Policy Brief: Promoting Agroecology for Sustainable Agriculture and Climate Resilience in Senegal

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Executive Summary

Agriculture remains the backbone of the economy in Senegal, providing livelihoods for the majority of the population and ensuring food security. However, the sector faces numerous challenges, including soil degradation, unsustainable farming practices, and the growing impacts of climate change. These issues have reduced productivity, making smallholder farmers vulnerable to food insecurity and poverty. Climate variability, including frequent droughts and erratic rainfall, exacerbates these challenges, threatening the sustainability of agricultural systems.

Agroecological practices offer a viable solution to these challenges by promoting sustainable farming methods that restore soil health, conserve biodiversity, and enhance resilience to climate change. Despite their potential, agroecological practices have not been widely adopted in Senegal due to barriers such as limited policy support, restricted access to organic inputs, inadequate market infrastructure, and insecure land tenure for smallholder farmers.

This policy brief outlines key recommendations for promoting agroecological practices in Senegal:

1. Integrate Agroecology into National Agricultural Policies
   Recognizing agroecology as a core component of Senegal's agricultural strategy will enhance long-term sustainability and climate resilience. Policy frameworks should prioritize agroforestry, crop diversification, and organic fertilization.

2. Improve Access to Organic Inputs and Resources
   Establishing local production hubs for organic inputs, providing financial incentives, and improving distribution networks will enable farmers to access affordable organic inputs, reducing dependence on chemical fertilizers.

3. Strengthen Agroecological Research and Farmer Training
   Increased funding for region-specific research and training programs will equip farmers with the knowledge and technical skills to implement agroecological practices effectively.

4. Develop Market Access for Agroecological Products
   Developing market infrastructure, such as certification systems and cold storage, will provide smallholder farmers with access to premium markets, incentivizing the adoption of sustainable farming practices.

5. Strengthen Land Tenure Security for Smallholder Farmers
   Implementing land reforms to provide secure land tenure, particularly for women and marginalized groups, will encourage long-term investments in sustainable agricultural practices.

6. Support Climate Adaptation through Agroecological Practices
   Agroecological practices that improve biodiversity, soil health, and water retention can enhance resilience to climate change, particularly in drought-prone regions of Senegal.

Introduction

The agricultural sector in Senegal plays an important role in the country's economy and food security, but faces significant challenges. Despite its importance, agricultural growth has been low, with an average annual rate of 6.3% from 1961-2014 (Toure, 2019). This has led to a decline in agriculture's contribution to national value creation, dropping from 24% in 1987 to 18% in 2016 (Toure, 2019).

The sector faces mounting challenges due to soil degradation, unsustainable farming practices, and increasing climate variability. This increases vulnerability to various risks, including drought, erratic rainfall patterns, and land degradation, which impact smallholder productivity, making rural communities prone to food insecurity and poverty (Sy, 2022).

Agroecological practices offer a sustainable solution to these challenges by promoting farming methods that enhance soil health, conserve biodiversity, and increase resilience to climate change. Agroecology encourages techniques that are crucial for restoring degraded land and improving agricultural productivity (Zenda & Rudolph, 2024).

Despite the promise of agroecology, widespread adoption in Senegal remains limited due to barriers such as insufficient policy support, restricted access to organic inputs, and limited market opportunities for sustainably produced goods. Addressing these gaps is critical for building a more resilient agricultural sector capable of withstanding climate shocks while ensuring food security for Senegal's growing population (Boillat et al. 2022).

This policy brief outlines key recommendations to promote agroecological practices in Senegal, focusing on enhancing research, improving access to organic inputs, supporting market development, and ensuring secure land tenure for smallholder farmers.

Agroecology for Sustainable Land Management

Since 2011, the Union of Tattaguine Communities (UCT) has spearheaded a remarkable transformation in Senegal's Fatick region, revitalizing agriculture in the face of challenging Sahelian conditions. Through an innovative community-based approach, the project has successfully combated soil salinization and degradation in the Groundnut Basin. The initiative has trained over 140 producers, including 60 women, in sustainable agricultural practices. This was achieved through the implementation of Farmer Field Schools. The results have been striking reforestation of 30 hectares with fertilizing species, creation of anti-salt dykes, and a 30% increase in yields on plots treated with semi-composted cow manure. This agroecological approach has not only improved soil health and crop productivity but also enhanced environmental education and strengthened food sovereignty. The success of the project demonstrates the power of community-led initiatives in overcoming agricultural constraints and achieving sustainable land management in challenging environments (1).

Key Policy Messages

- Agroecology is critical for sustainable agricultural growth in Senegal, offering solutions that enhance soil health, conserve biodiversity, and build resilience to climate change.
- Integrating agroecology into national agricultural policies will promote long-term sustainability, increase productivity, and improve the resilience of smallholder farmers against environmental challenges.
- Improving access to organic inputs and providing technical training are essential for empowering farmers to adopt agroecological practices and reduce reliance on chemical fertilizers.
- Developing market infrastructure for agroecological products will create financial incentives for farmers, enhancing access to premium markets and ensuring better livelihoods for rural communities.

Gaps and Barriers

Limited Policy Support

Agroecology is not yet fully integrated into national agricultural policies. Current policy frameworks favor conventional farming methods, which often prioritize short-term productivity over long-term sustainability. As a result, agroecological practices are underfunded and lack sufficient government backing.

Restricted Access to Organic Inputs

Many smallholder farmers face challenges in accessing organic inputs such as compost, bio-fertilizers, and organic pest management solutions. The distribution networks for organic inputs are underdeveloped, particularly in rural areas, making it difficult for farmers to transition away from chemical inputs.

Insufficient Research and Technical Knowledge

There is a lack of region-specific agroecological research that addresses the diverse agro-climatic zones of Senegal. Additionally, many farmers and extension officers lack the technical knowledge required to adopt and implement agroecological methods effectively.
Inadequate Market Access Farmers practicing agroecology often struggle to access premium markets due to the absence of certification systems and underdeveloped market infrastructure. This limits the financial incentives for adopting sustainable practices, as farmers are unable to sell their produce at a higher value.

Weak Land Tenure Security

Insecure land tenure discourages farmers from making long-term investments in sustainable practices such as agroforestry or soil conservation. Many smallholder farmers, particularly women, lack secure land rights, which limits their ability to adopt agroecological approaches.

Climate Change Impacts

Senegal is highly vulnerable to climate shocks such as droughts and flooding, which exacerbate land degradation and soil erosion. While agroecology can build climate resilience, limited resources and infrastructure prevent farmers from adopting climate-smart agroecological practices at scale.

Policy Options and Recommendations

Integrate Agroecology into National Agricultural Policies

Agroecology should be recognized as a core component of Senegal's agricultural policy framework. By embedding agroecological principles into national strategies, Senegal can promote long-term sustainability and climate resilience.

Recommended Actions

- Formulate national policies that prioritize agroecological practices such as agroforestry, crop diversification, and organic fertilization.
- Increase government funding for agroecological research, farmer education programs, and extension services to support sustainable farming.
- Create incentives and subsidies for farmers transitioning from conventional methods to agroecological approaches.

This will lead to a stronger policy framework that supports agroecology will encourage widespread adoption of sustainable farming practices and build resilience to environmental challenges.

Example:
The government of Senegal, through the Ministry of Agriculture and Rural Equipment, establishes a national agroecology program that integrates sustainable farming practices into its agricultural policies. Agroforestry, organic fertilization, and crop diversification are included in the country's national agricultural development plan. The government allocates part of its agricultural budget to fund agroecological research and training programs, offering subsidies for farmers transitioning to sustainable practices. Extension officers trained in agroecology are deployed to rural areas such as Fatick and Kaolack to provide technical support to smallholder farmers.

Key Implementers:

National Government (Ministry of Agriculture and Rural Equipment):

- *Lead the integration of agroecology into national agricultural policies and allocate budget for research, training, and subsidies to support agroecological practices.*
- *Develop and oversee national programs to promote agroforestry, organic fertilization, and crop diversification.*

Local Governments (Regional and District Agricultural Offices):

- *Ensure regional adoption of agroecology programs and provide support to local farmers through extension services.*

Research Institutions (e.g., Cheikh Anta Diop University):

- *Conduct research on region-specific agroecological practices and collaborate with the government to develop evidence-based policy frameworks.*

Non-Governmental Organizations (NGOs):

- *Support policy advocacy, help with the dissemination of information, and provide technical support to farmers transitioning to agroecological practices.*

Improve Access to Organic Inputs and Resources

To facilitate the adoption of agroecological practices, smallholder farmers need improved access to organic inputs such as compost, biofertilizers, and organic pest management solutions.

Recommended Actions
- Establish local production hubs for organic inputs to ensure availability and affordability for smallholder farmers, particularly in rural areas.
- Provide financial incentives and subsidies for the use of organic inputs, reducing reliance on chemical fertilizers and pesticides.
- Strengthen local supply chains and distribution networks for organic inputs through partnerships with private sector actors and cooperatives.

This will lead to increased access to organic inputs will enable more farmers to adopt sustainable practices, leading to healthier soils and improved agricultural productivity.

Example:
The Ministry of Agriculture partners with local cooperatives and NGOs to set up organic input production centers in key regions such as Thies and Saint-Louis. These centers produce compost, bio-fertilizers, and organic pesticides using locally available materials. The government provides financial subsidies to smallholder farmers to purchase these organic inputs at reduced costs. In addition, distribution networks are established to ensure farmers in rural and remote areas have access to these inputs. The program helps farmers move away from reliance on chemical fertilizers, resulting in healthier soils and improved crop yields.

Key Implementers:

National Government (Ministry of Agriculture):

- *Establish and fund organic input production centers and provide financial subsidies for farmers to access organic compost and bio-fertilizers.*

Local Governments (Regional Agricultural Offices):

- *Oversee the distribution of organic inputs and ensure that farmers in rural areas have access to production centers.*

Private Sector (Entrepreneurs, Agribusinesses):

- *Develop and manage local composting and bio-fertilizer production centers in partnership with government programs.*

Farmer Cooperatives:

- *Organize the collective purchasing and distribution of organic inputs among smallholder farmers to ensure affordable access.*

Non-Governmental Organizations (NGOs):

- *Provide training on the production and use of organic inputs and collaborate with local governments to establish input distribution networks.*

Strengthen Agroecological Research and Farmer Training

Expanding region-specific research on agroecological practices and improving technical knowledge is crucial for successful adoption. This requires collaboration between government, research institutions, and local communities.

Recommended Actions

- Allocate funding for agroecological research that addresses the specific challenges of Senegal's diverse agro-climatic zones.
- Train agricultural extension officers and farmers in agroecological techniques such as composting, agroforestry, and water conservation.
- Develop Farmer Field Schools and demonstration sites where smallholder farmers can observe and practice agroecological methods.

This will lead to enhanced research and training will equip farmers with the knowledge and tools they need to implement agroecological practices effectively, leading to increased yields and sustainable land management.

Example:
The government, in partnership with research institutions such as Cheikh Anta Diop University and international organizations, establishes Farmer Field Schools (FFS) in regions such as the Groundnut Basin. These schools serve as demonstration sites where farmers learn agroecological techniques such as composting, water conservation, and agroforestry. Agricultural extension officers are trained to provide ongoing technical support to farmers and to disseminate research findings on region-specific agroecological practices. Research centers collaborate with local farmer groups to conduct trials of climate-resilient crops, focusing on improving soil fertility and water retention.

Key Implementers:

National Government (Ministry of Agriculture):

- *Allocate funding for agroecological research and create partnerships with research institutions to develop farmer education programs.*

Research Institutions (e.g., Cheikh Anta Diop University):

- *Conduct agroecological research focused on Senegal's diverse agro-climatic regions and collaborate with extension services to transfer knowledge to farmers.*

Non-Governmental Organizations (NGOs):

- *Establish Farmer Field Schools and training programs on agroecological practices, working closely with local communities and extension services.*

Farmer Cooperatives:

- *Organize peer-to-peer learning sessions, field demonstrations, and collective access to technical support for smallholder farmers.*

Local Governments (Regional Agricultural Offices):

- *Ensure extension officers are trained in agroecological methods and coordinate demonstration farms and training programs at the regional level.*

Develop Market Infrastructure and Access for Agroecological Products

Creating viable markets for agroecological products is essential to incentivize farmers to adopt sustainable practices. This can be achieved through certification systems, market infrastructure, and public procurement programs.

Recommended Actions

- Establish low-cost certification systems, such as Participatory Guarantee Systems (PGS), that allow smallholder farmers to access premium markets for agroecological products.
- Develop public procurement programs that prioritize agroecological products for use in schools, hospitals, and other public institutions.
- Invest in market infrastructure, including cold storage, transportation, and processing facilities, to reduce post-harvest losses and improve market access.

This will lead to improved market access and infrastructure will provide farmers with financial incentives to adopt agroecological practices and ensure a stable market for sustainably produced goods.

Example:
The Ministry of Trade, along with international donors, launches a Participatory Guarantee System (PGS) in rural areas such as Kaffrine and Diourbel, allowing smallholder farmers to certify their agroecological products at minimal cost. Additionally, the government establishes organic marketplaces in major cities such as Dakar and Ziguinchor, equipped with cold storage facilities to reduce post-harvest losses. Public procurement programs are introduced, ensuring that at least 20% of the food sourced for schools, hospitals, and government institutions comes from certified agroecological farms. Farmer cooperatives are supported to collectively market their products, providing them with greater negotiating power and access to premium markets.

Key Implementers:

National Government (Ministry of Trade, Ministry of Agriculture):

- *Develop a national certification system for agroecological products (e.g., Participatory Guarantee Systems) and oversee public procurement programs for agroecological products.*
- *Invest in market infrastructure, including marketplaces, cold storage, and transportation networks.*

Local Governments (Regional Market Authorities):

- *Facilitate the development of agroecological marketplaces and support the formation of local farmer cooperatives for collective marketing.*

Farmer Cooperatives and Associations:

- *Help farmers obtain certification for agroecological products and organize collective marketing efforts to access premium markets.*

Non-Governmental Organizations (NGOs):

- *Support public awareness campaigns on the benefits of agroecological products and assist farmers in navigating the certification process.*

Private Sector (Retailers, Distributors):

- *Partner with agroecological farmers and cooperatives to distribute certified products to local, regional, and export markets.*

Strengthen Land Tenure Security for Smallholder Farmers

Secure land tenure is a critical enabler for farmers to invest in long-term agroecological practices. Implementing land reforms that protect the rights of smallholders will encourage sustainable land management.

Recommended Actions

- Implement land reforms that provide smallholder farmers, especially women, with secure land titles and tenure.
- Establish legal frameworks that protect communal land rights and promote community-led land management.
- Create financial incentives, such as grants and low-interest loans, for farmers who adopt long-term agroecological practices on securely held land.

Land tenure security will empower farmers to invest in sustainable land management practices, improving soil health and increasing productivity.

Example:
The government, through the Ministry of Urbanism, Housing, and Public Hygiene, implements land tenure reforms to provide secure land titles to smallholder farmers, particularly women and marginalized communities in rural regions such as Tambacounda and Kolda. Farmers are assisted with the legal process of obtaining land titles through community-led land mapping initiatives, supported by NGOs and farmer cooperatives. Once secure land tenure is achieved, farmers receive grants to invest in agroforestry, soil conservation, and other long-term agroecological practices. The legal protection of communal land rights also promotes sustainable management of shared resources such as forests and water.

Key Implementers:

National Government (Ministry of Urbanism, Housing, and Public Hygiene):

- *Implement land tenure reforms and provide secure land titles to smallholder farmers, particularly women and marginalized groups.*

Local Governments (Regional Land Management Authorities):

- *Assist farmers in securing land titles and help facilitate community-led land mapping initiatives to ensure land rights are protected.*

Non-Governmental Organizations (NGOs):

- *Provide legal support and advocacy for land tenure security, particularly for smallholder farmers, women, and marginalized groups.*

Farmer Cooperatives and Associations:

- *Advocate for secure land tenure and provide technical support to farmers in navigating the land title registration process.*

Support Climate Adaptation through Agroecological Practices

Agroecological practices are well-suited to address the impacts of climate change, particularly in drought-prone regions. Integrating agroecology into Senegal's national climate adaptation strategies can help build resilience against climate shocks.

Recommended Actions

- Promote agroforestry, intercropping, and soil conservation techniques that improve biodiversity, reduce erosion, and enhance water retention.
- Invest in climate-resilient infrastructure, such as rainwater harvesting systems and contour farming, to support farmers in regions vulnerable to drought and floods.
- Promote the use of drought-tolerant and indigenous crop varieties suited to Senegal's climate to reduce the risk of crop failure during extreme weather events.

Agroecological practices will strengthen the resilience of Senegal's agricultural sector to climate change, ensuring long-term food security and environmental sustainability.

Example:
In drought-prone areas such as the Sahel region, the government, in collaboration with NGOs and international donors, funds the construction of water retention infrastructure, including rainwater harvesting systems and contour farming projects. Local farmers are trained in agroforestry and intercropping techniques that enhance biodiversity, improve soil health, and conserve water. Drought-tolerant indigenous crop varieties, such as millet and sorghum, are distributed through farmer cooperatives. Community-based adaptation projects integrate traditional knowledge with modern agroecological practices, empowering farmers to withstand climate variability and ensure long-term food security.

Key Implementers:

National Government (Ministry of Environment, Ministry of Agriculture):

- *Integrate agroecology into national climate adaptation strategies and allocate funding for water conservation infrastructure projects (e.g., rainwater harvesting, zai pits).*

Local Governments (Regional Authorities in Vulnerable Areas):

- *Implement climate-resilient agroecological projects and ensure the distribution of drought-tolerant seeds and indigenous crop varieties to farmers in vulnerable areas.*

Non-Governmental Organizations (NGOs):

- *Support community-based climate adaptation projects by providing training on agroforestry, water conservation, and the use of drought-resistant crops.*

Research Institutions (e.g., National Institute for Agronomic Research):

- *Conduct research on climate-resilient agroecological practices and collaborate with the government to promote climate-smart farming techniques.*

Farmer Cooperatives:

- *Facilitate the adoption of climate-resilient practices by organizing collective training sessions on water management and drought-resistant cropping systems.*

Conclusion

The agricultural sector in Senegal faces critical challenges stemming from soil degradation, unsustainable practices, and the impacts of climate change. Agroecology presents a powerful opportunity to address these issues, fostering a sustainable agricultural system that improves

productivity, builds resilience, and supports food security. However, for agroecological practices to be widely adopted, targeted policy actions are essential.
Senegal can create an enabling environment for agroecological practices by integrating agroecology into national agricultural policies, improving access to organic inputs, strengthening research and farmer training, enhancing market access, and securing land tenure. Supporting climate adaptation through agroecological methods will ensure that the country's agricultural systems are resilient to the growing threats posed by climate variability.

The adoption of these policy recommendations can empower smallholder farmers and position Senegal as a leader in sustainable agriculture. With the right support, agroecology can drive long-term environmental sustainability, improve rural livelihoods, and ensure a more secure and prosperous future for agriculture in Senegal.

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Footnotes

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