



Day 1: Finance cluster session
18 September 2025

Financial mechanisms for the biotrade sector: the example of marula fruit





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Case study:

Main findings of a study: Finance innovation in the biotrade: Mapping, analysing and advising on financial instruments for small biotrade businesses in Namibia and South Africa





Setting the scene for biotrade

Valorisation of *in situ and cultivated* genetic resources







[S0] BORSTOL Cough Remedy. Ref. No.: G907 (Act 101/1965). Each 10 ml of emulsion contains: 29 mg ammonium chloride, 0,1666 ml infusion senegae conc., 0,0572 ml infusion buchu conc., 0,2135 ml camphor, 0,4453 ml tinct. cinchona co. sine serpentaria, 0,3125 ml balsam sulphuris and 0,3125 ml turpentine oil. [S0] BORSTOL Linctus – Peppermint Flavour. Reg. No.: Y/10.1/53. Each 10 ml of emulsion contains: 200 mg guaiphenesin. [S0] BORSTOL Linctus – Orange Flavour. Reg. No.: Y/10.1/52. Each 10 ml of emulsion contains: 200 mg guaiphenesin. Trademarks are owned by or licensed to the Aspen Group of companies. © 2023 Aspen Group of companies or its licensor. All rights reserved. Marketed by Pharmacare Limited t/a Aspen Pharmacare Co. Reg. No.: 1898/000252/06. Healthcare Park, Woodlands Drive, Woodmead, 2191. Website: ZAR-NKN-04-22-00010 09/2022; Legals: ZAR-AAP-01-23-00001 02/2023

Healthcare. We Care.



INGREDIENTS



INGREDIENT HEROES



ALOE



SPEARMINT



BAOBAB

INGREDIENT LIST

Aqua (Water), Cocamidopropyl Betaine, Aloe Barbadensis (Aloe Vera) Leaf Extract*, Glycerin, Coco-Glucoside, Xanthan Gum, Glyceryl Oleate, Inulin*, Adansonia Digitata (Baobab) Fruit Extract*, Citric Acid, Aspalathus Linearis (Rooibos) Leaf Extract*, Benzyl Alcohol, Dehydroacetic Acid, Tocopherol, Helianthus Annuus (Sunflower) Seed Oil, Cananga Odorata (Ylang Ylang) Flower Oil, Methyl Anthranilate**, Mentha Viridis (Spearmint) Leaf Oil, Citronellol**, Linalool**, Limonene**, Benzyl Benzoate**

*Ingredients from Organic Farming

**Component of Natural Essential Oils

99.5% of the total ingredients are from Natural Origin





Source: Gustav Heess (offtaker of marula oil from Namibia)



Source: eBay
The Body Shop (TBS) uses marula oil from Namibia in many of its products



Source: Rossmann lifestyle centres Germany



The SMME Context

Valorisation of *in situ and cultivated* genetic resources



Importance of definitions, terminology

When carrying out this study it became clear that the definition of “biotrade” was important to clarify.

In Southern Africa “biotrade” is specifically understood in terms of legislation and regulations arising out of National implementation of the Nagoya Protocol.

Table 1: *Terms and Abbreviations Used to Describe Financing of the Biotrade Sector in the Context of this Study*

TERM OR ABBREVIATION	DEFINITION OR DESCRIPTION
ABS	Access and Benefit-sharing as required by national legislation and regulations in countries who are signatories to the Convention on Biological Diversity and the Nagoya Protocol (Source: CBD)
BIODIVERSITY	Biodiversity is the natural capital base for a sustainable economy. The conservation of biodiversity and the sustainable use and trade of biodiversity-derived products and services can provide countries valuable opportunities for economic development and improvement of livelihoods. (Source: UNCTAD)
BIOTRADE	BioTrade is when a product or service sourced from native (indigenous) biodiversity is commercialised and traded in a way that respects people and nature. (Source: UNCTAD) Commonly used in Southern Africa to refer to trade in indigenous natural plant products
FINANCIAL PRODUCT(S) OR SERVICES OR FINANCIAL INSTRUMENT(S)	A product that is connected with the way in which one manages and uses one's money, such as a bank account, a credit card, insurance, etc. (Source: Cambridge Dictionary)
FINANCING MECHANISM	A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology. (Source: UNFCCC, Article 11, para 1)

Essentially “biotrade” refers to indigenous plant and tree species. Outside of the biotrade sector in Southern Africa “biotrade”, and “BioTrade” could include trade in, and processing of, organic mangoes grown with a biodiversity conservation metric like “tiger friendly”. This led us to understand these related but not identical sectors calling them “adjacent” sectors.

Definitions for SMMEs and cooperatives are diverse

Namibia

- Informal and survivalist enterprises are not included in this definition.
- 2 types of cooperatives: workers' or services
- For cooperatives, >51% of the transactions must be led by or benefit its members
- Support to cooperatives are guided by Ministry of Agriculture, Water, Fisheries & Land Reform
- Support to MSMEs is guided by Ministry of Industrialisation, Mines and Energy
- MSMEs are defined as follows:

Size of enterprise	Total full-time equivalent of paid employees	Total annual turnover
Medium	31-100	<500,000 EUR
Small	11-30	<150,000 EUR
Micro	0-10	< 15,000 EUR

South Africa

- Cooperatives and SMME are classified as small businesses
- Informal and survivalist enterprises are not included in this definition.
- Support to both cooperatives and SMMEs is guided by Department of Small Business Development, and Department of Trade, Industry and Competition
- Small businesses are defined as follows:

Size of enterprise	Total full-time equivalent of paid employees	Total annual turnover
Medium	51-250	<1,750,000 EUR
Small	11-50	< 850,000 EUR
Micro	0-10	< 350,000 EUR

SMEs as part of the solution

- Widespread impact and significant presence to implement sustainable practices at local and global scale:
- **Scale and number** – income and employment
- **Local presence** – ecosystem managers
- **Agility** – new practices & adapt
- **Innovation** – new business models, products and services
- **Connection to communities**
- **Utilisation of traditional / indigenous knowledge and products** – biodiversity-friendly behaviour
- **Sustainable markets** – responsive to growing demand
- **Regulatory compliance** – more agile → reducing risks
- **Resilience** – towards macro-shocks



Source: UEBT



Biotrade Business Models

Typology and Business Models of SMMEs in Biotrade in the Southern African Region



Typology and Business Models of SMMEs in Biotrade in the Southern African Region

Primary Producers:

- directly involved in the extraction or harvesting of biological resources.
- Examples: Small-scale organic/ certified producers (rooibos, buchu, pelargonium), community-based natural resource management groups (marula, devil's claw, manketti)

Processors:

- raw biological resources are transformed into value-added products or basic ingredients
- Examples: Herbal supplement manufacturers (pelargonium, devil's claw), essential oil distillers (Commiphora), organic food processors (rooibos tea, baobab fruit pulp)

Service Providers:

- providing services related to biotrade, such as wildlife conservation services, and consulting on sustainable practices
- Examples: community support organisations (WWF, NNF, Greater Sekukhune Cooperative), business support organisations (WESGRO, CECOSA, NANCi, NDCEAT)

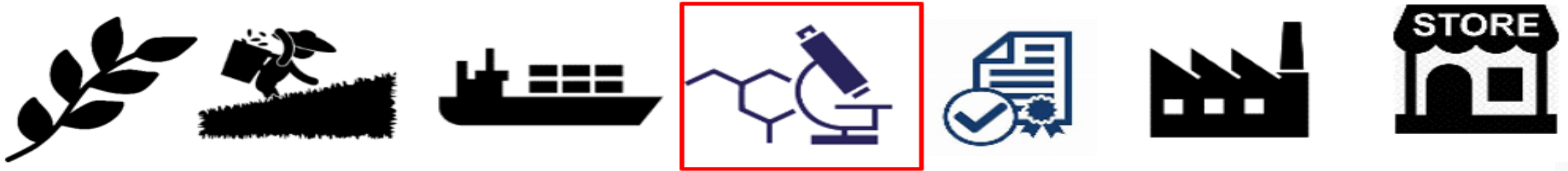
Retailers and Distributors:

- marketing and selling biotrade products, often focusing on niche markets that value sustainability, organic certification, and fair trade.
- Examples: locally – devil's claw exporters, rooibos “board”; European partner – The Body Shop

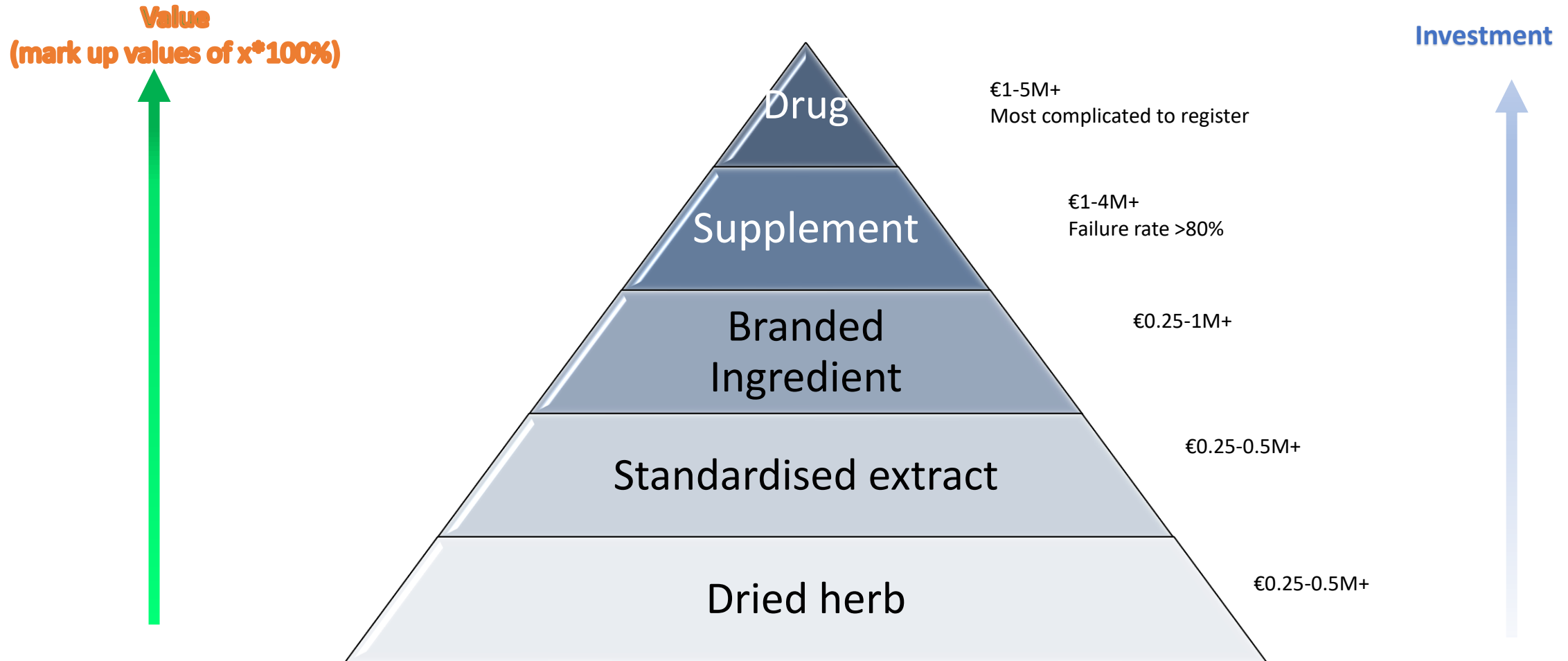
Research and Development Enterprises:

- research, product development, and innovation, including bioprospecting.
- Examples: local – CRIAA (resource Y), Parceval (resource X)

Biodiversity-based Value Chain - from field to consumer



Value Chain and Entry levels to the (Export) Market





Funding Requirements for Biotrade Businesses

Due to the plethora of compliance requirements, consequential financing mechanisms are needed.



„Typical“ funding and the additional finance requirements for SMME in biotrade?

Conventional / Traditional Funding

Operations finance	Asset finance
Start-up capital	Debt repayment
Expansion capital	Cost of Sales
Working capital	Market research, marketing and market access
Employees and Benefits	Technology and Equipment
Emergency fund	Logistics
General business compliance	Equity

Additional funding requirements

Sector-specific funding

Research, Development and Innovation
Mandatory compliance (GMP, safety dossiers, permits, etc.)
Market compliance (organic certification, etc.)
Contingency planning



- ABS compliance
- Building new supply chains
- Access to new markets
- Building industry and consumer awareness

Financing Dynamics in the Biotrade Sector: Bridging the Gap Between SME Demand and Financial Supply

Aspect	Demand Side (SMEs in Biotrade)	Supply Side (Financial Institutions/Funders)
Financing Types	- Working capital for daily operations - Investment in sustainable practices - Funding for market access and product development - Technical assistance for financial management	- Focus on conventional lending products - Short-term financing focus - Limited provision of non-financial support (e.g. TA)
Typical Investment Areas	- Sustainable sourcing and resource management - Development of nature-based products in food, cosmetics, and wellness sectors - Marketing for ethical and green markets - Compliance with standards	- Preference for traditional sectors with predictable returns - Investment in large-scale projects with high financial returns - Limited participation in niche sectors like biotrade
Eligibility Criteria	- Often lack collateral and credit history - Small-scale may fall below revenue/asset thresholds - Require flexible and inclusive financing criteria	- Require high-value collateral and financial track record - Favour established businesses - Stringent criteria that exclude smaller/informal actors
Terms and Conditions	- Need affordable rates reflecting social/environmental impact - Flexible terms aligned with seasonal or irregular income cycles	- Higher interest rates due to perceived risks - Standardised repayment terms often incompatible with SME realities - Pressure for short-term returns
Risk Perception	- Require recognition of sustainability benefits - Need risk-sharing tools (e.g., guarantees, blended finance)	- Perceive biotrade as high-risk due to lack of collateral and market volatility - Minimal deployment of de-risking mechanisms
Alternative Financing	- Demand for innovative financing (impact investing, crowdfunding, green bonds) - Need support for innovation and sustainability	- Limited offerings in alternative finance - Traditional lending dominates - Low institutional readiness to develop impact-oriented instruments



A new approach for the Biotrade Sector is required

Sectors Adjacent to Biotrade already attract large scale finance. What can we learn here?



Sectors adjacent to Biotrade

- *Agroforestry*
- *Organic agriculture*
- *Fair-trade*
- *Regenerative agriculture*
- *Agricultural practices linked to biodiversity or conservation indicators*
- *Agriculture and forestry leading to carbon sequestrations with carbon credits and biodiversity credits opportunities for investors – Nature-based Solutions*
- *Agriculture and forestry leading to climate change mitigation and adaptation*
- *Nature-positive transitioning using renewable energy*



Why focus on SMEs in Biotrade?

- ***Large Collective Impact:***

- Even small changes can be implemented quickly, leading to significant positive impacts on biodiversity.
- Collective effects lead to sustainable biodiversity

- ***Catalysts for Change:***

- Upstream and downstream influence
- Larger corporations, suppliers, and customers, depend on SMMEs creating a ripple effect that promotes biodiversity conservation.

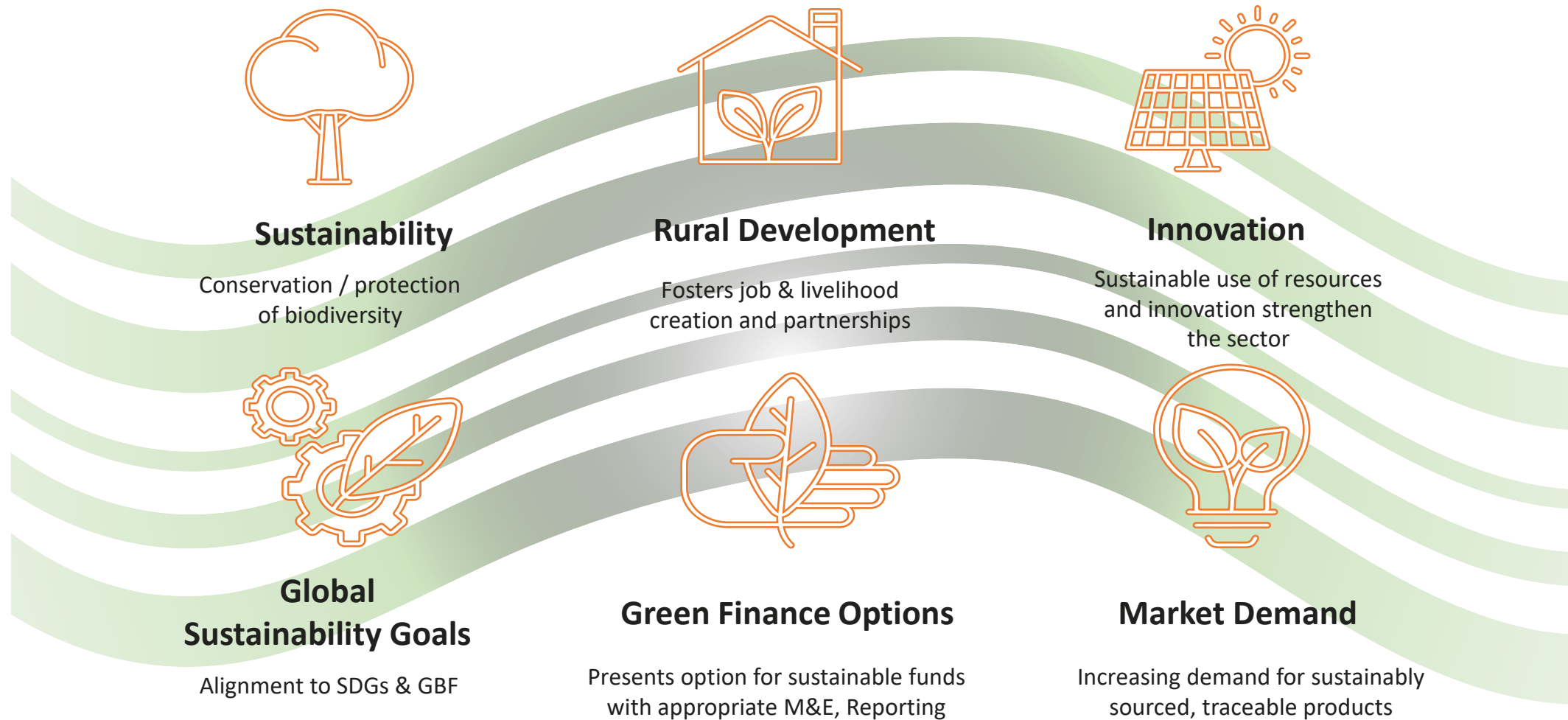
- ***Targeted Support and Scalability:***

- Governments, NGOs, and international organisations can provide targeted support (e.g., training, financial incentives, certification programs)
- Support is easily scalable and replicable across the board.

- ***Job Creation and Sustainable Development:***

- Targeted support to SMMEs in biodiversity-friendly sectors can drive job creation, rural development, and poverty alleviation.
- Efforts can easily be aligned to Sustainable Development Goals and the Global Biodiversity Plan(s)

The Strengths of and Opportunities for SMEs in Biotrade



Source: Dagmar Honsbein



Lessons Learnt & Conclusions

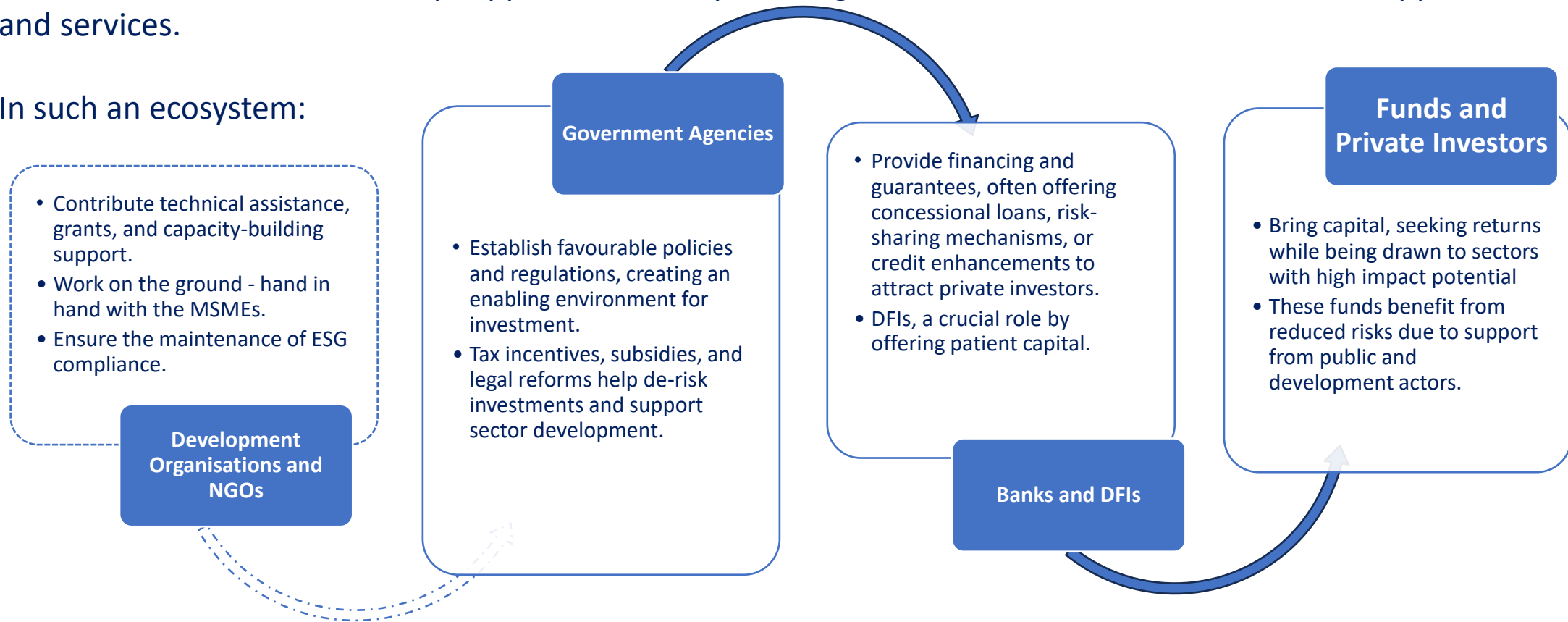
Despite promising opportunities in biotrade markets, most financing instruments fail to meet the nuanced realities of biodiversity-based SMEs—highlighting the urgent need for tailored, blended finance solutions, mutual learning between finance and biotrade actors, and a clearer distinction between general SME barriers and biotrade-specific constraints.



Blended Finance: An Ecosystem

An ecosystem of funds, banks, Development Finance Institutions (DFIs), development organizations, and other stakeholders can collaboratively support a sector by creating a robust network of blended finance opportunities and services.

In such an ecosystem:



=> leveraging strengths - sharing of risks - aligning of incentives - creating a pipeline of investable initiatives
By pooling resources, coordinating efforts, and reducing entry barriers, these stakeholders can catalyse sustainable impact in a way that none could achieve independently.

Building a pipeline of SMEs within the biotrade sector



1. Assessment of SME's stages within the business life cycle based on management practices and their positioning within the Value Chain.
 - What are the key characteristics that positions the SME in each of these categories?
 - What are the key criteria for graduation from one category to another?
 - Who can provide support in each of these categories
 - Public v/s Private funding
 - Public funding models most likely supports 1 & 2 mostly
 - Private funding institutions only gets interested once companies have reached 3 & 4
2. The model should also be applicable for business support organization, alas with differences /adaptations.

We need a joint public-private venture for Impact investing





Thank you for your attention

Special recognition is given to GIZ BIA and ProBATS who funded the financial mechanism study
Dagmar Honsbein and Cyril Lombard were contracted to conduct the review





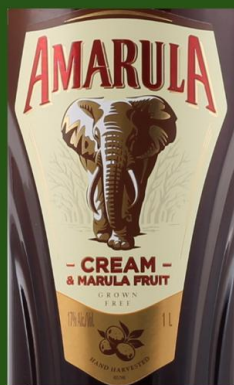
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Financial mechanisms for the biotrade sector: the example of marula fruit



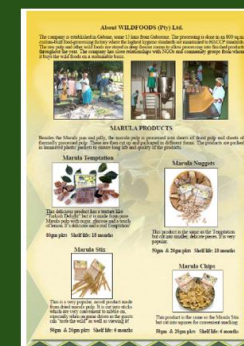
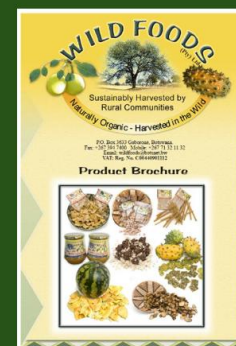
Marula fruit products including the best known

THE
MARULA
FRUIT PRODUCTS ASSOCIATION



Pioneering Marula fruit products – Wild Foods

THE
MARULA
FRUIT PRODUCTS ASSOCIATION



Marula fruit (not including nut/seed oil) as a case study for reflecting on the financial mechanisms to support biotrade

Marula products - Botswana

THE
MARULA
FRUIT PRODUCTS ASSOCIATION



Marula fruit products - Israel

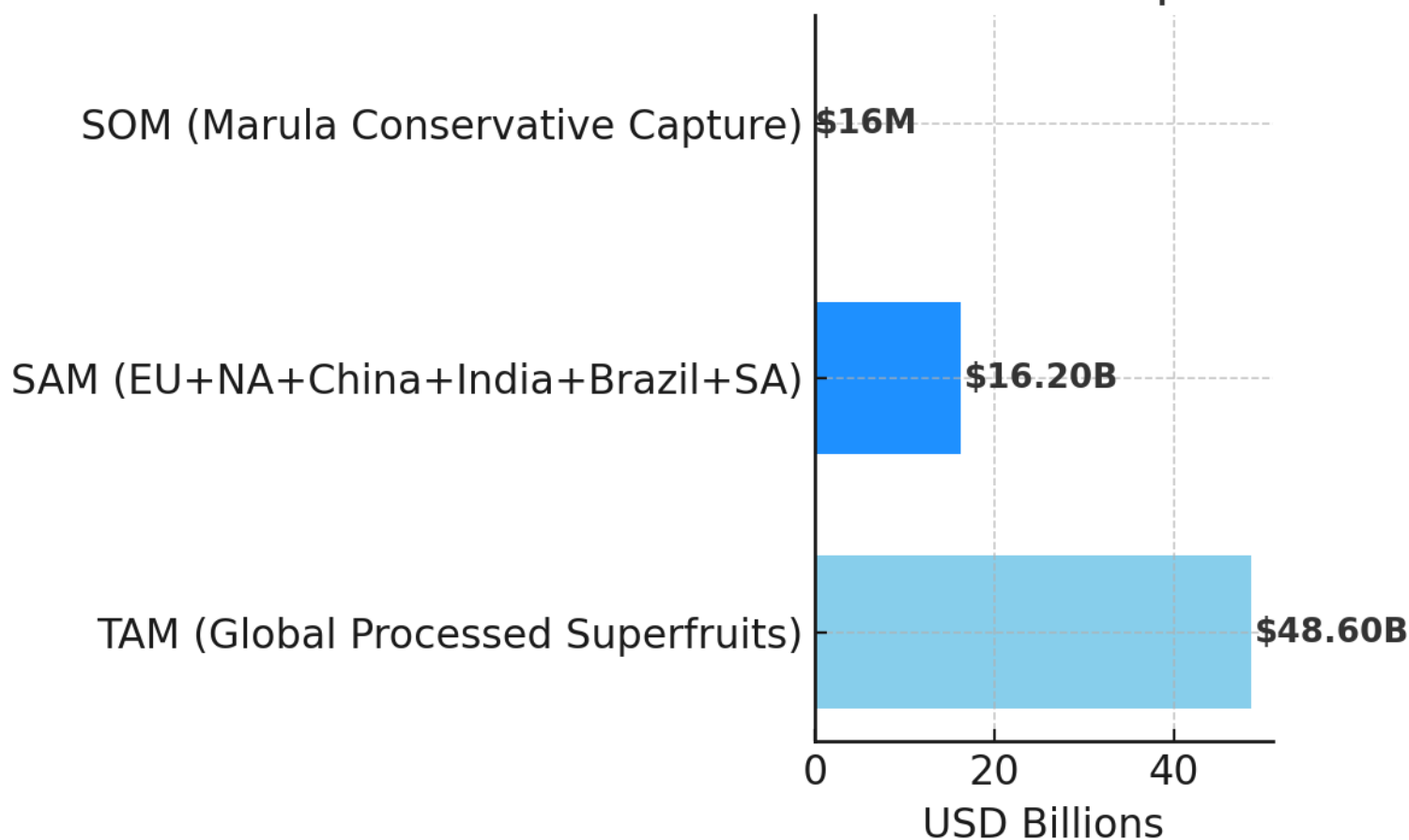
THE
MARULA
FRUIT PRODUCTS ASSOCIATION



- Grown and made in Israel
- Builds on the science in *Borochoy-Neroi 2008*
- Owns the "Ardom" patents



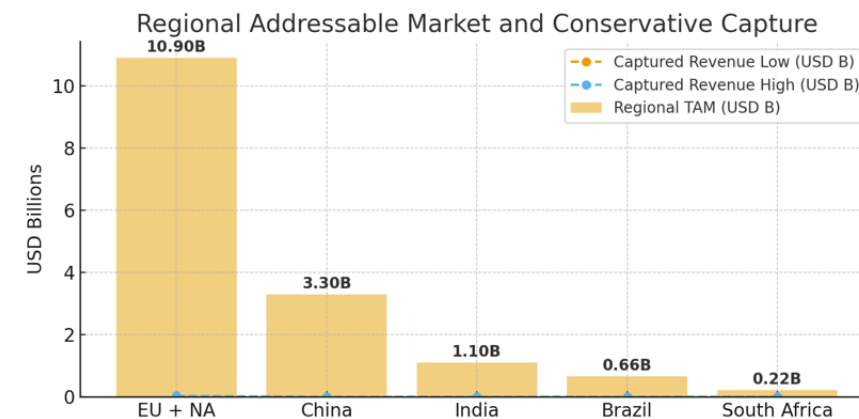
TAM → SAM → SOM for Superfruits /



TAM = Total Addressable Market
 SAM = Serviceable Addressable Market
 SOM = Serviceable Obtainable Market

R272,000,000 / year
 to
 R816,000,000 / year

Global Marula Addressable Market – Conservative View



Conservative Captured Revenue Potential: USD 16–48 M
 per year (Year 5+)



Proxy	Consumer products	Ingredient	Primary applications
Açaí	US\$1.27–1.40B (2023) global açaí foods & ingredients	20% US\$254M	Frozen pulp/purée, smoothie bowls/RTD, concentrates, ingredient powders; built on organic + Fair Trade
Acerola extracts	US\$18.8–20.7B (2023–2024) (extracts across F&B and nutraceuticals)	10% US\$1.9B	Natural <u>vitamin-C</u> / antioxidant in beverages, bakery, meat, supplements
Aronia berries / products	US\$0.60–0.79B (2024)	15% US\$90M	Juice/concentrate blends, extracts; strong EU cultivation (Poland ~50k t/yr, export-oriented)
Dragon fruit	US\$0.53B (2024)	20% US\$106M	Purées, colourful blends/RTD, fruit preps

Açaí = US\$254,000,000 = Rand 4,318,000,000 at ingredient level



Dragon fruit

Why not Marula fruit?



Açaí berries



Acerola berries



Aronia fruit

Publications on Marula fruit, health, nutrition

Thesis
Submitted in fulfillment of the requirements for the degree of doctor
at Wageningen University
by the authority of the Rector Magnificus
Prof. dr. M. J. Kroppf,
in the presence of the
Thesis committee appointed by the Academic Board
to be defended in public
on Friday 25 October 2013
at 11 a.m. in the Aula

Food Reviews International, 28:275-288, 2013
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DOI: 10.1080/10407591.2013.840716



**Sclerocarya birrea (Marula), An African Tree of
Nutritional and Medicinal Uses: A Review**

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ABDELWAHAB²

¹Department of Food Science and Technology, College of Agricultural Studies,
Sudan University of Science and Technology, Khartoum North, Sudan

²Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala
Lumpur, Malaysia

Convincing array of publications
supporting a health positioning
around the metabolic syndrome.
Molecules and compounds such
as phenols, polyphenols,
catechins, epigallocatechins,
flavonoids, seem to be
responsible

**Processing of marula
(*Sclerocarya birrea subsp. Caffra*) fruits:
A case study on health-promoting
compounds in marula pulp**

This is supported by a
body of grey and
confidential literature

Marula fruit, pectin and dietary fibre

TABLE 2.3. NUTRIENT AND PROXIMATE COMPOSITION OF MARULA FRUIT (DR PARTS THIRSDON)
FROM DIFFERENT REGIONS IN SOUTHERN AFRICA

	Estimablen	Isenabene	Isenab	SWA/Namibia	SWA/Namibia
	Fruit	Fruit	Fruit	Flesh	Skin
Moisture	92	91.7	86.4	85.2	80.7
Protein		0.8	0.3	0.1	0.8
Fat		0.1	0.1	0.4	0.4
Ash		0.2	0.4	0.9	1.0
Crude fiber		0.6	0.8	1.4	2.0
Lignocellulose		0.9	1.0	1.4	2.0
Phenolics	2.3	2.3	1.4	0.7	0.8
Carotenes				0.75	0.8
Sucrose	5.9			5.9	5.9

The puree has a total pectin content of about thrice the concentration
present in either the turbid or depectinized juices. Accordingly, the ap-

Fruits of tropical and subtropical
origins, composition, properties and uses.
Nagy G.; Shaw R.E.; Wondolowski W.P.
1970
Ki, Bopp
Florida Science Center
Lake Alfred, Fla.
O - 944.941-00-2

> Unpublished reports suggest pectins and fibres
are abundant, but requires confirmation

> Newer studies don't seem to be interested in
these "old fashioned" compounds...

10%?



2 % pectin, considered high

Selection and Processing of Marula Fruit (*Sclerocarya
birrea subsp. caffra*)

1988

F. Gans, J. A. G. Wilson¹ and P. J. van Wyk²

Marula fruit has been selected as a model system for the study of the effect of ripeness on the content of
phenolic compounds and organic acids. The fruit was selected as a model system for the study of the effect of
ripeness on the content of phenolic compounds and organic acids. The fruit was selected as a model system for the
study of the effect of ripeness on the content of phenolic compounds and organic acids. The fruit was selected as a
model system for the study of the effect of ripeness on the content of phenolic compounds and organic acids.

PRELIMINARY NUTRITIONAL ANALYSIS OF MARULA (*SCLEROCARYA
BIRREA*) FRUITS FROM TWO KENYAN PROVINCES

Hannah Jamirice and Margaret K. Thiong'o
International Centre for Research in Agrobiology
P.O. Box 10077
Nairobi
Kenya

2000

	Units	Subsidiary	Units	Subsidiary	Units	Subsidiary
Moisture	92	91.7	86.4	85.2	80.7	80.7
Protein	0.8	0.3	0.1	0.8	0.4	0.4
Fat	0.1	0.1	0.4	0.4	0.4	0.4
Ash	0.2	0.4	0.9	1.0	1.0	1.0
Crude fiber	0.6	0.8	1.4	2.0	2.0	2.0
Lignocellulose	0.9	1.0	1.4	2.0	2.0	2.0
Phenolics	2.3	2.3	1.4	0.7	0.8	0.8
Carotenes				0.75	0.8	0.8
Sucrose	5.9			5.9	5.9	5.9

10%?



forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

THE ABS
CAPACITY
DEVELOPMENT
INITIATIVE



Marula fruit chemistry, health, nutrition

INTERNATIONAL JOURNAL OF FOOD PRESERVATION
2012, Vol. 35, No. 1, 109-117
http://dx.doi.org/10.1080/03650370.2012.694915



OPEN ACCESS

Nutritional composition, polyphenolic compounds and biological
activities of marula fruit (*Sclerocarya birrea*) with its potential food
applications: a review

Mpho Edward Makhau¹, Tsepo Ebrahim Kgama², Makhado Virginia Makhado³,
Maitso Samuel Mkhay⁴, and Shontani Eugenia Ramahlal⁵

¹Department of Food Science and Technology, Faculty of Science, Engineering and Agriculture, University of Venda,
Thabankwini, South Africa; ²Department of Plant and Soil Science, Faculty of Science, Engineering and Agriculture,
University of Venda, Thabankwini, South Africa; ³Department of Animal Science, Faculty of Science, Engineering and
Agriculture, University of Venda, Thabankwini, South Africa

Table 1. Proximate analysis of edible marula pulp and nut (g/100 g).

Parameters	Pulp	Nut	Functions	FSR	WHO	References
Moisture	81.14	420.417	Serves as essential body part structure, weight, reduces fluid waste while maintaining a body temperature.	2.5-3.7	3.1-3.5	[64,65]
Ash	6.37	247-443	Control hypotension condition in the and maintain acid-balance blood stream.	NA	5.6	[66,67]
Carbohydrates	61.65	63.0-72.29	Dietary energy contribution of many physiologically active compounds and stimulate insulin resistance and inflammation.	275	305	[64,71]
Fiber	4.25	2.47	Reduce glucose absorption and amounts of phytosterols to reduce the risk of colon cancer, constipation, hyperlipidemia and cardiovascular disease.	38	16-55	[69]
Protein	12.46	35.50-38.36	Promote growth and repair of body cells in immune system. Play an important role in molecular scaffolding to memory as beneficial biological functions.	59	38-45	[71,72]
Lipids	9.68	53.04-57.25	Energy provider, synthesis and repair of cell-cell parts to regulate blood pressure.	78	44-77	[71]

FSR: Food and Drug Administration; WHO: World Health Organization; NA: not available



Will Marula be the next superfruit from Africa?

An overview of science supporting new product ideas and what the
Marula sector can learn from Baobab industry growth

14th September 2023
Cyril Lombard



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Rich history of traditional use of Marula fruit

Food Reviews International, 28:275-288, 2013
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DOI: 10.1080/10407591.2013.840716



The ethnobotany of marula (*Sclerocarya birrea*, Anacardiaceae) in South Africa

MARIBETH JESSICA MUTUWA

DISSERTATION

submitted in fulfillment of the requirement for the degree

MASTER OF SCIENCE

BOTANY
at the
FACULTY OF SCIENCE
JOHANNESBURG
UNIVERSITY OF JOHANNESBURG

SUPERVISOR: PROF BEN-ERIK VAN WYE
CO-SUPERVISOR: DR KHATHUTSHILO MASHREWE

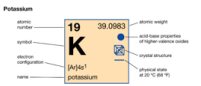
31 JANUARY 2021



Potassium in Marula fruit

Table 2. Potassium content of Marula and other commonly consumed fruits

Fruit	K content (mg)	Fruit weight (g)
Marula flesh	1250	50
Marula Peel	900	50
Apricots (dried)	814	70
Banana	467	118
Dates	542	83
Kiwi	252	76
Melon, cantaloupe	494	160
Orange	237	131



Also called Kalium
hence symbol "K"

Health benefits

Potassium has been linked with health benefits ranging from its impact on blood pressure to muscular function and digestion. Several other more specific health benefits have also been identified and are highlighted below.

Bone Health - A link has been seen between a potassium-rich diet and bone health, particularly in elderly women. This suggests a link to osteoporosis prevention.

Hypokalemia - Potassium is used to symptoms of hypokalemia (low potassium) which includes weakness, lack of energy, muscle cramps, stomach upsets, irregular heartbeat. It is a result of the body losing too much potassium in the urine or intestines.

High Blood Pressure - There is some evidence to suggest potassium causes a slight drop in blood pressure and can reduce the risk of cardiovascular disease. However, there are some contradictory studies and further research is required.

Stroke - People with potassium-rich diets have been shown to have a lower risk of stroke.

Inflammatory Bowel Disease - People suffering from IBD are less able to absorb nutrients and may be required to take a potassium supplement to ensure they are receiving enough.

RDIs by age groups, USA:

- > Infants birth - 6 months: 400 mg/day
- > Infants 7 months - 12 months: 700 mg/day
- > Children 1 - 3 years: 3 grams (3,000 mg)/day
- > Children 4 - 8 years: 3.8 grams (3,800 mg)/day
- > Children 9 - 13 years: 4.5 grams (4,500 mg)/day
- > Adults 19 years and older: 4.7 grams (4,700 mg)/day
- > Pregnant women: 4.7 grams (4,700 mg)/day
- > Breastfeeding women: 5.1 grams (5,100 mg)/day



Available online at www.sciencedirect.com
ScienceDirect
Food Chemistry 181 (2015) 82-87

Food Chemistry 181 (2015) 82-87

Phenolic composition of *Flacourtia indica*, *Opuntia megacantha* and *Sclerocarya birrea*

A.R. Ndihlala, A. Kasiyamhuru, C. Mupure, K. Chitindings, M.A. Benhura, M. Muchuruwi *

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Food Chemistry 181 (2015) 82-87

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Full Length Research Paper

Sclerocarya birrea: Review of the pharmacology of its
antidiabetic effects and toxicity

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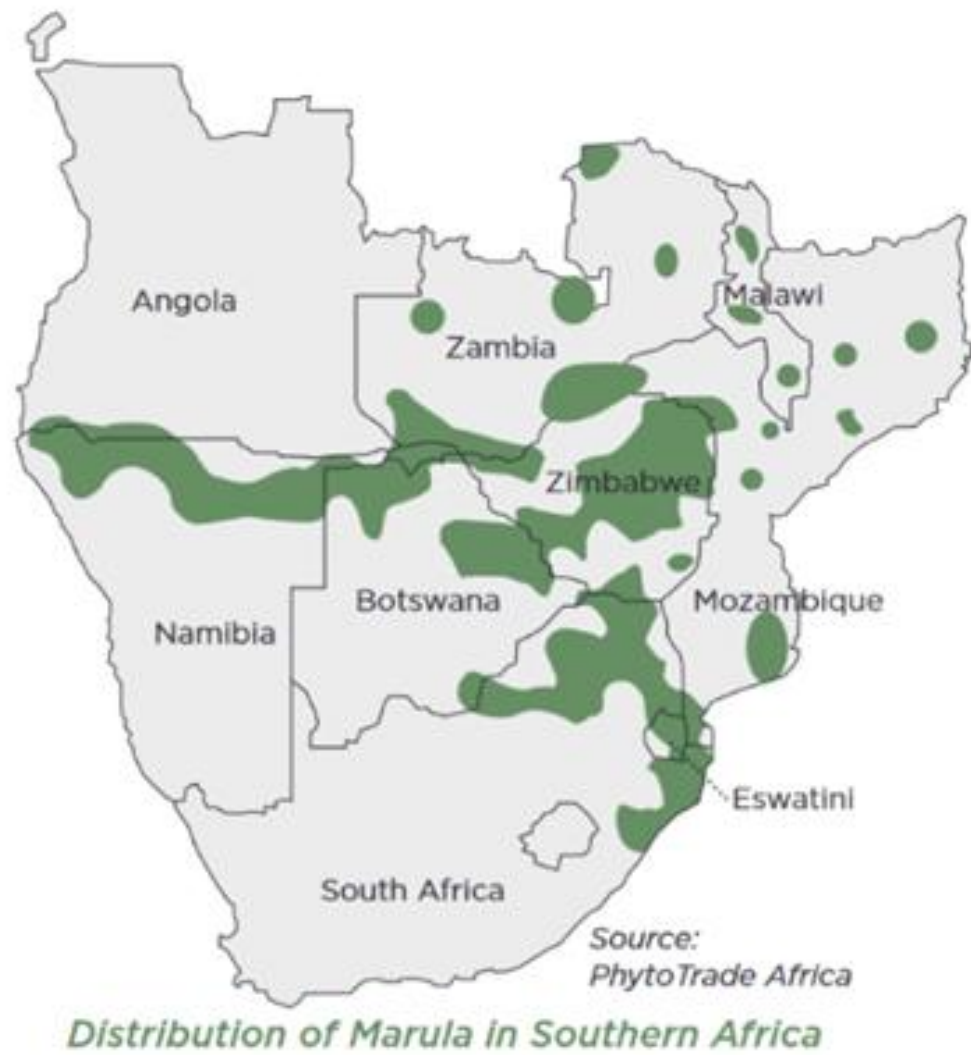
Sclerocarya birrea (Marula), An African Tree of
Nutritional and Medicinal Uses: A Review

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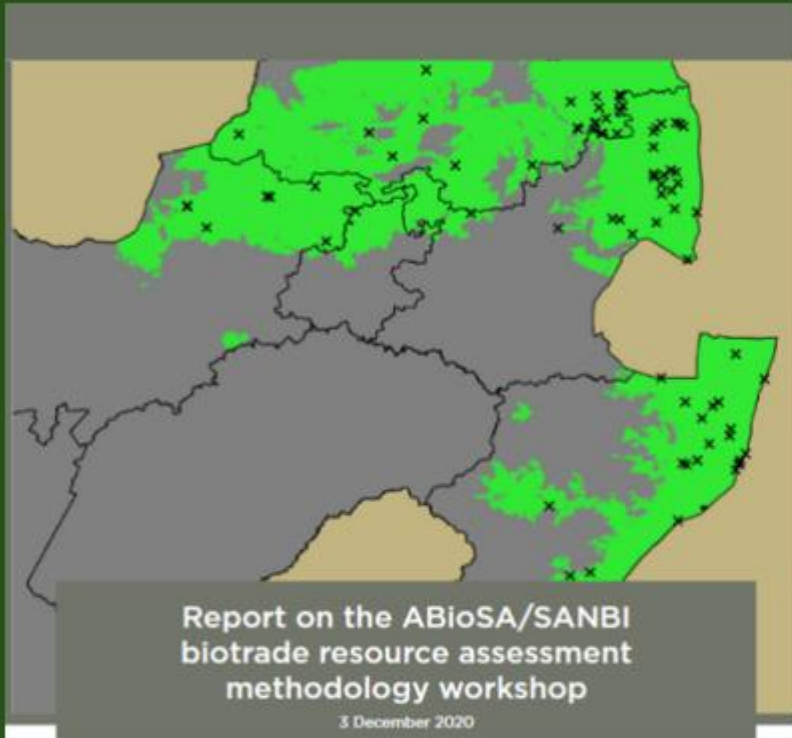
Keywords: Antidiabetic, Anti-inflammatory, Antimicrobial, Antioxidant, Phenolic
compounds, Protein, Oil, *Sclerocarya birrea*





How much Marula is there?

THE
MARULA
FRUIT PRODUCTS ASSOCIATION



An assessment of the marula (*Sclerocarya birrea*) resource in the
Binga, Hwange and Beitbridge districts of Zimbabwe



Submitted to Bio-Innovation Zimbabwe
Clare Douc
Jonathan Whitaker
Scott Richardson
Alexander Melle

December 2014
Contents

BIZ
BIO-INNOVATION
ZIMBABWE
Science Trade World

Prepared by: Saskia den Adel
CRIA SA-DC

For: the Indigenous Plants Task Team (IPTT)

July 2010

Marula Resource Survey

*A report on the Sclerocarya birrea tree population and the
availability of its fruits in Northcentral Namibia*

It was estimated that in principle, people would be willing and able to sell:

- ✓ between 570T and 940T in the EWC associations directly surrounding the factory
- ✓ between 8'000T and 13'500T in the 10'000 households surrounding the factory
- ✓ between 6'000T and 10'000T amongst the whole EWC membership, and
- ✓ between 85'000T and 141'000T in the marula producing areas in North-central Namibia

Marula appears to be abundant





Marula is a peoples' resource



1. There is enormous market potential as assessed by the “superfruit” category and selected proxies like Açaí
2. Marula fruit has the properties that could allow it to become a superfruit, or a unique flavour for beverages, or and ingredient in other health and wellness products
3. Marula fruit is abundant (the most abundant BioPANZA species?) occurring across Southern Africa. There are tens of thousands of people who have Marula on their land and have interesting associated traditional knowledge of the fruit, and are interested in being part of a value chain from source to the consumer

But how do we pull all these pieces together and finance it?

Meso level

What needs to be done at the
sector level?

DRAFT**Marula Fruit Sector Development Plan - Current Ideas for 1 to 3-year Plan**

Pillar	Notes of selected activities	Selected costs
Market Development & Promotion	- Establish partnerships, collaboration between local, regional and international companies - Cooperation with SIPPO, IPD	R1 million [€50K]
Sustainable Supply Chain Development	- Developing innovative solutions for ABS permits (including primary producers, farmers, harvesters, landowners as TK holders) - Resource assessments considering issues specific to Marula fruit selection, varieties, emerging quality requirements - Support to farmer groups to establish quality and reliable supply, scaling through agriculture - Conservation practices	R6 million [€300K]
Product Innovation & Development	- Collaboration between universities, incubators, SMMEs and industry to address current product challenges and develop potential as a superfruit, food and beverage ingredient, local products - Curation of latest science, IP information (BioMoT)	R5 million [€250K]
Quality, Standards & Regulatory Compliance	- Finalisation of EU NFR “master dossier” as basis for global market access and compliance for FBO members - Technical support to develop and operate Master Dossier model, ongoing compliance management - Establish and manage industry standards	R9 million [€450K]
Coordination, Governance & Investment	- Complete proposal with rationale for the “Food Business Operator” as an association, operating model - Launch FBO with board of directors - Raise funds to implement SDP and manage process - Establish M&E system linking to conservation, SDGs and KMGBF goals and targets, UNFCCC, jobs and other targets	R1 million [€50K]



Sector Development Plan Pillar	<i>Selected costs</i>
Market Development & Promotion	R1 million [€50K]
Sustainable Supply Chain Development	R6 million [€300K]
Product Innovation & Development	R5 million [€250K]
Quality, Standards & Regulatory Compliance	R9 million [€450]
Coordination, Governance & Investment	R1 million [€50K]
Total	R22 million [€1.1 million]

Significant costs derive from the requirements of the Nagoya Protocol (ABS permits and agreements, national and international) – we need to negotiate and develop an effective ABS methodology for the sector

Commercialising novel products from plant biodiversity incurs statutory requirements to comply with regulations in target territories – Non-tariff Measures. Without addressing these, market opportunities are limited

What financial or other support mechanisms are there to support these sector-level costs?



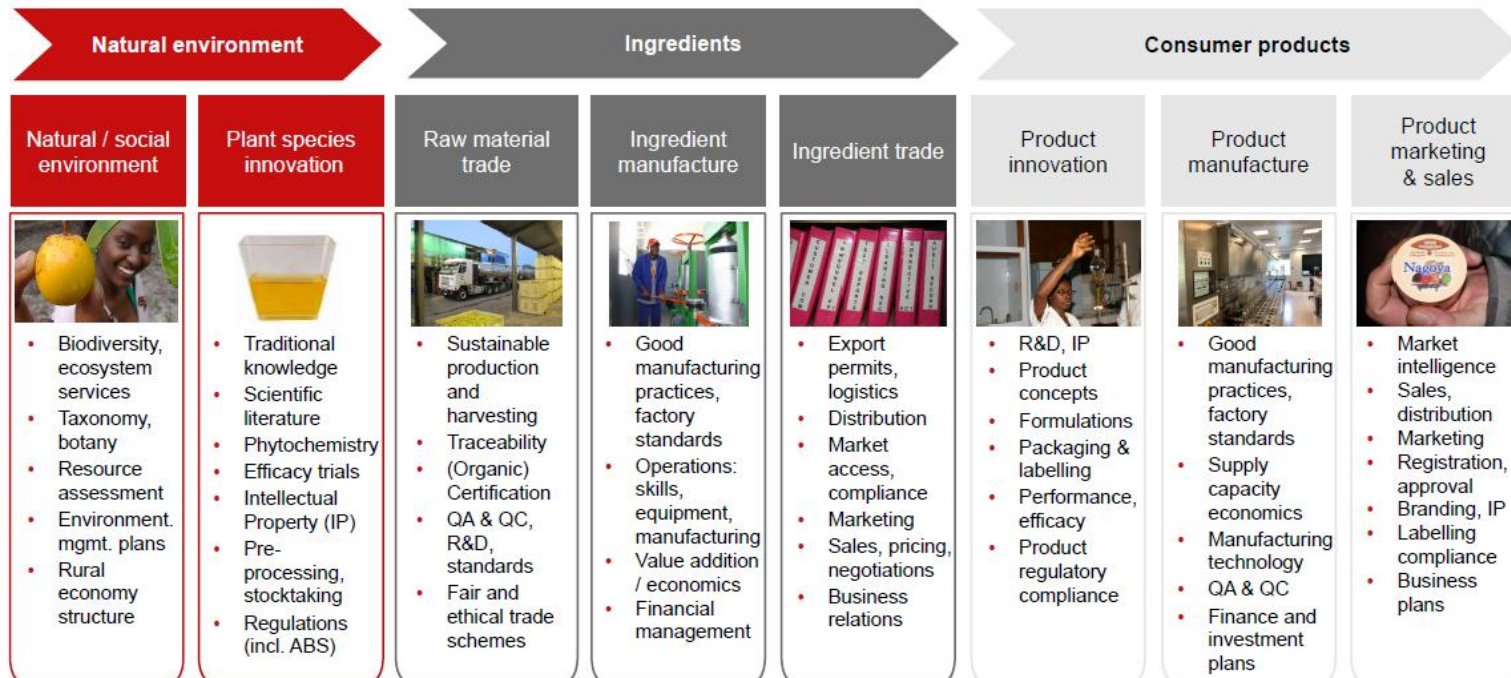
Micro level

What kind of support is needed
at the individual SMME level?

Building a pipeline of SMEs within the biotrade sector



Biodiversity based value chain model from the field to the product



Bearing in mind the categorization issues highlighted in the Market Access Cluster

And that the value chain must function for the sector to be able to grow



Voices from the Marula resource areas

Investor and funder reactions, reflections

Way forward



Thank you for your attention

Special recognition is given to GIZ BIA who funded the financial mechanism study
Cyril Lombard and Dagmar Honsbein was contracted to conduct the review



Subject to time: Some
additional slides

Example from the Amazon



Açaí (*Euterpe oleacea*)



Sustainability

- Rainforest reserves
- Cooperatives, associations
- Certified organic
- Fair trade
- Partnerships, supply agreements
- Local manufacturing of value added ingredients



Innovation is important



Espacenet patent search “*Euterpe oleracea*” + 50 entries

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— of inventorship (Rule 4.17(iv))

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For two-letter codes and other abbreviations, refer to the "Guide to Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PREPARATION AND PHARMACEUTICAL USE OF EUTERPE OLERACEA (ACAI) EXTRACT COMPOSITIONS

(57) Abstract: The present invention deal with a process to obtain a decoction from *Euterpe oleracea* fruits and stones; process to obtain a hydro-alcoholic extract from the decoction; process to obtain a lyophilized and/or spray dried from the hydro- alcoholic extract; pharmaceutical preparations containing the decoction and/or the before mentioned extracts and therapeutic utilization of the preparations in the prevention and treatment of arterial hypertension and other cardiovascular diseases. The extracts induced a significant vasodilator effect in the isolated vascular mesenteric bed of the rats. Capsules and tablets were prepared with the decoctions and lyophilized and or spray dryer of the extracts.

WO 2008/

(57) Abstract: The present invention deal with a process to obtain a decoction from *Euterpe oleracea* fruits and stones; process to obtain a hydro-alcoholic extract from the decoction; process to obtain a lyophilized and/or spray dried from the hydro- alcoholic extract; pharmaceutical preparations containing the decoction and/or the before mentioned extracts and therapeutic utilization of the preparations in the prevention and treatment of arterial hypertension and other cardiovascular diseases. The extracts induced a significant vasodilator effect in the isolated vascular mesenteric bed of the rats. Capsules and tablets were prepared with the decoctions and lyophilized and or spray dryer of the extracts.



Science, health wellness

Table 10: New product launches containing Açaí by functional claim

Functional Claims	Claim frequency
Digestive (Functional)	84
Immune System (Functional)	68
Cardiovascular (Functional)	38
Brain & Nervous System (Functional)	24

2002 to 2012
2,363 products
containing Açaí
were developed
and launched

Table 8: New product launches containing Açaí by company (top 20 only)

Top 20 companies	Number of launches
Sambazon	55
Royal Gypsy Tea	29
Rio Polpas Ind. e Com.	28
Perfekt	26
Powerbrands	26
Stash Tea	24
The Healthy Beverage Company	24
Unique Beverage	23
Honest Tea	22
Genesis Today	19
Ocean Breeze Universal	19
Glacéau	18
The Berry Company	18
Talking Rain Beverage	18
Vrumona	18
Refrigerantes Convenção	18
Albert Heijn	17
Maiautá	17
Parmalat	16
Target	15

Product launches

Blueberry & Açaí Infusion

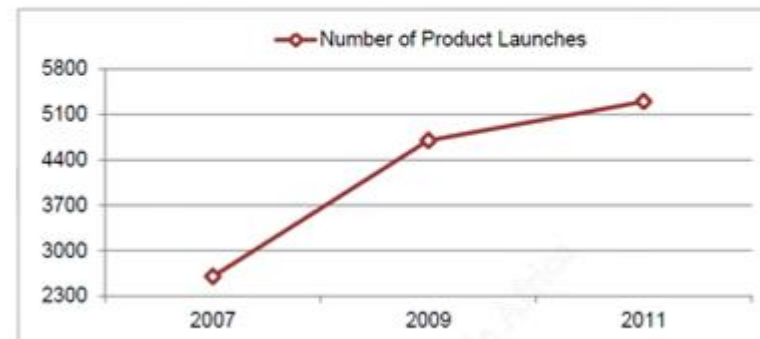
Record ID: 1706513
Company: Tata Global Beverages
Brand: Tetley Superfruits
Category: Hot Beverages
Sub-Category: Tea
Country: Switzerland
Store Name: Migros
Store Type: Supermarket
Store Address: Schönbühl 3321
Date Published: Jan 2012
Product source: Shopper
Launch Type: New Product
Price in local currency: 3.5
Price in US Dollars: 3.86
Price in Euros: 2.87
Bar Code: 5014328074792



Table 7: New product launches containing Açaí by country (top 10 only)

Country	Number of launches
USA	1,125
Brazil	524
Canada	271
UK	136
Netherlands	99
Germany	64
Australia	37
Finland	32
Poland	31
Mexico	29

Year	2007	2008	2009	2010	2011
Number of Product Launches	2600	3700	4700	4500	5300



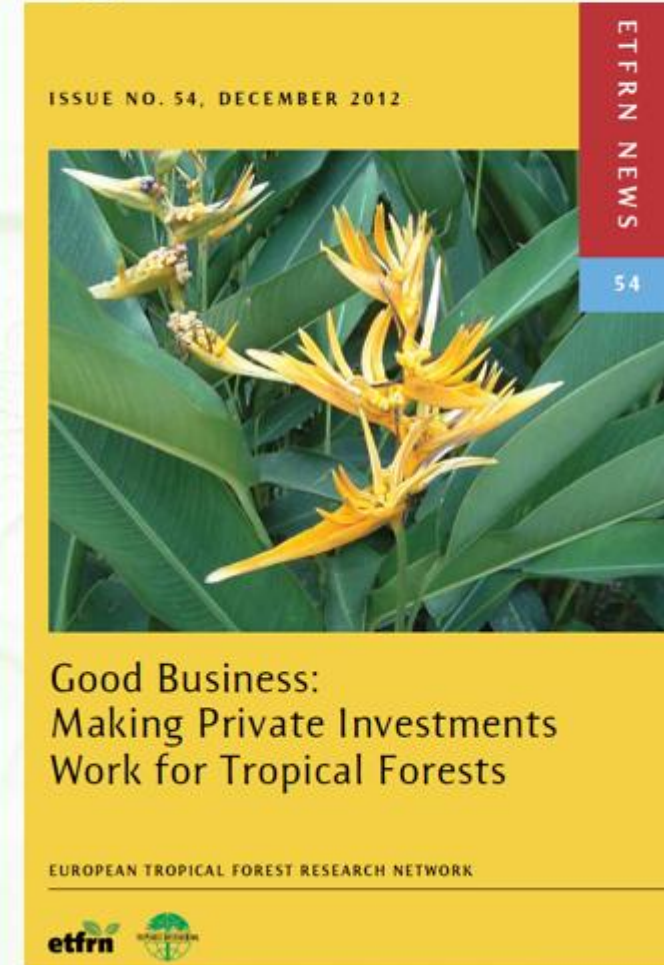
Investment to get Sambazon going



- Brazilian and international donor support to NTFP - local harvesters, resource management, supply chain, certification
- Significant public sector/donor funds
- Sambazon (Saving and Managing the Brazilian Amazon), 2000
- Athletes in extreme sports
- 2003 = 350 retailers
- 2004 = 1,000
- Private sector investment \$200,000 (“angel” investors, co-financiers)
- Leveraged additional financing - OPIC, investors in organics

Investment to get Sambazon going

- EcoEnterprises Fund, Root Capital, Union Bank of California and the project principals.
- Date Invested: October 6, 2003
- 2003 - 2008 = more than US\$10 million sales
- Loan repaid October 2007



Investment to scale up



Dec. 2008: Sambazon Announces
Private Equity Funding from Verlinvest



“We help scale great
companies and create
global opportunities”

Investment probably
\$25,000,000 plus

Stonyfield Farms

Jump to 2025



**Original Açaí Amazon
Energy Drink**



**Original Blend Frozen
Açaí Superfruit Packs**



**Mango Passion Fruit
Frozen Açaí Bowl**



**Acai Berry Frozen
Sorbet**

As of May 2025, Sambazon's estimated annual revenue is approximately \$75 million, with a workforce of around 537 employees across five continents . The company has raised a total of \$115 million in funding to date . In March 2024, Sambazon acquired SunOpta's açai and smoothie bowl business, a strategic move aimed at enhancing its product portfolio and doubling its production capacity .

LeadIQ

Tracxn

The Business Research Company





Thank you for your attention

