

From Waste to Resource: Greenheart's Journey in Transforming Agricultural byproducts into Sustainable Solutions

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Introduction

Agricultural activities generate an estimated 1.3 to 2.1 billion tons of waste annually (Waste Managed, 2025). In Africa, vast amounts of agricultural waste are produced each year, much of which is improperly disposed of—leading to environmental pollution and lost economic opportunities. However, with the growing emphasis on climate action and sustainability, innovative solutions are emerging to transform this waste from pollutants into valuable resources.

One such innovation comes from Greenheart SE, a Ghanaian startup converting agricultural waste into biochar-based products for farmers. By turning what was once considered low-value waste into a resource, Greenheart is not only helping reduce pollution but also contributing to a more sustainable future. This case study highlights their journey, the challenges they've overcome, and the impact of our investment as they scale their operations.

The Origin Story

GreenHeart SE was born in 2021 out of a shared vision by Caleb Lomo, Benjamin Dompseh, and Priscilla Gilberts. Observing the untapped potential in agricultural and forestry waste, they saw an opportunity to create value while addressing pressing environmental challenges.

From a modest setup in Koforidua, they began producing biochar, drawn by its promise to enrich soil, increase yields, and sequester carbon. What started as a small-scale initiative quickly evolved, backed by research and collaborations with sustainability-driven partners. A key turning point came with the adoption of smoke capture technology, enabling the production of wood vinegar and expanding their impact beyond soil health to natural crop protection.

With each step, GreenHeart SE deepened its commitment to regenerative agriculture and circular economy solutions, laying the foundation for a company built not just on innovation, but on purpose.

Technology & Innovation

GreenHeart SE distinguishes itself through its flagship product "BioCharge" - an innovative all-in-one solution which functions simultaneously as an organic pesticide, fungicide, soil conditioner and a plant growth enhancer. They also offer biochar that enhances soil structure, serves as a natural animal feed additive, and plays a vital role in long-term carbon sequestration. By providing these versatile solutions, GreenHeart SE helps farmers through a reduction in the need for multiple products, streamlining their operations and addressing a variety of agricultural challenges with a single, sustainable solution.

They utilize advanced pyrolysis technology to produce premium biochar and wood vinegar (BioCharge), ensuring efficient carbon sequestration and exceptional soil enhancement benefits.

Early challenges & pivots

GreenHeart's path to market readiness was marked by several early challenges. Initial versions of the pyrolysis process were hindered by design inefficiencies and limited processing capacity, necessitating multiple rounds of technical refinement. Farmer adoption also proved difficult at first, as many were skeptical of the product's performance relative to conventional chemical inputs. The startup addressed this through targeted education efforts and demonstration farms, allowing users to evaluate the benefits firsthand. On the regulatory front, securing certifications was complex, given that the product did not align with existing classification frameworks, creating uncertainty among regulatory bodies.

Growth & Traction

Greenheart has demonstrated significant progress since its inception. Annual biochar production has increased from an initial 10 tons to 50 tons, with plans to scale to 1,000 tons following the investment of \$50,000 by GBHub Africa into the startup, substantially expanding their capacity for waste processing and carbon

sequestration. The company now supports over 1,000 farmers, alongside partnerships with agribusinesses and industrial clients, delivering biochar-based soil improvement solutions. To date, Greenheart has diverted more than 300 tons of agricultural and forestry waste from disposal, reduced carbon emissions by over 180 tons, and created 13 sustainable direct jobs in rural communities.

Market Opportunity

Amid rising global emphasis on sustainability and environmental responsibility, Greenheart SE is strategically positioning itself to expand its market presence and impact. Key initiatives include expanding into new markets by developing innovative biochar-based solutions for various industries, while intensifying marketing efforts to boost product visibility across Ghana and West Africa. Additionally, the company is pursuing carbon credit certification to unlock new revenue streams and reinforce its role in advancing global climate objectives. These efforts align with Greenheart SE's broader vision to deliver scalable, eco-friendly solutions that drive both environmental and commercial value.

GBHub Africa's Investment

At GBHub Africa, our investment in Greenheart SE reflects our commitment to regenerative agriculture and environmental sustainability, anchored on our vision of *investing in Africa's food system to improve livelihoods*. We believe Greenheart is poised for significant growth due to:

1. **Strategic Role in the Food Value Chain** : By converting agricultural waste into biochar, Greenheart addresses critical challenges in soil health, productivity, and waste management, adding value at multiple points in the agricultural ecosystem.
2. **Proven Technology**: Demonstrated ability to efficiently convert agricultural waste to biochar-based solutions at commercial scale

3. **Sustainability Metrics:** Quantifiable environmental benefits that align with global ESG priorities
4. **Scalable Business Model:** A clear strategy for expansion across new regions and new markets.
5. **Farmer Impact:** We believe that their solution will greatly enhance the livelihoods of farmers, as they have improved yields on their farms.

Looking Ahead

With this investment, Greenheart plans to:

1. **Scale Production Capacity** – Expanding biochar production to 1,000 tons annually to meet increasing demand and enhance climate impact.
2. **Machinery Acquisition & Process Optimization** – Investing in advanced pyrolysis equipment to improve efficiency, reduce emissions, and enhance product quality.
3. **Accelerate Market Expansion & Partnerships** – Strengthening collaborations with farmers, agribusinesses, and carbon markets to drive adoption of biochar and wood vinegar.
4. **Improve Impact Measurement & Reporting** – Tracking and communicating the environmental and social benefits of our solutions, particularly in carbon sequestration and soil regeneration.

This investment marks the start of GBHub Africa's commitment to transforming Africa's food system and improving livelihoods across the continent. It is the first step in a broader journey, one that drives meaningful change, supports sustainable innovation, and creates lasting impact throughout the region.

GreenHeart SE represents a perfect example of the circular economy in action – transforming what was once considered waste into valuable resources while creating economic opportunity and environmental benefits. We're proud to partner with Greenheart on this journey of agricultural innovation.

GBHub invests in transformative solutions addressing critical sustainability challenges with scalable, profitable solutions across the food value chain in Africa. This case study is part of our portfolio documentation series highlighting the journey of our partner companies.

REFERENCE

Waste Managed. (2025). *Agricultural waste guide: Everything you need to know*. Waste Managed. <https://www.wastemanaged.co.uk/our-news/agriculture/agricultural-waste-guide/>