

Dieuf Dieul!

An inquiry into the state and promotion of agroecological farming in Senegal



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Dieuf dieul is a Wolof expression meaning as much as “you shall reap what you sow”

Cover image by Jolies Muurling: Banga Women's Cooperative/GIE (Diourbel, Bignona)

Abstract

This study investigates the effectiveness of agroecological (AE) farming projects in southern Senegal, specifically in the West Casamance region. Employing a mixed-methods approach, the research engaged government officials, NGOs, and local farmers through a three-stage empirical investigation. Despite continuous efforts since the 1970s to enhance domestic food production, Senegal remains heavily dependent on food imports. The government's emphasis on promoting agroindustrial farming often overlooks simple, cost-effective agroecological techniques.

The primary objective of this research is to assess how AE practices contribute to food security and empower smallholder farmers, thereby fostering greater agricultural independence. The three stages of empirical research included: analyzing government policies and their impact on AE, examining the role and activities of NGOs in promoting AE, and conducting extensive fieldwork with local farmers through on-site visits to ten farms. These visits were instrumental in understanding the practical implementation of AE practices and their impact on farm productivity and farmer livelihoods.

The findings indicate that AE farms in the region have experienced improved yields and greater autonomy, suggesting that AE practices can play a significant role in enhancing food security at the local level. However, the study also highlights that AE alone may not be sufficient to meet the country's high demand for staple crops like rice and wheat. The evaluation points to the need for a balanced approach that integrates AE practices with other agricultural strategies to address broader food security challenges.

Furthermore, the research underscores the importance of policy support and infrastructure development to scale up AE practices effectively. The role of NGOs and local cooperatives in providing training and resources is crucial for the success of AE initiatives. Overall, this study contributes to the growing body of knowledge on agroecology in Senegal and offers valuable insights for policymakers and practitioners aiming to enhance sustainable agricultural practices in the region.

Keywords: food security, food sovereignty, agroecology, food transitions, alternative food system

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Introduction

Topic relevance/food (in)security in West Africa

Food security and food sovereignty are crucial issues in international development, particularly for nations like Senegal where agriculture forms the backbone of the national economy. Food security ensures that people have consistent access to sufficient, safe, and nutritious food, while food sovereignty emphasizes the right of people to define their own food systems and to be less dependent on foreign parties governing what can be eaten and where it can grow (FAO, 2001 La Via Campesina). In recent decades these concepts have gained popularity in addressing hunger and malnutrition, promoting sustainable agricultural practices, and fostering economic stability. Within International Development Studies these problems are relevant to the targets of ending hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2).

However, there is a growing concern that conventional agriculture rooted in Green Revolution practices cannot be sustained in the long run due to its significant environmental and social costs (FAO, IFAD, UNICEF, WFP and WHO. 2023). There is a consensus that this form of agriculture, which relies heavily on chemical inputs and large-scale monocultures, is leading to soil degradation, loss of biodiversity, and increased greenhouse gas emissions. In this regard the FAO and the WFP stress the following four concerns:

- Worldwide, food is not produced where it is mostly consumed or needed
- Energy, chemical and genetic inputs used in conventional agriculture are not affordable for all farmers
- Current trends in diets and food habits are not compatible with the sustainable use of global resources
- Markets chains are ineffective in ensuring access to food for everyone and lead to substantial food wastes

According to research by IATP (Institute for Agriculture and Trade Policy), the Green Revolution in Africa has failed to deliver and hasn't fully succeeded in Senegal, mainly due to investment shortages (Wise, 2020). Family farming still represents 95% of Senegalese farms; the sector remains largely non-mechanized, with far less chemical input use than in Europe. However, small farmers often struggle to produce enough for their needs and secure stable basic incomes (Association SOL). Consequently, there is a pressing need for alternative agricultural practices that can provide food security without compromising the environment or the livelihoods of farmers. For this reason, it is wise to explore alternative approaches.

State of Senegalese agriculture

Agriculture is a cornerstone of Senegal's economy, accounting for almost 16 percent of GDP and employing over half of the workforce (FAO, 2018). Despite its importance, many farmers and their families struggle to make ends meet. While Senegal's overall economy grew by 6.1% in 2021, agricultural growth slowed to 4.6% after a significant 23.4% increase in 2020. The lack of productive

rural jobs drives young people and women to urban centers and abroad, even as far as Europe. Over half of Senegal lies within the drought-prone Sahel region, marked by irregular rainfall and poor, eroded soils. These geographical factors, combined with historical colonial reasons and the fact that Dakar is a primate city with a port that's well integrated in the world trade system, mean that today Senegal relies on imports for approximately 70 percent of its food. The primary food and beverage suppliers to Senegal include the European Union (48%), India (26%), Brazil (10%), China (10%), and Indonesia (6%) (US Trade Administration). According to West Africa's leading economic union, the region currently relies too heavily on imports from Asia and Latin America for staple foods like rice and wheat (ECOWAS 2022). The urgency to become more self-sufficient is further emphasized by the World Bank's Commodity Markets Outlook (October 2023), titled "Under the Shadow of Geopolitical Risk." It warns of potential impacts on Senegalese food security, such as the rise in rice prices to their highest levels since the 2007/08 crisis, and India's ban on non-Basmati rice exports due to domestic price increases and climate concerns. Additionally, ongoing concerns about grain supplies from Russia and Ukraine highlight the vulnerabilities in global food supply chains (Ferguson & Ubilava, 2022).

Therefore, bold government statements call for an end to import dependency. Since his election in 2012, President Macky Sall has aimed to make Senegal more self-sufficient in multiple sectors. Several programs have been initiated to boost the country's agriculture. Presidents before him like Abdoulaye Wade have also made attempts at increasing agricultural production, even supporting ecological ideas such as the eco villages (UNDP, 2011) However, 2014 saw the most ambitious plan yet, The Plan for an Emerging Senegal (Plan Sénégal Emergent: PSE) aims to enhance the nation's economy and investment and carries a key focus on increasing staple food production. Notable results include the tripling of rice production (from 469,649 tons of paddy in 2012 to 1,409,120 in 2022), a 65% increase in millet production, and a tenfold increase in potato production (Gouvernement du Sénégal). The main tool to fuel this increase in agricultural production is the introduction of (foreign) investments into large agro-industrial style farms.

This approach has faced increasing resistance in the Global North, e.g., the nitrogen crisis in the Netherlands and eutrophication-related problems in other European countries. Nonetheless, there is a national push to upscale agro industrial farming aligning with a broader regional initiative by the Economic Community of West African States (ECOWAS) known as The Regional Offensive, launched in 2014. Aimed at eliminating rice imports to West Africa by 2025, this initiative underscores the relevance of Senegal's plans within the West African context, even though the goal has yet to be fully realized (ECOWAS Rice Factbook). Recent global crises, such as the COVID-19 pandemic and the war in Gaza, also highlight the importance of national food production. Increasing agricultural productivity, improving local supply chains, and supporting research and innovation are crucial for achieving self-sufficiency. Additionally, reducing dependency on global food markets is vital to prevent civil unrest and food insecurity due to fluctuating global food prices. This makes the matter all the more pressing since Senegal lies within the proximity of countries plagued with instability such as Mali, Burkina Faso, and Niger.

In this context of growing West African food autonomy, The Dakar 2 Declaration on Food Sovereignty and Resilience was assembled in January 2023, underscoring the commitment of African nations, including Senegal, to transform their agricultural sectors. This summit, hosted by President Macky Sall and the African Development Bank, brought together heads of state, international organizations,

and private sector leaders to address food security challenges worsened by global disruptions such as COVID-19, climate change, and conflicts (DAKAR 2, 2023). The declaration highlights Africa's vast agricultural potential, emphasizing the continent's significant share of the world's uncultivated arable land, 60 to 65 per cent (African Development Bank). For Senegal, the Dakar 2 Declaration is important for this research as it aligns with the country's goals of achieving food self-sufficiency and sustainable agriculture. The focus of Dakar 2 lies on supporting agricultural technology, improving infrastructure, and mobilizing financial investment to boost agro-industrial farming.

Dawning of agroecology

In the midst of this turbulent globalizing world where threats and food prices are rising, there is an alternative direction which is only just starting to gain momentum. Agroecology (AE) presents itself as a potential solution for Senegal to reduce its dependence on food imports while making agriculture more sustainable and restoring biodiversity. The phenomenon of AE is often mentioned within the debate about making countries and local communities more resilient (Kasi, 2024 and Altieri & Nicholls, 2012). *Transition theory and food sovereignty* literature suggest that AE could help Senegal achieve greater food autonomy and environmental sustainability (Bini, 2016 and McMichael, 2013). AE also appears in the debate about introducing more *Participatory Development* since it highlights the importance of involving local communities in the development and implementation of agroecological practices (Méndez, 2013).

In Senegal, numerous initiatives are introducing agroecological practices as a sustainable alternative to conventional farming. Agroecology, which integrates ecological principles into agricultural practices, offers a holistic approach to farming that is environmentally friendly and socially just. 2019 saw a notable development in this direction with the formation of the Dynamic Agroecological Transition in Senegal (DyTAES), which aims to promote agroecological practices across the country. This movement aims for a critical shift towards sustainable agriculture, aligning with global calls for more resilient and equitable food systems and especially with the FAO's decision to support agroecology in West Africa whilst declaring Senegal a pilot country for the agroecological transition in 2015 (Boillat, S., Belmin, R. & Bottazzi, P., 2022).

Thesis structure

Central to this research is the question of what role agroecology can play in enhancing food security in Senegal. To address this question, a literature review and an introduction of concepts related to agroecology in Senegal and West Africa will be provided to establish a clear understanding of the subject. Subsequently, the methodology section will outline how the empirical study was conducted in Senegal. Followed by a geographical overview and subsequently three empirical chapters giving insights to answer the main question. The first chapter examines the government's stance on agroecology and the context in which it develops. The second chapter provides an overview of the active NGOs promoting agroecology. The final empirical chapter discusses the findings from on-site interviews with farmers practicing agroecology. After having drawn the face of agroecology we can conclude if and what kind of role it can play in making Senegal more food secure.

Structure of empirical chapters

The empirical part of the thesis first provides a geographical context of Senegal and is then structured into three chapters, each addressing a key aspect of the agroecological transition in Senegal.

Chapter 1. Geographical context

- Gives background information by providing a small overlook of Senegal's geography, climate and socio economics

Chapter 2: Analysis of Government Efforts

- Explores the policies and strategies adopted by the Senegalese relating to agroecology
- Analyzes the extent of governmental support

Chapter 3: Agroecology in Senegal, the role of NGOs

- Investigates the involvement of NGOs and transnational partnerships in advancing agroecological practices
- Highlights the links between local and international actors and the impact of transnational ties on empowerment processes

Chapter 4: Impact on local farmers and effectiveness of AE

- Examines the effectiveness of agroecological practices from the perspective of local farmers
- Assesses the socio-economic benefits and challenges faced by smallholder farmers in adopting agroecology

Literature overview and introduction of concepts

Introduction

This section provides an overview of existing literature and ideas, illustrating what agroecology is and how it can contribute to enhancing food security. It also introduces the evolving debate on achieving food security in West Africa and explores the contemporary understanding of what it means to be food secure. Additionally, several key concepts related to agroecology are introduced to better understand the field on which agroecology promises to make an impact.

Defining agroecology

Agroecology represents a holistic approach to agriculture that emphasizes ecological principles and local knowledge to enhance agricultural productivity, improve nutritional outcomes and environmental sustainability, and social equity (Altieri, 2002 and Kasi, 2024). At its core, agroecology acknowledges the interdependence of ecological processes and human activities, advocating for diversified farming systems, ecosystem-based management practices, and participatory approaches to decision-making (Altieri, 2002; Gliessman, 2007). By fostering synergies between biodiversity, soil health, and water management, agroecological practices offer sustainable solutions to the complex challenges of modern agriculture, including soil degradation, water scarcity, and climate change (Badgley et al., 2007). Empirical evidence from diverse contexts in South America, Asia and Africa demonstrates the efficacy of agroecology in addressing food insecurity, particularly in resource-constrained settings where smallholder farmers rely on subsistence agriculture (Altieri, 2012; Gliessman, 2007). In Senegal agroecology is broadly viewed as:

“A farming practice and movement built upon traditional principles of ecology, agroecology emphasizes the design and management of agricultural systems to mimic natural ecosystems. It prioritizes soil health, and local food systems, aiming to enhance resilience and empower small farmers and other disadvantaged actors in food production” (Boillat et al.).

Studies have shown that agroecological practices in West Africa, such as agroforestry and crop rotation, can significantly enhance food production and resilience to climate change (Altieri, 2012; Bini, 2016).

Identification of knowledge gap

While existing literature provides valuable insights into the theoretical foundations and practical applications of agroecology, there remains a gap in understanding its implementation and impact in Senegal. Limited empirical research has explored the socio-political dimensions of blooming agroecological transitions in West Africa, particularly regarding the role of government policies, institutional frameworks, and community-based initiatives in shaping agricultural practices and food security outcomes. This thesis therefore aims to provide a lookout. Besides its obscurity to the bigger academic audience, agroecology also represents a "territory in dispute" as is stated by Giraldo and Rosset, 2018. AE can follow either reformist trends, such as organic food and consumer movements

mainly found in the Global North (and increasingly among the fortunate Dakarois) or more radical agendas of food sovereignty, land redistribution, and anti-capitalist transformation, prevalent in the Global South, especially in South America (Holt Giménez and Shattuck 2011). While literature suggests that Senegalese agroecology is on the rise, its full scope and nature are yet to be unveiled. To better understand what it can mean to society and farmers, Altieri’s Pathway of Peasant Modernization is relevant to us. In figure 1 it illustrates how agroecology can provide farmers with guidelines for transitioning towards more sustainable agriculture, depending on their position along the modernization gradient. In Senegal, different regions can be placed at various stages of this gradient. The fieldwork conducted for this thesis took place in Casamance, a region characterized as a partly transitional peasant society with scattered modernization.

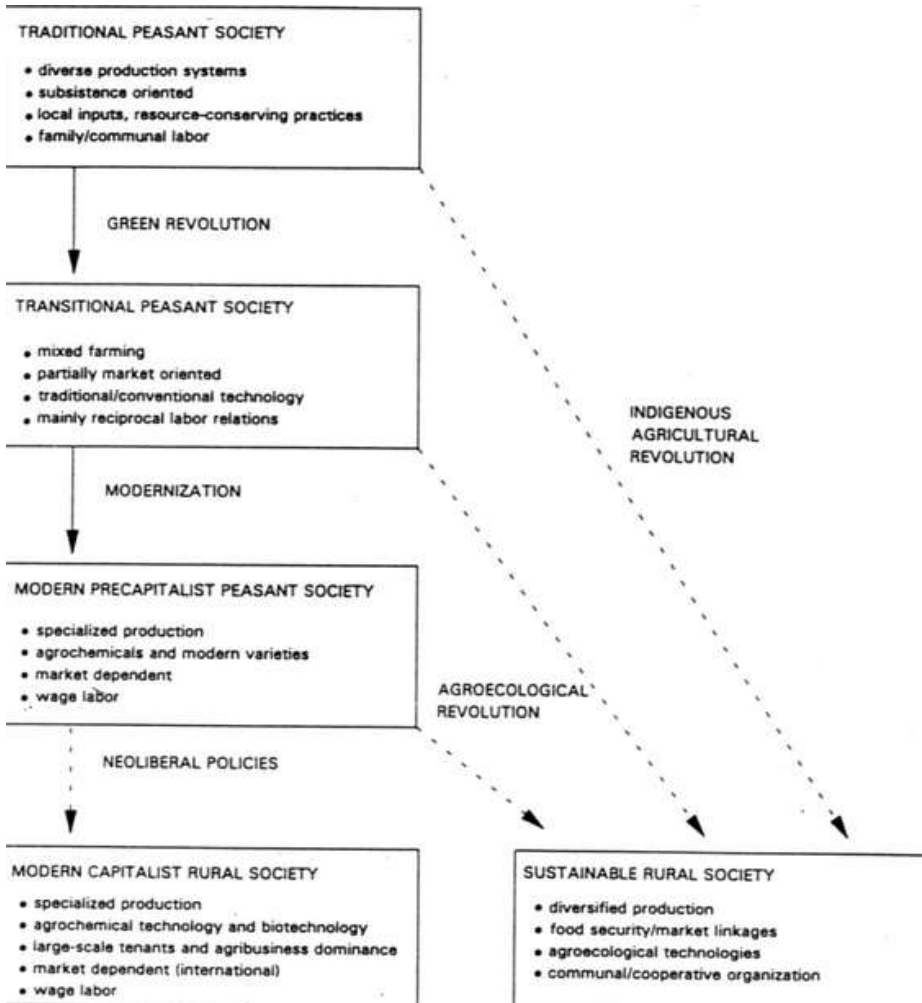


Figure 1: Pathways of Peasant Modernization (Altieri, 2011)

Concepts relating to the debate on food security in West Africa

In order to better understand in which structure Senegalese agroecology is developing several relating concepts need further explanation. Most importantly **Food security**, which is defined by the Food and Agriculture Organization (FAO) as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. (FAO, 2001). Food security encompasses multiple dimensions, including food availability, access, utilization, and stability, each of which is influenced by a complex interplay of socio-economic, environmental, and political factors (FAO, 2008). Food security aligns closely with the principles of **Food sovereignty**, which advocate for local control over food systems and prioritize the rights of small farmers and communities to define their agricultural practices. Agroecology is closer related to food sovereignty since they both promote local control over food production. La Via Campesina (a world wide movement advocating the rights of peasant farmers) postulates that

"Long-term food security depends on those who produce food and care for the natural environment. As the stewards of food producing resources we hold the following principles as the necessary foundation for achieving food security: Food is a basic human right. This right can only be realized in a system where food sovereignty is guaranteed. Food sovereignty is the right of each nation [and community] to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity. [...] Food sovereignty is a precondition to genuine food security. (La Via Campesina Citation 1996).

This view of La Via Campesina is conflicting with the way Senegal's government has attempted to provide its population with food over the last half century, namely by relying on the possibility to sell agricultural produce like peanuts and cashews and buying staple food stuffs like wheat and rice (World Bank, 2023). In accordance with the Ricardian influenced economics of the 1980s, which focussed on a comparative advantage, it made absolute sense over many decades to buy cheaper staple foods elsewhere, but in a geopolitically changing world Phillip McMichael, a renowned scholar on the matter of food sovereignty, questions: "*which new paradigm after cheap food: corporate food or food sovereignty?*" (McMichael, 2013). It is exactly this dichotomy that frames our investigation into how agroecology can support food sovereignty and reduce Senegal's dependence on food imports.

The agroecological movement, La Via Campesina and advocates of food sovereignty all talk of a transition to another food system. **Transition theory** provides a useful lens for understanding the shift from conventional agriculture to agroecological practices. Transition theory examines the processes through which socio-technical systems change, highlighting the roles of niches (innovative practices), regimes (dominant practices), and landscapes (wider contextual influences) (Geels, 2002). This concept helps to understand how agroecological practices can emerge and be scaled up within a context dominated by conventional agriculture. Senegal's efforts to transition towards more sustainable agricultural practices can be viewed through the lens of transition theory. The dichotomy between small-scale family farming and large-scale agribusiness operations financed by foreign capital is a significant point of contention in sub-Saharan Africa (Collier and Dercon, 2014; Deininger

and Byerlee, 2011). The polarization between these two agricultural models underscores the need for a nuanced understanding of agroecological transitions in Senegal.

Beyond its pure practical dimensions, AE has to be understood as a **Social movement** advocating for transformative change in the food system. Rooted in principles of *food sovereignty* and environmental justice, the agroecological movement seeks to empower farmers, indigenous communities, and marginalized groups to reclaim control over their food systems (Holt-Giménez & Altieri, 2013). At its heart, *“agroecology embodies principles of grassroots participation, collective action, and horizontal knowledge exchange, challenging conventional top-down approaches to agricultural development”* (Patel et al., 2015). The agroecological movement in Senegal can not be viewed primarily as an organisation wanting to switch the nation’s agriculture to an organic form, but rather as a movement that wants to help farmers who are already operating without the use of pesticides and artificial fertilizer and make them more productive using better techniques (C. Sambou). It also wants to make farmers more resilient to shocks such as climate change and wants to make them more independent. Moreover, social movement theory provides valuable insights into the agroecological mobilization, highlighting the role of collective action, political consciousness, and solidarity in challenging dominant paradigms of agricultural development (Holt-Giménez & Altieri, 2013; Patel et al., 2015). By analyzing the strategies and tactics employed by agroecological movements, scholars have shed light on the processes of grassroots organizing, coalition-building, and advocacy that underpin transformative change in food systems: *“The rise of AE does not necessarily imply a total switch or overthrow of the current order”* (Holt-Giménez & Altieri, 2013). Mockshell and Kamanda (2018) distinguish between the proponents of *“continuation of technological advancements and intensive production systems [Green Revolution ed.] with high optimal input use through sustainable agricultural intensification (SAI) practices”* and the advocates of a *“paradigm shift to eco-agriculture, agroecology”*. This distinction is critical for understanding the debates surrounding agricultural development in Senegal and the potential role of agroecology in achieving sustainable development goals.

Recognizing the significant environmental challenges humanity faces in the 21st century, this research has been conducted and this thesis written with an awareness of the necessity for **Sustainable development**. Which is grounded in the principles of equity, resilience, and environmental stewardship. Sustainable development seeks to meet present needs without compromising the ability of future generations to meet their own needs (Hickel, 2019). Within agriculture this involves promoting practices that are economically viable, environmentally sound, and socially just. AE farming often appeals to these promises, this study aims to investigate whether this applies in the Senegalese context.

Methodology

This section outlines the research design, including the research questions, methodology, and the layout of the empirical chapters.

Research questions

To answer the question what role agroecology can play in enhancing food security in Senegal this research was guided by the following questions:

- What are the characteristics of agroecology in Senegal, and how do they compare to conventional agricultural practices?
- What is the Senegalese government's stance on agroecology, and how does it influence agricultural policies and initiatives?
- Which organizations are involved in promoting agroecological practices in Senegal, and what role do they play in the surge/transition?
- What are the experiences and perspectives of farmers engaged in agroecological practices, and how do these practices contribute to food security and sustainability?

Data collection methods

Document analysis: Relevant documents, such as policy papers, reports, and organizational documents, were analyzed to understand the broader institutional and policy context influencing the agroecological surge in Senegal.

Observations: Field visits to agroecological farms, government agencies, and agricultural organizations were conducted to observe practices and interactions. These observations provided contextual understanding.

Interviews: Semi-structured interviews were conducted with key stakeholders, including government officials, NGO representatives, farmers, and experts in the field. These interviews provided insights into participants' views, experiences, and challenges related to agroecology.

Identification of NGOs: To identify NGOs active in promoting agroecology, a comprehensive search was conducted using online databases, NGO websites, and search engines. Keywords such as "agroecology," "sustainable agriculture," "food sovereignty," and "Senegal" were used. Contacts and referrals found during interviews and field observations expanded the list of active organizations. Reports, publications, and project documents from international and local NGOs were reviewed to identify specific initiatives and partnerships.

Selection of cases and respondents

Upon arrival in Dakar, it proved challenging to reach the farmers initially targeted for interviews. Contacting farmers through ENDA PRONAT revealed that interviews in Northern Senegal were impractical during the dry season. Consequently, interviews took place in a more southern region of Senegal: Casamance. This choice shaped the results and limitations of the research. Information

about agroecological farms and organizations in the remaining regions was supplemented by data gathered through NGO websites and documents.

Positionality and potential biases

As the researcher, my positionality may influence data collection, analysis, and interpretation. Differences in cultural norms and behavior, language barriers, and preconceived notions about agroecology and conventional agriculture posed challenges. To mitigate biases, self-awareness was practiced throughout the field study and during writing. The added appendix includes reflections on the researcher's role and its implications for data collection.

Research design

The research employs a mixed methods and qualitative approach to explore the rise of agroecological practices in Senegal. This makes it an *inductive exploratory* research, focusing mainly on the past decade during the Macky Sall presidency. Acknowledging the relevance of the new presidency elected in March 2024, the conclusion of this thesis will also include a further outlook on the future development of AE under the new government. The empirical part of this thesis combines a literature review, government document analysis, observations, and semi-structured interviews. This multifaceted approach gives rise to a first exploration of the complexities surrounding the push for an agroecological transition in Senegal, aiming to uncover the influence of government policy, the presence of international NGOs, but most essentially the efforts and wishes of local communities and social movements.

Variables

The research takes male and female dichotomies into consideration and also the discrepancy between pastoralists and sedentary people is of an urgent matter for the study of AE. During field work different areas of Senegal were visited, these differences in geography and climate have been taken into account.

Chapter methodology

Methodology for chapter 1

Information gathered through renowned institutions like the FAO and the World Bank. Maps retrieved through Senegalese NGOs

Methodology for chapter 2

The second chapter is grounded in an analysis that examines key government documents, including amongst others:

- Programme d'Accelération de la Cadence de l'Agriculture Senegalaise (PRACAS), 2014
- Dakar Declaration on Food Sovereignty and Resilience (DAKAR 2), 2023
- Strategie Nationale de Souverainete Alimentaire: 2024, Ministry of Agriculture, Dakar, 2023
- Rapport exploratoire sur l'économie verte, 2019 Republique du Senegal

A semi-structured phone interview was conducted with former minister of agriculture Papa Abdoulaye Seck. A critical review of this conversation enriched the analysis with firsthand information thus providing valuable context through the eyes of someone who had been closely

involved. Documents considering government policy were nearly all found in the database of the FAO since the websites of the Senegalese government were often down or links didn't function. This could be considered as a factor influencing the research, meaning that what this research can say about government policy does not extend the scope of what the FAO provides.

Methodology for chapter 3

This chapter employs various research methods to explore the triggers behind the agroecological surge in Senegal. Document analysis involved a review of existing literature and organizational reports from key NGOs such as CIRAD, GRET, and ENDA PRONAT. These documents included project evaluations, strategic plans, and annual reports, providing insights into the entities driving the agroecological movement. Field observations were conducted during visits to agroecological projects in the Western Casamance and the Groundnut Basin. These visits gave direct interaction with local farmers and offered practical insights into the activities and presence of NGOs in these regions. Semi-structured interviews were also conducted with experts such as Absa Mboj from ENDA PRONAT and Clement Sambou, founder of the AE organization ECO from Africa. These interviews provided valuable perspectives on the collaboration between NGOs and government agencies and the challenges faced in promoting agroecology.

Methodology for chapter 4

This chapter examines the effectiveness of agroecological practices from the farmers' perspectives, focusing on the experiences of smallholder farms in Senegal. The research methods employed include field visits and observations as well as interviews. During the field visits, ten farms were visited to observe agroecological practices and understand how different farmers interpret and implement AE. These visits provided direct insights into farm operations and the socio-economic context. In addition to field visits, semi-structured interviews were conducted with farmers, cooperative leaders, and experts, including Clement Sambou of Eco From Africa and Mariama Sonko of We Are the Solution. These interviews explored the benefits and challenges of agroecology, particularly for women-led cooperatives. Fortunately, all interviewees agreed to have their real names published. Interview guide and transcripts can be found in the appendix. This chapter relates the outcomes of these interviews to concepts like food sovereignty and resilience.'

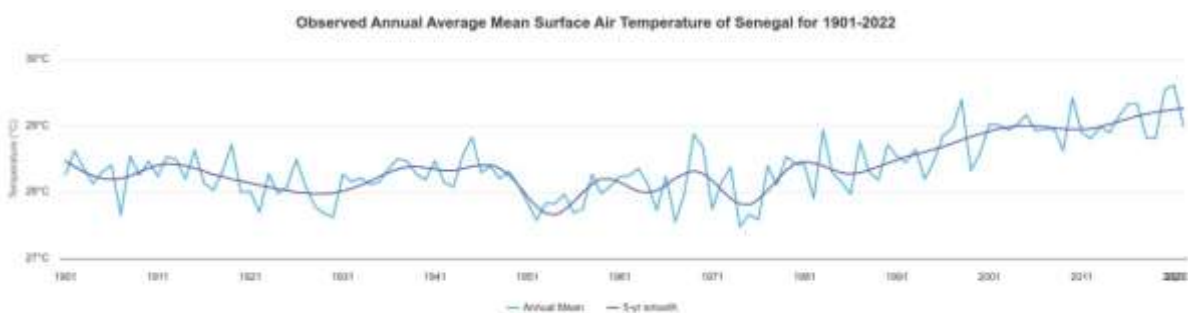
1. Geographical and thematic context

In examining agroecology in Senegal, it is essential to consider the historical context. In pre-colonial times, the area was used for seasonal pasture, palm recollection, and fishing. Shifting agriculture with millet and peanuts started in the 18th century, and from 1930 to 1960, the French colonial authorities supported horticulture development to supply the growing city of Dakar. The drought of 1970–1980 led to the abandonment of rain-fed cultivation in sandy soils and gave rise to a small number of movements looking for alternative forms of agriculture.

Climate

Senegal is situated in the westernmost part of the African continent, with a population of approximately 15.85 million and a land area spanning 197,161 km². The socio-economic landscape in which agroecology in Senegal is to be studied is influenced by its geographical features, climate patterns, agriculture, urbanisation, and demographic trends. This contextual framework provides a compressed overview of these factors to better understand the challenges facing the country. Senegal's geography encompasses a variety of eco-geographical zones, including coastal, Sahelian, and Sudanic regions, each characterised by distinct environmental conditions and land use patterns.

The country experiences a tropical dry climate, with three primary seasons: a rainy season from June to September, a colder dry season from October to February, and a hotter dry season from March to May. These climatic patterns are influenced by the seasonal migration of the Intertropical Convergence Zone (ITCZ). The average annual rainfall varies significantly, from around 300 mm in the north to 600-800 mm in the centre, and up to 1200 mm in the southeast. Climate change poses significant challenges, including drought, flooding, soil salinisation, coastal erosion, and locust invasions, which impact agriculture, food security, and livelihoods across the country (Climate Change Knowledge Portal, World Bank, 2024).



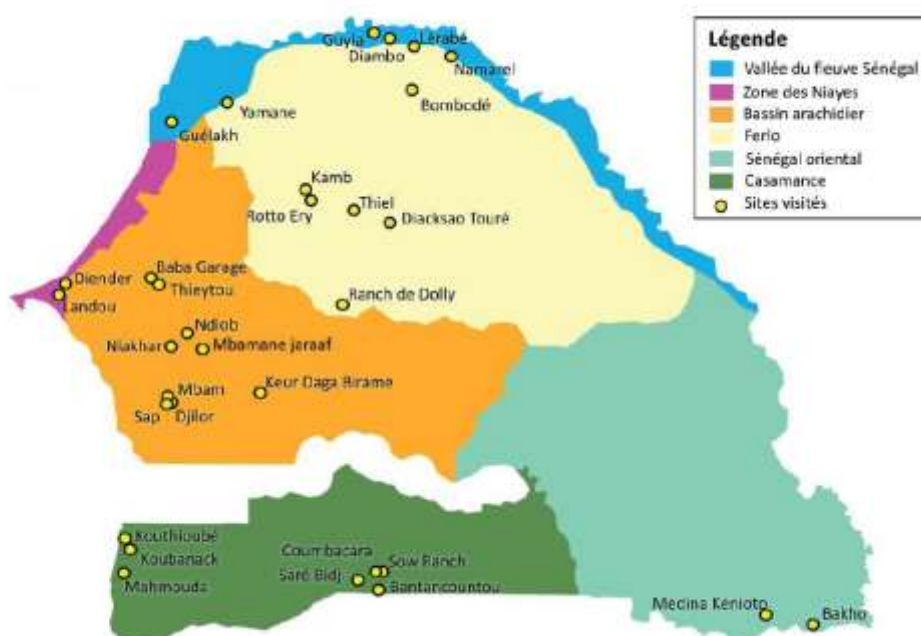
Graphic 1, Mean surface temperature (day and night), Climate Change Knowledge Portal, World Bank

Economy

Agriculture is a cornerstone of Senegal's economy, employing one-third of its population. The country has 3.8 million hectares of arable land, with an average of 2.5 million hectares cultivated annually. However, the sector faces challenges such as low productivity, limited access to resources, and vulnerability to climate variability. Despite its importance, the agriculture sector is characterised by high levels of informality, with nearly 70 to 89 percent of the workforce engaged in informal employment. This informality leads to low wages, underemployment, and limited social protection for agricultural workers, particularly women and youth (Faye et al. 2021). Additionally, the country has 35 billion cubic metres of water resources, with surface water primarily from the Senegal, Gambia, Casamance, and Kayanga rivers, and 4 billion cubic metres of groundwater. However, only 5% of groundwater is mobilised, mainly for potable water.

The potential irrigable land is about 350,000 hectares, of which only 130,000 hectares are developed. Main crops include rice, millet, maize, sorghum, fonio, peanuts, sesame, onions, tomatoes, cotton, potatoes, beans, sweet potatoes, cassava, melons, watermelons, mangoes, bananas, papayas, and citrus fruits. Agriculture types include family farming (approximately 90% of farms) and agro-business/industrial agriculture (both national and international investments).

Although the Senegalese economy has shown growth since the presidency of Macky Sall, with the poverty rate according to national standards falling from 43.0 percent in 2011 to 37.8 percent in 2018, many people still struggle, living on \$2.15 a day, thus making it a low-income country according to the World Bank. Poverty is particularly acute in rural areas, where access to basic services and economic opportunities is limited (World Bank, Poverty & Equity, 2023).

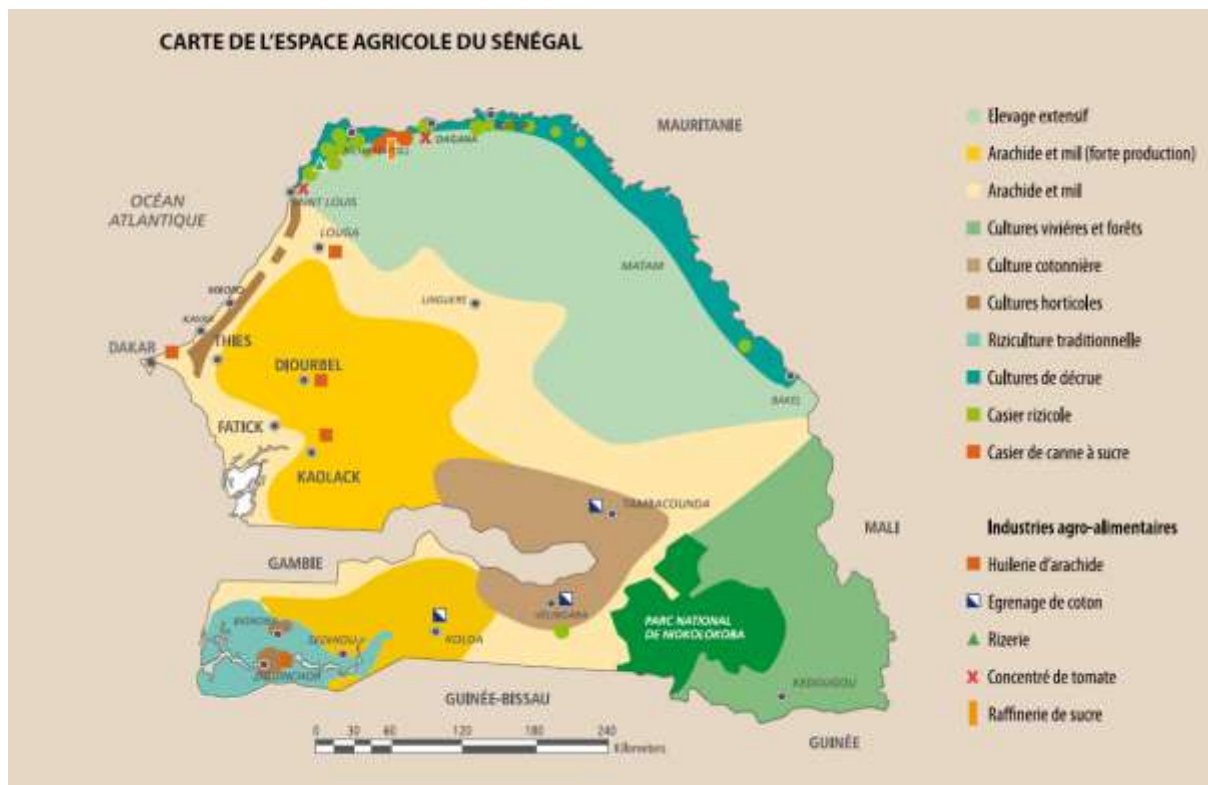


Map 1. regions of Senegal, source: DyTAES, 2020.

Economy

Senegal's economy exhibits robust growth, with a GDP valued at 24.13 billion USD in 2018 and a GDP growth rate of 6.8 percent. However, disparities in wealth distribution persist, reflected in a GDP per capita of 1,522 USD in the same year. The dominance of the informal sector, coupled with low levels of industrialisation and technological advancement, poses challenges to sustainable economic development and inclusive growth (World Bank, Poverty & Equity, 2023). Senegal's demographic landscape is characterised by a youthful population, with 20 percent aged between 15 and 24 years and more than half the country under 40. This demographic presents both opportunities and challenges, as the country seeks to harness the potential of its youth while addressing issues such as youth unemployment, education, and social inclusion. Gender disparities persist, particularly in rural areas, where women face limited access to resources, employment opportunities, and decision-making power.

Urbanisation is rapidly increasing, with an annual urban population growth rate of 3.7 percent in 2018. This urbanisation trend presents opportunities for economic development but also stresses urban infrastructure and services, exacerbating challenges such as unemployment, housing shortages, and environmental degradation. This urban challenge is particularly relevant for this research, as it affects the Niayes area north of Dakar, which sees increasing pressure from the expanding city.



Map 2 Agricultural land-use in Senegal, source: Institut de Recherche pour le Développement (IRD Senegal), 2015

2. Analysis of Government Efforts to Improve Food Autonomy and AE

Introduction

The idea of food autonomy in Senegal has been around for many decades, politicians often have expressed the need to steer towards more durable farming practices that emphasize domestic consumption of local produce, development of the agricultural sector and better resilience to shocks in world food prices. Despite significant potential and numerous government efforts, achieving genuine food sovereignty and sustainable agro development remains a challenge. First, this chapter reviews the Senegalese government's stance and initiatives on increasing food autonomy in order to draw the context in which agroecological practices are developing. Primary sources include the "Plan Sénégal Emergent" (PSE) and the Stratégie Nationale de souveraineté alimentaire (SNSA), both designed under Macky Sall's investment-driven developmental agenda. The second part of this chapter builds upon an interview conducted with Dr. Papa Abdoulaye Seck. The former Minister of Agriculture and Rural Equipment has been appointed ambassador of agroecology by the FAO and expressed his views on the possibilities of AE being a successful tool in strengthening agriculture.

Government efforts and plans to improve food autonomy

The Senegalese government has long pursued initiatives to enhance food sovereignty and self-sufficiency, focusing on key (cash-) crops such as onions, rice, peanuts, and cashews (PRACAS, 2014; supported by personal observations). Despite these efforts, the growing population still relies heavily on food imports, which underscores the limitations of the current strategies. Keeping in mind the downsides of chemical-intensive practices and conventional Green Revolution based we shall now delve into written policy.

Plan National d'Action pour l'Environnement (PNAE)

One of the earliest attempts to include sustainable development in agricultural policy followed shortly after the 1992 Rio World Conference. Since then the PNAE has been renewed twice, in 2002 and 2012. The PNAE emphasizes sustainable development and combating desertification, supporting initiatives like the Great Green Wall. It also promoted agro-sylvo-pastoralism and the creation of eco-villages to increase environmental awareness, promote sustainable agriculture, and enhance climate resilience. However, despite its emphasis on sustainability, the PNAE did and does not explicitly mention agroecology.

National Strategy on Sustainable Development (2015)

Established in 2015, this document acknowledges the severe ecological degradation of agricultural soils but lacks actionable solutions for field implementation. While it mentions sustainable land governance and agroforestry promotion, it fails to provide detailed, practical advice for adopting sustainable practices.

Stratégie Nationale et Plan National d'Actions pour la Biodiversité (2015)

Written in 2015 this paper on biodiversity does not incorporate agroecological farming as a method for land use and nature conservation. This raises the question whether there was any knowledge of the possibilities of AE practices and its potential benefits for biodiversity in agricultural areas.

Under Macky Sall's presidency, the Ministry of Agriculture has focused on enhancing agriculture through programs categorized into training and subsidies. Recently, the administration acknowledged the overuse and misuse of plant protection agents, which polluted groundwater and harmed farmers (Gestion des Pestes). The 2019 Exploratory Report into the Green Economy (Rapport Exploratoire) looked for possibilities to make the Senegalese economy more sustainable. Regarding agriculture, the report proposed more sustainable land management practices, subsidizing solar irrigation pumps, expanding irrigated rice production, developing family and agro-industrial farming, increasing the use of organic fertilizer, and promoting agroecology. Making 2019 the first year mentioning AE which coincides with the founding of Dynamics for an Agroecological Transition in Senegal (DyTAES) as will be discussed more extensively in the next chapter.

Lettre de Politique du Secteur de l'Environnement (2021)

The Ministry of Environment and Sustainable Development's Lettre de Politique du Secteur de l'Environnement (LP/SEDD, 2021) is the first governmental document to mention agroecology and organic agriculture as potential practices for reorientation. It notes that approximately 200 hectares of organic agriculture have been established through the eco-village project, demonstrating a modest but noteworthy step towards incorporating agroecological practices. Reading this more critically however we can state that this has to be attributed to former president Wade.

Plan Sénégal Émergent (PSE) the first chapter 2014-2019

Launched in 2014 under President Macky Sall, the PSE aims to boost the economy, including the agricultural sector, and transform Senegal by 2035. An integral component of the PSE is the Programme PSE Vert, which focuses on sustainable development through five key points:

- Green Job Creation: Promoting employment opportunities within the green economy.
- Investment Opportunity: Encouraging investments that foster sustainable growth.
- Environmental Impact: Reducing greenhouse gas emissions, controlling pollution, protecting ecosystems, and enhancing resilience to environmental vulnerabilities.
- Sustainable Socio-Economic Impact: Ensuring equitable distribution of value added through sustainable practices.
- Alignment with Strategic Priorities: Supporting national strategic goals and international Sustainable Development Goals (SDGs).

The Programme Vert aims to integrate sustainable practices within the broader economic development framework of the PSE. This program underscores the importance of environmental protection, green investment and adherence to international sustainability commitments. Despite these goals, tangible implementation of sustainable agricultural practices remains limited, with conventional agriculture still dominating the landscape.

Plan d'Actions Prioritaires Ajusté et Accéléré, the second chapter (PAP2A)

The PSE plan was adjusted in 2019 with the PAP2A, a policy document addressing what needs to be done to keep up with the goals set by the PSE. Key among these is the still running National Rice Self-Sufficiency Program (PNAeR, 2015) which focuses on the development of rice farming and horticulture. This initiative also includes the establishment of agropoles and infrastructure for storing agricultural products, which are crucial for enhancing the agricultural value chain and reducing post-

harvest losses. The document writes: *Agricultural production is designed to meet internal consumption needs while revitalizing the agro-industrial sector, particularly the food processing industries, to achieve food self-sufficiency. Significant investments are planned for agriculture, livestock, and fisheries, amounting to 1,195.2 billion FCFA, representing 9.9% of the PSE's total cost.* The agriculture sector alone accounts for 8.4% of the PAP2A budget, with rice program (PNAeR) taking up most of the budget followed by the national horticulture program. Additionally, the plan emphasizes the importance of family farms.

PAP2A however acknowledges that despite the resilience of the agricultural system, food security remains a challenge. Increased food availability and improved economic and physical access to food have not fully addressed the issue, as 1.8 million people were undernourished in 2018. The agricultural sector also faces challenges such as value chain disruptions, strategic partner withdrawal, and market instability, particularly affecting key crops like mango, cashew, onion, and potato. To address these challenges, the PAP2A includes measures to enhance storage capacity and reduce post-harvest losses for both cereals and fruits and vegetables. During a trip in the field this could also be observed in the western Casamance.



One out of dozens of cashew storage facilities in West Casamance (personal observation)

In 2023 the PAP2A saw a follow up in the PAP3. In this third Plan d'actions prioritaires, there is slowly more attention given to helping out local producers. To enhance resilience to various hazards and to drive economic and social development by 2035, the National Strategy on Food Sovereignty (SNSA) will be completed, with the objective of ensuring durable food and nutritional security for the population. The selected actions include: *promoting "buying local"; and supporting the commercialization of local products promoting the availability of diversified and nutritious food at an affordable cost* (Plan d'actions prioritaires 3, 2023).

In order to achieve the above mentioned PSE goals, the Ministry of Agriculture and Rural Equipment (MAER) has implemented complementary programs such as the Accelerated Program for the Pace of Senegalese Agriculture (PRACAS), the Agricultural Program for Sustainable Food Sovereignty

(PASAD), and the National Strategy on Food Sovereignty (SNSA). The PASAD (2022-2026) was launched during a national workshop on July 5, 2022 and aims to enhance rice production, horticulture, and dry cereal development, with an estimated cost of 1,021 trillion francs (approximately 1,5 billion euros). The workshop, which brought together 117 participants from various sectors, including state actors, civil society, and agricultural partners, resulted in the provisional validation of the PASAD report. The Feed the Future Senegal Project for Support to Agricultural Reforms and Policies played an important role by providing technical assistance to the MAER in finalizing the PASAD. This initiative can be viewed as the ministry's contribution to the PAP2A on the matter of sustainable food sovereignty and agricultural resilience.

Initially, sustainability was not a primary focus of the PSE and within the agriculture section there was no mentioning of AE as a way to make agriculture more sustainable. However, since the founding of the DyTAES in 2019, there has been a stronger emphasis on integrating sustainability into future PSE strategies, particularly for the period 2024-2028. The arrival of this Dynamic can be viewed as a momentum since it managed to anchor Agroecology in the Strategy National de Souverainete Alimentaire of 2023. In an interview Absa Mboj from Enda Pronat informed me that for the first time, AE was taken seriously as a method to reach food autonomy (interview A. Mboj). Thus can be concluded that the government increasingly made efforts since 2019 and underwrites the need to introduce more sustainable ways to produce while at the same time diminishing the need for import. Though much support has been expressed, substantial efforts are still needed. Based on the reading of these documents it becomes clear that the Senegalese government agrees on promoting sustainable agricultural development, possibly with the addition of agroecology (AE). And also sees the positive effects it can have on food sovereignty, but what is lacking is the need for a shift from short-term management to long-term and integrated planning. To illustrate this with a quote from former minister Seck:

“Just as with the eco-villages under (former President) Wade, the duration of the projects is too short.”

Next to the lack of long term planning there is also not enough government subsidized training to increase agroecology. Building an agroecological farming sector would mean engaging all stakeholders in the value chain, from farmers to policymakers, in a collaborative effort to design and implement sustainable agricultural practices (Boillat). Systemic thinking is essential for addressing the complex and interrelated challenges of agriculture, environment, and food security. Increasing agroecological production alone is not sufficient to achieve food self-sufficiency, we need a nuanced approach that balances production with market demands. A problem that illustrates the need for this is post-harvest losses. For example, despite increased production in sectors like horticulture and rice, post-harvest losses remain high. Post-harvest spillage would be lower with organic produce since it is more resilient to rotting. However, it's made it clear that the same problems would occur due to limited food processing facilities. The Strategie Nationale de Souverainete Alimentaire mentions that with cereals, 15% is lost due to spoilage, and with vegetables, it's over 40% (Strategie Nationale, 2023). For this reason, Senegal is still dependent on imports. Improved storage, processing, and marketing strategies are crucial to overcoming spillage, ensuring food security, and reducing imports.

Governance is considered problematic to increasing AE is. This kind of agriculture requires decentralization and collaborative management. Agroecology should be built bottom up, it is not just

a matter for the government, it concerns all of society. This was confirmed by Seck: “A bottom-up approach is the only way to succeed and to mobilize actors, including urban actors it involves all stakeholders in decision-making, ensuring transparency and accountability.” Another key factor is to understand farmers, their tradition and culture. If there is to be a model promoting AE should define clear roles and responsibilities and promote specialization based on comparative advantages. The situation witnessed during fieldwork in Casamance, which will be discussed in Chapter 3, illustrates this, as produce did not effectively reach Dakar (personal observation).

Practical actions to stimulate AE are that smallholder farmers should be given better access to land, credit, organic seedlings, improved access to water, and robust infrastructure. Next to this it is importance of invest in infrastructure to reduce post-harvest losses, lower transport costs, and enhance market access. This was a point not only mentioned by Seck, but also often mentioned during interviews conducted with farmers. These problems were repeatedly mentioned, especially infrastructure.

Lastly the former minister was asked that if the agroecological farm model was to be developed, which aspects would he like to see return. His answer called for an inclusive model committed to support traditional farms, create opportunities for rural youth, and enable women to have more economic freedom. Adding optimistically that these groups have significant potential and need the right conditions to thrive. Policies that provide equitable access to resources, training, and markets, ensure that all stakeholders benefit from the agroecological transition and resilience of local farmers can be improved. Family farms and small enterprises must collaborate to achieve food security based on agroecology. With regard to the AE cooperatives I was to visit Seck highlights the need for a balanced approach that secures private investment while safeguarding community structures.

Delving into government policy documents has provided us with a sketch of the landscape in which agroecology is trying to bloom and the interview with Papa Abdoulaye Seck provided an official view on the possibilities that lay ahead. But despite rhetoric in policy documents, the Senegalese government's support for agroecology appears limited upon closer examination. While initiatives like the Plan Vert aim to promote sustainability they often miss to reach the ground. Subsidies for organic fertilizer increased by threefold between 2005 and 2013, but primarily benefited large agro-industrial producers (IPAR 2017). This suggests amongst other examples a disconnect between policy intent and implementation. Also the positive tone which can be noted in the interview with former minister Papa Abdoulaye Seck is hard to rime with the direction the ministry went under his leadership until 2019. Much may have changed in recent years, but after this inquiry it dawns on us that the Senegalese government is not the major driver behind the AE ecological movement, but then who is?

3. Agroecology in Senegal, the role of NGOs

Introduction

The Senegalese agroecology movement is among the most well-established in Africa, strongly supported by a network of transnational partnerships (Bolliat, 2021). Influential French partners include CIRAD (Agricultural Research Centre for International Development) and GRET (Group for Research and Technology Exchanges), both of which have been based in Dakar for decades. The main Senegalese NGO active in promoting agroecology is the environment-focused ENDA PRONAT. They support several projects and organized the impactful Days of Agroecology. However, collaboration between NGOs and governmental agencies in agroecological undertakings remains limited, with minimal overlap observed between government-led and NGO-led projects.

The question arises, how AE came to be so “well-established”, without noteworthy government support. This chapter therefore breaks down the rise of AE in Senegal; 1. discussing connections made with the Ministry of Agriculture, 2. collecting activities of the different international and local NGOs and 3. geographically visualizing AE activities throughout the country.

Landscaping AE movement

After the FAO held their 2014 International Symposium on Agroecology in Rome, ENDA PRONAT conducted a study in 2018 to examine the effectiveness of AE. This resulted in the creation of DYTAES, the Dynamic for Agroecology, in 2019. Facilitated by ENDA, this DyTAES network serves to foster coordination and knowledge exchange. Virtually all organizations already active in the movement have joined to form a network of agroecological organizations, including the Senegalese Organic Federation (FENAB) which gives out organic labels and the Task Force for the Promotion of Agroecology in Senegal (TaFAé) operating between AE and the government. Between 2019 and 2022, this led to a ‘Caravane Agroecologique’ a nation wide tour which visited over 50 farms and producers. The goal of this caravan was not only the promotion of AE to a broader audience but also to understand what the farmers needed to improve and augment their production (DyTAES, 2024). Its effectiveness can be recognized for ENDA PRONAT expert Absa Mboj noted that since its establishment in 2019, DYTAES has been participating in several government strategies on agricultural development. Although the TaFAé Initially had the objective of enhancing exchange of agroecological knowledge between farmers, NGOs, government and academia as well as advocating for the adoption of agroecology and its support by national policies. “Unfortunately, only the first objective was pursued” (interview A. Mboj).

Thanks to the activity of DyTAES the national research institute for agriculture (ISRA), most notably its section which researches value chains (BAME), has recently shown more interest in AE. In their most recent report involving agroecology, they project the year 2050, when Senegal’s population is expected to grow to almost 33 million. They sketch two opposing scenarios of a food system based on agro-industry or agroecology. A thorough scan of previous BAME documents shows that before 2022 there was zero attention given to the possibility of incorporating AE.

Agroecological projects are dispersed across Senegal, spanning its six geographical regions. Every region has its distinct agricultural landscapes and challenges, each influencing the nature of agroecological projects. Notably, the Niayes region, situated north of Dakar, is characterized by thriving horticulture which has seen growing foreign investment in recent years, including Dutch

enterprises (RVO, 2024). The northern Region du Fleuve features rice cultivation irrigated by the Senegal River and has seen most investments by the government in order to increase rice production to secure food self-sufficiency. Therefore the Fleuve has been overemphasised by government projects in order to achieve rice self-sufficiency. This however consequently also makes it one of the most polluted areas in Senegal due to excessive use of agrochemicals and fertilizer. The Basin Arachider/Groundnut Basin is renowned for its peanut and millet production, where these two crops give mutual support to one another: peanuts give nitrogen to the soil for millet to thrive on and millet can be eaten as staple food and provides straw/organic matter (Zhu LIU, et. al., 2023). Moving southwards the Western Casamance supports rainfed rice cultivation and cashew nut farming, while the Eastern Casamance also hosts rice although less over recent decades due to decreased precipitation. Finally, the Ferlo region, also named the "Region sylvopastoral," primarily accommodates nomadic cattle herding amidst its shrub dotted Sahelian terrain (Prudhomme et al., 2024). Each region's agroecological practices are contextualized to its unique challenges and opportunities. In the Ferlo, agroforestry techniques predominate, alongside initiatives focused on soil restoration through the separation of cattle from agricultural areas. Meanwhile, as we learned during an interview at the Kaydara School, in Senegal's groundnut basin large-scale peanut cultivation has led to soil degradation and increased salinity. Researchers from ISRA and Cirad are addressing these issues by advocating for agroecological practices that incorporate traditional methods. One such practice is intercropping millet with trees like the acacia species *Faidherbia albida*. This tree is particularly beneficial because it enhances soil fertility, provides livestock forage during the dry season, and supports crop growth during the rainy season without competing for resources (Kaydara visit and DyTAES, 2024). Local branches of the national organization DYTAES, known as Dytaels, coordinate activities across regions but are not always the primary drivers of projects. For instance, in the conflict-prone Western Casamance, Terre et Paix initiated agroecological projects to restore peace and stability (interview S. Sow). Desk analysis of annual reports and NGO briefings aligns with this example showing that often DyTAES functions as bond between donors and farmers.

Input of international NGOs

This research began with the assumption that government institutions were leading AE projects, but it soon became clear that most agroecological projects are initiated by various non-governmental stakeholders, including established NGOs like GRET and SOS Sahel, as well as grassroots initiatives led by farmers themselves. Here we'll first discuss the NGOs involved.

On a transnational level the ECOWAS has showed increasing effort to promote the AE transition in West Africa. With funding of the EU their PATAE (Support Programme for the Agroecological Transition in West Africa: 2018 - 2021) tries to strengthen centers specializing in the training and installation of farmers who wish to engage in agroecology; encourage partnerships between producer organizations and research to better support the integration of agroecological practices.

Bilateral links are found with the French development organization CIRAD is one of the largest and most active organisations operating in Senegal. Over a decade, spanning from 2009 until 2019 the organisation worked on agroecology with producers, researchers, development professionals and decision makers in Senegal, ultimately leading to being one of the founders of DyTAES and support of AE in Senegal will be continued until 2035 (CIRAD, 2021). GRET has been present in Senegal since

1985. Over this period, it has established partnerships with Senegalese NGO's like DyTAES and ENDA. It focuses on empowering local communities and helps them develop agronomic and technical skills. By focusing on farmers and local leaders GRET tries to bring management of natural resources, support for agricultural value chains and agroecological transition to the community level. GRET's activities stretch to Senegal's most important horticultural region Niayes. Extensive horticulture has led to overuse of water reserves and severe water pollution. Since 2017, the NGO, in collaboration with the Senegalese government, has been addressing the problems in the Niayes through the Opress project. Water is scarce and polluted due to competing demands from agriculture, mining, and industrial activities. The project aims to establish a shared governance framework for sustainable and equitable water resource management, emphasizing agroecological solutions. By forming Local Water Platforms (PLEs) in five communes, the initiative brings together diverse stakeholders—farmers, herders, private operators, and local authorities—to collaboratively manage water resources. Key actions include the implementation of agroecological practices such as using natural fertilizers. Additionally, the project involves mapping hydraulic infrastructure and conducting pesticide surveys to mitigate pollution. As the project progresses, plans include expanding governance frameworks, raising public awareness through theater forums and cine-debates, and conducting reforestation campaigns. By promoting these agroecological practices, the initiative aims to sustainably manage water resources, improve soil fertility, and ensure long-term food security for the Niayes region (GRET, 2017).

While CIRAD and GRET are specialized in aiding research and policymaking other NGOs focus primarily on the farmers associations. This is shown by Humundi (formerly SOS FAIM). Through the Opress project, this organisation is supporting agroecological farmers' associations to overcome organizational and market access challenges. This support includes training sessions, improved seed stock management, and facilitating contracts with local agro-food companies. Humundi states that many bigger NGOs and companies focus on the productive aspect of agroecology, which can lead some farmers to see it as a new agricultural practice, potentially overshadowing the value of their traditional knowledge. Humundi tries help farmers develop their own understanding of agroecology. This approach emphasizes the importance of both endogenous (local) and exogenous (external) knowledge, though initially prioritizing traditional practices (Humundi, 2021).

The NGOs mentioned above incorporate agroecological practices but it is not their main activity. SOL however, (translating to soil in English) is an NGO specialized in projects working with agroecology and thus differs from the more established ones like CIRAD and GRET. Since 2018, SOL has coordinated the Biofermes Sénégal project with the Villageois de Ndem NGO in the Louga region (Groundnut Bassin and Ferlo). The project aims to create a training farm for agroecology to experiment with and share locally adapted production techniques, training 200 farmers between 2020 and 2022. It also established a seed house to train 200 farmers in seed conservation and multiplication, collecting and preserving local seeds and identifying resilient ones to reintroduce into fields. Another SOL project, in partnership with FONGS, focuses on valuing local cereals. The goal is to strengthen food sovereignty, rural employment, and women's work in several regions by using locally produced traditional cereals to reduce cereal import dependence. The project's first phase (2015-2018) trained 150 family farms in sustainable agriculture, increasing their harvests and sales. These farms supply three newly created mills that process cereals (millet and maize) into flour. Additionally, 36 bakers learned to incorporate local cereals into their products, and 180 women now sell cereal-based products weekly. The initiative had a ripple effect and raised awareness among 6,000 people

in 85 villages. The second phase (2019-2021) aimed to strengthen and sustain the local cereal sector throughout the production process by training family farms, mills, bakers, and processors. Political advocacy, networking, and village communication are crucial for encouraging local cereal consumption. This approach shows how Agroecology is a holistic approach, not only considering the farmer or solely the government but trying to make the whole chain from farm to fork aware about the interconnectedness between food production, (national) economy and personal health.

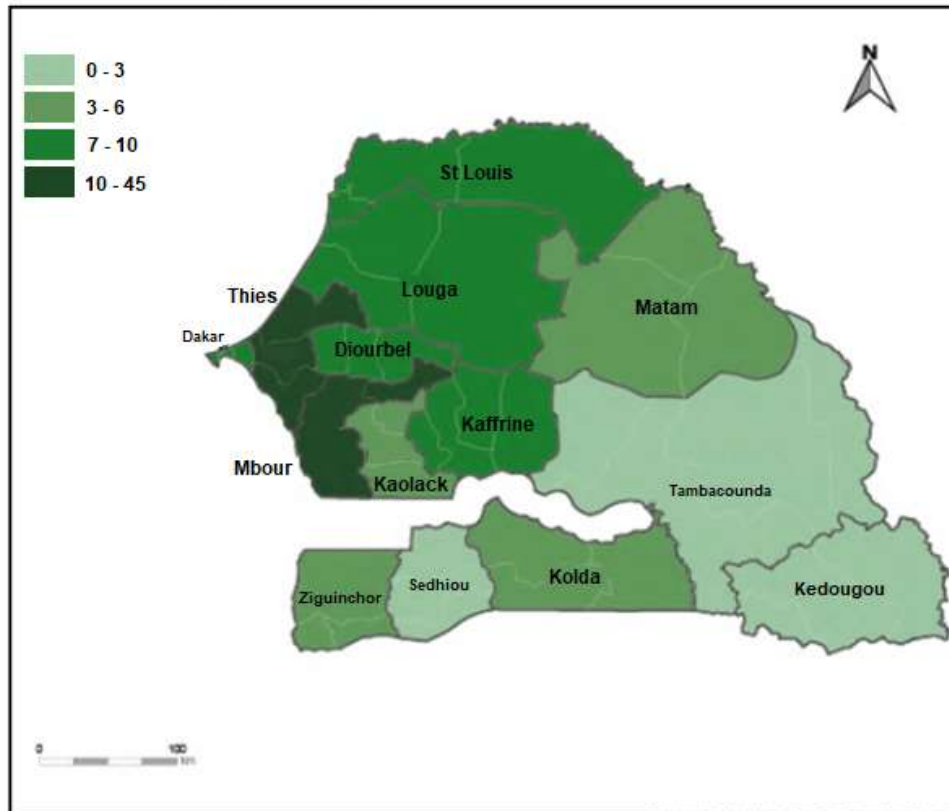
Senegalese organisations

Next to international NGOs there are also Senegalese organisations which have to be considered when breaking down the structures which are supporting and promoting AE. Among the oldest is the FAPD, (Federation des AgroPasteurs de Diender) created in 1982 due to the aftermath of the major drought that affected the Ferlo herdsman. The federation understands AE as a holistic vision, as a way of life and not simply as an agricultural technique. Activity: raising awareness and giving trainings in AE to smallholder farmers in Ferlo. Ten years after the CNCR (National Council for Rural Cooperation) was created in 1993 as an apolitical organisation that focuses on the civil society and works together with 28 farmers federations and unions from the local to the national level. Its main goal became promoting and guiding family-based peasant agriculture and in recent years they've made this goal compatible with the agroecological vision.

More recently the Alliance for Agroecology in West Africa (3AO) was established in 2018. It doesn't involve in funding, but serves as a coordination and information platform comprising farmers organizations, research institutes/universities, international NGOs, and social movements. Other than DyTAES they are not only active in Senegal but in the several countries of West Africa the 3AO was founded by the ROPPA (Network of Peasant Organizations and Agricultural Producers of West Africa) and IPES-Food (International Panel of Experts on Sustainable Food Systems). Other than the organisations mentioned previously 3AO was created just to promote and support an agroecological transition in West Africa.

Impact at the communal level

In addition to the efforts of NGOs and nationwide organisations, several regions in Senegal host a well-established agroecological popular movement. These movements consist of active communities and farmers whose efforts have a direct impact at the communal level. Notable examples include the agroecological schooling farms, such as the Kaydara Farm in the Sine Saloum delta, which not only produces food but also educates farmers interested in transitioning to agroecological farming. Other important actors are the Villageois de Ndem founded in 1985 and practicing AE since 2005. Located east of Dakar in the Groundnut Basin it has adapted to the Sahelian dry periods. South of Dakar along the coast we find the Ferme des 4 chemins in Toubab Dialow where the focus is with fresh vegetables and promoting AE produce through a market known as far as Dakar. This is just a selection of many grassroots initiatives. Although it is unnecessary to list all of them here, a quick look at the map presented hereafter provides valuable insight into the scale of the agroecological movement. This visualization illustrates the widespread nature and impact of these initiatives across Senegal.



Map 3: Number of agroecological initiatives per region based on a 2020 enquete by TaFAé [design by L. Grimaud for the European Platform for NGOs in Senegal].

In conclusion, the role of NGOs in promoting agroecology in Senegal is crucial if not essential. The FAO chose Senegal as an AE pilot country in 2015 before ENDA PRONAT conducted a study grading its efficiency. This gave the AE movement a good kick start, but makes it a movement which is brought upon the people, hasn't spurred from within their midst. Through a network of local and international partnerships, organisations are leading the agroecological trend and have created its local movements. After the trend had taken off Senegalese NGOs became involved. As Papa Abdoulaye Seck mentioned during the interview: Agroecology is not just a matter for the government, it concerns all of society. Over time, especially during the last decade, a trickle down of agroecological thinking has taken place in Senegal, from International networks to local NGOs to farmers associations (some of which existed before but reframed their approach) and eventually to farmers themselves. From this last group the AE approach can now collect and adapt to traditional knowledge which then can lead back up to policy making levels as minister Seck proposed. While the path to widespread adoption of agroecology is a great challenge, the collaborative efforts of NGOs, local farmers, and supportive networks appear to have a foothold. The following and definite chapter will look at how this has worked out in the fields.

4. What's in it for the Farmers?

Introduction

This chapter delves into the practical application of agroecological farming in Senegal, based on fieldwork in the Bignona area of Western Casamance. Through interviews and observations, it explores how different farms adapt AE practices to local conditions and needs. The findings offer valuable insights into the different approaches and challenges faced by Senegalese farmers, highlighting the role of women's cooperatives, food markets, and the potential contributions to food sovereignty. By examining farm diversity, productivity, and sustainability, this case study sheds light on the impact of agroecology on local communities and the broader agricultural landscape.

The literature did not mention a preferred scale for agroecological farming in Senegal, but Bignona hosts mostly farms ranging from 1 to 5 hectares. These farms grow food but also serve as centers of experimentation, blending traditional practices with modern ecological principles. The share of women's cooperatives, representing 6 out of the 10 visited farms, highlights the inclusive nature of agroecology and its potential to empower women financially. This became all the more clear when visiting the organisation "Nous sommes la Solution". Led by Mariama Sonko it embodies a holistic approach to farming, emphasizing the interdependence of soil fertility and human health. Sonko notes, "Women are inherently more conscious about the fertility of the soil and the health of their children". She hereby challenges the profit-driven focus often found in male farmers. Through cooperative efforts, these women not only cultivate crops but also sow seeds of empowerment, reshaping traditional gender roles and fostering a more equitable future. The FAO's efforts to promote agroecology in West Africa as mentioned in the introduction is illustrated as Sonko's organisation is active in several neighboring countries in West Africa, comprising over 500 rural women's associations from Burkina Faso, Senegal, Ghana, Gambia, Guinea Bissau, Mali, and Guinea. They sell produce and offer education which is supported by European The Agroecology Fund.

Market and local impact

Despite their modest scale, the Bignona farms significantly impact their immediate surroundings. Fruits, peanuts, and vegetables from these farms enrich the local diet and economy. Selling produce far away is hard however, the journey from farm to fork remains relatively short, with produce rarely reaching beyond neighboring villages. Pape N'diaye from Kaydara Farm School emphasizes, "Surplus produce is sold at local markets, but better market access and transportation would help." This localized approach underscores the resilience of agroecological systems, promoting self-reliance and sustainability. Fatou Sarr, a member of GIE Banga interviewed in Bogoutir, favors selling her crops at the market in Bignona over middlemen, despite having to match her prices with non-organic products. The bad roads, however, are a bottleneck she mentions. Other women in the cooperative agree, noting the difficulty of transporting produce over long distances, with the nearest city being far away (Interview GIE Banga). Clement Sambou (ECO From Africa) notes that being an AE farmer in Casamance is not easy money, as he needs to compete with farmers who use chemicals. He mentions that while the market price of a kilo of tomatoes is about 500 CFA (€0.75), he needs to sell them at 700 CFA (€1.05) to make a living. He can stay in business by generating extra income through

giving courses on his farm, but for others, selling agroecological products remains challenging due to higher prices compared to conventional products, limiting their market appeal.

Contributions to food sovereignty

Can these farms bring Senegal towards greater food self-sufficiency and provide healthier food on a continuous basis? The short answer is no, as it will take time to instruct enough Senegalese farmers to use AE practices and to provide them with necessary equipment, starting with water supply. However, most farmers already make their living as smallholder farmers, playing a crucial role in feeding the country and fulfilling an important role in rural communities. If these farmers switch to AE, they could help make rural areas more resilient. Aissatou Diouf from GIE Niaguis explains, "By diversifying crops, we have more reliable food sources." In the face of global challenges like climate change and food insecurity, these farms can sustain themselves as long as water is available. They are not dependent on imported fertilizer and costly pesticides, contributing to their independence. Samba Sow, a farmer in Diouloulou, informs: "The harvest is bigger because we use good compost" (interview S. Sow). However, next years seeds are rarely grown on the farm; they are typically purchased from large companies based in Western countries. When confronting the farmers with the question why there is an absence or neglect of so-called land races which truly struck as an anomaly, Clement Sambou explained that the local races would not deliver the desired product.

Productivity and sustainability, nutrition and livelihoods

How does agroecological farming compare to conventional methods in terms of productivity and sustainability? While conventional approaches may offer short-term gains, agroecology provides lasting prosperity. "Our harvests are more consistent and sustainable," says Moustapha Diassy of Association ASSAF-2D. By nurturing biodiversity and mimicking natural processes, agroecological farms achieve resilience against problems like soil erosion and depletion. A recent study by ISRA-BAME underscored that AE yields a smaller output per hectare than agro-industrial farming, but AE added value is much higher, (Prudhomme et al., 2024). The women of Saloum Bandia report higher yields but emphasize the need for adequate storage facilities to protect goods from the elements (Interview Saloum Bandia). Agroecological farming in Bignona offers more than just calories; it enriches diets, combats malnutrition, and promotes healthier communities. "Our diet is now richer and more varied," observes Pape N'diaye. The economic benefits extend beyond the farm, empowering women to invest in their children's education. "The money we generate is meant for the education of our children," notes a member of the Banga women's cooperative. However, transitioning to agroecology presents challenges, requiring investments in infrastructure and training. Can agroecological principles thrive in a profit-driven world? Ousmane Sambou from 6 Hectares 1 Family reflects, "*Agroecological farming has transformed not only my livelihood but also the well-being of my community.*" By selling his oranges on the market, he makes a profit, generating financial income. While healthy food is important, wanting to buy it is equally important. Are consumers willing to embrace local produce, or do they remain reluctant to depart from familiar staples? The answer is nuanced, reflecting a complex interplay of cultural, economic, and social factors. Yet, as awareness grows and appreciation for local flavors deepens (as can already be observed in Dakar supermarkets), the tide may be turning in favor of agroecological farming. "Fresh vegetables can

provide nutrients to prevent stunting and add to healthier lives over longer periods," highlights Mariama Sonko. By cultivating relationships with consumers and restoring the deeper connection to the land that has been ever-present in Casamance, farmers pave the way for a more sustainable future, one harvest at a time.

In conclusion

To gain a better understanding of Senegalese agroecology, further research is essential. This chapter forms a case study, entirely based on interviews conducted in the Bignona area of Western Casamance during April 2024, supplemented by personal observations gathered during visits to AE schooling farms (*fermes écoles*) in the Groundnut Basin. We can however conclude that agroecological farming in Bignona can be viewed as the holistic approach to agriculture described in the literature. Conversations with the people actually involved tell that AE combines environmental stewardship, community resilience, and economic empowerment. The interviews indicate that the transition to agroecology is not an easy journey, with many challenges, but it paves the way for a more sustainable and equitable future for Senegal. From a researcher's perspective, it is crucial to note that the farmers visited all received direct or indirect support from organizations promoting AE. Eight out of ten were given water wells, seven received fences, and organic fertilizer was available to kick-start their produce. These factors make it difficult to calculate the value of agroecology on its own. Moreover, bottlenecks such as insufficient water access, bad roads, and produce spillage are problematic for conventional agriculture as well. The "unfair" market position, however, is a disadvantage that organic farmers worldwide face. This problem will not be solved until markets are better regulated, meaning more government support and guidance could improve the market share for AE produce.

Discussion of findings

Government policy and agroecology

Over recent years, the Senegalese government has increased its attention to environmental stewardship, recognizing the role agroecology (AE) could play in promoting biodiversity and restoring soil health. Contrary to earlier assumptions it became clear that the Senegalese government, mainly the Ministry of Agriculture and Rural Equipment, doesn't consider an agroecological transition necessary even though they acknowledge the increasing problems which AE practices can help mitigate. Through the interview with Pape A. Seck it became clear that the Sall government did agree with the potential AE offers but that there was no intention of seriously promoting it. This highlights a considerable gap between governmental recognition of environmental issues and the actual implementation of supportive policies for AE.

Role of NGOs and international partnerships

The second empirical chapter sheds light on the instrumental role of NGOs and international partnerships in promoting agroecology in Senegal. The epicenter of this movement was in Rome, where the FAO organized an international symposium that catalyzed a network of transnational partnerships, which have been crucial in research, promotion, and advocacy for AE. These partnerships have facilitated knowledge exchange, technology transfer, and funding support, thereby laying the foundation for agroecological initiatives across Senegal. Local organizations like ENDA PRONAT have subsequently taken a leading role in community level advocacy and project implementation.

The AE movement in Senegal can thus be viewed as a foreign innovation that has been successfully integrated and embraced by various local organizations, cooperatives, and communities, albeit with substantial guidance and financial support from European donors and NGOs. This external influence underscores the importance of international collaboration in the diffusion of sustainable agricultural practices but also raises questions about the sustainability and autonomy of these initiatives without continued external support.

Localized adaptation and case studies

The case study from the Bignona area in Western Casamance showcases the diversity of agroecological farming practices in Senegal, from smallholder farms to larger experimental centers like ECO From Africa. A notable finding is the crucial role of women's cooperatives, which empower women financially and reshape traditional gender roles in agriculture. Led by figures like Mariama Sonko, these cooperatives not only cultivate crops but also serve as agents of change, promoting a holistic approach to farming that emphasizes the interdependence of soil fertility, human health, and community wellbeing.

While agroecological farms in Bignona contribute significantly to local diets and community economies, challenges such as limited market access and transportation bottlenecks hinder their broader market reach. Although AE practices claim to build resilience, contribute to food sovereignty, and reduce dependence on imported inputs, the interviews revealed that AE shares some common problems with conventional agriculture. Water scarcity remains a critical issue, and despite AE's potential to combat evaporation, investments in wells and boreholes are essential. Additionally, true food sovereignty requires self-sufficiency in seeds, yet farmers in Bignona still rely

on purchased seeds, including hybrid varieties produced by some of the world biggest chemical enterprises. The use of organic fertilizers, often sourced from other parts of the country, also raises questions about the self-sufficiency of AE practices.

Challenges and opportunities

Despite the promising outlook, the last empirical chapter highlight several challenges and opportunities facing agroecology in Senegal. The limited collaboration between NGOs and governmental agencies demands for stronger institutional support and policy integration if AE initiatives are to be scaled up. Market access, infrastructure, and consumer acceptance are key challenges inhibiting the growth of AE. Farmers reported difficulties accessing markets, competing with conventional products, and navigating logistical constraints. However, these challenges also present opportunities for intervention, including improved market infrastructure, policy support, and consumer education to promote AE products.

Recommendations for upscaling agroecology

The empirical findings underscore the need for combined efforts to address the challenges and leverage the opportunities presented by agroecology. Overcoming these challenges requires a multifaceted approach:

- **Local Initiatives and Community Engagement:** Support and expand local businesses like Clement Sambou's ECO From Africa, which can serve as models for community-based AE practices. These initiatives can foster local innovation and adaptation while strengthening community resilience.
- **Government Regulation and Support:** Increased government regulation of agrochemicals and proactive policies supporting AE can provide a more level playing field for agroecological products. Government support is crucial for scaling AE practices and integrating them into national agricultural strategies.
- **Consumer Awareness and Education:** Raising consumer awareness about the benefits of AE products can enhance market demand. Educational campaigns can promote the nutritional and environmental advantages of AE, encouraging consumers to choose locally grown, organic produce.
- **Training Programs and Capacity Building:** Broad training programs for farmers, coordinated by influential NGOs, can spread AE knowledge and practices. These programs should focus on practical skills, sustainable farming techniques, and the economic benefits of AE.
- **Infrastructure Development:** Investing in infrastructure, such as better roads and storage facilities, can reduce post-harvest losses and improve market access for AE farmers. Enhanced infrastructure can facilitate the transportation of goods to broader markets, increasing the profitability of AE practices.
- **Food processing:** Farmers experience great post harvest losses. The creation of food processing facilities could add value to produce prevent it from being wasted. Packaging can also be designed to make consumers more aware, e.g. by adding labels saying it considers an organic product.
- **Research and Innovation:** Continued research and innovation are essential to address the specific challenges faced by AE in different regions. This includes developing locally adapted

seed varieties, improving water management techniques, and exploring alternative organic fertilizers. Additionally, it is essential to collaborate closely with the farmers and to understand their actual needs. Sometimes they receive tools or commodities that they cannot use or repair when they break.

The empirical findings presented in the three chapters provide valuable insights into the surge of agroecology in Senegal. The central role of NGOs and international partnerships in promoting AE, the importance of localized adaptation, and the diverse impacts on food sovereignty, sustainability, and resilience are evident. However, challenges such as limited institutional support, market access, and infrastructure need to be addressed. Through collaborative action and policy intervention, agroecology has the potential to transform Senegal's agricultural landscape, enhancing food security, preserving natural resources, and empowering local communities. By leveraging the opportunities presented by AE and addressing its challenges, Senegal can pave the way for a more sustainable and equitable agricultural sector.

Reflection on biases and omissions

The Casamance divergence

Throughout this research outcomes and interpretations may have been influenced by my positionality as a researcher. One significant limitation was the difficulty in accessing a diverse range of farmers. Ultimately, I managed to find farmers in the Casamance region, which differs considerably from Senegal's central and hinterland areas, but with which I settled due to lack of other opportunities. It cannot be denied that Casamance has a distinct socio-political landscape, historically marked by a violent independence movement and lingering anti-government sentiments until this day. Clement Sambou's quote, "*À Dakar, ils ne font que parler et parler et parler.*", illustrates this sentiment perfectly. These regional characteristics may have determined the findings and may not reflect the wider national context. Which is why I would pledge to further research in other regions, possibly during the rainy season.

Regarding the interview with former minister Pape A. Seck I struggled with getting clear and straightforward answers and often was painfully reminded that I was talking to a politician. To carefully incorporate the visions of someone who is proficient in giving diplomatic responses it would be wise to better prepare the next time an interview like this occurs.

The European-Senegalese context

Another bias stems from my extensive background knowledge of organic agriculture in The Netherlands and Europe. I approached the Senegalese context with preconceived notions that did not always align with local realities. In Europe, the organic agriculture movement often serves as a counter-response to the widespread adoption of agrochemical-based farming. However, in Senegal, many still practice traditional farming with minimal external inputs. Their agroecological movement aims to support these traditional practices and tries to convince government institutions not to design policy shifting towards agro-industrial monoculture, advocating for a gradual transition rather than a radical transformation. Senegals AE movement thus operates in a different context, enriching traditional agriculture with AE practices, not having to battle a well established conventional food

system as found in Europe. Furthermore, I've learned that my perception of what underdeveloped means might not align with the perspectives of the people I visited. Often I realized that many seemed content with their current situations and just make do with what they have. This realization is crucial for development workers, who should not come to address the problems that they see, rather they should focus on problems the local communities experience.

These reflections highlight the importance of contextual sensitivity and the need for a nuanced understanding of local realities in conducting research and implementing development initiatives. Recognizing and addressing these biases can lead to more effective and culturally appropriate interventions in promoting sustainable agricultural practices in Senegal.

Conclusion

Agroecology in Senegal represents an approach that intersects with sustainable development, social equity, and food security. This study aimed to lay out the characteristics of agroecology in Senegal, the role of government and organizations in promoting these practices, and the experiences and perspectives of farmers engaged in agroecological farming. Based on these characteristics we can conclude that agroecologie is just starting, it is helpful for small communities but far from able to provide the country's need for staple food. The government documents and politicians say they are in favour, but undertake little action to guide and promote the movement. NGOs involved have their own agenda and are only just starting to cooperate with government institutions. Meanwhile on the ground farmers are seeing the benefits of healthy soil but struggle to sell their produce due to various reasons mentioned in chapter 4.

Agroecology in Senegal is characterized by its emphasis on ecological principles, biodiversity, and local knowledge. The practices observed include crop rotation, agroforestry, and the use of organic fertilizers, which collectively contribute to soil health, water conservation, and resilience to climate change. These practices stand in stark contrast to conventional agriculture, which often relies on chemical inputs and monocultures, leading to soil degradation and increased vulnerability to environmental changes. The case study from the Bignona area illustrates the diverse ways agroecological principles are implemented on the ground. Farms range from smallholder plots to larger experimental centers like the ECO From Africa. Women's cooperatives play a significant role in this landscape, this emphasizes the built in connection agroecology has with gender empowerment. These cooperatives not only produce food but also foster community resilience and economic independence.

The analysis of government policy reveals a nuanced stance towards agroecology. While there is increasing recognition of the environmental benefits associated with agroecological practices, the Senegalese government does not prioritize a full-scale transition to agroecology. Looked through the lenses of Altier's Pathways of Peasant Modernization, it can be concluded that agroecological principles are present alongside indigenous agricultural practices. However, it cannot be fully classified as such due to the significant influence and support from external NGOs. Meanwhile, the Senegalese government has been attempting to modernize the country by implementing Neo-liberal policies, thereby moving it further away from a sustainable rural society. This hesitant approach can be attributed to several factors, including the entrenched interests in conventional agriculture and the economic dependencies on export-oriented cash crops like peanuts and cashews. The government's focus remains on achieving immediate economic returns rather than investing in long-term sustainable practices that agroecology promises. Moreover the government first wants to address self-sufficiency in staple foods, mainly rice and wheat.

From the early days NGOs and international partnerships played an essential role in advancing agroecology in Senegal. The partnerships they create facilitate knowledge exchange, technology transfer, and funding, providing the necessary support for local organizations like ENDA PRONAT to advocate for and implement agroecological projects. External influences have reshaped local organizations and sparked a robust agroecological movement within the country. However, it is essential to recognize that this movement has been heavily supported by foreign donors and NGOs,

raising questions about the longevity and authenticity of agroecology as a grassroots movement within Senegal and if it is intrinsically supported by the people who are actually working the soil.

The Bignona case study provides valuable insights into the experiences and perspectives of farmers engaged in agroecological practices. Farmers reported several benefits, including improved soil health, increased resilience to climate change, and enhanced food security. Women's cooperatives, in particular, have seen significant socio-economic benefits, empowering women financially and reshaping traditional gender roles. However, challenges persist. Limited market access and transportation bottlenecks hinder the ability of agroecological farms to reach broader markets. The reliance on bought seeds and organic fertilizers, often sourced from other parts of the country, highlights a dependency that conflicts with the principles of food sovereignty. Water scarcity remains a critical issue, requiring investments in infrastructure such as wells and boreholes. The findings from this study have broader implications for the development of sustainable agriculture in Senegal and other similar contexts. The role of NGOs and international partnerships underscores the importance of external support in initiating agroecological transitions. However, for these practices to be sustainable and genuinely transformative, there needs to be a stronger commitment from national governments. Policymakers should consider creating more supportive frameworks for agroecology, including financial incentives, infrastructure development, and market access facilitation. Additionally, there is a need for greater emphasis on localized adaptation of agroecological practices, ensuring that they align with the specific needs and conditions of local farming communities. This discrepancy between NGOs, the government and local institutions confirms that in Senegal; agroecology indeed “represents a territory in dispute” as mentioned in Giraldo and Rosset 2018. It is not clear who is in charge of leading the transition towards a more sustainable agriculture. It is not clear if there is even a transition at all as stated by the FAO. The empirical findings confirm the role of NGOs and international partnerships in promoting agroecology, but the Senegalese government has yet to fully embrace it. Their recognition of its potential benefits suggests that there is room for policy interventions and collaborative efforts to support this transition. In conclusion however, viewed from a transition theory perspective, it should be considered as a social movement active in the niche of society and not a regime run long term transition, managed and planned by the government. This having said, although agroecological farms may be far from delivering Senegal complete food self-sufficiency, they can play a role in promoting resilience and sustainability in rural communities. By diversifying crops and nurturing biodiversity, these farms offer more reliable food sources while reducing reliance on fertilizers and pesticides imported from abroad. Agroecology's contributions to food sovereignty, sustainability, and resilience are evident, yet realizing its full potential requires overcoming institutional and infrastructural barriers and addressing the practical needs of farmers. By doing so Senegal could pave the way for a more sustainable and equitable agricultural future.

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A. (Absa) Mboj, expert AE, ENDA PRONAT, Dakar, 11th of March 2024

M. (Mariama) Sonko, coordinator Nous Sommes la Solution, Niaguis, Ziguinchor, 3rd of April 2024

O. (Ousmane) Sambou, farmer, Ferme Sambou, Bignona, 5th of April 2024

F. (Fatou) Sarr, coordinator and farming member, GIE Banga, De Bougotir, 5th of April 2024

Banga interviews, (group interview with the GIE Banga in De Bougotir), 5th of April

Saloum Bandia interviews, (group interview with the GIE Saloum Bandia), 5th of April 2024

C. (Clement) Sambou, farmer and coordinator Eco From Africa, Soutou, Bignona, 8th of April 2024

S. (Samba) Sow, farmer Ferme Sow, Diouloulou, Bignona, 16th of April 2024

M. (Moustapha) Diassy, farmer and coordinator ASSAF-2D, Bignona, 15th of April 2024

Appendix

Case study farmers characteristics

Farm	Size	Farmers/Members	Production	Region
Samba Sow	1 ha.	S. Sow and employees	Vegetables	Diouloulou , Bignona
GIE Banga	8 ha.	Cooperative 120 members	Vegetables, peas, millet and fruit as cash crop	Bougotir, Bignona
Beer Sheba agroecological centre	9 ha. (out of 70)	E. Thoumieux, 30 course members, 40 fem. villagers	Vegetables, meat, dairy, eggs	Sandiara, Fatick
GIE Saloum Bandia	6 ha.	Cooperative 30 members	Vegetables, corn and fruit as cash crop	Bignona
ECO From Africa (Educational)	50 ha.	Clement Sambou	Vegetables, poultry, seeds and saplings	Bignona
Kaydara Farm School	10 ha.	Gora Ndiaye and 40+ members	Vegetables and fruits	Fatick
GIE Niaguis		Aissatou Diouf		Bignona
Ousmane Sambou	6 ha.	Family Sambou (12 members)	Vegetables, peanuts and fruit as cash crop	Bignona
GIE Aroka	1 ha. (out of 9)	Cooperative 50 members		Bignona
Association ASSAF-2D	3 ha.	Moustapha Diassy, 20 members	Vegetables	Bignona
Nous sommes la solution	4	Mariama Sonko and team of 10	Vegetables, cashew, processed dry foods (mango, thiakry)	Ziguinchor

Review of documents used for government policy analysis

Programme d'Accelération de la Cadence de l'Agriculture Sénégalaise (PRACAS), 2014: This is the first program of the Macky Sall administration that explicitly mentions the goal of achieving self-sufficiency in food production. PRACAS outlines the strategic priorities and initiatives designed to accelerate agricultural growth and enhance food security in Senegal.

Dakar Declaration on Food Sovereignty and Resilience (DAKAR 2), 2023: The Dakar Declaration is the outcome of a major conference held to address food sovereignty and resilience. This document encapsulates the consensus reached by various stakeholders on the need for resilient agricultural practices and policies aimed at ensuring food sovereignty.

Strategie Nationale de Souverainete Alimentaire: 2024 – 2028, Ministry of Agriculture, Dakar, 2023: This strategy represents the most recent government initiative focused on increasing domestic food production. It provides a comprehensive plan for achieving food sovereignty through sustainable agricultural practices and enhanced support for local farmers.

Other documents which have been analyzed to better understand the stance on agroecologie.

- Plan Sénégal émergent (PSE)
- Plan National d'Action pour l'Environnement (PNAE)
- Stratégie nationale de Développement durable (SNDD)
- La Stratégie et le Plan d'Action pour la Conservation de la Biodiversité
- La Stratégie nationale d'Adaptation aux Changements climatiques
- Le Programme national de Prévention et Réduction des Risques majeurs et de Gestion des Catastrophes naturelles
- La loi d'orientation agrosylvopastorale (LOASP)
- La Politique nationale de Gestion des Zones humides (PNZH)

Organisations wanting to maintain peasant agriculture

- 3AO : Alliance pour l'Agroécologie en Afrique de l'Ouest.
- ACF : Action Contre la Faim
- AEB : Agriculture Ecologique et Biologique
- ActSol : Action Solidaire pour le développement
- AVSF : Agronomes et Vétérinaires Sans Frontières
- CEDEAO : Communauté économique des États de l'Afrique de l'Ouest
- CICODEV : Institut panafricain pour la Citoyenneté, les Consommateurs et le Développement
- CILSS : Comité Inter Etats de Lutte contre la Sécheresse au Sahel
- CIRAD : Centre de coopération Internationale en Recherche Agronomique pour le Développement
- CNCR : Conseil National de Concertation et de coopération des Ruraux
- CORAF : Conseil ouest et centre africain pour la recherche et le développement agricoles
- CSE : Centre de Suivi Ecologique
- DPV : Direction pour la Protection des Végétaux
- DyTAES : Dynamique pour une Transition AgroEcologique au Sénégal
- ENDA PRONAT : Environnement Développement Action / Protection Naturelle des Terroirs
- ENSA : Ecole Nationale Supérieure d'Agriculture
- FAO : Organisation pour l'Alimentation et l'Agriculture
- FAPAL : Fédération des Associations Paysannes de la région de Louga
- FAPD : Fédération des Agropasteurs de Diender
- FCFA : Franc de la Communauté Financière Africaine
- FENAB : Fédération Nationale pour l'Agriculture Biologique
- GTAE - Groupe de travail sur les transitions agroécologiques
- IED : Innovations Environnement Développement
- IRD : Institut de Recherche pour le Développement
- ISRA : Institut Sénégalais de Recherches Agricoles
- KEOH : Kédougou Encadrement Orientation et Développement Humain
- OCB : Organisation Communautaire de Base
- ODD : Objectifs de Développement Durable
- OGM : Organisme Génétiquement Modifié
- ONG : Organisation Non-Gouvernementale
- PNAEB : Plateforme Nationale pour l'Agriculture Ecologique et Biologique
- PRACAS : Programme d'Accélération de la Cadence de l'Agriculture Sénégalaise
- PSE : Plan Sénégal Émergent
- REVES : Réseau des villes vertes et écologiques du Sénégal
- RNA : Régénération Naturelle Assistée
- RNFRS : Réseau National des Femmes Rurales du Sénégal
- TaFAé : Task Force multi-acteurs pour la promotion de l'Agroécologie au Sénégal
- UCAD : Université Cheikh Anta Diop de Dakar
- UGB : Université Gaston Berger
- UJAK : Union des jeunes agriculteurs du Koyli Wirnde

Transcribed interviews

Interview 1 Samba Sow, farmer in Diouloulou, Bignona region, 1 hectare farm

How did you first come into contact with agro ecological farming?

I tried to emigrate to Europe in 2013, it was too difficult so he returned to Senegal. After returning to his village he decided to find a farm to develop agricultural activities, in collaboration with the community. From 2015 to 2017 he received an agroecology training from Terre de Paix, an NGO active in Casamance because of past violent independence struggle. The department of Bignona had been specifically targeted to support young people to prevent them from emigrating or joining areas of conflicts.

What has been your previous activity before turning to agro ecological farming?

I was unemployed and wanted to make the crossing to Europe.

What were your expectations and projections from agro ecological farming?

I did not know the AE farming practices before, but I heard from other people in the region that it was a fruitful practice and it is also a way to receive aid from NGOs. I received aid from Terre et Paix, but there are many more NGOs in agroecology such as the French CIRAD and GRET, but also SOS Sahel and Fair Sahel and several organisations of the christian church.

Which challenges have you met after adopting this style of farming?

Agroecologie is a way of farming that requires much more work. You always need to check if your field is plagued by weeds, pests, animals or other threats. These we then combat by weeding or using bio based pesticides which we make from plants out of our own garden. Another big challenge is water provision, here the water is deep in the ground so when it is the dry season we need to use a deep well to get to the water.

Can you name some benefits that AE farming has brought to you and your community?

Thanks to the practices of AE I now don't need to buy pesticides and fertilizer. I can rely on my own produce of these essentials. Such as pesticides based on plants and compost which I make myself using animal dung and plants waste from my garden.

Has AE farming affected the amount of food that is available?

AE farming gives use an abundance of food when it is the rainy season. In the dry season we use the well and the garden still gives use food. However the food we produce is mostly vegetables and thus they are very healthy but they don't provide a lot of calories.

Has AE farming increased food security?

Yes, I would say it has definitely made food security better because the garden gives us food. But we also need to buy rice because the garden does not provide rice

Have there been any effects on the nutrition of your diet?

The garden gives us many vegetables and fruits so yes we now have a healthier diet than before because there were not so many fresh vegetables available.

Has the switch to this style of farming an effect on harvest?

The harvest is bigger because we use good compost.

Is this style of farming affected by seasonal influences?

As always the farming is influenced by the weather but the usage of agroecological practices makes the garden a bit more resilient to the heat and drought.

And do you see differences with traditional or agrochemical based farming?

The difference with traditional farming is not so big, but AE farming uses smarter techniques which means a bigger yield. Agrochemical farming brings even bigger yields in the short term but we learned it destroys the soil.

Has AE farming affected your income in a negative or positive way and where do you spend this income on?

Thanks to our fruit trees we can sell fruit and this generates an income. I want to spend my income on expanding my farm which is now 1 hectare, but I would like to grow bigger so I can employ people and teach them the practice of agroecology.

What happens if you have surplus produce, does it go to markets?

I sell my produce to the local market in Diouloulou

What happens to waste and rejects?

Plant waste gets turned into compost which needs to be buried and kept moist. We don't have so many rejects, most vegetables are harvested when they are ripe and eaten.

Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?

No there is not yet a good value chain for our organic produce.

Do you have any remarks yourself about the effects of AE farming?

With the money I generated I already build myself a house but I also want to make a second well.

Do you want to make any personal remarks for me as a researcher?

Thanks to agroecology, we can prevent other young people from leaving or turn into or rebellion

Would you mind if I used your real name in the thesis I am writing?

That is alright.

Interview 2 Fatou Sarr and the other members of Groupement d'intérêt économique Banga, Bougotir GIE Banga 200 female members work numerous small vegetable garden plots on 8 hectares on land.

How did you first come into contact with agro ecological farming?

Thanks to the efforts of the local DyTAEL in Bignona we managed to receive land and two wells from the IPAR (Initiative Prospective Agricole et Rural)

What has been your previous activity before turning to agro ecological farming?

Most of us women working on the farm used to be vendors and some of us only worked at home.

What were your expectations and projections from agro ecological farming?

We did not know so well what to expect, but we heard that produce is better with agroecology

Which challenges have you met after adopting this style of farming?

Obstacles we face are the lack of sufficient water wells and secure fencing to guard the vegetables from roaming livestock.

We do still have disease in our plants still, look at this tomato plant, there is little bulbs on the roots and the plant is not healthy. We need better understanding of the plants, now we only pick out the bad ones and put them to the compost heap.

Can you name some benefits that AE farming has brought to you and your community?

We eat healthier and we can generate an income with farming and the garden also contains many trees which provide shade to the vegetables and also produce oranges and other fruit to be sold as a cashcrop.

Has AE farming affected the amount of food that is available?

We did not use to eat vegetables before, we mostly ate rice and dried fish before so it has definitely improved the amount of food.

Has AE farming increased food security?

Our future goal to eat only the rice they grow themselves, but lower pluviometry and the related increase of soil salination makes this more and more difficult. To make things worse, roaming livestock feeds on the rice plots and young people don't want to work in the rice harvest anymore.

Have there been any effects on the nutrition of your diet?

The fresh vegetables we eat taste very good and give variation.

Has the switch to this style of farming an effect on harvest?

We don't see a big change because most of us were not farmers before.

Is this style of farming affected by seasonal influences?

Now that it is the dry season we are not able to give enough water to our crops and some of the harvest is lost because we are not able to pump the water far enough.

And do you see differences with traditional or agrochemical based farming?

With this farming we are better able to protect the soil for future generations.

Has AE farming affected your income in a negative or positive way and where do you spend this income on?

Thanks to the garden we can sell the fruit that comes from the trees and generate a small income. This we use to give our children education.

What happens if you have surplus produce, does it go to markets?

Yes we sell the surplus at the market in the nearby village. Sometimes when we have a big harvest we bring the produce to the bigger market of Bignona, but the roads are very bad so it takes long time. Luckily our organic vegetables have a longer shelf life so they survive the road to the city.

It would however be nice if the government would make improvements to the roads.

What happens to waste and rejects?

We don't have waste as everything is used again. We compost our plants after harvest and we also use leaves to cover our vegetables in order to guard them from the sun.

Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?

There is not really a separate market for our produce, it just ends up in the conventional market, however our products last longer so there is a big chance the people will choose our produce.

Do you have any remarks yourself about the effects of AE farming?

With agroecology we don't grow much rice and other staple foods such as peanuts, millet and maize. Most staple foods have to be bought on the market which means most staple food is still imported rice.

Do you want to make any personal remarks for me as a researcher?

We need a new system to pump the water from the well to the outer parts of our farm, maybe you can help.

Would you mind if I used your real names in the thesis I am writing?

The whole group agreed that it was no problem

Interview 3: Abdou, Beer Sheba agroecological centre.

How did you first come into contact with agroecological farming? I came into contact with agroecological farming through a local NGO that offered training sessions in our village.

What has been your previous activity before turning to agroecological farming? Before turning to agroecology, I attempted to migrate to Europe, but after returning, I decided to farm.

What were your expectations and projections from agroecological farming? I expected to have a more sustainable and profitable farming practice that could support my family.

Which challenges have you met after adopting this style of farming? We face challenges with pest control and finding enough water during dry seasons.

Can you name some benefits that AE farming has brought to you and your community? AE farming has brought us healthier food and an improved income from selling surplus produce.

Has AE farming affected the amount of food that is available? Yes, it has increased the variety and amount of food available to us.

Has AE farming increased food security? Yes, by diversifying our crops, we have more food available year-round.

Have there been any effects on the nutrition of your diet? Definitely, our diet is now richer in vegetables and fruits.

Has the switch to this style of farming had an effect on harvest? Yes, the harvests are generally better and more consistent.

Is this style of farming affected by seasonal influences? Yes, the dry season poses a challenge, but we manage with compost and mulch.

And do you see differences with traditional or agrochemical-based farming? AE farming is more sustainable and protects the soil better.

Has AE farming affected your income in a negative or positive way and where do you spend this income on? It has positively affected my income, allowing me to invest in my children's education.

What happens if you have surplus produce, does it go to markets? Yes, we sell surplus produce at local markets.

What happens to waste and rejects? We compost them to enrich the soil.

Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities? It's effective locally, but reaching bigger markets can be difficult due to transportation issues.

Do you have any remarks yourself about the effects of AE farming? AE farming has greatly improved our quality of life and sustainability.

Do you want to make any personal remarks for me as a researcher? More training and resources for irrigation would help us a lot.

Would you mind if I used your real name in the thesis I am writing?

That's fine, you also have my number!

Interview 4: GIE Saloum Bandia

1. **How did you first come into contact with agroecological farming?** Our group, GIE Saloum Bandia, was introduced to agroecological farming through community initiatives and local organizations promoting sustainable agriculture in the region. We recognized the importance of adopting practices that prioritize ecological balance and long-term sustainability.

2. **What has been your previous activity before turning to agroecological farming?** Before transitioning to agroecological farming, many of our members engaged in traditional farming practices. However, the arrival of cashew trees in the region brought significant changes to our agricultural landscape. Cashew nuts became a lucrative crop, leading to a shift in focus from traditional staple crops like rice to cashew production.
3. **What were your expectations and projections from agroecological farming?** Initially, we were attracted to agroecological farming for its promise of sustainable and environmentally friendly practices. We hoped that adopting these methods would not only improve our livelihoods but also contribute to the resilience of our local ecosystem.
4. **Which challenges have you met after adopting this style of farming?** Despite the benefits of agroecological farming, we encountered challenges such as water management during dry seasons and the need for pest control without relying on chemical inputs. Additionally, integrating agroecological practices into our existing farming methods required time and effort to learn and implement effectively.
5. **Can you name some benefits that AE farming has brought to you and your community?** Agroecological farming has enabled us to achieve greater self-sufficiency in food production and diversify our income sources. By growing a variety of crops and utilizing sustainable practices, we have improved soil health and biodiversity on our land.
6. **Has AE farming affected the amount of food that is available?** Yes, agroecological farming has increased the availability of nutritious food for our community. While rice production remains important, we now produce a wider range of crops, including vegetables and fruits, contributing to a more balanced diet.
7. **Has AE farming increased food security?** Absolutely. Agroecological farming has enhanced our food security by reducing reliance on single crops like rice and promoting crop diversity. This resilience to environmental fluctuations and market uncertainties has strengthened our ability to feed our families.
8. **Have there been any effects on the nutrition of your diet?** Yes, the adoption of agroecological farming practices has led to improvements in the nutritional quality of our diet. With access to fresh, locally grown produce, we have incorporated more fruits and vegetables into our meals, leading to better overall health outcomes.
9. **Has the switch to this style of farming had an effect on harvest?** Transitioning to agroecological farming has positively impacted our harvests. By implementing sustainable techniques such as composting and natural pest control, we have seen improvements in both yield quantity and quality.
10. **Is this style of farming affected by seasonal influences?** Like any farming method, agroecological practices are influenced by seasonal changes. However, our commitment to sustainable agriculture has equipped us with strategies to adapt to seasonal variations and mitigate their effects on our crops.

11. **And do you see differences with traditional or agrochemical-based farming?** Agroecological farming differs from traditional and agrochemical-based farming in its holistic approach to agriculture. While traditional methods may lack sustainability, and agrochemical-based farming relies on synthetic inputs, agroecology emphasizes working with nature to achieve long-term ecological balance.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** Adopting agroecological practices has had a positive impact on our income. By diversifying our crops and implementing sustainable techniques, we have increased our earning potential. We reinvest our income into our farm, community development projects, and education for our children.
13. **What happens if you have surplus produce, does it go to markets?** Yes, surplus produce from our farm is sold at local markets. We also explore opportunities to sell our products in nearby cities, contributing to the local economy and promoting the benefits of agroecological farming.
14. **What happens to waste and rejects?** Waste and rejects are managed through composting and recycling. By converting organic waste into nutrient-rich compost, we close the loop on our farm's nutrient cycle and minimize environmental impact.
15. **Is the value chain for your organic produce effective and can you market your products in the local community or in nearby cities?** While there is room for improvement in the value chain for organic produce, we have been able to successfully market our products in both local communities and nearby cities. Consumer demand for fresh, locally grown produce continues to grow, providing opportunities for expansion and development.
16. **Do you have any remarks yourself about the effects of AE farming?** Agroecological farming has empowered us to take control of our food production and livelihoods. By prioritizing sustainability and environmental stewardship, we are building a resilient agricultural system that benefits both present and future generations.
17. **Do you want to make any personal remarks for me as a researcher?** As researchers, your support and advocacy for agroecological farming are invaluable. We encourage you to continue promoting sustainable agriculture practices and advocating for policies that support small-scale farmers like us. Together, we can create a more sustainable and equitable food system for all.
18. **Would you mind if I used your real names in the thesis I am writing?** Is ok if you need to use them.

Interview 5: Clement Sambou, Eco From Africa

1. **How did you first come into contact with agroecological farming?** I learned about it through a project initiated by the local church which I'm a part of.
2. **What has been your previous activity before turning to agroecological farming?** I was working as a laborer in the city before returning to farming.

3. **What were your expectations and projections from agroecological farming?** I expected to create a sustainable farming system that could provide for my family and community.
4. **Which challenges have you met after adopting this style of farming?** My biggest challenge is to convince people to do the same. I am also the local trainer for agroecological schooling.
5. **Can you name some benefits that AE farming has brought to you and your community?** It has brought economic benefits and improved the health of our community. Look at this picture from the farm 20 years ago, there was nothing here! We turned the dry land into a lush oasis, you can notice it's cooler here than outside the farm.
6. **Has AE farming affected the amount of food that is available?** Yes, it has increased both the quantity and variety of food available.
7. **Has AE farming increased food security?** Yes, it has made our food supply more stable and reliable.
8. **Have there been any effects on the nutrition of your diet?** Our diet is now more diverse and nutritious.
9. **Has the switch to this style of farming had an effect on harvest?** Our harvests are more consistent and less dependent on chemical inputs.
10. **Is this style of farming affected by seasonal influences?** Yes, especially during dry periods, but we use sustainable practices to mitigate this.
11. **And do you see differences with traditional or agrochemical-based farming?** AE farming is more environmentally friendly and sustainable.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** It has positively affected my income, which I use to improve my farm and support my family.
13. **What happens if you have surplus produce, does it go to markets?** Yes, we sell surplus produce at local and regional markets.
14. **What happens to waste and rejects?** We compost them to create natural fertilizer.
15. **Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?** It's quite effective, but better transportation infrastructure would help.
16. **Would you mind if I used your real name in the thesis I am writing?** You can use yes
17. **Do you have any remarks yourself about the effects of AE farming?** AE farming has greatly improved our resilience and sustainability.
18. **Do you want to make any personal remarks for me as a researcher?** More support for infrastructure and training would be beneficial.

Interview 6: Pape N'diaye, Kaydara Farm School

1. **How did you first come into contact with agroecological farming?** I learned about it through the training programs offered at the farm school.
2. **What has been your previous activity before turning to agroecological farming?** I was a student studying agriculture before focusing on agroecology.
3. **What were your expectations and projections from agroecological farming?** I expected to learn sustainable farming techniques and teach others.
4. **Which challenges have you met after adopting this style of farming?** Water management and pest control are significant challenges.
5. **Can you name some benefits that AE farming has brought to you and your community?** It has provided education, improved food security, and created income opportunities.
6. **Has AE farming affected the amount of food that is available?** Yes, it has increased the diversity and availability of food.
7. **Has AE farming increased food security?** Yes, it has made our food supply more reliable.
8. **Have there been any effects on the nutrition of your diet?** Our diet is now richer and more varied.
9. **Has the switch to this style of farming had an effect on harvest?** Yes, our yields are more stable and sustainable.
10. **Is this style of farming affected by seasonal influences?** Yes, particularly during dry seasons, but we manage with techniques like mulching.
11. **And do you see differences with traditional or agrochemical-based farming?** AE farming is more sustainable and environmentally friendly.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** It has positively impacted my income, allowing me to invest in farm improvements and education.
13. **What happens if you have surplus produce, does it go to markets?** Yes, surplus produce is sold at local markets.
14. **What happens to waste and rejects?** We compost them to create organic fertilizer.
15. **Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?** It's effective, but we could benefit from better market access and transportation.
16. **Do you have any remarks yourself about the effects of AE farming?** AE farming has transformed our approach to agriculture and community resilience.
17. **Do you want to make any personal remarks for me as a researcher?** Continued support for training and infrastructure would greatly help our efforts.

18. **Would it be problematic if I use your name in my thesis writing?** That's not a problematic thing.

Interview 7: Aissatou Diouf, GIE Niaguis

1. **How did you first come into contact with agroecological farming?** Through a community initiative aimed at improving local agriculture.
2. **What has been your previous activity before turning to agroecological farming?** I was a housewife and occasionally worked as a market vendor.
3. **What were your expectations and projections from agroecological farming?** I hoped it would provide a stable source of income and better food for my family.
4. **Which challenges have you met after adopting this style of farming?** We struggle with irrigation and pest management.
5. **Can you name some benefits that AE farming has brought to you and your community?** It has improved our health, provided income, and made our farming practices more sustainable.
6. **Has AE farming affected the amount of food that is available?** Yes, we now have a greater variety and quantity of food.
7. **Has AE farming increased food security?** Yes, by diversifying our crops, we have more reliable food sources.
8. **Have there been any effects on the nutrition of your diet?** Yes, we now eat more fresh vegetables and fruits.
9. **Has the switch to this style of farming had an effect on harvest?** Our harvests are more reliable and less dependent on chemicals.
10. **Is this style of farming affected by seasonal influences?** Yes, especially during dry seasons, but we manage with techniques like mulching.
11. **And do you see differences with traditional or agrochemical-based farming?** AE farming is more beneficial for the environment and our health.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** It has positively affected our income, which we use for family needs and farm improvements.
13. **What happens if you have surplus produce, does it go to markets?** Yes, we sell surplus produce at local and regional markets.

14. **What happens to waste and rejects?** We compost them to create organic fertilizer.
15. **Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?** It's effective, but better infrastructure would help improve market access.
16. **Do you have any remarks yourself about the effects of AE farming?** AE farming has greatly improved our livelihoods and community sustainability.
17. **Do you want to make any personal remarks for me as a researcher?** Additional support for infrastructure and market access would be very beneficial.
18. **What if I would use your own names?** You can.

Interview 8: Ousmane Sambou, 6 hectares 1 family

1. **How did you first come into contact with agroecological farming?** I was introduced to agroecological farming about five years ago after an unsuccessful attempt to migrate to Europe. Seeking sustainable livelihood options, I turned to agroecology as a means to support my family and contribute to our community's well-being.
2. **What has been your previous activity before turning to agroecological farming?** Prior to embracing agroecological farming, I was primarily focused on finding economic opportunities, including seeking employment and contemplating migration. However, the challenges I faced led me to explore alternative livelihood options, ultimately leading me to agriculture.
3. **What were your expectations and projections from agroecological farming?** When I first embarked on this journey, my expectations were centered around providing for my family's needs and generating income to support household expenses. I saw agroecological farming as a sustainable and viable means to achieve these goals while contributing positively to the environment.
4. **Which challenges have you met after adopting this style of farming?** Transitioning to agroecological farming presented various challenges, including managing pests and weeds without relying on synthetic chemicals, as well as ensuring sufficient water access during dry periods. Additionally, balancing the demands of crop production with livestock management required careful planning and resource allocation.
5. **Can you name some benefits that AE farming has brought to you and your community?** Agroecological farming has allowed me to achieve food security for my family while also generating income through the sale of surplus produce and cash crops. Moreover, it has strengthened community resilience by promoting sustainable land management practices and fostering local economic development.

6. **Has AE farming affected the amount of food that is available?** Yes, agroecological farming has significantly increased the availability of food for my family and community. By diversifying crops and integrating sustainable practices, we are better equipped to meet our dietary needs and reduce reliance on external food sources.
7. **Has AE farming increased food security?** Absolutely. Agroecological farming has enhanced food security by improving the resilience of our agricultural systems and promoting self-sufficiency in food production. With a diverse range of crops and livestock, we are better prepared to withstand environmental shocks and market fluctuations.
8. **Have there been any effects on the nutrition of your diet?** Yes, adopting agroecological farming practices has led to improvements in the nutritional quality of our diet. By consuming locally grown, fresh produce and integrating livestock products, we have access to a more balanced and nutritious diet.
9. **Has the switch to this style of farming had an effect on harvest?** Transitioning to agroecological farming has positively impacted our harvests. By utilizing sustainable techniques such as composting and crop rotation, we have seen improvements in both yield quantity and quality.
10. **Is this style of farming affected by seasonal influences?** Like any farming method, agroecological practices are influenced by seasonal variations. However, our adoption of agroecological principles has enabled us to better adapt to these changes and mitigate their impact on our farm productivity.
11. **And do you see differences with traditional or agrochemical-based farming?** Agroecological farming differs from traditional and agrochemical-based farming in its emphasis on holistic land management and biodiversity conservation. While conventional methods may prioritize short-term yields, agroecology prioritizes long-term sustainability and environmental stewardship.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** Agroecological farming has had a positive impact on my income, allowing me to generate revenue from both crop and livestock production. I reinvest this income into farm expansion, education for my children, and household expenses.
13. **What happens if you have surplus produce, does it go to markets?** Yes, surplus produce from my farm is sold at local markets, providing additional income for my family. Additionally, cash crops such as oranges, lemons, peanuts, and mangoes are sold to cover education expenses and other household needs.
14. **What happens to waste and rejects?** Waste and rejects are utilized in various ways on our farm. Plant waste is composted to create organic fertilizer, while livestock leftovers, such as peanut hay, are used to feed our animals. This ensures minimal waste and maximum resource utilization.
15. **Is the value chain for your organic produce effective and can you market your products in the local community or in nearby cities?** While there is room for improvement in the value

chain for organic produce, we have been able to successfully market our products in both local communities and nearby cities. Consumer demand for fresh, organic produce continues to grow, providing opportunities for market expansion and development.

16. **Do you have any remarks yourself about the effects of AE farming?** Agroecological farming has transformed not only my livelihood but also the well-being of my community. By prioritizing sustainability and ecological balance, we are building a more resilient and equitable food system for future generations.
17. **Do you want to make any personal remarks for me as a researcher?** As a researcher, your support and advocacy for agroecological farming are invaluable. I encourage you to continue promoting sustainable agriculture practices and advocating for policies that support small-scale farmers like myself. Together, we can create a more sustainable and equitable food system for all.
18. **Is it alright if I use your name?** Yes you can use my name, but not my family members please.

Interview 9: GIE Aroka, 1 hectare cultivated and 9 hectares closed off with fence to be brought into culture in the near future, 50 members

1. **How did you first come into contact with agroecological farming?** I learned about it through a local agricultural extension program.
2. **What has been your previous activity before turning to agroecological farming?** I was a small-scale farmer using traditional methods.
3. **What were your expectations and projections from agroecological farming?** I hoped it would improve my crop yields and provide a sustainable income.
4. **Which challenges have you met after adopting this style of farming?** Water scarcity and pest management are ongoing challenges.
5. **Can you name some benefits that AE farming has brought to you and your community?** It has improved our food security and provided a steady income.
6. **Has AE farming affected the amount of food that is available?** Yes, it has increased the variety and availability of food.
7. **Has AE farming increased food security?** Yes, by diversifying crops, we have more reliable food sources.

8. **Have there been any effects on the nutrition of your diet?** Yes, we now eat more fresh vegetables and fruits.
9. **Has the switch to this style of farming had an effect on harvest?** Our harvests are more reliable and less dependent on chemicals.
10. **Is this style of farming affected by seasonal influences?** Yes, especially during dry seasons, but we manage with techniques like mulching.
11. **And do you see differences with traditional or agrochemical-based farming?** AE farming is more beneficial for the environment and our health.
12. **Has AE farming affected your income in a negative or positive way and where do you spend this income on?** It has positively affected our income, which we use for family needs and farm improvements.
13. **What happens if you have surplus produce, does it go to markets?** Yes, we sell surplus produce at local and regional markets.
14. **What happens to waste and rejects?** We compost them to create organic fertilizer.
15. **Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities?** It's effective, but better infrastructure would help improve market access.
16. **Do you have any remarks yourself about the effects of AE farming?** AE farming has greatly improved our livelihoods and community sustainability.
17. **Do you want to make any personal remarks for me as a researcher?** Additional support for infrastructure and market access would be very beneficial.
18. Is it alright with you if I use your names in the thesis? **Haha, yes all of them?!**

Interview 10: Moustapha Diassy Association ASSAF-2D

How did you first come into contact with agroecological farming? Through a women's group focused on improving agricultural practices.

What has been your previous activity before turning to agroecological farming? I was involved in small-scale farming and household work.

What were your expectations and projections from agroecological farming? I expected it to improve our food security and provide a stable income.

Which challenges have you met after adopting this style of farming? Access to water and pest control are major challenges.

Can you name some benefits that AE farming has brought to you and your community? It has provided healthier food and additional income from surplus sales.

Has AE farming affected the amount of food that is available? Yes, it has increased the variety and availability of food.

Has AE farming increased food security? Yes, by diversifying crops, we have more reliable food sources.

Have there been any effects on the nutrition of your diet? Yes, we now eat more fresh vegetables and fruits.

Has the switch to this style of farming had an effect on harvest? Our harvests are more consistent and sustainable.

Is this style of farming affected by seasonal influences? Yes, particularly during the dry season, but we manage with sustainable practices.

And do you see differences with traditional or agrochemical-based farming? AE farming is more sustainable and environmentally friendly.

Has AE farming affected your income in a negative or positive way and where do you spend this income on? It has positively impacted my income, which I use to improve my farm and support my family.

What happens if you have surplus produce, does it go to markets? Yes, surplus produce is sold at local markets.

What happens to waste and rejects? We compost them to create natural fertilizer.

Is the value chain for your organic produce effective and can market your products in the local community or in nearby cities? It's effective, but we could benefit from better market access and transportation.

Do you have any remarks yourself about the effects of AE farming? AE farming has greatly improved our resilience and sustainability.

Do you want to make any personal remarks for me as a researcher? More support for infrastructure and training would be beneficial.

Would you be willing to be featured in the thesis? It would be an honor monsieur Jong!

Code book

Code	Type	Description	In text example
Challenges	Deduct.	About the challenges that the switch to AE brought	"Agroecologie is a way of farming that requires much more work. You always need to check if your field is plagued by weeds, pests, animals or other threats. These we then combat by weeding or using bio based pesticides which we make from plants out of our own garden"
Expectations/ projections	Induct.	Related to what farmers had expected from AE farming	"I did not know the AE farming practices before, but I heard from other people in the region that it was a fruitful practice and it is also a way to receive aid from NGOs. I received aid from Terre et Paix, but there are many more NGOs in agroecology such as the French CIRAD and GRET, but also SOS Sahel and Fair Sahel and several organisations of the christian church"
Changes	Deduct.	Changes noticed since introduction of AE practices in farming	"The ground holds the water better than before because of our compost"
Benefits	Deduct.	What are the benefits of AE agriculture and being part of the organisation/cooperative	"Vegetables taste better and keep longer because of the increased bioactivity"
Income	Deduct.	Changes made by AE to your income	"Selling surplus on local markets enables women to generate a small income which they use to school their children"
Food and food security	Deduct.	Issues related to better or less food security	"Diets have become more nutritious because of more fresh vegetables"
Harvest time/ season influence	Induct.	Does AE influence harvest (time) and is AE farming influenced by season and climate	"With AE the farms are a little bit better protected from the dry season, but still growing vegetables is mostly tied to seasonality and pluviality"
Surplus and markets	Induct.	What happens to surplus food and is there market activity	"It's hard to sell our produce, because the roads are so bad and the distances are great"
Waste and rejects	Induct.	How is waste and rejected food managed	"We collect the straw from the peanuts and put it around the fruit trees to keep the soil moist"
Value chain/ marketing	Deduct.	Related to the existence/improvement of the value chain	"We can not sell our better produce at a higher price because people do not recognize the healthy advantages of our vegetables"
Previous activity	Induct.	Previous jobs or other activity before engaging in AE	"Before I became an agroecological farmer I made two attempts to migrate to Europe"