BioTrade Africa

Crop Intelligence Atlas

A synopsis of the interactive mapping tool and its principal findings

MARKET VALUE	RURAL JOBS
$5.6B → $10.5B current → at full adoption	22.7M → 39.5M current → at full adoption

CARBON STOCK	BIODIVERSITY	COVERAGE
28 → 120 tC/ha monoculture → multi-strata agroforestry	4,859 spp. threatened species in crop habitats	21 crops across 54 African countries

About the Tool

The BioTrade Africa Crop Intelligence Atlas is an interactive map that visualises the commercial and ecological opportunity of **21 high-value agroforestry crops** across **51 African countries**, drawing on peer-reviewed species distribution data, global market intelligence, and biome-adjusted carbon science.

The tool offers four interactive analytical lenses:

- **Crop view —** maps current production zones and bioclimatically suitable expansion areas for each species, filtered by product category.
- **Market view —** renders each country's BioTrade portfolio value in three modes: current production, saturated potential, and unrealised opportunity.
- **Carbon view —** overlays estimated agroforestry carbon stocks adjusted by biome and agroforestry tier, from monoculture baseline (Tier 0) through full multi-strata systems (Tier 4).
- **Biodiversity view —** maps threatened species richness by country and ecosystem, showing where BioTrade crop habitats overlap with the highest concentrations of at-risk species.

All layers are underpinned by cited literature and clearly distinguished as modelled estimates. The Atlas is designed as a living decision-support layer for programme design, investor briefings, and policy dialogue.

Principal Findings

1. A $4.8 billion commercial gap

Africa's 21 mapped BioTrade crops currently generate an estimated **$5.6 billion** in annual market value. Projecting to saturated potential points to a **$10.5 billion** addressable market — a **$4.8 billion unrealised opportunity.**

Shea alone accounts for $2.28B in current African market value — the single largest crop in the Atlas at 95% African market share — followed by Gum Arabic ($447M, 85% share) and Ginger ($720M). The largest absolute expansion gaps sit in Shea (+$1.24B), Ginger (+$576M), Moringa (+$568M), and Turmeric (+$528M). The overall portfolio has grown from $2.7B to $5.6B in current value since the previous 15-crop version, primarily due to the addition of Shea and Gum Arabic.

2. Geographic concentration — and its mirror opportunity

Current production remains heavily concentrated. West Africa (Shea belt) dominates by value. South Africa holds near-monopolies in Rooibos, Aloe ferox, Honeybush, and Buchu. Madagascar and the Comoros control Vanilla and Ylang Ylang. Sudan anchors Gum Arabic globally. This concentration is a structural vulnerability — supply shocks in any one country reverberate through global markets — but it also reveals the scale of diversification possible. **DRC alone** has potential suitability for at least eight Atlas crops yet remains almost entirely absent from current production figures.

3. Niche crops deserve targeted investment

Several crops potentiate exceptional growth trajectories not yet reflected in commercial scale:

- **Akpi — 22.0% CAGR.** Currently $4M Africa market. West African forest nut with fast-rising demand for distinctive flavours and functional botanicals. Tier 3 carbon at 58 tC/ha.
- **Mondia — 18.2% CAGR.** East and Central African medicinal root. Embryonic market ($3M) but strong trajectory. Threatened by overharvesting of wild populations — certification and cultivation programmes would both protect supply and create premium market access.
- **Allanblackia — 12.0% CAGR.** The only crop with an established Tier 3 buyer relationship (Unilever) and the highest carbon density in the portfolio. A rare convergence of market readiness, biodiversity significance, and carbon value.
- **Marula — 14.1% CAGR.** Premium cosmetic and food market with established Amarula brand infrastructure. Strong community harvest traditions across Zimbabwe, Mozambique, and South Africa.
- **Baobab — 12.4% CAGR.** Growing superfood and cosmetic demand. The African Baobab Alliance coordinates a buyer network across 15 countries from Senegal to South Africa.

4. Carbon opportunity is biome-determined, not crop-determined

Sequestration potential is primarily a function of climate zone. Humid tropical countries in the Congo Basin and West African coast achieve up to **120 tC/ha** under full multi-tier agroforestry (Tier 4). The same tier in the Sudano-Sahelian zone yields approximately 45 tC/ha; Sahara-fringe countries approach zero regardless of land use.

Within this structure, certain crops amplify the carbon case significantly. Allanblackia (80 tC/ha, Tier 3) and Wild Nutmeg (65 tC/ha, Tier 3) represent the highest carbon densities in the portfolio and both occupy the Congo Basin / Guinea Forest Belt — the highest-scoring biome. Shea parkland (52 tC/ha, Tier 3) over 32 million hectares represents the single largest continental carbon reservoir in the Atlas. **Congo Basin and Guinea Forest Belt projects carry carbon co-benefit valuations several times higher than equivalent-area projects in drier climates** and should be priced accordingly.

5. Multi-tier systems unlock compounding returns

The agroforestry tier framework illustrates that carbon and commercial returns compound rather than compete. A smallholder farm progressing from open-field ginger monoculture to a vanilla-pepper-moringa-timber multi-strata system in a sub-humid zone moves from approximately 15 tC/ha to 65 tC/ha in carbon stock while simultaneously unlocking three to four discrete revenue streams.

The six new crops reinforce this dynamic. Shea parkland is itself a multi-tier system — the trees create shade canopy under which Ginger, Turmeric, and Moringa can be intercropped. Vanilla requires a canopy host and is suited to systems where Allanblackia or Wild Nutmeg provide the upper tier. **The 21-crop portfolio is not a list of independent species: it is a set of interlocking agroforestry building blocks**, and the Atlas makes their spatial co-occurrence visible at continental scale for the first time.

6. Biodiversity significance is geographically concentrated

The biodiversity overlay — new in the current version — maps threatened species richness against the BioTrade crop portfolio. The finding is stark: **biodiversity and BioTrade opportunity are geographically co-located.**

The Cape Fynbos (1,840 threatened species) hosts Rooibos, Honeybush, and Buchu — all endemic to this single biome. The Guinea Forest Belt (1,111 threatened species) supports Shea, Allanblackia, Vanilla, Moringa, and Akpi simultaneously. The Congo Basin (710 threatened species) is the primary range for Wild Nutmeg and secondary range for Allanblackia. This co-location means a landscape programme designed around BioTrade production is **simultaneously a biodiversity conservation programme** — without requiring any additional intervention. The economic incentive to maintain the living landscape and the conservation case for doing so point in exactly the same direction.

What the Tool Enables

The Atlas is designed as a living decision-support layer for programme design, investor briefings, and policy dialogue. It allows users to move from continent-wide pattern recognition — identifying where commercial, carbon, and biodiversity opportunity converge — down to the country level, where crop-specific market data, biome context, and expansion potential inform site selection, partnership strategies, and investment cases.

Running all four overlays simultaneously against any candidate country or landscape returns a composite picture: **what crops are viable, what market they access, what carbon value they carry, and what biodiversity they sit alongside.** This methodology was used to identify the three candidate landscape programmes described in accompanying pitch materials: Ghana (Shea + Allanblackia, Guinea Forest Belt), Uganda (Vanilla, Albertine Rift), and South Africa (Rooibos, Cape Fynbos).

The tool is openly accessible and can be embedded in programme websites, pitch materials, or policy documents. All data is citable, versioned, and available for export.

Crop Portfolio Summary

Africa's estimated annual market share per crop, ranked by current value. Highlighted crops (**CAGR ≥12%**) carry exceptional growth trajectories. All values are modelled estimates.

Crop	Current (Africa)	Potential (Africa)	Uplift	CAGR	Categories
Shea Vitellaria paradoxa	$2.28B	**$3.52B**	+$1.24B	7.9%	Cosmetic · Food
Gum Arabic Acacia senegal	$447M	**$648M**	+$201M	6.4%	Food · Medicinal
Ginger Zingiber officinale	$720M	**$1.30B**	+$576M	7.2%	Spice · Food
Moringa	$224M	**$792M**	+$568M	9.3%	Food · Medicinal

Crop	Current (Africa)	Potential (Africa)	Uplift	CAGR	Categories
Moringa oleifera					
Turmeric Curcuma longa	$456M	**$984M**	+$528M	8.5%	Spice · Food · Medicinal
Black Pepper Piper nigrum	$368M	**$624M**	+$256M	5.4%	Spice · Food
Vanilla Vanilla planifolia	$322M	**$672M**	+$350M	9.1%	Spice · Food
Rooibos Aspalathus linearis	$213M	**$381M**	+$168M	5.8%	Medicinal · Food
Devil's Claw Harpagophytum procumbens	$108M	**$220M**	+$113M	6.3%	Medicinal
Aloe ferox Aloe ferox	$90M	**$193M**	+$103M	7.9%	Cosmetic · Medicinal
Tamarind Tamarindus indica	$152M	**$240M**	+$88M	5.5%	Food · Medicinal
Allanblackia Allanblackia floribunda	$50M	**$200M**	+$150M	**12.0%**	Food · Cosmetic
Ylang Ylang Cananga odorata	$43M	**$115M**	+$72M	9.7%	Cosmetic
Marula Sclerocarya birrea	$36M	**$145M**	+$109M	**14.1%**	Cosmetic · Food
Baobab Adansonia digitata	$17M	**$99M**	+$82M	**12.4%**	Food
Wild Nutmeg Pycnanthus angolensis	$28M	**$114M**	+$86M	9.0%	Spice · Food · Medicinal
Honeybush Cyclopia spp.	$30M	**$84M**	+$54M	10.3%	Medicinal · Food
Buchu Agathosma betulina	$22M	**$70M**	+$48M	11.5%	Medicinal
Akpi Ricinodendron heudelotii	$4M	**$25M**	+$22M	**22.0%**	Food
Mondia Mondia whitei	$3M	**$18M**	+$15M	**18.2%**	Medicinal · Food
Carob Ceratonia siliqua	$31M	**$48M**	+$17M	4.0%	Food · Medicinal
TOTAL (21 crops)	**$5.64B**	**$10.48B**	**+$4.84B**	—	

Data Sources

Market data: GIZ/BioTrade value chain profiles, FAOSTAT 2024, Grand View Research, Allied Market Research, Mordor Intelligence, Coherent Market Insights. Carbon: Zomer et al. (2016), Somarriba et al. (2013), Albrecht & Kandji (2003), IPCC (2006) Tier 1 ecological zones. Species ranges: Kew POWO, GBIF occurrence records. Biodiversity: IUCN Red List, Kew State of the World's Plants 2023. All figures are modelled estimates and should not be treated as audited financial data.