



Photo by: African Bamboo

African Bamboo

An Ethiopian Startup Transforming Sustainable Construction, Creating Jobs and Regenerating Forests





We are creating diversified skilled employment and entrepreneurial opportunities throughout the bamboo agroforestry value chain: from seedling production and sustainable forest management, to value addition manufacturing, to forest and soil carbon development. These solutions are not independent, isolated fixes; rather, they are part of a holistic ecosystem that addresses the social, economic and environmental challenges faced by different populations in Ethiopia.

–Khalid Duri, Founder and CEO, African Bamboo

By 2030, about 3 billion people globally will need new housing and basic infrastructure. This demand has immense health, wellbeing and climate implications.

The buildings and construction sector contributes to 37% of global emissions. As we think about new construction, we must consider replacing carbon-intensive materials with sustainable and climate resilient ones.

This is where bamboo, the fastest-growing plant on earth, comes in. Technically a grass, one hectare of bamboo can sequester about 17 tons of carbon a year. More crucially, it can continue to store carbon even when used in construction.

But can the mighty bamboo prove to be a match for the old construction stalwarts of concrete and cement? According to Ethiopia-based African Bamboo, and other breakthrough bamboo-based initiatives working in the sector, the answer is yes.

African Bamboo is a company that has developed a strong and resilient bamboo-based material that is a sustainable and lower-carbon alternative to traditional construction materials such as steel, plastic, aluminum or tropical hardwood.

African Bamboo's journey from inception to investability has been adaptive and systematic, yielding valuable lessons for other nature-based start-ups. This case study captures African Bamboo's path to building a sustainable and scalable business and the valuable lessons learned along the way.

The road to developing a strong prototype and an equitable supply chain to manufacture bamboo-based building materials was long, but none were more suited to the journey than entrepreneurial brother-and-sister duo Khalid and Rania Duri.

Originally in the furniture business, the Duri siblings had a deep knowledge of the timber value chain. While their primary customer base was the local market, they noticed supply chain challenges - timber was increasingly scarce, and they faced competition from cheaper imported products. Seeking more sustainable forestry sources, they recognized the need to pivot their business model. As they spent time studying Ethiopia's nascent forestry sector, the Duris' search for a supply of high-performance, locally available material led them from timber to bamboo.

The Duri siblings dedicated time to studying Ethiopia's native bamboo species - its availability, usability and potential for broader adoption. Khalid spent months immersed in bamboo-growing regions to deeply understand the market dynamics, existing technology and the overall value chain.

TECHNICAL APPROACH

The first commercial product African Bamboo developed was high-end bamboo decking and cladding with a certified 20-year lifespan. Replacing tropical hardwood and modified wood products, it is sourced from Forest Stewardship Council (FSC) certified forests and tested in accordance with European standards¹. African Bamboo manages bamboo forests in a socially-, environmentally-, and economically-sustainable manner, supplying FSC-compliant bamboo from a 10,000 hectare catchment area and 4,500 hectares of community-owned bamboo patches.

The Duri siblings' journey to this point spanned 7 years, encompassing product development, testing and building a strong network of international technology partners. This included collaborating with

state-of-the-art applied research institutions such as Fraunhofer Institute WKI Germany, TU Dresden, TU Delft and TU Munich. In addition, African Bamboo collaborated with the Netherlands Organization for Applied Scientific Research (TNO) to co-innovate and refine the processing technology and advanced bamboo materials.

The early capital to build the pillars of the business was drawn from the Netherlands Enterprise Agency (RVO), the German development agency (GIZ), and USAID, together with the Duris who invested more than US \$5.5 million of their own capital.

To innovate and streamline manufacturing processes, African Bamboo collaborated with German mechanical engineering firm Dieffenbacher, international plywood leader Raute and a host of other companies. Several NGOs have also supported the development and growth of the business, including SNV Ethiopia, the International Bamboo and Rattan Organization (INBAR), iDE Global and more.

With its pilot facility in Addis Ababa, African Bamboo has leveraged Europe's advanced applied research infrastructure to support both the development of an innovative product line and conduct further research. It has developed a technology cluster to support its growth, patent inventions and proprietary processes. While it raises capital for its manufacturing facility in Ethiopia, it also provides technology services to established materials manufacturers, which generates an additional source of revenue for the startup.

The bamboo species used in African Bamboo's products is *Yushania alpina*, or highland bamboo. This variety features longer fibers than Asian bamboos, a beneficial property for industrial applications. Additionally, highland bamboo is non-invasive and grows in loose clumps, with a productivity rate of 40-60 tons per hectare. This fast-growing bamboo also sequesters a significant amount of CO₂, capturing 30-50 tons per hectare annually.

African Bamboo has pioneered innovative processing technologies that have significantly enhanced the sustainability and efficiency of its products compared to conventional alternatives. The company has patented a novel production method that doubles throughput volumes relative to industry standards. This proprietary technology represents a 50% reduction in energy consumption compared to the pressing techniques commonly used for bamboo, plywood and similar materials. Additionally, it has also patented resin technology allowing for a 33%



reduction in resin consumption and enhanced application precision for mass production. This versatile technology works for different bamboo species as well as a range of other natural fibers.

Finally, it has devised a process for bamboo fiber enhancement. By altering its biomass contents, specifically reducing hemicellulose and increasing its lignin content, the company has been able to achieve up to 90% fiber enhancement and has resulted in 37% energy savings compared to conventional wet processes.

THE PRODUCT

African Bamboo's flagship product is bamboo decking, a high-quality material suitable for outdoor use and available in lengths up to 10 meters. This decking is as strong as the commonly used tropical hardwood Bangkirai, with even higher stiffness. The product – which conforms to EU standards – is fire-, water-, and termite-resistant, and comes with a 20-year manufacturer's warranty.

Through its approach, African Bamboo has developed a versatile high-performance bamboo board suited for modern construction applications that can be transformed into a variety of products. The company's alternative construction products are made from natural fibers that are extremely strong and durable, with 28,000 MPa bending strength –

the most important parameter for estimating the strength of a product in the industry. It has the strongest engineered structural material, 2 times stronger than wood and the highest engineered wood class (LVL80S), and is both environmentally friendly and price competitive.

POLICY SUPPORT

African Bamboo enjoys strong national-level support in Ethiopia and has been able to gain more support through the National Platform of the initiative Partnering for Green Growth and the Global Goals 2030 (P4G). P4G National Platforms (NP) are multi-stakeholder platforms co-chaired by senior government and private sector leaders. In the case of Ethiopia, this includes leaders from the Ministry of Planning and Development and the Chamber of Commerce. The NP has played a pivotal role in enabling African Bamboo's success in several ways: facilitating strategic partnerships and connections with national and local institutions, providing technical assistance, securing political buy-in, offering policy and regulatory support, and facilitating project implementation.

As with any nascent market, Ethiopia's current policies and regulations don't always keep up with the pace of change. African Bamboo aspires to see bamboo and trees categorized as an asset class in Ethiopia, so that utilizing these resources can be financed in new ways. Currently, asset classes in Ethiopia tend to be properties, movable assets like cars or, more recently, livestock.

One consequence of bamboo lacking this designation is that farmers are not able to borrow against their bamboo holdings. As a result, farmers cannot access revenue until they sell to African Bamboo – and they don't have available cash reserves to wait until the bamboo is mature to sell. Highland bamboo takes four years to mature before it can be harvested. The distinction of this bamboo is that it is harvested piecemeal, which means the plant remains healthy and standing after harvesting and continues to produce new shoots for future harvests. This nature of bamboo makes it more appealing for it to be considered a long-term investment asset.

By introducing carbon credits as a way of assigning value to the non-revenue-generating period of the tree, banks can design loans that use young bamboo or prospective bamboo farms as collateral. Pegging



Photo by: African Bamboo

this to carbon credits also allows banks to give loans in local currency while selling the credits in dollars, thus circumnavigating the foreign exchange barrier that is an ongoing challenge in Ethiopia.

In addition, with the European Union's new Deforestation Regulation (EUDR) to curb the EU market's impact on global deforestation and forest degradation, there is an opportunity to restore lands and bring more traceability to the EU supply chain in Ethiopia. Under the new EU regulation, companies trading in commodities such as coffee, cocoa and wood (among others) are required to inspect their value chain to ensure the products do not contribute to deforestation or degradation.

This new regulation gives African Bamboo a significant advantage in the international market because of its heavy emphasis on sustainable production and land restoration. The business follows international sustainability standards with ongoing monitoring to comply with its FSC certification and Verra's Verified Carbon Standard. Practices include maintaining over 75% of canopy cover, involving and training local communities in bamboo growing and harvesting, and restoring degraded lands through seedling distribution to maintain native species and biodiversity. African Bamboo also works with local technical and vocational training institutes and governments to support smallholders.

Moreover, African Bamboo offers product traceability right to the source by using the Kanop software system to monitor and verify project activities. The system can trace bamboo and other species within the project ecosystem to the stock in a specific farmer's plot or a block in a natural forest asset.

INVESTMENT READINESS

Bamboo companies in low- and middle-income countries often face challenges in securing investment through equity or debt. This is primarily due to development finance institutions categorizing them as either forestry or agricultural ventures, which are perceived as high-risk – despite bamboo not strictly fitting into either category. The lack of clarity regarding classification is further compounded by the absence of financial models with suitable structures or expected returns.

What is clear, however, is that there is an incredible market opportunity for sustainable building materials – with expected market growth for bamboo projected at 4.5% until 2030². This can be attributed to several factors, from countries and companies

trying to meet their emissions targets and manage their climate risks to a growing consumer preference for sustainability and traceability.

African Bamboo's offering is well-positioned to meet this project market demand. The company's growth strategy is aligned with the Ethiopian government's ambition³ of becoming the leading bamboo supplier in Africa by 2030. A distinct advantage African Bamboo has over other Ethiopian startups is its focus on exports. This allows it to generate foreign currency that covers its import needs. While Ethiopia's current economic policy incentivizes exporters, recent fiscal reforms have increased the investment case for the country, one that could attract more interest in African Bamboo and more broadly in the country's agroforestry sector.

Since its establishment in 2012, African Bamboo has dedicated itself to build a strong foundation for business at scale. During this time, it has:

- Developed and refined its technology and products to meet international standards
- Built an agro-forestry ecosystem through community engagement of nearly 6,000 farmers over 10,000 hectares
- Established the right to operate: Securing of more than 20,000 hectares of natural forest rights through a 25-year Supply Purchase Agreement with the regional government
- Obtained a production shed in the Hawassa Industrial Park and obtained the licenses for forestry, agriculture, trade, manufacturing and import/export needed to run the business at scale
- Developed a Verra-listed carbon offset product
- Signed a guaranteed offtake agreement with SECA, a leading wood industry company
- Began operating as a technology-first company providing research and development support on using

The company envisions its growth coming from multiple business lines:

1. Licensing its patented technology for processing natural fibers so that others can start their own product lines using the same species
2. Scaling the production and sale of the bamboo materials through its factory in Hawassa to meet its secured offtake agreement

3. Generating revenue through the sale of Verified Carbon Units from AB's Verra-listed ARR project in Ethiopia

The startup's core business is its technology services to others in the building industry. The licensing of its intellectual property to businesses across Africa is also part of its vision for expansion. In addition, African Bamboo envisions the sale of materials from its own manufacturing facility in Ethiopia and future partner facilities in other countries to generate additional revenue.

African Bamboo owns the patents to its processes, as well as a licensing model that will allow it to scale across Sub-Saharan Africa – which currently houses more than 4.5 million hectares of bamboo resources⁴. In Ethiopia alone, the bamboo industry could generate up to US \$5 billion in annual revenue and provide over 1.3 million jobs⁵.

The company expects its annual revenue to grow 300% from a projected US \$2.7 million in 2025 to US \$8.1 million in 2026. By 2030, it expects to generate an annual revenue of almost US \$26.6 million. This growth rate is dependent on African Bamboo's ability to maintain its current positive trajectory and sustained growth across all its business offerings.

The company's business case has attracted strong interest from Germany's KfW and the Dutch development bank FMO for a financing round amounting to more than US \$16 million to scale up African Bamboo's operations starting in 2025. It expects to close KfW financing by the end of 2024 and FMO financing in March 2025. The funding will enable the company to establish its manufacturing factory in Hawassa, Ethiopia. The startup is targeting June 2025 for placing plant and machinery orders for the factory with trial production starting in Q3 2026 and commercial production in Q4 2026. At capacity, the factory will be able to produce 900,000 m² of outdoor bamboo decking per year. The factory will enable African Bamboo to generate US \$94 million within the first 5 years through its secured offtake agreement.

The company is listed on Verra and will implement reforestation activities and trade in Verified Carbon Units, adhering to Verra's latest reforestation methodology (VM0047). The first carbon project is expected to store over 6 million tons of carbon over a 40-year period.

FUNDER ACTIVITIES

A key factor contributing to African Bamboo's investment readiness is the grant and technical assistance it received from Partnering for Green Growth and the Global Goals 2030 (P4G).

P4G is an initiative hosted by the World Resources Institute. It aims to mobilize climate finance to support early-stage businesses working in food, water and energy to enable country climate transitions. In 2022, P4G first provided African Bamboo with about US \$585,000 in grant funding to enhance its investment readiness. In 2024, it provided a second round of grant funding amounting to US \$500,000.

These funds have helped the company pursue activities and develop tools to expand its forest-to-business model – from building a modular financial model, to developing a risk measurement, management and sensitivity tool, to conducting environmental and social safeguard assessments.

The grants have also helped African Bamboo pursue a decarbonization plan that will include the production and sale of biochar and carbon credits, providing the company with the agility of an additional revenue stream. With the aid of P4G's funding, African Bamboo solidified its market presence by cementing a supply purchase agreement, showcasing its advanced technology, and entering the voluntary carbon market. These efforts ensured a strong value proposition for potential investors and partners while also reducing the business's risk perception.

P4G has also featured African Bamboo at high-profile events such as its 2023 global summit in Bogota, Colombia, where it spotlighted the company in accelerator and investor pitch sessions and brought it to the attention of different investors.

The African Bamboo team continued to meet with investors between 2021 – 2024 including institutions like the Dutch Fund for Climate and Development and the German state-owned investment and development bank KfW. In addition, it is working to secure additional revenue from carbon buyers by 2025.



Photo by: African Bamboo

BAMBOO CULTIVATION AND COMMUNITY IMPACT

African Bamboo was founded with a strong emphasis on community-led forestry operations. Drawing from their prior experience, the Duri siblings brought a deep understanding of how to build a sustainable value chain from the ground up. They recognized the key elements required to develop a resilient and financially viable project that delivered social, environmental and economic returns.

The community-centric approach is central to African Bamboo. Therefore, it works directly with smallholders to understand their needs. The business has established 30 farmer cooperatives across five districts in the Sidama Region in southern Ethiopia, bringing together 4,800 smallholder farmers covering 4,400 hectares (with an average land holding size of 1 hectare) to develop bamboo agroforests. This enables the procurement of bamboo as well as restoring degraded land – a particular issue plaguing the Sidama Region⁶.

African Bamboo provides cooperative members with capacity-building technical and business training. On the technical side, this includes training on planting, harvesting, monitoring and reporting of carbon removal units. Business training includes business

and financial plan development, bookkeeping, basic cooperative management, access to finance and market linkages. In addition, it has provided the community with upskilling opportunities on using digital tools that give farmers traceability. Since many of the farmers African Bamboo works with are also involved in coffee-growing operations, these skills are critical and transferrable to their work on coffee farms.

African Bamboo has also worked to address gender inequalities, encouraging women's participation in bamboo farms by prioritizing bamboo plots and parcels for reforestation located near homesteads. The startup has also held tailored training and conducted capacity-building initiatives in locations where women typically meet and congregate, so that they do not have to take more time out of their day to attend.

Bamboo grows at higher altitudes than coffee farms and men are typically more involved in coffee-growing. This has given African Bamboo a unique opportunity to prioritize women's engagement and financial inclusion.

At its full capacity of producing 900,000 m² of bamboo decking per year, African Bamboo's bamboo agroforestry undertaking has the potential to unlock an array of employment opportunities⁷ and pathways in Ethiopia. The business could generate more than 300,000 jobs across the bamboo value chain, including jobs in planting, irrigation, harvesting, transportation, processing, biochar manufacturing and monitoring. African Bamboo has determined its jobs modeling through expert and community consultations and on-the-ground implementation experience.

For Meseret Tona, a 23-year-old female farmer who attended a training conducted by African Bamboo on the potential of bamboo-growing, a local bamboo nursery backed by a kebele (a small administrative unit in Ethiopia) would be a "game-changer."

Growing bamboo, Tona says, "has the potential to bring about positive change in our community and empower local farmers."

African Bamboo has assisted farmers in several ways:

- Providing them with seed capital to build the capacity of their satellite and community nurseries
- Providing bridge loans to cover operational costs
- Supplying micro, small and medium enterprises (MSMEs) with bamboo-processing equipment (including supplying them with basic bamboo furniture and coffee-drying mats)



Photo by: African Bamboo

In total, the company has provided 12 cooperatives and 19 MSMEs with access to finance – totally more than 1,000 beneficiaries.

Genet Tumicha is a cooperative farmer working on her 2-hectare homestead. She sells bamboo and coffee at the local markets. One of the most challenging aspects of her work is her daily 15 kilometer (9.3 mile) trek to fetch water from the river to use in her home. She plans on using the seed capital that African Bamboo has provided her with to invest in a cart and water jerrycans. This will enable her to transport more produce to the market and reduce her water collection trips to just twice a week. More produce sold means more earnings for her – and she can use her free time to further invest in her homestead, such as building a fence to protect her crops from animal damage.

KEY LESSONS LEARNED

- 1. An experienced team with deep technical and fundraising expertise is a key ingredient for success:** An experienced and tenacious team was paramount to African Bamboo's success. Khalid and Rania's deep familiarity with building resilient value chains in forestry helped the company build a robust business model that was both commercially viable and impact-driven. Embedding team members with an in-depth understanding of the start-up capital landscape boosted the company's fundraising efforts. In addition, adding employees with strong smallholder networks in the region helped African Bamboo reach and train more farmers to build an inclusive, strong and wide-ranging supply chain.
- 2. Flexible finance is critical:** Raising greenfield finance in East Africa is challenging as most financiers require a fully operational model. African Bamboo's manufacturing model is not well-suited to this requirement. In order to build a resilient and sustainable business, the company had to build a forestry sector from the ground up. This differs vastly from regions such as the US or Europe, which have established forestry sectors. A lesson learned from African Bamboo's success story is that the market in countries like Ethiopia requires financing mechanisms beyond blended finance. The importance of grant funding, in particular, cannot be undervalued in terms of its contribution to de-risking early-stage businesses. African Bamboo credits P4G as one of the initiatives that helped it turn the corner to commercial viability by providing it with grant



Photo by: African Bamboo

funding and technical assistance to lower its risk and become bankable. This was instrumental for a business working in a very challenging and fragile environment.

- 3. Incorporating technology into the investable model has been a big value-add:** African Bamboo realized that positioning itself as a technology company with roots in manufacturing allowed for quicker commercialization. Through technology services, it offered a stronger investable proposition that could be scaled and replicated at speed in other African countries.
- 4. A strong understanding of the start-up capital landscape is crucial:** Having a team with a better understanding of the start-up capital landscape would have allowed the company to structure itself to be more responsive to those markets. This would have also allowed for better engagement with the capital market. Once the team realized the benefits of accessing this market, it quickly

hired employees with startup know-how and spent time analyzing the key players investing in the forestry sector so they could foster deeper engagement with them.

- 5. Strategic partnerships and a supportive multi-stakeholder network are critical:** African Bamboo's strategic partnerships have been crucial to its success, enabling the company to access technical expertise and support, enhance its credibility and visibility, build a strong reputation for social and environmental responsibility, and scale its operations efficiently. The company is leveraging these partnerships to access resources, expertise and markets that it would not otherwise have access to, ultimately allowing it to increase its impact and reach in Ethiopia. The table below gives an overview of the key stakeholders African Bamboo has engaged with and their role in supporting the business on its journey.

STAKEHOLDER	ROLE
Government of Ethiopia	The Ethiopian Ministry of Planning and Development played a critical role in endorsing the growth of the bamboo sector. The ministry recognized African Bamboo's alignment with national priorities relating to sustainable economic growth and supported the business by facilitating key connections. The ministry also took on board policy recommendations shared by African Bamboo to open the sector and attract new investors.
Regional and woreda (district) government	Regional and woreda (district) government support – which included facilitation, community engagement and smooth project implementation – was also essential to African Bamboo's success.
Private sector	Five-year guaranteed offtake agreements with leading wood industry companies like SECA helped African Bamboo boost investor confidence in its product and model.
International organizations	<p>Partnering with reputable organizations such as the International Bamboo and Rattan Organization (INBAR) and TU Delft helped African Bamboo gain credibility and visibility. This, in turn, helped strengthen its reputation and brand as a company committed to social and environmental responsibility. Other partnerships include TNO, Fraunhofer WKI, TU Dresden, TUM international, IHD, iDE, Farm Africa, Solidaridad and Fair Climate Fund.</p> <p>It is also working to partner with national and international organizations like Digital Green, Bamboo for Africa, BFA global and others to demonstrate its commitment to sustainable development and dignified job creation.</p>
Farmer cooperatives	By entering into contracts with farmer cooperatives, African Bamboo was able to reach a larger network of smallholder farmers interested in becoming part of the supply chain. The cooperatives were also instrumental in helping build the capacity of smallholders to grow bamboo and operate nurseries.
University incubators	Having a research and development base at the applied research Technical University of the Netherlands (TNO Delft) allowed African Bamboo to access the technical expertise, research and lab facilities, and international validation required to build a strong product and business foundation.
International trade agencies within government ministries	Working with agencies like the Netherlands Enterprise Agency (RVO), housed within the Dutch Ministry of Economic Affairs, connected African Bamboo with key ecosystem players in Europe and enabled it to expand its reach and network.
Funders – including grant funders, development finance institutions and private sector investors	Grant funding from organizations like P4G and the Challenge Fund for Youth Employment enabled African Bamboo to get the support it needed to set up critical de-risking elements such as dMRV tools, risk tools and financial models.

Key Forecasted Achievements



\$25 million

Capital committed
in cash and assets



2,500

Female Smallholders
with Increased Incomes



6,200

Jobs Created



\$94 million

Guaranteed Offtake
Agreement



112,700

People Positively Affected

12,700 direct beneficiaries and
over 100,000 indirect beneficiaries
(i.e. assuming eight dependents per family)
over 10-year period



\$25 million

Carbon Investment
Catalyzed (Projection)

ENDNOTES

1. European Standard EN 15534-4, specifying the characteristics of decking profiles made from cellulose-based materials.
2. <https://www.grandviewresearch.com/industry-analysis/bamboos-market#:~:text=What%20is%20the%20bamboos%20market,USD%2088.43%20billion%20by%202030>.
3. https://www.epa.gov.et/images/PDF/Bambbo/Ethiopia_Bamboo_Development_Strategy__Action_Plan.pdf
4. <https://onlinelibrary.wiley.com/doi/10.1155/2021/8835673#:~:text=The%20review%20process%20found%20out,of%20the%20total%20bamboo%20species>.
5. <https://www.un-redd.org/news/bamboo-ethiopia-can-it-help-stimulate-its-economy-while-same-time-help-achieve-redd>
6. <https://www.epa.gov.et/images/PDF/Environment/Sidama%20Natural%20Resource%20degradation%20&prevention.pdf>
7. African Bamboo has determined its jobs modeling through expert and community consultations and on-the-ground implementation experience.



P4G contributes to green and inclusive growth in low- and middle-income countries by helping early-stage businesses become investment ready and matching them with supporting public-private National Platforms to enable country climate transitions in food, water and energy systems. P4G provides grants and technical assistance to startup partnerships; contributes to enabling systems improvements in partner countries through National Platforms; and shares learning on green entrepreneur ecosystems and solutions. Hosted by World Resources Institute and funded by Denmark, the Netherlands and the Republic of Korea, P4G implements in Colombia, Ethiopia, Indonesia, Kenya, South Africa and Vietnam.

www.p4gpartnerships.org