



# Senegal Agro-circular Economy Case Study

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**Theme:** Agro-circular Economy

**Companies:** COPEOL  
Biotech Services

**Date:** May 2025

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Commercial Agriculture for Smallholders and Agribusiness

## Our approach

The Commercial Agriculture for Smallholders and Agribusiness (CASA) Technical Assistance Facility (TAF) supports agribusinesses that source from smallholder farmers across Africa and Asia. Our approach involves working closely with agribusiness management teams to develop an Inclusive Business Plan (IBP) – a roadmap for the agribusiness to deepen, broaden or strengthen supply chains in a way that delivers value to both smallholders and shareholders.

### **An Inclusive Business Plan (IBP) is a piece of thorough analysis produced over 3-6 months that:**

- Diagnoses smallholder supply chain challenges;
- Identifies or validates the inclusive business growth opportunity, aligned to commercial objectives, identifying opportunities for greater commercial and smallholder impact;
- Quantifies the opportunity in terms of commercial value for the business and impact for smallholder farmers;
- Lays out a strategy to access the opportunity including investment and any partners required;
- Maps out an implementation plan; a linked package of technical assistance and blended finance structure, including required partnerships to support the inclusive business model.

## Case Study Description

To explore opportunities for agro-circular economy in Senegal, the Commercial Agriculture for Smallholders and Agribusiness (CASA) programme, funded by the UK Foreign, Commonwealth & Development Office (FCDO), conducted this study identifying key value streams and investment opportunities based on the experience of two businesses supported by the CASA Technical Assistance Facility.

This case study highlights two primary value streams in Senegal's agro-circular economy:

- **Bioenergy:** Converting agricultural waste into power.
- **Organic Inputs:** Using manure, compost, organic fertilisers, and biochar to enhance soil fertility

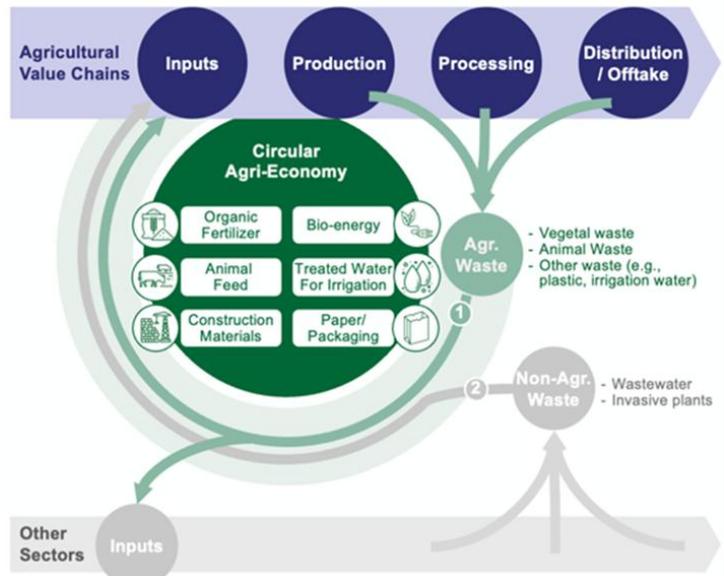
CASA TAF and FCDO identified 12 private sector investment opportunities in the agro-circular economy in Senegal to be supported, of which 3 were selected by CASA TAF for the development of an Inclusive Business Plan. Biotech Services and Copeol are two of these businesses.



# Unlocking Senegal's Agro-Circular Economy Potential

Senegal's agricultural sector is highly vulnerable to climate shocks, soil degradation, and supply chain disruptions. With 95% of its farming being subsistence-based and low in productivity, the country also heavily relies on food imports, which accounted for 70% of its food requirements. Farmers face limited access to affordable quality inputs and financing, further straining agricultural sustainability.

At the same time, Senegal generates significant amounts of agricultural waste, including vegetal and animal byproducts, wastewater, and invasive plants like typha. Mbodji et al.<sup>1</sup> based on data from 2018 published by ANSD<sup>2</sup> (National Agency for Statistics and Demography) estimated that combined residue of rice husk, palm kernel shells, groundnut kernel shells, corn cob and dry typha could amount to 1.3 million tons annually, with Typha accounting for 40% of the total. Some of this waste is seasonal, requiring mixed-use strategies or storage solutions to ensure availability throughout the year. Circular economy approaches offer a promising path toward increasing resilience and sustainability in the sector.



Despite the potential for agro-circular economy in Senegal, some challenges persist. Policies in Senegal tend to focus more on general waste management than organic waste utilisation. Awareness of waste-to-value models remains low, and waste recovery supply chains are fragmented. Additionally, a lack of investment incentives and limited financing options hinder the growth of circular economy initiatives. Similar findings were reported in 2020 in the Senegal Country Report - Circular Economy in Africa - EU Cooperation<sup>3</sup>.

However, the benefits of circular economy approaches are significant. Locally produced organic inputs can lower costs and improve soil health for farmers. Agro-industries can achieve greater energy security through biomass-based power generation. Smallholder farmers and agribusinesses can generate new revenue streams by selling agricultural waste. Environmentally, such models contribute to reducing greenhouse gas emissions, preventing soil degradation, and minimising water pollution.

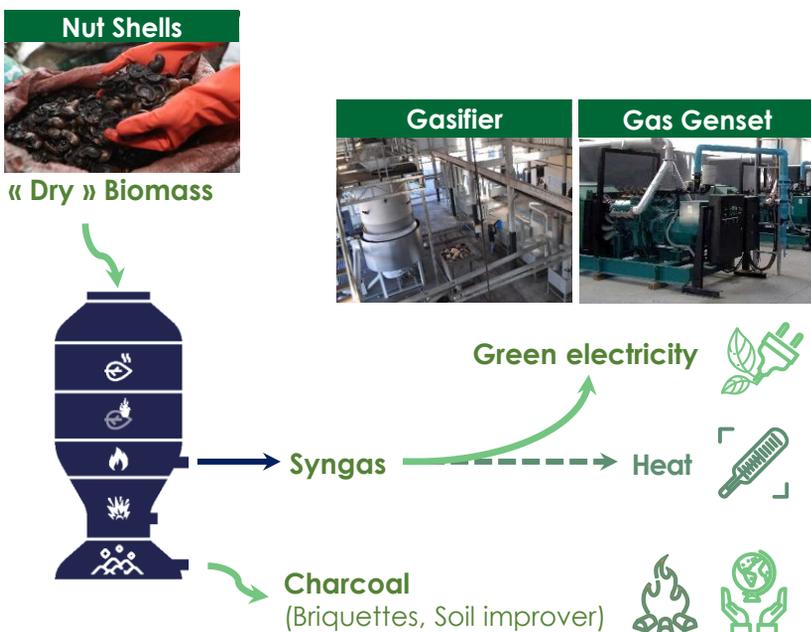
[1] [Energy Potential of Crop Residues in Senegal Techn.](#)

[2] ANSD. (2019). Bulletin mensuel des statistiques économiques. Agence Nationale des Statistiques et de la Demographie

[3] [https://trinomics.eu/wp-content/uploads/2020/12/Country-Report-Senegal\\_Final\\_20122020\\_EN.pdf](https://trinomics.eu/wp-content/uploads/2020/12/Country-Report-Senegal_Final_20122020_EN.pdf)

One company taking steps toward circular solutions is COPEOL, one of Senegal's largest peanut oil processing firms. Established in 1990, COPEOL processes between 40,000 and 60,000 tons of peanuts per year, sourced from around 60,000 smallholder farmers. This operation generates substantial waste, mainly peanut shells, which are currently sold for use in animal feed and alternative fuel for cement factories.

Through an Inclusive Business Plan (IBP), COPEOL explored ways to use its peanut shells—and in the future, cashew nut shells—to generate its own energy. Gasification was identified as the most viable technology for this process, allowing solid biomass to be converted into syngas, which can be used for electricity generation.



Source: IED Consult

CASA TAF contracted IED Consult to carry out a feasibility study for COPEOL. The proposed solution involves installing two gasification units, one at COPEOL's Kaolack peanut processing plant and another at its Ziguinchor cashew processing plant. These units could collectively produce 4.2 GWh of energy annually, with a projected return on investment (ROI) below 10 years with certain feed-in conditions to the grid, particularly the confirmation that the self-producer can sell up to 100% of its own consumption, which is a standard in the sub-region.

This initiative would not only lower energy costs but also contribute to environmental sustainability by reducing reliance on Senegal's national grid, cutting CO<sub>2</sub> emissions, and generating biochar, which can improve soil fertility or serve as green charcoal. The project also has the potential to create jobs. However, the success of surplus energy sales will depend on clarifying regulatory conditions and tariffs. Establishing a favourable framework for local agro-industries leading to higher and stable utilisation rate of their processing capacity would be a prerequisite for additional investment in this type of production facilities.

## Focus on Biotech Organic Fertilisers Business Model

Another key player in Senegal's agro-circular economy is Biotech, a company specialising in organic fertilisers, bio-stimulants, and biopesticides, from 100% natural organic materials, including agricultural waste, carefully selected and enriched for optimal soil and plant absorption.

Founded in 2013, Biotech has led efforts in organic agriculture but faces several structural challenges.

A major issue for Biotech is its heavy reliance on state subsidies, with 90% of its sales tied to government contracts. Delayed payments have impacted its ability to scale. High transportation costs and a single factory location further limit access to organic inputs, especially for farmers in remote areas.

To address these barriers, CASA is supporting Biotech in developing an inclusive business plan to increase smallholder farmer adoption of organic inputs, and specifically their range of bio-fertiliser, enriched compost produced partly through agro-circular economy.

### A virtuous model ready to expand

The development of a company like Biotech, can address three critical needs for the agricultural sector in Senegal:



Reducing greenhouse gases emissions from agricultural waste by recycling them into bio-inputs

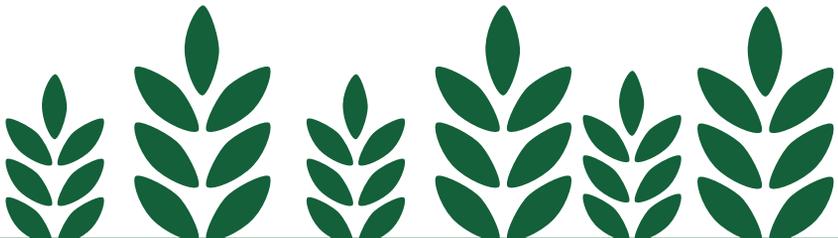


Allowing the country to reduce its dependency from imported chemical inputs imports



Providing small-scale and commercial farmers with bio-inputs, rich in organic matter and beneficial to soil health, critical for climate adaptation.

Three steps to complete a full virtuous circle of climate mitigation and adaptation. However, this calls for minimum investment which could be achieved through blended finance.



# The Road Ahead: Policy, Partnerships, and Scale-Up

Scaling Senegal's agro-circular economy requires a holistic and coordinated approach involving government policies, private sector engagement, and investment in research and development. Addressing systemic challenges while leveraging opportunities can accelerate the transition towards a more sustainable agricultural sector..



**Policy & Regulatory Engagement:** Circular economy businesses require stronger policy incentives to thrive. A regulatory framework that encourages sustainable waste management, organic input production, and waste-to-energy projects is essential. Additionally, improved policies supporting higher surplus energy sales and fairer feed-in tariffs for renewable power generation will enhance the viability of waste-to-energy solutions.

**Private Sector Coordination:** Strengthening linkages between waste producers and recyclers is critical for scaling up circular economy initiatives. Agro-industries can benefit from pooling resources to optimise waste-to-energy projects, organic fertiliser production, and waste repurposing. Facilitating partnerships among agribusinesses, cooperatives, and technology providers can enhance efficiency, improve waste valorisation processes, and create new revenue streams.



**Demonstration & Replicability:** Pilot projects serve as powerful proof-of-concept models that can be replicated across different regions. Establishing demonstration sites showcasing successful circular economy models—such as Biotech's organic input system and COPEOL's gasification project—have the potential to drive wider adoption. Technical assistance and knowledge-sharing platforms can further support businesses in optimising their models and scaling operations effectively.

**Expansion of Waste Recovery Initiatives:** A key priority is to map agricultural waste streams, assess their recovery potential, and foster collaborations with waste-to-power and biofertiliser innovators. Encouraging agribusinesses to adopt waste recovery technologies and implement low-tech solutions, such as drying agricultural waste for industrial boilers, composting, biochar production, or briquetting, can drive sustainability at both industrial and smallholder levels. Creating financial incentives for businesses to invest in circular economy initiatives will be essential for long-term impact.



**Investment & Capacity Building:** A lack of funding and technical expertise often hinders the growth of circular economy ventures. Expanding access to finance through blended funding models, grants, and impact investment can encourage agribusinesses to adopt circular practices. Additionally, capacity-building programs and farmer training initiatives on organic waste utilisation, composting, and biomass energy production will be key to fostering grassroots adoption and long-term sustainability.



# Technical Assistance and agro-circular economy

Technical assistance plays a crucial role in supporting businesses and smallholder farmers in adopting circular economy practices. Providing tailored advisory services, knowledge transfer, and capacity-building programs can help enterprises optimise their waste-to-value processes, improve efficiency, and scale their operations.

Additionally, inclusive investment mechanisms, such as blended finance models, impact investing, and public-private partnerships, can unlock the necessary funding to support circular economy projects, ensuring that financial resources reach businesses of all sizes, including smallholder-driven initiatives.

By integrating these elements into Senegal's agro-industrial strategy, the country can make significant strides toward a resilient, sustainable, and economically viable agricultural sector.

The agro-circular economy in Senegal is more than a vision, it is a necessary evolution to enhance food security, create employment, and mitigate environmental degradation. Now is the time for action, collaboration, and investment in a future that prioritises both economic growth and ecological balance.



The FCDO-funded Commercial Agriculture for Smallholders and Agribusinesses (CASA) Technical Assistance Facility (TAF) partners with investors with development interests to increase the smallholder impact of existing investments. We design, co-fund, and manage delivery of inclusive technical assistance (TA) projects at selected agribusinesses that can drive commercial and social impact by strengthening, deepening, or broadening inclusive supply chains.

Over its seven-year life cycle, the CASA TAF will collect data on the impact of inclusive technical assistance, not only at the farmer-level, but also at the portfolio company and investment fund level. The objective is to learn and to influence DFIs, impact investors, commercial investors, and TA providers on the significance of generating compelling evidence to track commercial and development impact metrics, thus demonstrating the value of inclusive TA.



<https://www.casaprogramme.com/technical-assistance/>

For further information:

Melanie Machingawuta  
TechnoServe Director, Inclusive Investment  
mmachingawuta@tns.org

Ana Herrera  
CASA TAF Team Lead  
aherrera@tns.org