not displayed in the organogram but relevant to the functioning of the NAGGW are the internal governing council, state implementation committee and local government implementation committee (National Agency for the Great Green wall - Establishment Act no 3, 2015).

"the truth is when it comes to Nigeria we can do stratification of projects very well, that is not our problem, because when you look into it, you will find out that we have a coordinator for everything and yet it is not how it goes" (Interviewee 4, July 16, 2021).

Starting in 2022, the NAGGW will start a new partnership with the International Fund for Agricultural Development (IFAD). IFAD is focused on the rural poor, smallholder farmers, small agri-processes, farmer organisations at the grassroots level and helps them secure funding for their business plan at affordable rates. IFAD will be in direct contact with NAGGW sites to assess the needs of the local people and accommodate them. So now that the NAGGW is partnering with IFAD, as a joint force they can provide grassroot level expertise. One interviewee, who works at IFAD, mentioned how IFAD and the NAGGW complement each other:

> *"they [the NAGGW] have the vision and the strategies and we [IFAD] are able to mobilise resources, now we have the expertise to work with communities at the grass-roots level" (Interviewee 3, June 29, 2021).*
>
> *"when you are talking about IFAD they do not plan for the people, you plan with the people. For a kind of initiative like this [GGW] the people need to be involved, you need to involve people at the grassroots, you need to involve the local government, and you need to try for buy-in from the state government" (Interviewee 5, November 8, 2021).*
>
> *"You need to get the people to commit together. One thing that the GGW is not doing and IFAD is doing effectively, is that they are not entering from the base. They govern from the top. There are two ways they can do that, partnering by sister projects if they are not comfortable with the state government for example because, normally a federal project does not like the state controlling them, that is a very big issue. But they can partner with existing organisations that are working with the people and so they likely will get more results. Because anything you do without a big grassroots mobilisation, you are not likely to get a good result" (Interviewee 5, November 8, 2021).*

Social nodes also exist out of local communities. These grass-root communities exist out of local farmers, women, youths, pastoralists, agropastoralists whose livelihoods are dependent on the success of the GGW in Nigeria as it influences the natural resources available in their communities. From a top-down, NSAP, organisational perspective, a lot is expected of their prescribed role in implementing the GGW in Nigeria (Federal Republic of Nigeria, 201). However, clear and actual communication on what their roles and responsibilities are often failed, while their commitment appears to be essential to the success of the GGW (a, Adanikin, 2019; b, Adanikin, 2019; Alexander et al., 2016; Lawal, 2016).
Another social node is the forest guards. Around 800 forest guards were trained by the Federal Ministry of Environment. They trained and empowered youths to guard the afforestation program (Pan-African Great Green Wall, 2018). Initially, it was a great plan, this created a direct link between the social and ecological. However, as also mentioned by one of the interviewees, it appeared to be a case of political favouritism and ended up as a failure:

"Engaging them as forest guards will make the people take ownership over their projects. But what played out is that the process of engaging the forest guards was flawed, kind of. It was politicised, in the sense that politicians brought in their people, and took advantage of the opportunity, meanwhile, people, youth, who are residents in that area, across the states were supposed to be captured by the project exhibition." (Interviewee, 1).

The most pivotal social nodes have been mentioned. Yet, to argue that the list presented is complete would be naive. Unquestionably, there are individuals or even organisations that influence the implementation of the GGW in Nigeria that rather operate outside the spotlight, but that has been overlooked in this research due to failing documentation. In the TSES these social nodes are represented by the NGOs without any connection to the case. This way, while analysing the case, one is remembered of the versatility of the social nodes and their influences. The social nodes mentioned are divergent and all have their own role. Where the social nodes are positioned and how they relate to each other will be covered in the next two sections.

6.2.2 Where are the social nodes positioned within the social layer in the TSES?

Figure 7 displays the social layer of the TSES with all the social nodes (triangles), positioned in them.

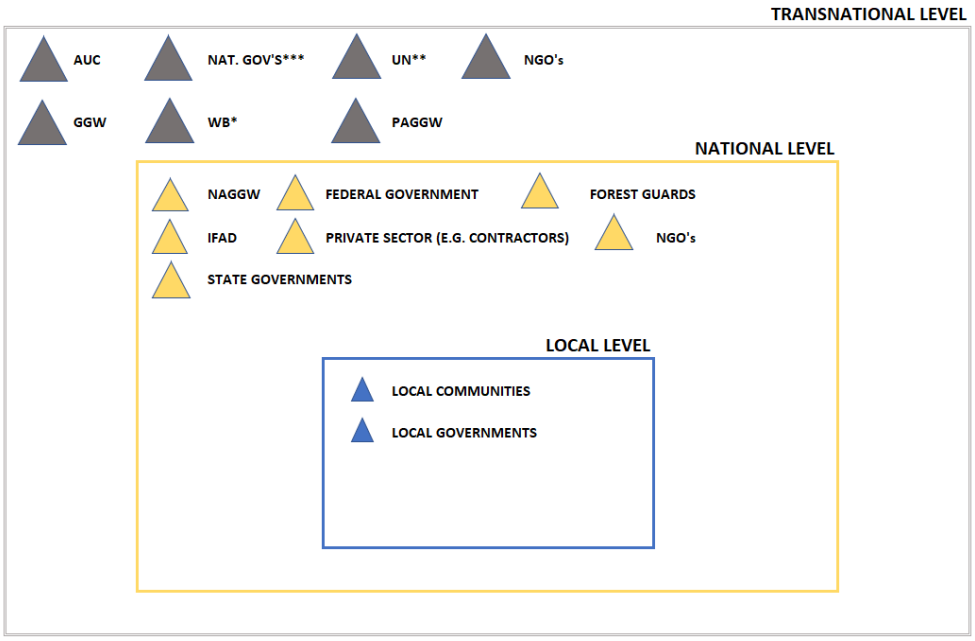


Figure 7. Social Layer of the TSES (Author, 2021)
*WB * = World Bank, IAEA, CIDA, GEF, CENSAD, ECOWAS, LCBC, NNJC, AMCEN, CILLS, JICA, DFID, AfDB, EU, FAO, USAID, IUCN; UN ** = UNDP, UNEP, UNCCD, UNIDO; NAT. GOVs *** = Other national governments than of the GGW members*

Following is a list of the social nodes in the TSES. At the transnational level the social nodes are:

- AUC; PAGGW; GGW; Other National Governments; NGOs; UNDP, UNEP, UNCCD, UNIDO (clustered); World Bank, IAEA, CIDA, GEF, CENSAD, ECOWAS, LCBC, NNJC, AMCEN, CILLS, JICA, DFID, AfDB, EU, FAO, USAID, IUCN (clustered).

At the national level the social nodes are:

- NAGGW (i.e. Director-General, Departments and Units); Federal and State government (i.e. ministries, departments, forest guards); NGOs; Private Sector; IFAD.

At the local level the social nodes are:

- The local communities (i.e. residents, farmers, pastoralists, agropastoralists).

To clarify, as mentioned in chapter 2, for effective natural resource management it is essential to focus on the interconnectedness of the social and the ecological nodes, as well as the focus on transboundary cooperation, since ecological nodes and their interconnectedness does not stop at national nor at transnational borders, whereas often social systems do (Bodin, et al., 2016). This does not mean that a social node cannot influence more than 1 level. For example, a social node that operates at the local level, also operates at the national level, because 'the local' is inherent to 'the national'. In the case of transnational environmental governance, many obstacles are being created due to the incapacity to communicate and cooperate over borders. In the TSES this will be displayed as a missing link between social nodes.

6.2.3 Social nodes and the links between them

The links between the social nodes represent a relationship between the two. This relationship can signify different things, it can be a financial influence, aid, political leadership, partnerships, job offerings and global oversight.

The AUC has the political leadership role over the GGW (Federal Republic of Nigeria, 2012). The UN, through its various departments, supports the GGW. The UNCCD has created a public awareness campaign regarding the GGW, financial initiatives like FLEUVE have been created under the wing of the UNCCD in support of the GGW (The Great Green Wall Initiative, n.d.). The World Bank has offers the GGW tremendous financial support (World Bank Group, 2013 & Great Green Wall receives over $14 billion to regreen the Sahel, 2021). The PAGGW is responsible for the implementation, coordination and development of the set plans and strategies, as well as for the mobilisation of resources for these developments in coherence with the GGW and NAGGW (PAGGW, 2018). The GGW offers leadership advice and the GGW program to the Nigerian national agency of the GGW, the NAGGW (National Agency for the Great Green wall - Establishment Act no 3, 2015). National governments like Spain, France, Israel and China, have financially

supported the GGW over the years (Federal Republic of Nigeria, 2012 & Great Green Wall receives over $14 billion to regreen the Sahel, 2021).

The Nigerian Federal Government and the state and local government are supposed to operate independently and be coordinated. However, the Federal government has overriding political authority, such as legislative and judiciary powers (Onah, 2014). The federal government has created the role of forest guards. They were trained by the Federal Ministry of Environment to guard the NAGGW afforestation program (Pan-African Great Green Wall, 2018). The Federal Government and especially the Federal Department of Forestry monitor and assist the NAGGW.

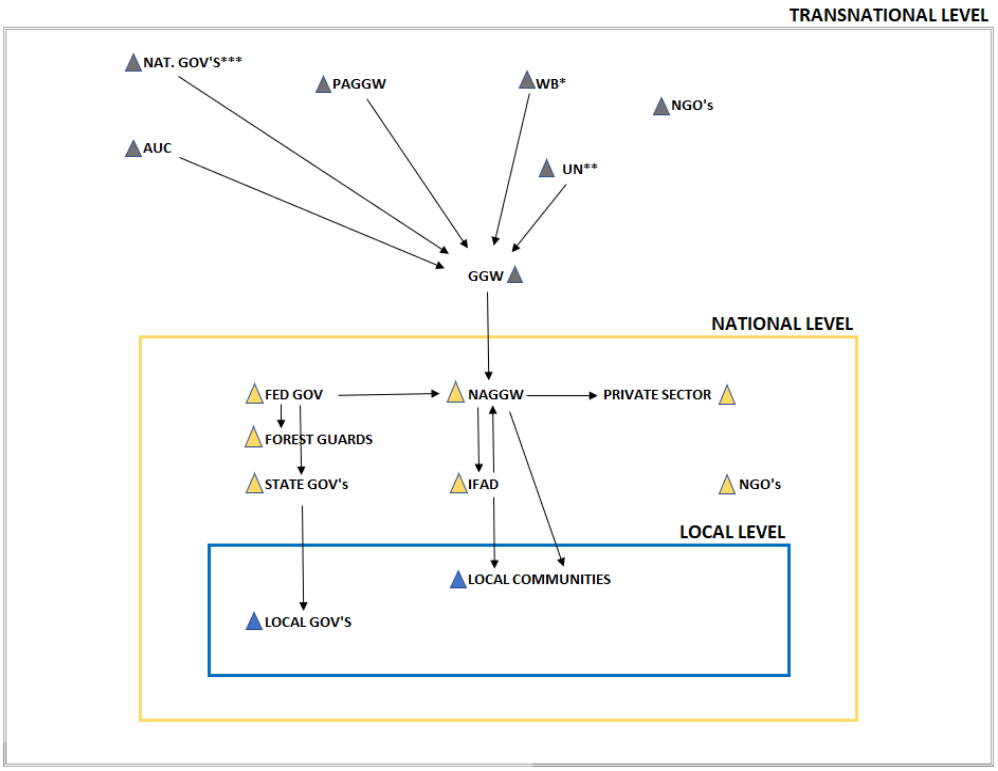
> *"The relationship is a window of political issues, the GGW ensures that such related policies and programs are implemented. The forestry department is also involved in the monitoring of the activities of the GGW. Among the monitoring they also help some programs being developed, that also refer to the GGW as part of the department of forestry implementation. So there is a synergy between the department and the NAGGW. The NAGGW is the implementer, there have been times where they have created the shelterbelts within the frontlines states of the country where they have drought and desertification" (Interviewee 2, June 24, 2021).*

The NAGGW and IFAD are starting a partnership in which IFAD will improve the connection with the local communities to ensure better NAGGW implementation success.

> *"We will work with the local government to identify who are the most vulnerable in the communities. That is the work we do before the start of every program that we invest in, but when we identify the communities that we are working with and in the community, [...] Then we work with them and they can identify who can best benefit from this, who are the most vulnerable but also economically active. So that is a process from going from the state level, the level of the funding to the local government level and community level, that is where we identify who will be the actors with whom we will work. [...] So our entry point is really the community" (Interviewee 3, June 29, 2021).*

The previous quote describes the reciprocal nature of the influence since both social nodes are gaining from this partnership. To a certain extent, on paper the NAGGW is connected to the local communities. Two departments of the NAGGW, the 'Afforestation & Land Management Department' and the 'Rural Development & Extension Services Department' are supposed to be involved with the local communities (National Agency for the Great Green Wall, n.d.). However, little documentation exists on this. The only obvious way of connection is that the NAGGW has created job opportunities for the private sector to conduct the implementation of the GGW in Nigeria (a, Adanikin, 2019; b, Adanikin, 2019).

On paper, the state and local governments play a crucial role in the implementation of the GGW. Like they should. However, in reality, this does not seem to be the case (Jalam et al., 2021).



"The success of the program is small, actually it is the federal government is not much involved, but there is a need for more state, state government and local government buy-in. To give them more support for the program, for the GGW self. There is a need for more buy-in from state and local government to the federal level" (Interviewee 2, *June 24, 2021*).

"Let me first say that a project like this should be brought to the grass-root. And you hear many of these projects are being talked about at the federal government level without transmitting to the state. More importantly, to the local government because, unfortunately, when you research the state of the local government in Nigeria, they are as good as nothing, because when the local government institution, which is directly connected to the people, is weak. There are no projects, especially social-oriented projects that have to do with the people it governs because the link would be missing"

Figure 8. Links between the Social Nodes in the Social Layer of the TSES (Author, 2021)

All the links discussed above, are displayed in figure 8. These sections have shed light on the social nodes at play in the GGW implementation in Nigeria. How they are related to the ecological nodes will be covered in the next sections.

6.2.4 What are the ecological nodes?

An ecological node encompasses any ecological concept such as species or ecological communities (Bodin, et al., 2016). The macro appliance of the SES framework on the NAGGW at the transnational level allows for ecological nodes to be defined at a substantial size like GGW communal gardens or nurseries. Chapter 6.1.2 gives an overview of the amount of all the ecological nodes implemented by the NAGGW. The ecological nodes created by the NAGGW exist out of shelterbelts, community orchards, community gardens, woodlots, nurseries, produced seedlings, human-made water sources such as solar and wind-powered boreholes (Pan-African Great Green Wall, 2018).

6.2.5 Where are the ecological nodes positioned within the ecological layer?

The ecological nodes of the NAGGW are located in the arid region of Nigeria found between 11o 00'N and 13o 40 ´and 3o 30'E and 14o 40 (Onuoha, 2009). The 11 member states that are part of the NAGGW are Adamawa, Bauchi, Borno, Gombe, Kano, Katsina, Kebbi, Jigawa, Sokoto, Zamfara and Yobe. Those are the 11 frontline states of the North of Nigeria. Little rainfall, inter alia, leaves the land degraded and prone to become part of the Sahara Desert (Gadzama & Ayuba, 2016). The increasing heat, drought and encroaching desert silts the surface water, makes soils infertile, increases the risk of bushfires and decreases the amount of cultivable land (Onuoha, 2009; UNCCD, 2020).

Figure 9. Nigeria GGW Operational Area and Shelterbelt Route (Pan-African Great Green Wall, 2018).

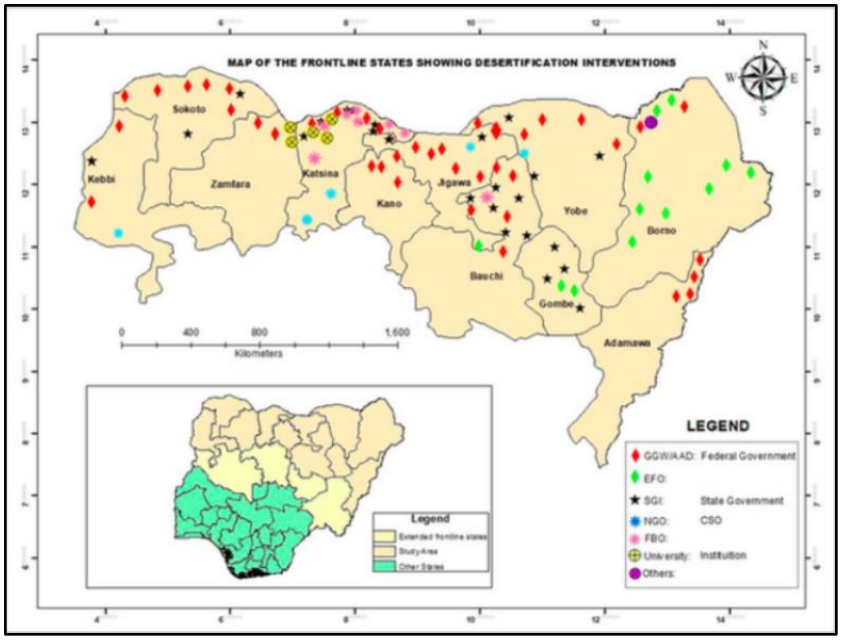


Figure 10. Desertification Interventions Executed in Frontline States (Jalam et al., 2021).

Figure 10 shows all the desertification interventions being executed in Nigeria's frontline states. The red checks represent GGW initiatives executed.

Data on specific NAGGW locations are rare. However, some places within the 11 states have been identified. The following is an enumeration of the location identified: Yanduna, Baure Local Government Area, Katsina State; Maibara in Yanduwa and Rogogo community in Zango Local Government Area of Katsina; Ganga Community, Daura LGA, Katsina; Gidan Gabes town, Munjibir, Kano state; Gezawa Local Government, Kano State; Mitchika and Vintim village, Adamawa State; Mada, Guyuk LGA; Mubi North, Loko in Song, Bazza in Michicka, Pela, Hong Local Government of Adamawa; Faru community, Sabon Birnin Local Government Area of Sokoto State; Futuk in Bauchi; Ungwar Lalle village in Sabon Birnin Local Government, Sokoto State (a, Adanikin, 2019; b, Adanikin, 2019; Jalam et al., 2021; Pan-African Great Green Wall, 2018).

As said in 7.2.2., within the TSES, you cannot subtract the local from the national. What is national is also local, so all of the above-mentioned locations are at the national, state and local levels. However, their influence crosses national borders to transnational regions. This will be further explained in the next section.

6.2.6 Ecological nodes and the links between them

Naturally, there are links between ecological nodes. Even in arid regions, fungi are connected to some other ecological source due to tiny threads of mycelium (Moreno et al., 2014). In more fertile areas, seed dispersal is a straightforward example of a link between two ecological nodes. According to Bodin and Tengö, "the levels of interdependencies among ecological components have substantial functional implications not only for the components themselves but also for the

larger ecosystem wherein these components are embedded" (2012, p.432). On the ecological level, ecosystems consist of living organisms that interact with the non-living components in their surroundings, such as soil, atmosphere, water, heat and sunlight. Elements of wind and rain, and the movement of animals connects ecological nodes across nations (Bodin et al., 2016).

As said before, in an ecological and geographical sense, what is perceived as local is also inherently national. So, all the ecological nodes discussed here are at the national level. However, their link to other ecological nodes can spread over national borders, where they are operating at the transnational level. Sinnassamy argues that putting local measures in place to combat land degradation like the NAGGW is doing, will generate global benefits for land, water and nature (Schleeter, 2013). In the way that desertification altering ecosystem services at a local scale has a global negative environmental impact, restoring land at a local scale has a positive global environmental impact (Olagunju, 2015).

At the start of the implementation of the GGW in Nigeria, the focus was put on creating shelterbelts, nurseries, woodlots, community gardens and orchards and so on. However, the implementation process has been carried out without much thought going into how these locations and ecological systems could be linked.

What seems to be the case at the national level, also seems to be the case at the global and the local level (Aigbokhaevbo, 2013). The GGW implementation in Nigeria has resulted in a patchwork of mostly failed initiatives. A patchwork in which there is hardly any connection between the GGW initiatives nor between the initiatives and the people that should and could care for them. A visualisation of this patchwork can be seen in figure 10.

However, the only documented example of a link between ecological nodes in the NAGGW is that of the initial 6,032,015 and additional 200,000 seedlings of various species that were produced in NAGGW nurseries to establish the shelterbelts, community orchards and woodlots in Nigeria (Pan-African Great Green Wall, 2018).

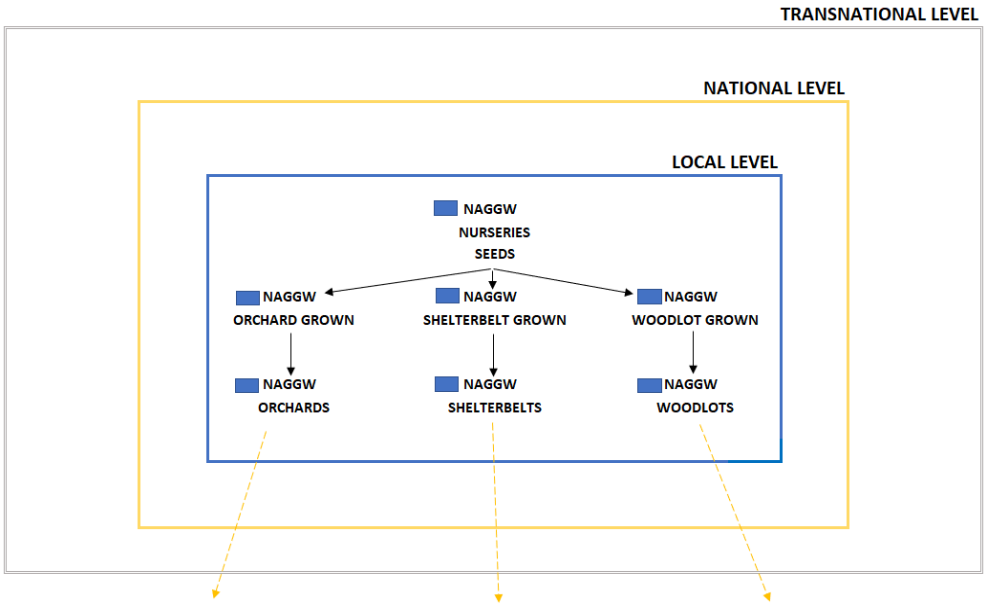


Figure 11. Links between the Ecological Nodes in the Ecological Layer of the TSES (Author, 2021)

Needless to say, the ecological nodes (squares) travel over national borders, as is displayed with the yellow dotted line in figure 11. Even though naturally, there is always a link between ecological nodes, like the woodlots that have been created in Adamawa, Bauchi, Gombe and Kano will lead to an increase in total vegetation cover and i.a. soil carbon content (O'Connor & Ford, 2014; Pan-African Great Green Wall, 2018). The astonishing conclusion appears to be that the only documented link between ecological nodes that have been created by the NAGGW, is that of the seedlings that grew in NAGGW nurseries that turned into the shelterbelts, community orchards and woodlots. This scarcity of links resulted in a patchwork of failed initiatives.

6.2.7 Conclusion

To answer the sub-question of this chapter "*What are the current relations within the social-ecological system that focus on the implementation of the Great Green Wall in Nigeria?*" we need to link the social and ecological nodes that are in contact with each other. All the conclusions drawn from the previous sections are presented in figure 12.

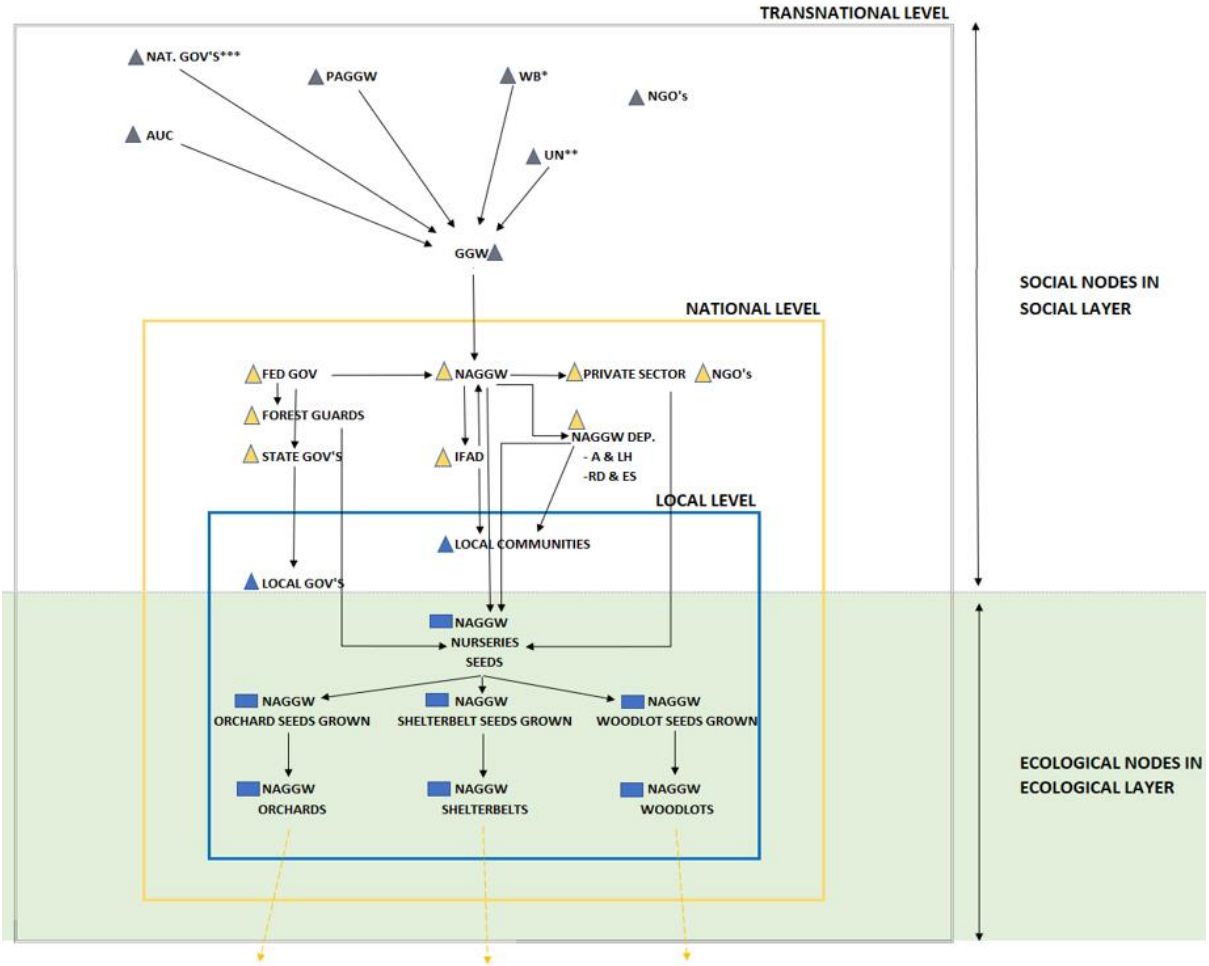


Figure 12. The TSES of the GGW implementation in Nigeria (Author, 2021)[3].

One can assume that in the management of the GGW in Nigeria, the relationship between the PAGGW, GGW and NAGGW is reciprocal. However, specific data on the matter is lacking, therefore this is not displayed but displays as a top-down approach.

As displayed in figure 12, one can analyse the following:

- Links between social nodes occur the most within their own level;
- There is no link between the social nodes at local level;
- The source for the ecological nodes is only linked to the NAGGW, the 'Afforestation & Land Management Department' and the 'Rural development & extension services Department', the forest guards and the private sector;
- There is no link between the social nodes and ecological nodes at local level;
- There are many social nodes not linked to the ecological nodes, and vice versa.

[3] To clarify, nodes like local communities, NAGGW orchards, shelterbelts and woodlots are presented as 1 entity, while they are clearly not, and exist out of many subcategories.

When analysing figure 12, one sees that there is room for more links to be made, or bluntly stated: there is a gap. As stated with transnational environmental governance, what would be preferred is a situation in which the social nodes are easily connected across national boundaries or levels, when managing ecological nodes that also cross the national boundaries or levels (Bodin, 2017). The utopian situation would be that social nodes are connected with each other, as well as with the ecological nodes that their livelihoods depend on, as displayed in figure 2. How should the gap be dissolved? Which social node should be connected to the ecological nodes for a better management outcome of the GGW in Nigeria? When critically looking at if all the relevant stakeholders are adequately involved, one sees potential for better alignment within the TSES. This will be further explored in chapter 7.

Chapter 7: Social Institutional Connectedness in NAGGW Implementation

"H*ow does the social institutional connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria*?" is the last sub-question that will be answered in this chapter. The data presented in chapter 6 and figure 12 shows a gap in the TSES. What would it mean for the local implementation if unused social nodes would be connected to other social and ecological nodes? Would the implementation of the GGW in Nigeria be improved if locals played a more prominent role as social nodes? This chapter will first look at the social institutional connectedness of the actors, then it will look at the SES mismatch in place in the TSES. Then it will look at the potential for community-level involvement and the local implementation impact this generates. Lastly, the TSES appliance to the GGW implementation in Nigeria is analysed through an institutional work lens.

"So the contractors continued with the project and did not carry the state government along in the project execution. " (Interviewee 1, June 16, 2021).

"the federal government is much involved, but there is a need for more state, state government and local government buy-in" (Interviewee 2, June 24, 2021).

7.1 Social institutional connectedness of the actors

Humans are not separated, but part of nature (Berkes & Folke, 1998). The SES perspective brings to attention that humans are emerged in ecosystems by the interactions the social nodes have with the ecological nodes (Berkes & Folke, 1998; Goffner et al., 2019).

In Nigeria, the GGW implementation is treated as a sectoral issue (Olagunju, 2015). Olagunju argues that as long as the GGW is not implemented in an integrated fashion, the policies and programs that are created remain in vain since desertification keeps aggravating (Olagunju, 2015). An integrated approach would entail the involvement of all the relevant parties, i.e. social nodes, especially the ones most dependent on the success of the initiative. Goffner et al., highlights several factors that caused the limited success of the GGW, these also apply to the GGW implementation in Nigeria. They argue "A combination of diverse factors caused this limited success, including poor choice of reforestation zones due to extremely limited prior knowledge in terms of biophysical characteristics and climate (environment); ill-adapted nursery protocols, planting densities, plantation dates and poor seed quality (technical), and insufficient staff expertise, and lack of local population buy-in (social)" (Goffner et al., 2019, p.1420), while this shows the lack of links between ecological nodes and social nodes, it also highlights the potential for new links between the nodes. Applying the TSES shows a gap of non-

existent links that could be created for improved TSES alignment. Local communities and government could play a pivotal role in improving social institutional connectedness. Currently, they are hardly involved in the implementation of the GGW in Nigeria (figure 12).

7.1.1 SES mismatches

In chapter 2.2.1.1, three forms of SES mismatches were discussed. Spatial, temporal or functional mismatches can occur between the scale of management and the scale of the ecological environment being managed (Cumming et al., 2006). A spatial mismatch applies to the TSES, in which the social nodes that control the ecological nodes are not sufficient for the scale of the desertification problem (Cumming et al., 2006). Both the horizontal and vertical dimensions of the TSES can be improved. The horizontal dimension is concerned with the link between social nodes and ecological nodes within the same level. The vertical dimension is concerned with the link between the social and ecological nodes across the levels. A vertical misfit occurs when a social node only represents a fraction of the ecological nodes, or when a social node across different levels is not linked to the ecological nodes. Vertical cross-level links between social nodes enhance horizontal social and ecological node alignment (Bodin, 2017). A prominent social node should be involved to improve alignment between the nodes. The social nodes that are most dependent on the ecological nodes are the local communities. Essential social nodes in sustainable development are the human beings whose patterns of social organisation are pivotal in creating the solutions needed (Onuoha, 2009). To solve this vertical mismatch, involving prominent unused social nodes like the local communities would lead to an improved TSES alignment.

7.2 Community level involvement

Local communities should be more involved. Onuoha (2009) argues that the involvement of all stakeholders is necessary for Nigeria to combat climate change challenges. Among those stakeholders are the local communities, as discussed in chapter 4.1.2.2. In their policy documents and strategic plans, it appears that the NAGGW and GGW do recognize the potential and necessity for a role to be played by local communities. Gadzama & Ayuba state that GGW implementation in Nigeria is a rural-based programme and ”community driven in outlook, as all the eleven frontline states, involving 46 local governments, running from Kebbi to Borno State, covering a distance of 1,500 Km long by 15 Km wide would be developed” (Gadzama & Ayuba, 2016, p.25). However, this is in stark contrast with reality.

"Well, the truth is when it comes to Nigeria we can do stratification of projects very well, that is not our problem, because when you look into it, you will find out that we have a coordinator for everything and yet it is not how it goes. The need for extra monitoring or coordination is not the issue, but rather does structures that have been set up, the framework should be worked out and followed. Are the people doing what they should be doing? The structure is okay, if the people would just be doing what they should be doing, there are so many coordinators even for geopolitical regions, coordination is not the issue" (Interviewee 4, July 16, 2021).

As described in the quote above, the issue is not the plan, but rather its execution. Even though the GGW does describe a role for the local communities, when analysing the gap, one sees that there remains a role to be filled by social nodes that are in closer contact with the ecological nodes. A perfect fit for the gap would be the involvement of local communities.

Firstly, local and grass-root communities are directly dependent on the initiative and are therefore internally motivated to contribute to its success. Bodin (2017) argues that when the social nodes involved have stakes in the common ecological components, these initiatives are more successful in preserving ecological resources due to more effective management.

"But depending if the states, the local communities, as you know, are carried along so that the community can take the responsibility and ensure the best use, even if there is any little problem, the community can arrange themselves and fix it for sustainability" (Interviewee 1, June 16, 2021).

"The issues of these projects have been fashioned in a way that there is some economic benefit to the community, for instance, the trees that have economic value are being grown, and the community we [federal government] provided water, they value the water, but also to ensure that this plant will get it" (Interviewee 2, June 24, 2021).

"For a kind of initiative like this the people need to be involved, you need to involve people at the grassroots, you need to involve the local government, and you need to try for buy-in from the state government because in Nigeria we have three levels of government, we have the local government, the state government and the federal government. But they won't view it as a federal matter no matter how many beautiful plans you have if it is not connected, then it is nowhere granted, it is nowhere anchored at the state and the local. And again for my experience in those areas, talking with the locals, talking with the people, the mission goes beyond just planting trees. In that sense, you have to connect the trees to their livelihoods" (Interviewee 5, November 8, 2021).

These quotes reinforce the idea that the local community and government are crucial for anchoring the initiative, are able to take on responsibilities for its implementation and are motivated, possibly due to financial reward.

Secondly, local communities hold valuable local knowledge (Sirolli, 1999). The government's top-down approach to the management of desertification has often failed due to the wrong choice of tree species or planting time (Cheri, et al., n.d.). This inconsiderate approach does not take into account local knowledge and resulted in a general failure. Considering local knowledge can prevent such mistakes, local communities are aware of when and which species thrive in their surroundings (Cheri, et al., n.d.). Furthermore, they also have traditional and native ways in which to curb desertification that are not about creating direct economic or nutritional benefits, such as planting weeds that have deep roots to reduce the movability of the soil and anchor it (Cheri, et al., n.d., p424).

"we need to promote landscape rehabilitation with the involvement of the farmers. That means you need to look at what they do know and say 'oh okay, this is a simple technique or technology that we can apply as is done in other areas, including rangeland management, you will actually get more results when we connect to the local people than just bringing a new plan from the top" (Interviewee 5, November 8, 2021).

"So that is probably one of their [the GGW] problems, limited knowledge on the effect of the project, and it may be that they know that it goes beyond the planting of trees but because the political will is not there" (Interviewee 4, July 16, 2021).

The GGW is limited in knowledge and fails to translate the implementation to local needs. Therefore, it makes even more sense to build on the local knowledge already available and work from there. Local communities know what species thrive and are needed in their surroundings.

Thirdly, Jalam et al., (2021) defined an absence of the use of local government and Civil Society Organisations (CSO) involvement in GGW implementation in Nigeria. For an initiative of the size of the GGW, that stretches across all different levels, participation at all levels is essential. They argue that "An all-inclusive bottom–top partnership building approach that provides ground for the participation of relevant stakeholders is urgently required" (Jalam et al., 2021, p.390), and will result in the participation of local communities and governments in curbing desertification in Nigeria.

"So another problem is that the local government should be strengthened such that whenever a project leader has to deal with the people and has been brought to the country, they can directly channel it to the local government which will effectively carry out such projects. So apart from the aforementioned things you talked about, there is the missing link between the federal government through to the grassroots local government, so it is a major factor that feeds the success of the project" (Interviewee 4, July 16, 2021).

"the contractor should work with the state minister of the environment and create a partnership with the local government. Then at the local government level, the

traditional rulers or chiefs can also be involved in the project execution. When almost all of these players are carried along in the project execution and then the communities are made to understand that this is your project, it belongs to you. At that stage, the communities will take ownership of the projects. Most of the contractors have executed the project and then left " (Interviewee 1, June 16, 2021).

There is a clear need for more local government involvement too. Local governments have a closer and efficient communication stream with the local communities and can foster GGW local ownership by the communities.

Adanikin (a, 2019) continues by arguing that there is a need for an improved relationship between federal, state and local government. However, for that to happen the first step should be that the local government is involved and is regarded as one of the stakeholders. Initiatives fail due to weak relationships between the state and federal government (a, Adanikin, 2019). The strength or weakness of the connection between the social nodes influences the strength and weakness of the connection between the ecological nodes and so its ecological success or failure. The lack of involvement of state and local governments feeds the potential for failure of the GGW.

7.3 Local implementation impact

Increased local community and government involvement allow for multiple positive outcomes. Firstly, the level of commitment that seems to be missing in the GGW implementation is most easily targeted at the local level by creating an economic incentive through local participation or buy-in (also referred to in chapters 5 and 6.2). Alexander et al., (2016) argue that applying the financial reward for improvement of the GGW at the local level kills two birds with one stone. A monoculture plantation generates short-term financial benefits for the owner, yet does not increase biodiversity. When a diversity of plants is planted, in the short-term fewer direct financial benefits are generated for the owners because the diversity of plants leads to a diversity of income streams since plants adhere to different growing times. Yet, this does create an incentive to increase plant diversity so more turnover can be created. Alexander et al., (2016) argue that this way the magnitude of the financial benefits depends on the diversity of plants.

Another example of a positive outcome is being applied in Ethiopia. The Provision of Adequate Tree Seed Portfolio (PATSPO) fosters cooperation between scientists and local communities and institutions. Together they identify the tree species that are best able to survive in their specific local environment. After defining the species, they are produced, distributed and planted. Due to the success of PATSPO in Ethiopia, its approach is desired to be implemented across the GGW (Cernansky, 2021). This approach is less prone to top-down implementation failures, due to the inclusion of the need assessment that is carried out in collaboration with the local communities.

7.4 Institutional work and the TSES

Social networks increase the links between social nodes. In managing natural resources, social networks have the ability to override the importance of prevailing formal institutions for compliance with environmental regulations. Especially in cases with different stakeholders, the existence of social networks is an important attributor in effectively managing natural resources (Bodin & Crona, 2009). Within a social network, the structural pattern of relations between actors, have a great impact on actors' behaviour, this influences their managing abilities (Bodin & Crona, 2009). Updating the social networks by letting new relevant social nodes participate has the power to reset the institutional structures and their implementation skills.

Within the neo-liberal arena of GGW implementation in Nigeria, power and hierarchy are influencing who is part of the conversation. Elements of anti-politicking empower the social nodes in place and disempower the ones not having a voice yet (Büscher, 2013). This reinforces the status-quo of disproportional social node involvement. As long as the social nodes involved obtain benefit from their sole involvement, there is no incentive to create a more holistic multi-stakeholder approach.

As discussed in chapter 2, institutional work focuses on the dynamic interplay between actors and institutional structures. The dynamic interaction between actors and institutional structures can alter, maintain, contest, reject and replace institutions (Lawrence and Suddaby, 2006). Following the argument of Greifs (2014) regarding the self-reinforcement of institutions and the habitus of actors that consciously or unconsciously upholds the institutional structures, makes one realise that the social nodes within the neo-liberal arena, upholding the institutional structures are not the ones to trigger change.

In order to alter the institutional structures, to create a holistic multi-stakeholder approach in which the most pivotal social nodes are involved, change needs to come from outside the existing structures.

González and Healey (2005) argue that institutional structures evolve through a variety of active struggles and encounters. After 6 years of NAGGW existence, the partnership with IFAD is the first step towards being a more aligned TSES. It will allow local communities to raise their voice and let them be heard. The next step would be to follow what is already written down in the policies and documents and let the local communities become dignified stakeholders. Involving local communities is the key to successful GGW implementation.

7.5 Conclusion

Aiming for a bottom-up grass-roots approach should be taken literally. When starting at the soil, assessing what it needs, what kind of species thrive in the environment and seeing which individuals have the means and knowledge to care for it, appears to be a better way forward with a lot of potentials. Currently, the bare minimum is achieved at the local level, being that an initiative is solely implemented. Yet, implementation alone does not scratch the surface, it needs to be adjusted to the local specific surroundings so it can thrive and it needs to be taken care of after being implemented by people who are motivated and knowledgeable in doing so. Local communities have intrinsic intentions because their livelihoods depend on GGW success. Having a multi-stakeholder approach without including the most willing, knowledgeable and connected stakeholder appears counterintuitive.

Chapter 8. Conclusion, Reflection & Recommendations

The living world is a unique and spectacular marvel. Billions of individuals, and millions of kinds of plants and animals dazzling in their variety and richness. Working together to benefit from the energy of the sun and the minerals of the earth. Leading lives that interlock in such a way that they sustain each other. We rely entirely on this finely tuned life-support machine. And it relies on its biodiversity to run smoothly. Yet the way we humans live on Earth now is sending biodiversity into a decline.

So, what do we do? It's quite straightforward. It's been staring us in the face all along. To restore stability to our planet, we must restore its biodiversity. The very thing that we've removed. It's the only way out of this crisis we have created.
We must rewild the world.

Sir David Attenborough, [4]
A life on our Planet.

8.1 Conclusion

The final chapter of this research answers the research question "*How does the social-ecological system connectedness of actors involved with the NAGGW have an impact on local implementation of NAGGW in Nigeria?*".

As we slipped into the Anthropocene, one of the greatest challenges humans are facing is tackling the environmental governance crisis (Rockström et al., 2009). The inadequacy and mismanagement of environmental governance systems feeds climate crises (Patterson & Beunen, 2019). Deserts are expanding around the world. Crucial to managing these crises is finding ways to improve environmental governance, across local and global scales. This research aims to do so by applying a TSES framework to the GGW implementation in Nigeria.

Institutional work focuses on the dynamic interplay between actors and institutional structures. In combination with the appliance of the TSES it showed that within the neo-liberal arena of GGW implementation in Nigeria, power and hierarchy are influencing the institutional structures and who is part of the conversation. Elements of anti-politicking reinforce the status-quo of disproportional social node involvement. As long as the social nodes, within this neo-liberal arena, obtain benefit from their sole involvement, there is no incentive to create a more holistic multi-stakeholder approach. In order to alter these institutional structures, to create a holistic multi-stakeholder approach in which the most pivotal social nodes are involved, change needs to come from outside the existing structures.

[4] Attenborough, D., & Hughes, J. (2020). A life on our planet: my witness statement and a vision for the future. Unabridged. [New York]: Hachette Audio.

Following the institutional work premise that the dynamic interaction between actors and institutional structures can adapt, the partnership with IFAD sparks hope. It is the first step towards including outsiders. It increases the likelihood that pivotal social nodes like local communities will become part of the conversation. This creates more TSES alignment.

Institutional behaviour is influenced by the dynamic interplay between actors and institutional structures. In our quest into the GWW and NAGGW, the focus has been put on the role of actors -social nodes- in these structures. However, when analysing the NAGGW, we concluded that in order to change to structure of the NAGGW to improve its TSES alignment, change needs to come from outside. Yet, this seems contradictory. This could mean multiple things. Either, the existing institutional structures are too rigid. This would obstruct change coming from within. Or, the perimeter of what is perceived as within a structure are applied to strictly and unused social nodes can be regarded as within the structures.

From a conceptual perspective, the SES is arguably the most comprehensive conceptual framework for diagnosing interactions and outcomes in social-ecological systems that manage common resources. However, it is also very susceptible to its context. Defining the context in which the SES will be applied causes methodological challenges in demarcating the perimeters of what constitutes a social and ecological node. Especially when there is a need to adjust the SES into the TSES to fit the context of the research. Probably, additional social and ecological nodes have been overlooked. However, this research has not been executed with the naive notion that the representation in the TSES is all-encompassing. As a humble reminder, an unconnected NGO is displayed in the TSES.

The TSES framework has transnational, national and local level perimeters. However, there is a difference in their appliance at the social or ecological level. In the social sense there is a clearer distinction between the levels, whereas in the ecological or geographical sense, these levels operate as Matryoshka dolls. The local is part of the national and the national is part of the transnational.

For the theoretical and the conceptual framework, the construction of the perimeters defined the shape of this research. Section 8.3 will discuss how a different definition of the perimeters can possibly lead to a different focus of research.

In a utopian world, any SES is perfectly aligned. The effectiveness of transnational environmental governance depends on the level of alignment and interconnectedness between the social and ecological layers. When social nodes are involved, and there are many connections or direct relations between them, it fosters communication which increases know-how. This leads to improved collaboration. The ties of social nodes to the ecological nodes makes them more

aware of the ecological systems in place. When the social nodes and their ties, match the ecological nodes and their ties it increases the ability to collaboratively solve environmental problems rooted in their ecological systems. TSES alignment will increase the ability to develop successful institutional arrangements for NAGGW governance since it highlights the interdependence between the social and ecological layers. Nevertheless, empirically we have seen in this research that the alignment in the TSES could still be improved. A gap exits due to i.a. missing connections between pivotal social and ecological nodes at the local level.

The appliance of the TSES framework displayed a gap in TSES alignment in the NAGGW. Furthermore, the data showed that what is presented at the national and the transnational level does not align with what is executed on the local level. This applies to the social impact, but especially to the ecological impact. The appliance of the TSES framework to the NAGGW analyses the actors involved and the ecological entities being managed. The TSES framework indicates the limits of the reach of social nodes when managing transboundary connected ecological nodes. This is relevant because it allows one to not lose sight of the transboundary nature of the problem - the GGW implementation operates at a transnational level - while at the same time zoom in on the disconnectedness between the social and ecological nodes at the local level. As said, the gap is created by the following elements: Links between social nodes occur the most within their own level; there is no link between the social nodes at the local level; there is no link between the social nodes and ecological nodes at the local level; there are many social nodes not linked to the ecological nodes, and vice versa; the source for the ecological nodes is only linked to the NAGGW, the 'Afforestation & Land Management Department' and the 'Rural development & extension services Department', the forest guards and the private sector (Author, Figure 12, 2021).

TSES alignment is the preferred situation in transnational environmental governance in which social nodes (actors) are easily connected across national boundaries or levels when managing ecological nodes (ecological resources) that also cross the national boundaries or levels (Bodin, 2017). This applies to the implementation of the NAGGW as well as to the GGW. The inclusion and recognition of local communities and government as essential stakeholders provides positive benefits for GGW implementation in Nigeria. It improves the social institutional connectedness of actors involved and their connection to the local implementation. Firstly, because local and grass-root communities are directly dependent on the initiative and are therefore internally motivated to contribute to its success. Secondly, local communities hold valuable local knowledge and have traditional and native ways in which to curb desertification. The top-down implementers lack this information which resulted in a general GGW failure. Implementing local knowledge can prevent such mistakes. Thirdly, when an initiative crosses multiple levels, its stakeholders should represent these levels. The only level not considered in the GGW implementation in Nigeria is the

local level. The involvement of local government and Civil Society Organisations as recognized stakeholders is crucial for the success of the NAGGW.

What seems to be the case at the global level, also seems to be the case at the national and the local level. When looking at the TSES and the NAGGW we see the importance of local involvement and improvement of communication and connection. Special attention should be put on the areas where transnational, national or local levels are crossed. The same logic applies to the GGW. The improvement of ties between the member states improves communication over national borders which will foster the better implementation of the GGW. It will disempower the idea to reinvent the wheel and institutions can learn from each other's mistakes and successes. Most of the GGW members have a thousand kilometres of shared borders. In these areas the cross-over of ecological nodes is ubiquitous. Particularly in these areas social connection and communication is crucial. Therefore, we can argue that the lessons learned that apply to the NAGGW also apply to the GGW.

Throughout the research, the institutional work lens is applied that focuses on the dynamic interplay between actors and institutional structures of the NAGGW. It became clear that within the neo-liberal arena of GGW empower the social nodes in place and disempower the ones not having a voice yet. To alter the institutional structures of the NAGGW and create a holistic multi-stakeholder approach in which the crucial stakeholders have a voice, change needs to come from outside the existing structures.

Humans are not separated, but part of nature. As is brought to attention by the SES framework. The GGW has the potential to turn around its trajectory when starting at the soil, assessing what it needs, what kind of species thrive in the environment and seeing which individuals have the means and knowledge to care for it. This way it can prevent the next decade from becoming a dark page in human history.

8.2 Reflections

When reflecting on the process the following aspects come to mind.

This research has aimed to represent different discourses of the social nodes involved. Creating a picture in which different voices of the stakeholders are co-existing and represented never gives a total truth. To present a total truth was also not the aim of this research. This research aimed to see which social nodes were involved and which ones were missing. The next step was to assess the potential of the missing social nodes to foster GGW local implementation. Since data collection methods were aimed at representing different stories, the discussion on sample size is less relevant. The goal was not to represent a general idea on the initiative, but rather diverging ideas of the social nodes involved. However, if the goal of this research was to represent a general overview of the whole population or all stakeholders involved, a different sample size would have been appropriate (Malterud et al., 2016). This quest would have been impossible due to limited time, space and resources for this research. This logic applies to twice in this research. From the primary and secondary data collected conclusions can be drawn for the functioning of the NAGGW. These conclusions on the NAGGW are also of value to the GGW.

Another element to keep in mind when looking at the results is that compounding crises are constantly influencing the context of the results. Crises like Boko Haram insurgencies that prevent the repair of damaged GGW facilities at the affected project sites, food and wood scarcity that lead to cutting down plants before they are full-grown, insecurity, the conflict between the Fulani and the farmers are influential. TSES alignment is not the be-all and end-all for the failure to successfully combat desertification in Nigeria. As argued, the occurrence of desertification is a natural process, however, its presence is also man-made. The presence of corruption also influences the context of the results. Implemented projects that are impossible to locate, contractors that are non-existent, double budgeted projects, wasted project investments are omnipresent.

Lastly, the problem that has been identified in the GGW implementation also translated into the research. The lack of transboundary communication was also noticed when requesting insight into certain documents that were supposed to be digitally available but were probably only printed for sharing at a certain moment in time. In conversations with others familiar with the topic or interviewees it became clear that they also recognized and encountered this struggle. However, this did not apply at all to the interviewees who were very generous with their time and willing to assist.

8.3 Recommendations

The initial objective of this research was to focus on a GGW project located on the border of Nigeria and Niger. Due to the reasons mentioned before, this objective evolved into better understanding the management of the GGW in Nigeria and drawing lessons from it for the whole of the GGW. However, researching GGW implementation along border communities of the GGW member state became even more relevant during this research. In the areas where transnational, national or local levels are crossed improvement of links between social nodes has a tremendous impact on the successfulness of the implementation on the ground.

A high rate of corruption and compounding crises influence the context of the research. Other GGW members with lower levels of social disruption possibly present a different case, in which it is still very relevant to research the SES alignment. The COVID-19 pandemic and current insurgencies in Nigeria did not allow for fieldwork to be conducted. This and the limited scope of time and space of the research prevented it from diving deeper into the local experience of the GGW and knowledge sharing systems between local communities.

For the scientific community, it is advised to take your positionality as a researcher in a specific context into account. As discussed in section 3.5 the irony who is questioning who led to an increased awareness, which in turn led to precautionary measures choosing the proper words while being in conversation with the interviewees.

To the current NAGGW and GGW social nodes or practitioners in the arena, it is recommended to aim for better TSES social alignment. This can be achieved by offering other unused but pivotal social nodes a seat at the table. In turn, this would also lead to better alignment between the social and the ecological layer. Following from the gap defined in the TSES, this research offers suggestions on how to close it. In this study certain perimeters have been deliberatively chosen. Yet, for both the theoretical and the conceptual framework these perimeters defined the scope of the case, as well as of the research. Different TSES perimeters could be applied to get a more detailed understanding of current affairs at that level, this could be very useful for practitioners at transnational, national or local level.

One would expect a recommendation for the policy makers in this case. Yet, aside from clearly appointing partners and stating their responsibility to increase accountability, for now, supporting social nodes to implement what is written down in the policy, would be most promising.

References

Adanikin, O. (2019, January, 3rd). Investigation: Failed contracts, lack of community ownership mar multi-billion Naira Great Green Wall Project. *International Centre For Investigation Reporting (ICIR). (a).*

Adanikin, O. (2019, January, 6th). Investigation: Failed contracts, lack of community ownership mar multi-billion Naira Great Green Wall Project (Part Two). *International Centre For Investigation Reporting (ICIR).* (b).

Aigbokhaevbo, V., O. (2013). The "Great Green Wall": Implementation Constraints. *Environmental Policy and Law*, 44(4), 375-379. https://content-iospress-com.ru.idm.oclc.org/download/environmental-policy-and-law/epl44-4-04?id=environmental-policy-and-law%2Fepl44-4-04

Alexander, S., Aronson, J., Whaley, O., & Lamb, D. (2016). The relationship between ecological restoration and the ecosystem services concept. *Ecology and society, 21*(1)

Attenborough, D., & Hughes, J. (2020). *A life on our planet: my witness statement and a vision for the future*. Unabridged. [New York]: Hachette Audio.

Baatz, C. (2013). Responsibility for the past? Some thoughts on compensating those vulnerable to climate change in developing countries. *Ethics, Policy & Environment*, 16(1), 94-110.

Batterbury, S.P.J, et.al, (2002) Responding to Desertification at the National Scale: Detection, Explanation, and Responses, In: Reynolds, J.F, and D.M. Stafford Smith, eds, Global Desertification: Do Humans Cause Deserts? Dahlem University Press, pp.403-424.

Berdej, S., Armitage, D., & Charles, A. (2015). Governance and Community Conservation. *Community Conservation Research Network*. Halifax, Nova Scotia. Available online at: www.communityconservation.net/resources/governance.

Berkes, F., & Folke, C. (1998). Linking social and ecological systems: management practices and social mechanisms for building resilience. *Cambridge University Press*, Cambridge, UK.

Berkes, F. (2004). Rethinking community-based conservation. *Conservation biology, 18*(3), 621-630.

Beunen, R., & Patterson, J. J. (2019). Analysing institutional change in environmental governance: Exploring the concept of 'institutional work'. Journal of Environmental Planning and Management, 62(1), 12-29.

Boeije, H. (2010). *Analysis in qualitative research*. Sage publications.

Bodin, Ö., & Tengö, M. (2012). Disentangling intangible social–ecological systems. *Global Environmental Change, 22*(2), 430-439.

Bodin, Ö., Robins, G., McAllister, R. R., Guerrero, A. M., Crona, B., Tengö, M., & Lubell, M. (2016). Theorizing benefits and constraints in collaborative environmental governance: a transdisciplinary social-ecological network approach for empirical investigations. *Ecology and Society, 21*(1).

Bodin, Ö. (2017). Collaborative environmental governance: achieving collective action in social-ecological systems. *Science*, *357*(6352).

Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Büscher, B. (2010). Anti-politics as political strategy: Neoliberalism and transfrontier conservation in southern Africa. *Development and change*, *41*(1), 29-51.

Büscher, B. (2013). Transforming the frontier. Duke University Press.
Bodin, Ö., & Crona, B. I. (2009). The role of social networks in natural resource governance: What relational patterns make a difference?. *Global environmental change, 19*(3), 366-374.

Cernansky, R. (2021, February 11). TAKING ROOT A new influx of funds could help realize Africa's Great Green Wall. But will the massive tree-planting effort learn from past failures? Science. Geraadpleegd op 23 mei 2021, van https://www.sciencemag.org/news/2021/02/great-green-wall-could-save-africa-can-massive-forestry-effort-learn-past-mistakes

Chechina, M. (2011). National Tree Day–How are you going to celebrate?. *The Forestry Chronicle*, 87(4), 461-467. https://pubs.cif-ifc.org/doi/pdf/10.5558/tfc2011-044

Cheri, L., Abdullahi, M., & Dlakwa, H. D. (n.d.) Managing Ecological Challenges in Nigeria: Effects of Desertification on Food Security in Yusufari Local Government Area of Yobe State, Nigeria.

Cleaver, F., & De Koning, J. (2015). Furthering critical institutionalism. *International Journal of the Commons*, 9(1).

Council on Foreign Relations. (2021). *Global Conflict Tracker: Boko Haram in Nigeria*. Last updated November 10, 2021. https://www.cfr.org/global-conflict-tracker/conflict/boko-haram-nigeria. Accessed August 1, 2021.

Council on Foreign Relations. Global Conflict Tracker.(Last updated September 8, 2021). *Boko Haram in Nigeria.* https://www.cfr.org/global-conflict-tracker/conflict/boko-haram-nigeria. Accessed August 1, 2021.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Cumming, G. S., Cumming, D. H., & Redman, C. L. (2006). Scale mismatches in social-ecological systems: causes, consequences, and solutions. *Ecology and society, 11*(1).

del Mar Delgado-Serrano, M., & Ramos, P. (2015). Making Ostrom's framework applicable to characterise social ecological systems at the local level. *International Journal of the Commons*, *9*(2)

Dover, G., & Lawrence, T. B. (2010). A gap year for institutional theory: Integrating the study of institutional work and participatory action research. *Journal of Management Inquiry, 19*(4), 305-316.

Dyer, J., Stringer, L.C., Dougill, A.J., Leventon, J., Nshimbi, M., Chama, F., Kafwifwi, A., Muledi, J.I., Kaumbu, J.M., Falcao, M. and Muhorro, S., (2014). 'Assessing participatory practices in community-based natural resource management: Experiences in community

engagement from southern Africa'. *Journal of environmental management, 137,* pp.137-145.

Etcetera Film Production & National Agency for the Great Green Wall [Etcetera Production]. (2020, 08,18). *The Great Green Wall Nigeria Documentary* [YouTube] Retrieved from https://www.youtube.com/watch?v=OcwzjLvQokw&ab_channel=ETCETERAProductions

Federal Republic of Nigeria, Ministry of Environment. (2012). *National Strategic Action Plan: Great Green Wall for the Sahara and Sahel Initiative*.

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).

Food and Agriculture Organization - FAO. (n.d.). *The Great Green Wall Program - National Agency for the Great Green Wall*. Retrieved from http://www.fao.org/3/be714e/be714e.pdf. Accessed March 4, 2021.

Gadzama, N. M., & Ayuba, H. K. (2016). On major environmental problem of desertification in Northern Nigeria with sustainable efforts to managing it. *World Journal of Science, Technology and Sustainable Development*.

Gluesing, J., Riopelle, K., & Wasson, C. (2017). Environmental governance in multi-stakeholder contexts: An integrated methods set for examining decision-making. In *Networked Governance* (pp. 211-244). Springer, Cham.

Globe. (n.d.). *The Great Green Wall Experience in Nigeria*. Accessed February 2, 2021, from https://gef6.globelegislators.org/nigeria/the-great-green-wall-experience-in-nigeria.

Goffner, D., Sinare, H., & Gordon, L. J. (2019). The Great Green Wall for the Sahara and the Sahel Initiative as an opportunity to enhance resilience in Sahelian landscapes and livelihoods. *Regional Environmental Change*, *19*(5), 1417-1428.

González, S., & Healey, P. (2005). A sociological institutionalist approach to the study of innovation in governance capacity. *Urban studies, 42*(11), 2055-2069.

Grainger, A., Smith, M. S., Squires, V. R., & Glenn, E. P. (2000). Desertification, and climate change: the case for greater convergence. *Mitigation and Adaptation Strategies for Global Change*, *5*(4), 361-377.

Great Green Wall receives over $14 billion to regreen the Sahel – France, World Bank listed among donors. (2021, January 11). United Nations Convention to Combat Desertification. Retrieved from https://www.unccd.int/news-events/great-green-wall-receives-over-14-billion-regreen-sahel-france-world-bank-listed-0 Accessed June 6, 2021.

Greif, A. (2014). Do institutions evolve?. *Journal of Bioeconomics*, 16(1), 53-60.

Hall, P. A. (2010). Historical institutionalism in rationalist and sociological perspective. *Explaining institutional change: Ambiguity, agency, and power*, 204-224.

Hall, P.A., and Taylor, R.C. (1996). “Political Science and the Three New Institutionalisms.” *Political Studies* 44: 936–957.

Hardin, G. (1968). The tragedy of the commons: the population problem has no technical solution; it requires a fundamental extension in morality. *science*, *162*(3859), 1243-1248.

Hillier, J. (2002). "Mind the Gap." *In Habitus: A Sense of Place*, edited by J. Hillier and E. Rooksby, Aldershot: Ashgate 143–172.

IUCN (2017). Africa & the Bonn Challenge: A demonstration of leadership. Forest Brief No 13.

Jalam, A. M., Sharaai, A. H., Ariffin, M., Zainudin, N., & Musa, H. D. (2021). Closing the policy-practice gaps in Nigeria's desertification interventions: a qualitative document analysis of sustainable practice. *Journal of Environmental Policy & Planning, 23*(3), 381-398.

Kuryla, P. (2003). Pan-Africanism. *Encyclopedia of African American society*.

Laestadius, L., (2017). Africa's Got Plans for a Great Green Wall: Why the idea needs a rethink https://theconversation.com/africas-got-plans-for-a-great-green-wall-why-the-idea-needs-a-rethink-78627. Accessed February 20, 2021.

Lamprey, H., F. (1975). Report on the Desert Encroachment Reconnaissance in Northern Sudan, 21 October to 10 November 1975, *Desertification Control Bulletin, 17*: 1-7.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.

Lawal, H. (2016, May 27). Tracking to ensure Accountability on Great Green Wall project in Jeke in Jigawa State. *CODE*. Retrieved from https://www.connecteddevelopment.org/tracking-to-ensure-accountability-on-great-green-wall-project-in-jeke-in-jigawa-state/ Accessed June 14 2021

Lawrence, T. B., & Suddaby, R. (2006). 1.6 institutions and institutional work. *The Sage handbook of organization studies*, 215-254.

Lawrence, T., Suddaby, R., & Leca, B. (2011). Institutional work: Refocusing institutional studies of organization. *Journal of management inquiry*, 20(1), 52-58.

Mahoney, J., and Thelen, K. eds. (2010). Explaining Institutional Change: Ambiguity, Agency, and Power. New York: *Cambridge University Press*.

Mainguet, M. (1999). Aridity: Droughts and Human Development, New York: Springer.

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: guided by information power. *Qualitative health research, 26*(13), 1753-1760.

Martello, Marybeth Long, (2004). Expert Advice and Desertification Policy: Past Experience and Current Challenges, Global Environmental Politics, (MIT Press), 4(3), 85-106.

MEA. (2003). 'Ecosystem and Human Wellbeing: Framework for Assessment', A Report of the Conceptual Framework Working Group of the Millennium Ecosystem Assessment. *Island Press*, Washington DC.

Miles et al. (2014). Chapter 4: Fundamentals of Qualitative Data Analysis in *Qualitative Data Analysis. A sourcebook*. Sage Publishing, Thousand Oaks.

Mirick, R. G., & Wladkowski, S. P. (2019). Skype in qualitative interviews: Participant and researcher perspectives. *The Qualitative Report*, 24(12), 3061-3072.

Mitchell, R.B. (2006). "Problem Structure, Institutional Design, and the Relative Effectiveness of International Environmental Agreements." *Global Environmental Politics* 6: 72–89.

Mohajan, H.K., (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment, and People*, *7*(1), pp.

Moreno, G., Alvarado, P., & Manjón, J. L. (2014). Hypogeous desert fungi. *In Desert Truffles* (pp. 3-20). Springer, Berlin, Heidelberg.

Mouffe, C. (2005). *The return of the political* (Vol. 8). Verso.

National Agency for the Great Green wall - Establishment Act no 3, 2015. Laws of the Federation of Nigeria. www.LawNigeria.com. Accessed June 6, 2021.

National Agency for the Great Green Wall (n.d.). *About NAGGW.* Retrieved from https://ggwnigeria.gov.ng/about-naggw/.

Nett, K., & Rüttinger, L. (2016). Insurgency, terrorism and organised crime in a warming climate: analysing the links between climate change and non-State armed groups. *adelphi*.

North, D. C. (1994). Economic performance through time. *The American economic review*, *84*(3), 359-368.

North, D. C. (2012). Understanding the process of economic change. In *Worlds of Capitalism* (pp. 107-120). Routledge.

O'Connor, D., & Ford, J. (2014). Increasing the effectiveness of the "Great Green Wall" as an adaptation to the effects of climate change and desertification in the Sahel. *Sustainability,* *6*(10), 7142-7154.

Olagunju, T. E. (2015). Drought, desertification and the Nigerian environment: A review. *Journal of Ecology and the Natural Environment*, 7(7), 196-209.

Olagunju, T. E., Adewoye, S. O., Adewoye, A. O., & Opasola, O. A. (2021, February). Climate Change Impacts on Environment: Human Displacement and Social Conflicts in Nigeria. In IOP Conference Series: Earth and Environmental Science (Vol. 655, No. 1, p. 012072). *IOP Publishing*.

O'leary, Z., (2017). *The essential guide to doing your research project*. Sage.

Onah, E. I. (2014). Nigeria: A country profile.

Onuoha, C. M. (2009). Climate change and sustainable development in Nigeria: The mitigating role of green wall Sahara Nigeria programme. *Implications of Climate Change for Economic Growth and Sustainable Development in Nigeria,* 33-41.

Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. Proceedings of the National Academy of Sciences of the United States of America 104(39):15181–15187. http://dx.doi. org/10.1073/pnas.0702288104

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. Science 325 (5939):419–422. http://dx.doi.org/10.1126/science.1172133
Ostrom, E. (1990). Governing the commons: the evolution of institutions for collective action. *Cambridge University Press*, Cambridge, UK.
http://dx.doi.org/https://doi.org/10.1017/

Ostrom, E. (2005). *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.

Oyema-Aziken, Chuks. "NAGGW Revalidates National Strategic Action Plan". The Authority NGR, March 1st, 2021, https://authorityngr.com/2021/03/01/naggw-revalidates-national-strategic-action-plan/. Accessed May 6, 2021.

Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global environmental change,* 19(3), 354-365.

Pan-African Great Green Wall (PAGGW). (2018). *The Great Green Wall Initiative: 2011-2017 Achievements and Challenges to the 2030 Path* (1). Les Echos de la GMV.
http://www.grandemurailleverte.org/images/ENG_GGWI_ACHIEVEMENT-2011_2017.pdf

Partelow, S. (2018). A review of the social-ecological systems framework. *Ecology and Society*, 23(4).

Patterson, J. J., & Beunen, R. (2019). Institutional work in environmental governance.
Pierson, P. (2000). Increasing returns, path dependence, and the study of politics. *American political science review*, *94*(2), 251-267.

Poteete, A., M. A. Janssen, and E. Ostrom. (2010). Working together: collective action, the commons and multiple methods in practice. *Princeton Universty Press, Princeton, New Jersey, USA*. http://dx.doi.org/10.1515/9781400835157

Powell, W. W., & DiMaggio, P. J. (Eds.). (2012). *The new institutionalism in organizational analysis*. University of Chicago press.

Råheim, M., Magnussen, L. H., Sekse, R. J. T., Lunde, Å., Jacobsen, T., & Blystad, A. (2016). Researcher–researched relationship in qualitative research: Shifts in positions and researcher vulnerability. *International journal of qualitative studies on health and well-being*, 11(1), 30996.

Raworth, K. (2017) A doughnut for the Anthropocene: humanity's compass in the 21st century. Lancet Planet Heal 1:e48–e49. https://doi.org/10.1016/S2542-5196(17)30028-1

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Foley, J. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*, 14(2).

Rockström J, Steffen W, Noone K, Persson Å, Chapin FS, Lambin EF, Lenton TM, Scheffer M, Folke C, Schellnhuber HJ, Nykvist B, de Wit CA, Hughes T, van der Leeuw S, Rodhe H, Sörlin S, Snyder PK,Costanza R, Svedin U, Falkenmark M, Karlberg L, Corell RW, Fabry VJ, Hansen J, Walker B, Liverman D, Richardson K, Crutzen P, Foley JA (2009) A safe operating space for humanity. Nature 461:472–475

Sacande, M., Parfondry, M., & Martucci, A. (2018). Biophysical and socio-economic baselines: the starting point for Action Against Desertification.

Schleeter, R., (2013, November 4). *The Great Green Wall*. National Geographic. https://www.nationalgeographic.org/article/great-green-wall/

Schlüter, M., J. Hinkel, P. W. G. Bots, and R. Arlinghaus. (2014). Application of the SES framework for model-based analysis of the dynamics of social-ecological systems. *Ecology and Society 19*(1): 36. http://dx.doi.org/10.5751/ES-05782-190136.

Schmidt, V. A. (2008). Discursive institutionalism: The explanatory power of ideas and discourse. *Annu. Rev. Polit. Sci.*, 11, 303-326.

Sirolli, E. (1999). Ripples from the Zambezi: Passion, entrepreneurship, and the rebirth of local economies. New Society Publishers.

Stoker, G. (1998). Governance as theory: five propositions. *International social science journal, 50*(155), 17-28.

Thabrew, L., Wiek, A., & Ries, R. (2009). Environmental decision making in multi-stakeholder contexts: applicability of life cycle thinking in development planning and implementation. *Journal of Cleaner Production, 17*(1), 67-76.

The Great Green Wall Initiative. (n.d.). United Nations Convention to Combat Desertification. Retrieved from https://www.unccd.int/actions/great-green-wall-initiative Accessed June 11, 2021.

The Great Green Wall. (n.d.). *Organogram* - Retrieved from https://ggwnigeria.gov.ng/organogram/

The Great Green Wall Program - National Agency for the Great Green Wall - *Food and Agriculture Organization (FAO)*. Retrieved from http://www.fao.org/3/be714e/be714e.pdf. Accessed March 4, 2021.

UNCCD Publications (2020). The Great Green Wall implementation status and way ahead to 2030: advanced version. Accessed March 4, 2021.

United Nations Convention to Combat Desertification -UNCCD. (n.d.). *Nigeria - Knowledge Hub*. Accessed March 4, 2021, from https://knowledge.unccd.int/countries/nigeria.

United Nations Convention to Combat Desertification. (n.d.). *Shelterbelts*. https://knowledge.unccd.int/best-practice/shelterbelts

United Nations Convention to Combat Desertification - UNCCD (n.d.). *The Great Green Wall Initiative - Actions*. Accessed March 4, 2021, from https://www.unccd.int/actions/great-green-wall-initiative.

United States Institute of Peace (2011). Special report on climate change adaptation and conflict in Nigeria. Gotten from www.usip.org. Accessed June 25, 2021.

Van Assche, K., Beunen, R., & Duineveld, M. (2013). *Evolutionary governance theory: An introduction*. Springer Science & Business Media.

Van Thiel, S. (2014). *Research methods in public administration and public management: An introduction*. Routledge.

Van Reisen, K. (2020). *Regenerative Agriculture in Africa*. Mustarded Research Reports Trust

Vijge, M. J. (2013). The promise of new institutionalism: explaining the absence of a World or United Nations Environment Organisation. *International Environmental Agreements: Politics, Law and Economics*, *13*(2), 153-176.

Wenger, E. (2011). Communities of practice: A brief introduction.

Westley, F. R., Tjornbo, O., Schultz, L., Olsson, P., Folke, C., Crona, B., & Bodin, Ö. (2013). A theory of transformative agency in linked social-ecological systems. *Ecology and Society*, 18(3).

Willmott, H. (2011). "Institutional work" for what? Problems and prospects of institutional theory. *Journal of Management Inquiry, 20*(1), 67-72.

World Bank Group. (2013, October 25). Transforming the Sahel: Supporting the Great Green Wall Initiative. World Bank. Retrieved from https://www.worldbank.org/en/region/afr/brief/world-bank-support-for-great-green-wall-initiative Accessed June 11, 2021.

Young, O. R. (2008). Building regimes for socioecological systems: institutional diagnostics. *Institutions and environmental change: Principal findings, applications, and research frontiers,* 115-144.

Young, O. R., & Underdal, A. (1997). Institutional dimensions of global change. *IHDP Scoping Report. Bonn: International Human Dimensions Programme*.

Zarpelon, F. D. M., Bittencourt, A. C., Faccin, K., & Balestrin, A. (2019). A decade of institutional work: context and opportunities for research. *Organizações & Sociedade, 26,* 750-775.