



NTFP Market Assessment Final Report

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The ECODIT Trust

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List of Acronyms

ABA	African Baobab Alliance
ABS	Access and Benefit Sharing
ABioSA	ABS Compliant Biotrade in Southern Africa
AGRITEX	Agricultural Advisory Services, Ministry of Lands, Agriculture, Fisheries, Water, and Rural Development
AIPO	African Intellectual Property Organization
BIZ	Bio Innovation Zimbabwe
CAGR	Compound Annual Growth Rate
CBI	Centre for Promotion of Imports, Netherlands Ministry of Foreign Affairs
DDC	District Development Coordinator
EGO	Economic Growth Office
EMA	Environmental Management Agency
EU	European Union
FC	Forestry Commission
FDA	US Food and Drug Administration
FGD	Focus Group Discussion
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GoZ	Government of Zimbabwe
GRAS	Generally Recognized as Safe
GSA	Global Shea Alliance
HS	Harmonized System [of Customs codes]
KII	Key Informant Interview
MoAg	Ministry of Lands, Agriculture, Water, Fisheries, and Rural Resettlement
MoT	Ministry of Environment, Tourism and Hospitality Industry
MoWA Development	Min of Women Affairs, Gender, Community, Small and Medium Enterprise
MT	Metric Ton
NBA	National Biotechnology Authority
NGO	Non-governmental organization
NPV	Net Present Value
NTFP	Non-timber forest product(s)
PTA	PhytoTrade Africa
RDC	Rural District Council
SEL	Southeast Lowveld
SADC	Southern African Development Community
SAZ	Standards Association of Zimbabwe
SECO	Swiss State Secretariat for Economic Affairs
SME	Small and Medium Enterprise
SVC	Save Valley Conservancy
UNDP	United Nations Development Program
USAID	US Agency for International Development

Executive Summary

This report was prepared by John Macy and Cyril Moyo, independent consultants, on behalf of USAID Zimbabwe and The ECODIT Trust, a subsidiary of ECODIT LLC, the prime contractor for the Resilience ANCHORS project, financed by USAID Zimbabwe.

The objective of the Non-Timber Forest Product (NTFP) Market Assessment project was to assess the commercial viability of five specific NTFP value chains (baobab, marula, Kalahari melon seed (KMS), ximenia, and ilala palm), identify constraints to commercialization, and make recommendations for how USAID Zimbabwe could most productively invest to foster growth of the markets for these NTFPs.

The NTFP Market Assessment consultancy took place between January 17, 2022 and March 4, 2022. The team used a combination of literature reviews, data analysis, key informant interviews, focus group discussions, and case studies to ascertain market size and growth rates for each NTFP value chain, identify key issues and opportunities, estimate market potential for Zimbabwe, and identify needed areas for USAID investment and support.

Current global market sizes are still relatively low, with baobab ingredients estimated at \$50-75 million (at export value)¹, marula at \$42-50 million, KMS at \$5-7 million, ximenia at less than \$1 million, and Ilala palm basketry products at around \$10-15 million. For the fruit products, the growth rates tend to be inversely related to market size, with baobab and marula having lower projected growth rates (3-6%) than KMS and ximenia (10-20%), mostly because of their different levels of market maturity. Ilala palm baskets are expected to grow at a rate of about 3-5%, although US imports grew at a rate of almost 12% over the last decade.

Profitability is quite variable across the five NTFPs. Daily income ranges from \$1.13/day at the low end to \$6.71/day at the high end for the fruit NTFPs. Similarly, total annual income per collector ranges from \$10.70/year at the low end to \$143.15/year at the high end. KMS has the potential to generate the highest daily income, while ximenia has the potential to generate the highest total annual income, although KMS could generate more total income if farmers dedicate more land to cultivation of the melon. In contrast, basket weavers can earn \$10/day and as much as \$2,400 per year because of their higher skill level and production of value-added products.

¹ Note that market research studies peg the global market for baobab at \$4.0-4.5 billion, but this market estimate likely includes consumer end-use products containing only a very small percentage of baobab powder or oil as an ingredient (often less than 2% of the overall product).

Several important themes and issues emerged from the study: (1) low consumer and industry awareness and utilization; (2) inconsistent quality and no common standards; (3) small, fragmented supply chains with seasonal supply are challenging for large customers to manage; (4) improved tools and equipment would be helpful to enhance efficiency and quality; (5) supplies of some NTFPs are inadequate and will require tree planting campaigns; (6) some basket buyers lack adequate working capital, and trade finance would be helpful to mitigate a long cash-to-cash cycle in the oils value chains; (7) scientific research to support efficacy of claims is lacking and necessary to effectively grow the oils and powder value chains; (8) certification might be helpful, but it is quite costly; (9) shipping costs and long lead times inhibit growth of the basket value chain; (10) strong, well-resourced trade associations are essential to the development of these value chains, but will require long-term support. In spite of all these issues, the case studies of shea, argan, açai, and goji berries suggest that significant growth is possible with the right investments and policy framework.

Assuming adequate funding levels and effective implementation, the team estimates the net present value (NPV) of Zimbabwe incremental sales over the next ten years (using the Likely Case) to be \$7.8 million for baobab powder, \$3.3 million for the oils (combined), and \$780,000 for woven palm products. The NPV numbers are substantially higher when using the High Case or extending the calculations out to 20 years.

Additional considerations that can and should influence strategic choices by the mission include the potential for commercialization of the NTFPs to contribute to forest and biodiversity preservation, the potential of each NTFP to contribute to rural household poverty reduction and resilience, as well as the relative timelines to achieve lift off in each NTFP. In regard to the first consideration, KMS is the least likely to contribute to forest and biodiversity preservation because it will almost certainly be a cultivated crop rather than a wild-harvested crop. Baskets are most likely to contribute to poverty reduction because of their high daily and annual incomes. Baobab powder and the oils are not likely to make substantial contributions to poverty reduction, although they are potentially important income diversifiers. All of the fruits have the potential to contribute in varying ways to resilience and food security through their nutritional and income diversification benefits. Both KMS and ximenia are likely to have a much longer timeline to achieve lift off because they are the least developed, have the least consumer awareness and the least commercial products incorporating them. In addition, effective processing of ximenia may require the development of modified pressing and filtration equipment, further lengthening its timeline. While KIs suggest that both products have considerable market potential, it will likely take several years longer to achieve that potential. Conversely, baobab, marula, and ilala palm baskets are capable of realizing their potential much more quickly because they have the most developed markets and supply chains.

A variety of risks could create challenges and reduce the impact derived from these NTFPs. These include environmental, market, supply chain, political, and competitive risks. It is recommended that stakeholders periodically monitor these risks and take active steps to manage or mitigate their effects.

The team recommends that USAID Zimbabwe invest to address many of the key issues mentioned above. Specific recommendations are given below in the section on Recommendations for Funding Assistance. Given the regional nature of these value chains, it makes sense to engage other donors and other USAID country missions to support these initiatives along with USAID Zimbabwe. We also recommend that USAID Zimbabwe scale its funding support for these value chains based on the NPV for each NTFP category.

Introduction

Background

With an economy principally focused on agriculture, Zimbabwe's development progress depends in the short to medium term on the effective, efficient, and sustainable use of its natural resources. Unfortunately, Zimbabwe's forests and biodiversity are in steep decline, with steady deforestation and unsustainable exploitation rapidly depleting those natural resources. A lethal mix of fairly frequent droughts, dry spells, and flooding caused by tropical cyclones, increased poverty, population growth, poor land use planning, and weak governance all contribute to this depletion and degradation of natural resources. As a result, food security in rural communities is tenuous at best.

In addition to its more traditional agricultural development programming (e.g., the FARM activity²), in July 2020 USAID Zimbabwe launched Resilience ANCHORS, a five-year community-based natural resource activity which targets communities living in close proximity to protected areas to increase their capacity to sustainably protect and manage natural resources. One of the components of Resilience ANCHORS is to support community income-generating activities that utilize natural resources in a sustainable manner.

Non-timber forest products (NTFPs) are products other than wood that are extracted from natural forest or woodland areas for use by rural communities, domestic consumers, or exported to consumers all over the world. Uses of these NTFPs range from food, beverages, cosmetics, and medicine (both traditional and modern), to animal feed and handicrafts. While NTFPs have been utilized by local households for thousands of years, true commercialization is a relatively recent phenomenon. Recent efforts to promote the commercialization of baobab, marula, and other NTFPs in Zimbabwe and across the SADC region have met with some success. However, successes achieved with shea butter, argan oil, and açai (among others) point to the potential for much greater success. For example, Ghana (one of the largest exporters) now exports shea butter and its derivatives valued at \$90 million annually (55,990 MT).

² Fostering Agribusiness for Resilient Markets (FARM) is a 5-year agricultural development activity assisting 20,000 farmers with livestock and crop development in Masvingo and Manicaland. The objectives are to increase productivity, strengthen value chains, and increase crop and livestock sales.

A preliminary assessment and ranking of NTFPs was conducted by Bio Innovation Zimbabwe (BIZ) in late 2021 for the Resilience ANCHORS activity. That study concluded that five NTFPs (baobab, marula, KMS, ximenia, and ilala palm) are worthy of further study and potential investment by USAID Zimbabwe. A 2020 study funded by the UKAid's Livelihoods and Food Security Programme analyzed many plant species in Zimbabwe using the FAO's Market Analysis and Development Methodology (which includes marketing potential, ecological sustainability, socio-economic benefits to producers, and availability of appropriate technologies to produce the products). Out of the 79 species included in that analysis, the five target NTFPs which are the subject of this consultancy were ranked:

- Number 1 (Marula),
- Number 2 (Baobab),
- Number 3 (Kalahari melon),
- Number 7 (Ximenia), and
- Number 17 (Ilala palm).³

Thus, based on these two initial assessments, the target NTFPs appear to be prime candidates for commercialization.

Project Objectives

The primary objective of this project is to conduct a deeper analysis of five targeted Non-timber Forest Product (NTFP) value chains in Zimbabwe and assess their commercial viability. Learnings from the analysis will help the USAID/Zimbabwe Economic Growth Office (EGO) better target NTFP value chains for commercialization in support of resilience development objectives. The EGO hopes to leverage this study to help develop market-led income generation and employment opportunities for rural Zimbabweans while ultimately strengthening important natural resource management outcomes like forest and watershed management, reducing human-wildlife conflict, and biodiversity conservation.

This FSSC-II consultancy will build from the previous USAID-funded BIZ assessment of NTFP opportunities in the USAID Resilience Focus Zone (specifically the Southeast Lowveld) which highlighted five NTFP value chains for further consideration. This consultancy used that final report as a starting point to conduct a deeper analysis on the gaps, constraints, and overall viability for commercialization of these selected value chains.

More specifically, the objective of the project was to assess the commercial viability of the specific NTFP value chains including profitability, market requirements, and noteworthy constraints to commercialization such as business costs, political-risk, technology gaps, availability of labor, regulatory challenges, access to finance, marketing, transportation, seasonality of supply and/or demand, domestic and foreign demand, international trade-related factors, etc.

³ "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pages 2-4, Livelihoods and Food Security Programme, UKAid

Project Deliverables

The final deliverable of the present project is a report documenting the viability of the specific NTFP value chains, constraints, key lessons learned, and recommendations on how USAID should support the development of these value chains. Additionally, the team will make a presentation to the USAID Mission in Zimbabwe on the key findings.

Project Timeline

The NTFP Market Assessment consultancy took place between January 17, 2022 and March 4, 2022, with the Final Report submitted to USAID Zimbabwe on March 7, 2022.

Methodology & Approach

Much work has already been done to study a variety of non-timber forest product value chains and a number of companies have tried to commercialize these value chains over the past 25-plus years with varying levels of success (both in Zimbabwe and other countries). To get a comprehensive understanding of the historical efforts, current situation, trends, key issues and best pathways forward, the team utilized a multi-faceted approach for this present study. The methodology included a review of many reports and documents; analysis of a variety of data; interviews with key stakeholders and informants; focus group discussions with rural collectors and harvesters; case studies of similar value chains; analysis and brainstorming sessions; etc. These methods are described in more detail below.

Literature review

The team reviewed hundreds of documents including prior project reports, technical research studies, market research studies, case studies, news articles, information available on company websites, etc. Three sources that are particularly noteworthy are:

- BIZ (Bio Innovation Zimbabwe), which has carried out many resource mapping studies, implemented several NTFP development projects, and conducted a number of relevant studies;
- ABioSA (ABS Compliant Biotrade in Southern Africa, a project funded by the Swiss State Secretariat for Economic Affairs (SECO) and implemented by GIZ), which conducted many studies and wrote a number of relevant technical briefs (some of which are listed in Annex F);

- CBI (Centre for Promotion of Imports from developing countries, funded by the Netherlands Ministry of Foreign Affairs), which has funded and published numerous studies and reports on a variety of value chains, market potential, market entry requirements, etc.

Data analysis

Data analysis was an important component of the study. A variety of data was analyzed including market size & growth rates, US and EU Import data, Google Search Trend and Instagram hashtag post data as proxies for consumer awareness, number of product mentions in trade journals as a proxy for industry awareness & utilization, tree inventories, tree and nut yields, pricing and gross margin data. Much of that data can be found in the body of this report or in one of the annexes.

Key Informant Interviews

The team met with and interviewed over 60 individuals in government, private sector companies involved in the value chains, non-governmental organizations, trade associations, shipping companies, and financial services (see Annex C for a complete listing of KIIs). The KIIs were distributed across these groups as enumerated below. Key Informant Interviews necessarily varied depending on the interviewee, but generally followed a KII interview guide which can be found in Annex D.

KII Category	# of KIIs Conducted	Value Chain Focus
Private Sector Companies & Cooperatives	20 7 3	Oil seeds & Baobab powder Baskets Smoothie Companies
Financial Services	2	All
Shipping and Logistics Companies	2	All
NGOs & Trade Associations	8	All
Government	3 13 KIIs 6 Courtesy Calls/Briefings	GoZ District/Local
Total	64	

Focus Groups

Due to tight time constraints as well as inherent challenges scheduling focus group discussions during both the rainy season and the political season leading up to elections, only a few focus group discussions could be arranged. However, recognizing that the perspectives of rural collectors and producers were important inputs to the study findings, the team conducted several focus group discussions in various geographic areas as enumerated below. Focus group discussions followed a focus group discussion guide which can be found in Annex E.

Location (District/Village)	# of Participants (Total/F/M)	Value Chain Focus
Chiredzi (Ward 23)	Total: 13 Adults F: 6; M: 2 Youth F: 4; M: 1	Baobab, Marula, KMS, Ximenia
Chiredzi (Ward 10)	Total: 14 Adults F: 6; M: 3 Youth F: 4; M: 1	Marula, KMS, Ximenia, Ilala
Chipinge (Ward 29)	Total: 30 Adults F: 21; M: 7 Youth F: 2; M: 0	Marula, KMS, Ximenia, Ilala
Chipinge (Ward 30)	Total: 14 Adults F: 11; M: 3 Youth F: 7; M: 2	Marula, KMS, Ximenia, Ilala
Binga (Ward 15)	Total: 20 Adults F: 13; M: 0 Youth F: 7; M: 0	Ilala Palm Baskets
Binga (Ward 16)	Total: 31 Adults F: 30; M: 0 Youth F: 1; M: 0	Ilala Palm Baskets
Total	Total: 122	

Case studies

To round out the team's understanding of the key issues involved in developing markets for NTFPs, the team researched the development history of shea butter and argan oil, as well as two superfoods, açai and goji berry. These products were selected because of their similarity to four

of the NTFPs that are the focus of the present study, as well as their successful history of commercialization.

The team reviewed various data, market research studies, project reports, quarterly and annual reports, and other documents on the Global Shea Alliance (GSA). In addition, the team interviewed a representative from the GSA.

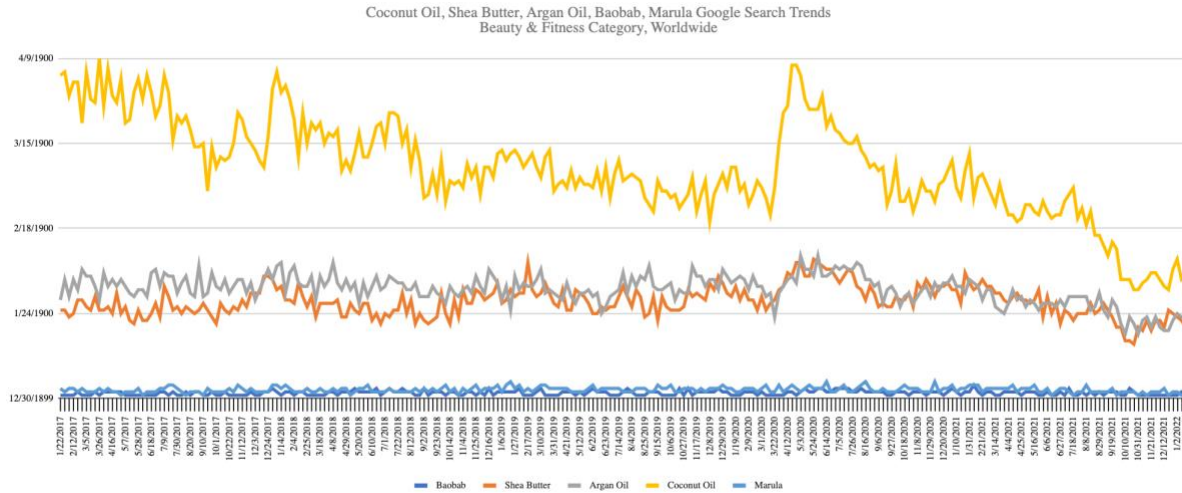
Analysis & Synthesis

After completing the literature review, data collection, KIIs, and FGDs, the team invested considerable time putting the various disparate and sometimes conflicting pieces of information together to form a relatively complete picture of the NTFPs. The team then spent a number of hours debating the most relevant key issues and brainstorming potential solutions. In some cases, the team conducted follow-up KIIs and exchanged follow-up emails with several individuals to gain greater clarity, obtain additional data, and to test out certain hypotheses. Emerging from that process were the key findings and recommendations which can be found in later sections of this report.

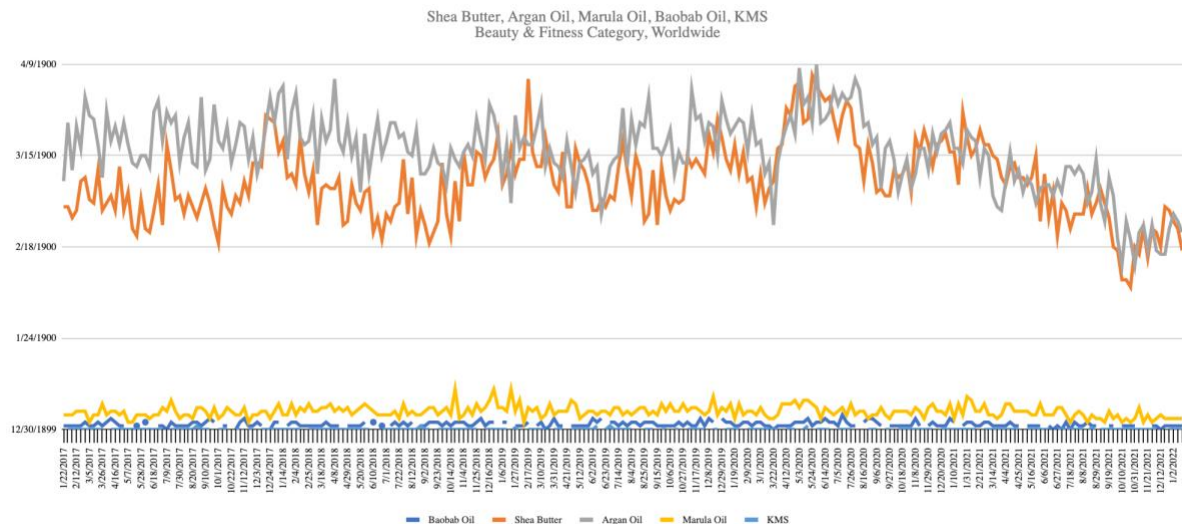
Consumer and Industry Awareness

Consumer Awareness and Interest

Generally, consumer awareness of each of the target NTFP oils is low, both in an absolute sense and relative to competing oils. While the team did not conduct any consumer surveys, we were able to use Google Search trend and Instagram hashtag posting data as proxies for consumer awareness and interest. Below is a graph of consumer search trends in the Beauty and Fitness Category comparing worldwide searches for coconut oil, shea butter, argan oil, baobab oil, and marula oil over the past 5 years. Coconut oil (yellow line) has by far the highest awareness and consumer interest. Roughly tied for second and third place are shea butter (orange line) and argan oil (gray line). Baobab oil (dark blue line) and marula oil (lighter blue line) barely register on the search trends data.



When we drop coconut oil from the analysis and include KMS oil the search trends change slightly but still paint a consistent picture.



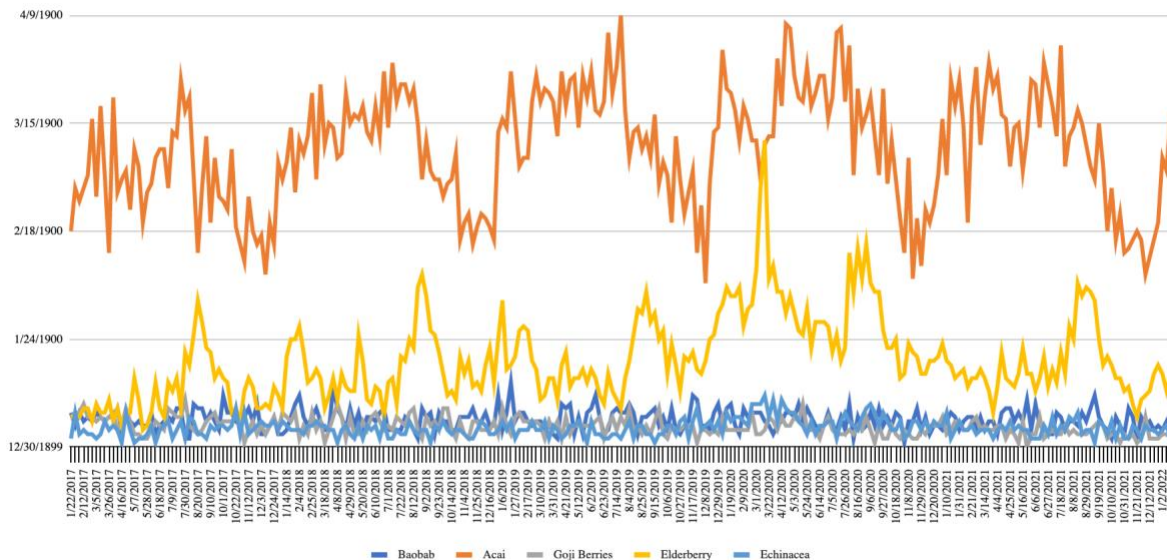
In the above graph, shea butter (orange) and argan oil (gray) are roughly tied for first and second place. Marula (yellow) is a distant third, and baobab oil (dark blue) and KMS oil (lighter blue) are barely registering in fourth and fifth place. Ximenia was not included in either graph because it had virtually no Google searches.

Using Instagram posts as another proxy for consumer awareness, we see a similar pattern in consumer interest and engagement, with shea butter and argan oil having a commanding lead. For convenience, the target NTFPs are highlighted in red in the table below.

Instagram Hashtag	# Posts
#sheabutter	1,890,841
#arganoil	1,203,175
#marulaoil	77,010
#moringaoil	45,807
#baobaboil	25,923
#kalaharimelon	1,750
#kalaharimelonseedoil	983
#kalaharimelonoil	538
#ximeniaoil	291

Switching to the Food & Beverage category, there are somewhat similar consumer search trend patterns when we compare baobab powder to açai, elderberry, goji berries, and echinacea. Acai (orange) is the strong number one leader, followed by elderberry (yellow) in second place. Baobab is roughly tied with goji berries and echinacea for rather distant third, fourth, and fifth places respectively.

Acai, Elderberry, Baobab, Goji Berries, Echinacea Google Search Trends
Food & Drink Category, Worldwide



The conclusion we can draw from these three graphs is that consumer awareness of and interest in the target NTFP oils and baobab powder is fairly low. This conclusion is supported by the following quotes from ABioSA,

“[in 2010 when baobab products began to be launched], both Baobab oil and powder were virtually unknown in export markets and there was almost no initial demand.”

“A 2018 survey of UK consumers showed that only 23% had heard of Baobab, of whom just 26% [in other words about 6%] had actually tasted it.”⁴

and this quote from the African Baobab Alliance:

“A major constraint to the growth of the baobab industry remains the relative lack of awareness amongst consumers as to what baobab is and what the benefits of consuming baobab products are”.⁵

Again, using Instagram posts as an additional proxy for consumer awareness, we see a similar story unfold. For convenience, we have highlighted baobab in the table below. As with the oils, several other superfoods have a commanding lead over baobab powder.

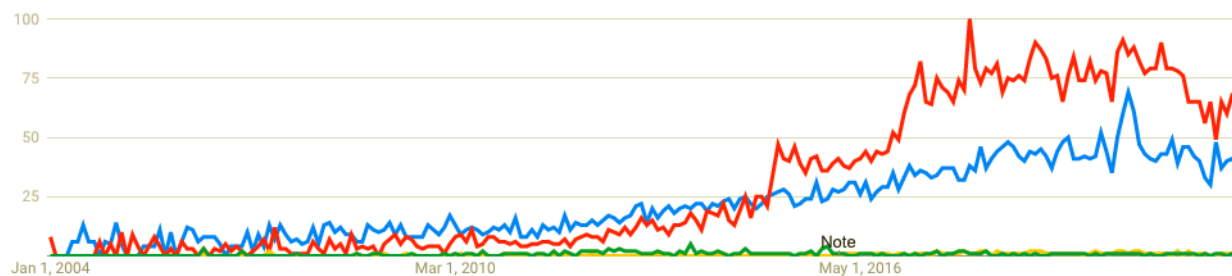
Instagram Hashtag	# Posts
#spirulina	4,577,657
#acai	2.9 million
#acaibowl	1.8 million
#pomegranate	2,159,144
#chiaseeds	1,876,559
#gojiberry	450,000
#echinacea	374,981
#echinaceapurpurea	41,078
#elderberry	336,439
#baobab	348,010
#baobabpowder	15,845
#camucamu	104,219

But all is not bleak. When we take a longer term view from 2004 to early 2022, the Google Search trends show definite progress for baobab and marula (although very little progress for KMS and ximenia). The graph below illustrates searches in the Beauty and Fitness category. Both baobab

⁴ “How the Baobab industry developed - From emerging to maturing sector”, ABioSA Case Study, June 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA-case-study-Baobab-emerging-to-maturing-industry-2021.pdf>

⁵ “A Two-Year Programme to Activate and Operationalise the African Baobab Alliance”, page 6, African Baobab Alliance, February 2022

and marula show significantly upward trends over the last 15 years, with marula (red line) overtaking baobab (blue line) in 2014.



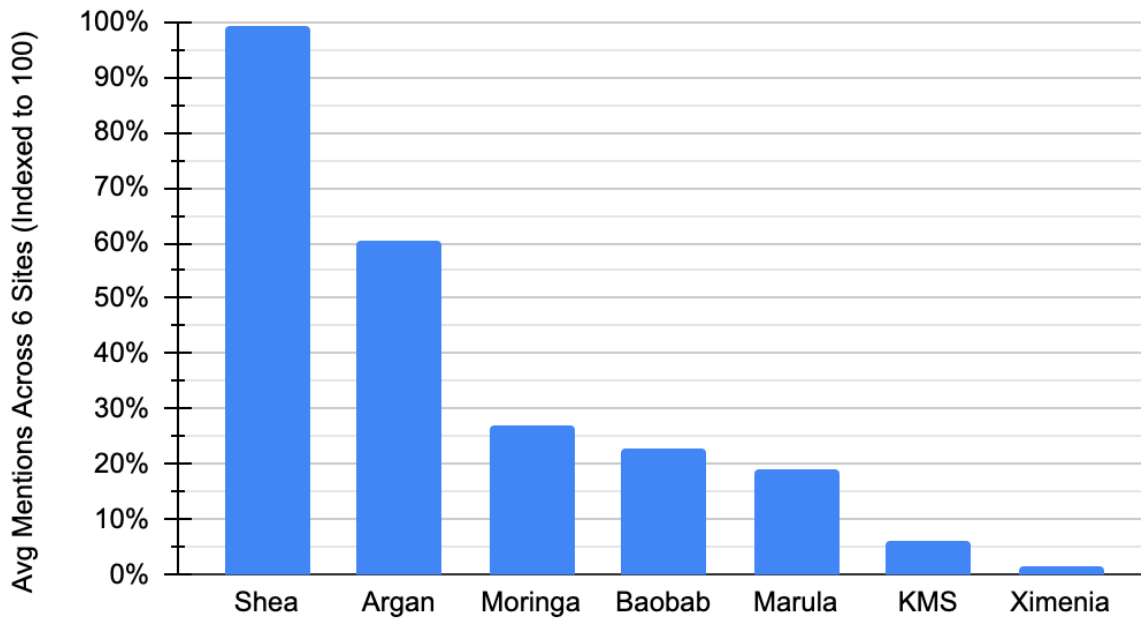
Within the Food and Beverage category over the past 18 years, marula outstrips baobab, likely because of the popular Amarula liqueur. Search trends in the Health category also show similar upward trends, although in that case, baobab remains far ahead of marula. Progress has clearly been made in consumer awareness for some of these products (especially baobab and marula); but among the oils, coconut oil, shea butter, and argan oil have a sizable head start, and among the superfoods açai, pomegranate, and elderberry have a large head start. It is also important to note that there is somewhat greater awareness of and interest in the target NTFP products in Europe than in the US.

Industry Awareness and Interest

Turning our attention from the consumer to the cosmetics and personal care industry as well as the food and beverage industry, we see similar trends. To gauge industry awareness and interest in our target NTFPs we looked at the number of product mentions in six cosmetic, beauty, and personal care journals as a proxy. When compared against shea butter, argan oil, and moringa oil, our target NTFP oils (baobab, marula, KMS, and ximenia) are in relatively distant fourth through seventh places as can be seen from the graph below⁶. Note that this data is not completely comprehensive; the data shows product mentions by the journals, not all products incorporating these oils.

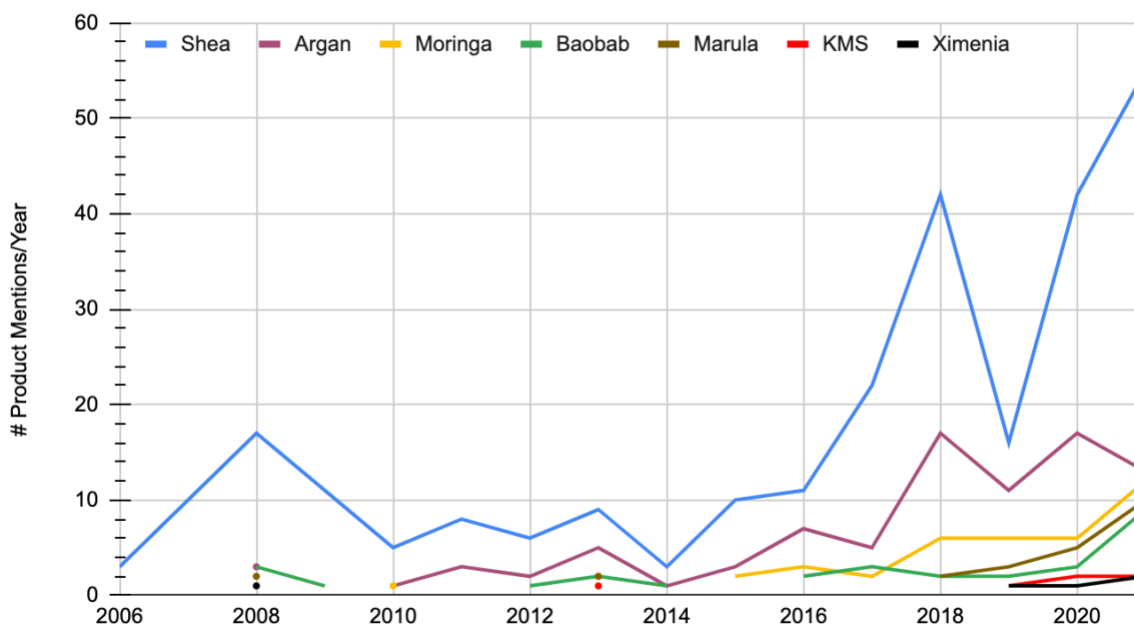
⁶ Note: Because of the rather different ranges in the number of product mentions across the journals we used an index for each journal, where the product with the highest number of mentions by that journal received an index value of 100% and all other products mentioned by that journal were calculated as a percent of the number one ranked product. This process was repeated for each journal, and then an average indexed score was computed for each product across all six journals.

NTFP Mentions in Cosmetics Trade Journals



The graph above shows a static picture of product mentions. To gain greater clarity on this topic of cosmetic industry adoption of new ingredients and how it evolves over time, we also looked at the number of mentions of new ingredients in cosmetic products over time for our target NTFP oils compared to competing products. As with the previous chart, the competing products used were shea, argan, and moringa. For this analysis, we used data from an industry journal “Cosmetics and Toiletries” because it had the richest and most accessible data on new product mentions over the past 14 years.

NTPF Product Mentions in Cosmetics & Toiletries



As can be seen in the chart above, shea product mentions (blue line) were relatively low-moderate, generally less than 11 per year (with the exception of 2008 when there were 17), from 2006 until around 2017 when they began to take off. Similarly, argan oil (purple line) was very low from 2008 - 2015, with typically less than 7 product mentions per year and then began to take off in 2018, although it is still lagging behind shea butter. Now argan oil is approximately where shea butter was in 2016-17. With a couple of new product introductions each year from 2010-2014, moringa (yellow line) started to gain a bit more traction in 2015 and increasingly was incorporated in new products over the next few years. Moringa is now where argan oil was in 2017-2018 and shea butter in 2016. Both baobab and marula are now where shea butter was in 2015 and where marula was in 2017 (in terms of product mentions in the journals).

The key takeaway from this chart is that baobab oil (green line) and marula oil (brown line) are roughly where shea butter and argan oil were about 5-6 years ago and have just about caught up to moringa now. KMS (red line) and ximenia (black line) are at an even more nascent stage of development⁷, roughly where shea butter was 15-20 years ago and argan oil was 8-12 years ago.

In recent years, online platforms such as Connature⁸ and Neat Wholesale⁹ have been developed to connect ingredient suppliers with cosmetics manufacturers. Shea butter, argan oil, moringa, and coconut oil are all listed on the Neat Wholesale platform, but baobab, marula, KMS, and

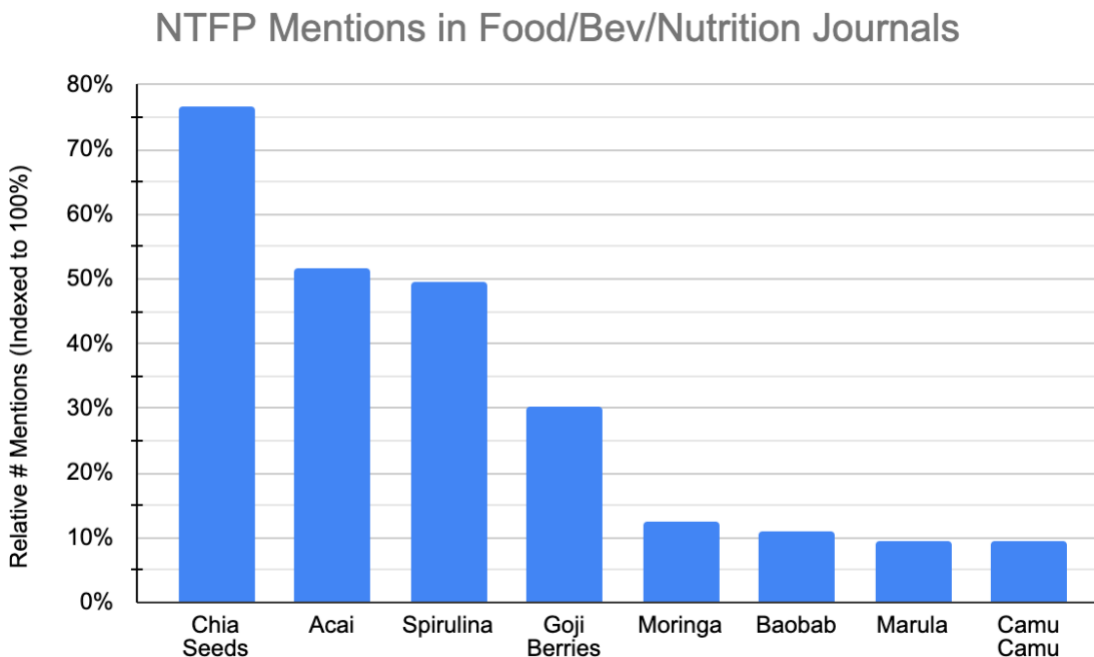
⁷ Note that data tracked by one of the companies with whom the team spoke indicated that there are currently about 116 products on the market containing KMS oil.

⁸ <https://www.connature.com/>

⁹ <https://neatwholesale.co.uk/>

ximenia do not appear on the site. The Connature site lists companies supplying baobab and marula (as well as shea, argan, moringa, and coconut), but not KMS or ximenia.

For the food, beverage, and nutrition industry we took a similar approach, comparing our target NTFPs (just baobab and marula in this case) to açai, chia seeds, spirulina, moringa, goji berries, and camu camu which are popular nutritional supplements and superfoods. We looked at the number of product mentions in 11 trade and popular journals as a proxy.¹⁰



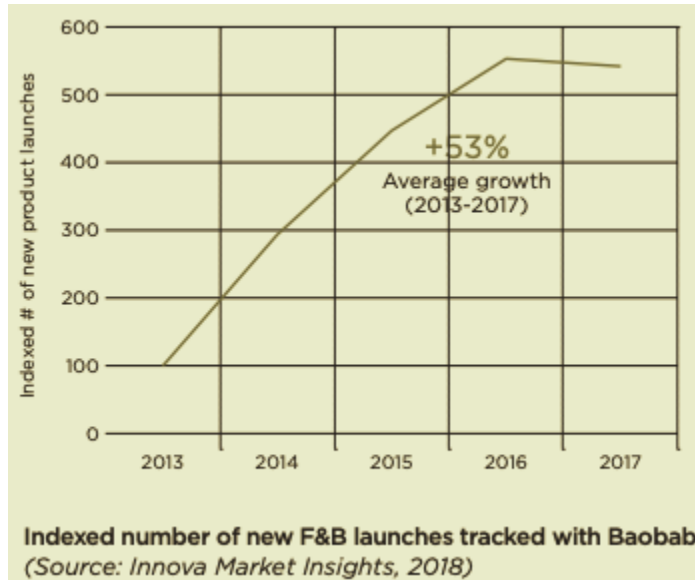
Again, two of our NTFP target products (baobab and marula) were in rather distant sixth and seventh places compared to chia seeds, açai, spirulina, and goji berries. Only camu camu had a lower score, although moringa's score was only marginally higher than baobab's.

The team also looked at many smoothie companies (both off-the-shelf ready-to-drink smoothies and fresh smoothie bars) to determine whether baobab powder is offered as a booster supplement or ingredient in smoothies. Out of 33 smoothie companies researched in the US and Europe, only three companies offered one or more products with baobab as an ingredient powder; none of the fresh smoothie bars offered baobab powder as a booster supplement.¹¹

¹⁰ Note: Because of the rather different ranges in the number of product mentions across the journals we used an index for each journal, where the product with the highest number of mentions by that journal received an index value of 100% and all other products mentioned by that journal were calculated as a percent of the number one ranked product. This process was repeated for each journal, and then an average indexed score was computed for each product across all 11 journals.

¹¹ One smoothie chain which the team contacted commented that they tried offering baobab powder in 6-8 of their stores last year in different geographic areas and there was no consumer demand for it so they

On the other hand, there are a number of food and beverage products (ranging from juices and dairy products to cereals, fruit bars, desserts and confectionary products) which have been introduced in the last few years incorporating baobab powder. These include products from Coca Cola (Innocent Smoothies), Unilever (Hellmans), Associated British Foods (Twinings Tea) and CostCo.¹² Below is a chart illustrating the growth in new food and beverage industry product launches incorporating baobab powder.¹³ Note that this chart from Innova Market Insights focuses primarily on baobab powder, not on baobab oil.



Thus, although on a relative basis baobab, marula, and KMS are a fair distance behind some of the other superfoods in their utilization by the food and beverage industries, we can take heart from the fact that they have gained traction and there are commercially available products on the market from major brands.

It is important to point out that 20+ years ago some of these other oils and superfoods had similar very low levels of consumer awareness and interest. Coconut oil, shea butter, and argan oil

have a roughly 10-15 year head start over the NTFP fruit oils and powder that are the focus of this study. It will take time and investments in both market and supply chain development as well as regulatory approvals to build the consumer awareness, interest, and demand pull-through, and encourage manufacturers to develop and offer products with these NTFPs as ingredients.

dropped the option. He also indicated that if it doesn't have an interesting color the consumer is generally not interested.

¹² "A Two-Year Programme to Activate and Operationalise the African Baobab Alliance", page 11, African Baobab Alliance, February 2022

¹³ "How the Baobab industry developed - From emerging to maturing sector", ABioSA Case Study, June 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA-case-study-Baobab-emerging-to-maturing-industry-2021.pdf>

Key Informant Interviews and Focus Group Discussions

Overall, the team conducted about 64 KIIs and meetings with a diverse group of stakeholders including fruit and oil processors, oil distributors, food and snack manufacturers, wholesalers, retailers, financial services firms, transport and logistics firms, NGOs, trade associations, and national and district/local government officials. From those interviews the team extracted a number of common themes which are shown below.

Thematic Area	Key Messages
Market Awareness	<ul style="list-style-type: none"> • Consumer awareness is fairly low, but especially for KMS & ximenia • Industry utilization is also fairly low, but growing
Quality	<ul style="list-style-type: none"> • Common quality standards do not exist • Quality is generally good but can be somewhat erratic and inconsistent • Negative impact of chemicals (crop & malaria chemicals)
Supply Chain	<ul style="list-style-type: none"> • Seasonal supply, small & fragmented volumes, small & under-resourced enterprises • Inadequate supply for some NTFPs (ximenia & Ilala Palm) • Comprehensive resource mapping is needed
Shipping	<ul style="list-style-type: none"> • Shipping costs are very high, negatively impacting basket exports • Limited transport options in some areas such as Binga
Trade Associations	<ul style="list-style-type: none"> • Trade associations are very helpful in providing foundational support to the sector and certification • PhytoTrade Africa was critical in development of baobab & marula VCs • Trade Associations will require long-term support
Scientific Research	<ul style="list-style-type: none"> • Very little scientific evidence exists to support functional & biological claims • Scientific evidence is needed to truly grow powder & oils value chains

The team also conducted 6 focus group discussions in Chiredzi, Chipinge, and Binga (two in each district). Several common themes that emerged from these FGDs are summarized below.

Thematic Area	Key Messages
Market	<ul style="list-style-type: none"> ● Lack of knowledge of/access to markets ● Buyers lack cash to pay for products; resultant barter trade hurts sellers & quality
Quality	<ul style="list-style-type: none"> ● Training is needed for basket weavers and wild harvesters ● Appropriate storage facilities at homestead/local collection points & correct packaging are needed
Tools & Technology	<ul style="list-style-type: none"> ● Some lack appropriate tools (e.g., long-handled knives & protective gloves for harvesting Ilala leaves) ● Better primary processing equipment is needed
Shipping	<ul style="list-style-type: none"> ● Poor roads make transport to markets difficult and time consuming ● Lack of transport to markets (especially Binga basket weavers)
Other	<ul style="list-style-type: none"> ● Human-Wildlife Conflict or Competition (during harvesting of fruits) ● Resource base is limited; also some conflicts over access to fruit trees ● Value to community – 60% consumed by household and 40% sold (varies by value chain and location)

These themes will be elaborated a bit more in the following sections of the report.

Assessment of Each Target NTFP

Overview of the Five Target NTFPs

Before diving into the details for each NTFP we provide a table summarizing information about each of the value chains below. Note that market size and growth rates are challenging to pin down for any of the target NTFPs. Although market research reports are available for two of the NTFPs, there is conflicting data across the different market research reports. Thus, although precise estimates are not possible, we have provided a range to give a general sense of the market size and growth rates.

	Baobab	Marula	KMS	Ximenia	Ilala Palm Baskets
Current Market Size	50-75 million ¹⁴	\$42-50 million ¹⁵	\$5-7 million, but possibly less ¹⁶	Less than \$1 million ¹⁷	\$10-15 million ¹⁸
Market Growth Rate	Pulp: 3.5% Powder: 4.0% Oil: 3.0% Nutraceuticals : 3.5% Food: 6.5%	4.3 - 6.3%	10 - 20% ¹⁹	N/A	3-5%
Potential Zim Revenues (2032)	\$2M ⇒ \$5.3M (Powder)	\$525K ⇒ \$2M (Oils Cluster)			\$260K⇒\$570 K
Current State of Mkt Devel.	Low-Med	Low-Med	Very Low	Very Low	Medium
Total Annual Income/ Collector ²⁰	\$39.08/yr (whole fruit)	\$10.70 - \$86.63/yr	\$46.94/acre/yr	\$143.15/yr	\$1,500 - \$2,400/yr
Income/day ²¹	\$2.00/day (whole fruit)	\$1.13-2.85/day	\$6.71/day	\$3.58/day	\$10/day
Wild vs Cultivated	Wild	Wild	Cultivated	Wild	Wild
Sustainability	Good	Questionable	Good if cultivate	Currently Adequate but	Inadequate in some areas

¹⁴ Global Market Insights puts the market size at \$4.5-5.0 billion; most likely the majority of this market size is for value-added products that include baobab ingredients as a portion of the product; it is likely that the total market value of baobab ingredients is far less than \$4 billion; using known volumes we estimated the market value between \$50-75 million for baobab ingredients

¹⁵ Lower estimates from Databridge Market Research; Higher estimates from Persistence Market Research

¹⁶ Rough consultant estimates using info from KIIs and other sources

¹⁷ Rough consultant estimates using info from KIIs and other sources

¹⁸ Using EU & US import values and estimating for the rest of the world..

¹⁹ One of the largest companies in the KMS value chain has experienced a high growth rate over the past several years; also, starting from much lower base than marula and baobab, so will grow more quickly; assuming 10-20% growth rates for the industry for the next few years

²⁰ Source: BIZ cost-benefit analysis of value chains (December 2020) adjusted using volumes from KIIs with industry participants; Ilala Palm Basket number came from KIIs and communication with industry participants.

²¹ Source: BIZ cost-benefit analysis of value chains (December 2020) for fruit NTFPs; Ilala Palm Basket number came from KII interviews and communication with industry participants.

of Supply				scattered ²²	
Elasticity of Supply	Extremely Low	Low - Medium	High	Medium	Low - Medium
Nutritional Value	Very High	High levels of Vit C; High protein in seeds	Some; high Vit E & Protein in seeds	High levels of Vit C & E & other minerals	Contains vitamin A, B and C. Rich in Potassium, Iron, Calcium, Phosphorus and Zinc ²³
Cosmetic Benefits	Very High: Antioxidant; moisturize	Very High: Deeply moisturizing	Very High: Antioxidant; Moisturize; Won't clog pores; great for acne-prone skin	Very High: Moisture; Good for night creams; great for aging skin	N/A
Oxidative Stability	Very Good	Very Good	Excellent	Stable but More Susceptible to Rancidity at Room Temp.	N/A

Several strategic dimensions that could influence strategic choices by the mission include the potential of each NTFP to contribute to rural household poverty reduction and resilience, the potential for commercialization of the NTFPs to forest and biodiversity preservation, the potential of each NTFP to contribute to rural household poverty reduction and resilience, as well as the relative timelines to achieve lift off in each NTFP. The team's subjective assessment of each NTFP along these dimensions is summarized in the table below.

NTFP	Income/ Poverty Reduction	Nutrition & Food Security	Preserve Biodiversity	NPV	Timeline to Success
Baobab	Low	High	High	High	Short-Med

²² Ximения supply may not be adequate if the market grows substantially; there are currently 2,100 MT of projected extractable oil. If Ximения oil were to become popular, demand could easily outstrip supply.

²³ <https://www.fruitsinfo.com/fruit-facts/2020/11/palm-fruit-nutrition-facts-and-health-benefits/>

Marula	Low	Low-Medium	High	Medium	Short-Med
KMS	Low-Med	Low-Medium	Low	Medium	Med-Long
Ximenia	Low-Med	Low	Low-Med	Medium	Long
Ilala	High	Low-Medium	Med-High	Low	Short-Med

None of the NTFPs is uniformly highly rated across all of the dimensions. Similarly, none of the NTFPs is uniformly poorly rated. The Mission will have to determine the relative priority of these (and perhaps other) dimensions to determine how to score the NTFPs. Some combination of the overall evaluation/score, combined with the Net Present Value of future Zimbabwean incremental sales could be used to determine which NTFPs are selected and how much funding is invested in each NTFP.

Key Trends in the Cosmetics Industry

Because the four oils in our target NTFPs have significant commercial applications in the cosmetics and personal care industry it is appropriate to look at how trends in the industry might affect the commercial viability of our NTFPs. As it turns out, there are a number of trends that are driving industry changes that are also highly relevant to our target NTFPs.²⁴ These include:

- Key functional properties that are important to consumers and industry are anti-inflammatory, antioxidant, anti-aging, and acne-clearing;
- Products that both hydrate and contain antioxidants generate the highest levels of interest among consumers. The industry is now creating products that perform multiple functions;
- The aging population in much of the developed world is driving the focus on anti-aging products and solutions for both skin and hair;
- Consumers and cosmetics companies are increasingly shifting from mineral oils and other synthetic chemicals to vegetable oils and natural ingredients;
- A sizable portion of the consumer base is shifting toward products containing organic ingredients;
- Purchasing ethically sourced products is also important to many consumers.

²⁴ <https://www.cosmeticsandtoiletries.com/research/consumers-market/article/21836122/anti-aging-the-trends-and-challenges-in-new-product-development>

Baobab, marula, KMS, and ximenia oils are all perfectly suited to take advantage of these trends, and thus will benefit from their tailwinds. Ilala palm baskets also benefit from a couple of these trends. Several of these trends are elaborated further below.

Consumers worldwide, but especially European consumers, are increasingly choosing natural cosmetic and personal care products. The European natural and organic personal care product market was valued at approximately US\$4.1 billion in 2018. A study by the Kline group pegged the global market for natural cosmetics at around US\$33 billion in 2015 and predicted it to grow to US\$50 billion by 2019. Of this total global market for natural cosmetics, approximately 45% is certified natural cosmetics and 55% is non-certified natural (or nearly 100% natural) cosmetics.²⁵ This natural cosmetics market is the primary target for our target NTFP oils, although some of them have good applications in the niche culinary oils market, similar to argan oil and other high-end culinary oils.

Second, with an increasingly aging population in many countries [except notably African countries], another growing trend worldwide is a focus on anti-aging products. The European anti-aging products market was worth US\$14.8 billion in 2019 and was projected to grow at a rate of 5.17 percent annually until at least 2024.²⁶ Because baobab, marula, KMS, and ximenia all are totally natural products with excellent moisturizing and antioxidant properties, they are a good fit for both of these trends. With these two trends at their backs, the future looks bright for the target NTFP fruit value chains.

One CBI study articulated these trends, focusing on natural and organic products as well as the dimensions of the exotic, mystical, traditional ritual use, and ethical sourcing: “Cosmetic brands commonly add these oils for their marketing value as well as their cosmetic benefits. Consumers are especially keen on ingredients with an interesting provenance. For example, there are oils that:

- come from a fascinating, exotic or mystical origin (e.g. Marula oil with its fascinating story of how it was made available across sub-Saharan Africa due to human migration).
- are produced with traditional or specific local production processes;
- are associated with traditional use or local beauty rituals;
- are associated with health, such as fruits;
- are ethically sourced. Ethical claims are increasingly important to consumers, who are also becoming more demanding. Cosmetic brands need to get the story behind these ethical claims right. Wild-collected fruit seed oils are especially interesting in this respect, such as marula. In their marketing, cosmetic brands emphasize the benefits to local communities of collectors”²⁷

²⁵ “Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, page 6, https://www.importpromotiondesk.com/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_190107.pdf

²⁶ Source: “The European market potential for baobab oil”, CBI, Netherlands Ministry of Foreign Affairs, <https://www.cbi.eu/market-information/natural-ingredients-cosmetics/baobab-oil/market-potential>

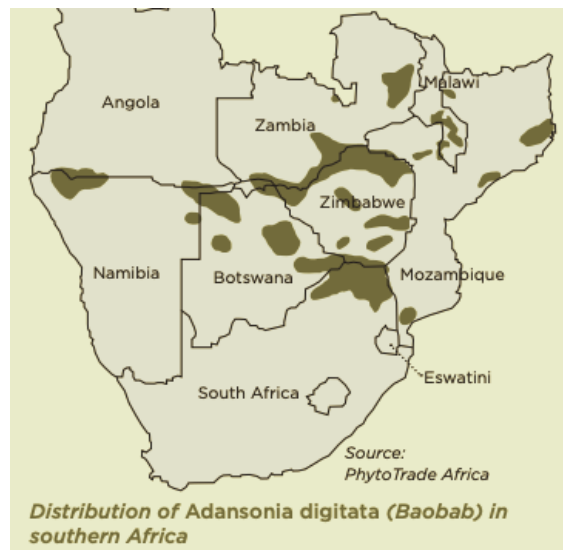
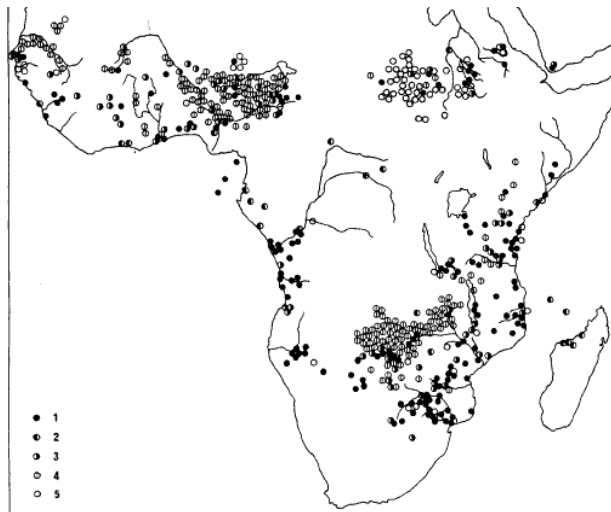
²⁷ “Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, Page 7, https://www.importpromotiondesk.com/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_190107.pdf

As mentioned in the last quote from CBI, whether for oils, food and beverage ingredients, or baskets, there is an increasing demand among consumers as well as in corporate boardrooms for products to be ethically sourced. Gone are the days when large corporations could afford to ignore the work conditions and environmental impact in their sourcing countries. While all of the target NTFPs are often ethically sourced, the relevant certifications are expensive and commonly not used among the small companies that currently dominate much of the market for these products.

Baobab

Baobab trees are long-lived, deciduous (shed their leaves during the dry season) trees with broad trunks and compact crowns. The trunk is made of fibrous wood arranged in concentric rings. Tree diameter fluctuates with rainfall so it is thought that water may be stored in the trunk (up to 120,000 liters or 32,000 US gallons) to endure harsh drought conditions. There are eight species of baobab; the variety of baobab found in Zimbabwe and Southern Africa, *A. digitata*, often have massive single or multiple trunks of up to 10 m (33 ft) diameter.²⁸

Baobab trees are found in seasonally arid areas in 32 African countries. On the left is a map of Sub-Saharan Africa showing the extensive range over which baobab can be found.²⁹ On the right is a map illustrating the distribution of baobab trees in Southern Africa.³⁰



²⁸ Wikipedia; <https://en.wikipedia.org/wiki/Adansonia>

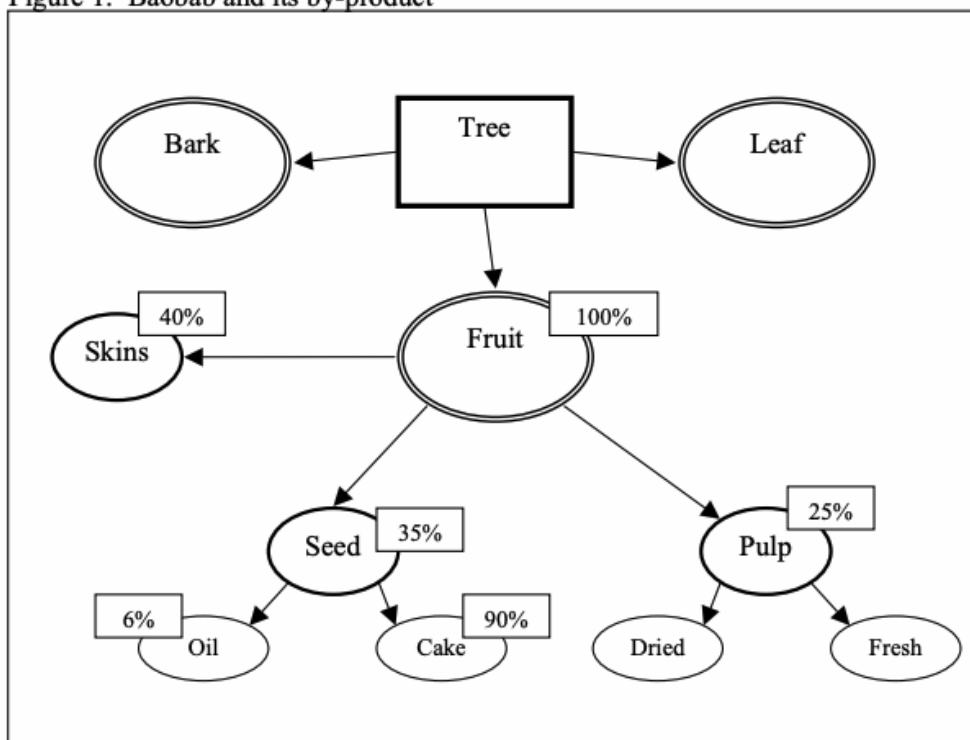
²⁹ "The Baobab: Africa's Upside-Down Tree", G.E. Wickens, Kew Bulletin, Vol. 37, No. 2, 1982, pg 181

³⁰ "How the Baobab industry developed - From emerging to maturing sector", ABioSA Case Study, June 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA-case-study-Baobab-emerging-to-maturing-industry-2021.pdf>

Baobab trees provide useful, and to varying degrees commercially valuable, products used in food, traditional medicine, cosmetics, animal feed, handicrafts, etc. The breakdown of these products by rough percentages is illustrated in the following diagram.³¹ The primary products discussed in this report are the powder and oil from the fruit pulp and seeds.

Potential new product categories in which baobab could add value include sports nutrition, diabetic-friendly (baobab powder helps to modulate blood sugar levels), vegan, non-dairy, paleo and probiotic food and beverages. Baobab powder also has certain functional attributes, enabling it to act as a thickener, an acidifier, a natural preservative, a yeast substitute and a flavor enhancing agent.³² If developed into pharmaceutical or consumer products with effective marketing, all of these products could potentially generate significant demand for baobab in the future.

Figure 1: Baobab and its by-product



Notes: Some losses occur in separating oil and cake from seed. Figures in boxes represent estimated quantity derived i.e., 35% of the whole fresh fruit is seed of which 90% will be cake if the seed is crushed for oil.

Source: Phytotrade Africa, pers comm..

³¹ Natural Products: The New Engine For African Trade Growth”, 2006, pg 115, <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.610.9509&rep=rep1&type=pdf>

³² Sources: “Useful Plants of Zimbabwe With Potential as Smallholder Crops”, pg 10, Livelihoods and Food Security Programme, UKAid

Baobab powder was granted Novel Foods status by EU regulators in 2008 and Generally Recognized as Safe (GRAS) status by the US Food and Drug Administration in 2009. Products incorporating baobab powder arrived on the market in 2010. Since 2010 the number of products and the market for baobab powder has grown steadily.

It is estimated that approximately 50,000 African women across the continent sell baobab fruit worth about \$25 million/annually.³³ Below is a graphic that shows the state of the industry in the SADC region (primarily Malawi, Mozambique, Zimbabwe, and to a limited extent, South Africa) in 2021³⁴. In total, about 4,000 MT of fruit are harvested annually (in the formal sector) yielding about 500 MT of powder and about 13.5 MT of oil. Approximately 9,000-10,000 harvesters and 60 SME companies are involved in the harvesting and processing of baobab products.

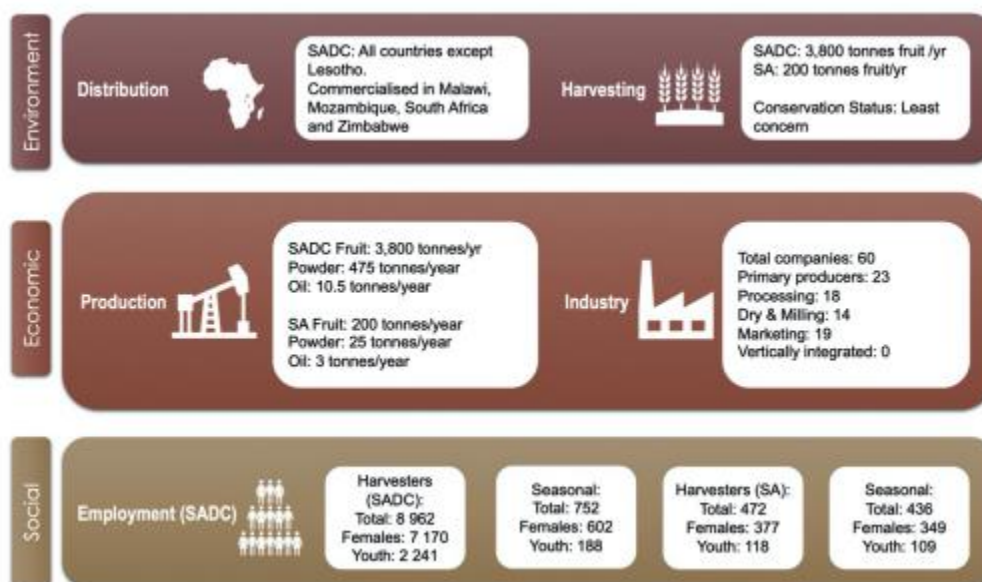


Figure 1: Baobab Context Analysis

Baobab Supply in Zimbabwe

Tree inventories suggest there are approximately 3.75 million harvestable baobab trees in communal areas of Zimbabwe, with many millions more throughout Africa. However, in the last 20 years ecologists have noticed some baobab trees in Southern Africa dying rapidly from an unknown cause. Furthermore, relatively low seedling rates lead to low levels of reproduction. Some tree planting may be required to ensure long-term sustainability of supply.³⁵ Although there

³³ “A Two-Year Programme to Activate and Operationalise the African Baobab Alliance”, page 3, African Baobab Alliance, February 2022

³⁴ “Baobab (Adansonia digitata) Sector Development Plan”, page 7, August 2021, ABioSA

³⁵ Practical Action stated the following in its Forest FORCES study: “Enrichment planting needs to be done in all the three wards to facilitate regeneration and a healthy population.” (source: “Tree Inventories For Hwange, Matobo, Lupane And Chimanimani Districts”, study conducted under the FOREST FORCES project); BIZ stated the same in its baobab resource assessment study: “Pressure on seedling and sapling survival in communal lands, where there is increasing pressure as populations of people and

appears to be an adequate supply of baobab fruit at the present time, given its very long maturation period of 15-50 years, baobab has a very low ability to respond to changing market demand. There is some concern among experts that if the market grows steadily, over the medium to longer term worldwide market demand could outstrip supply in the region.³⁶

Using experts' estimates for assumptions on sustainable offtake percentages, average tree production, average fruit size, etc. we arrive at an estimate of approximately 11,800 MT of harvestable fruit each year³⁷. From 11,800 MT of fruit can be extracted roughly 3,000 MT of pulp and 250 MT of oil. Note that this supply capacity in Zimbabwe is 20-25 times Zimbabwe's current production.

Typically powder processing companies sell the seed as a byproduct to oil expressors who then sell the oil to wholesalers and cosmetics companies; oil expressors sell the seed cake to livestock feed manufacturers if they can. However, there is a supply-demand mismatch between the volume of powder demanded/produced and the volume of seed/oil demanded/produced. From a batch of baobab fruit there is approximately 1 kg of oil produced for every 10-12 kg of powder. Since it is significantly less profitable to focus solely on oil production (compared to the combined value of powder and oil - see section below on Profitability to Producers), the demand for powder is the limiting factor in determining the supply of oil. That is, the supply of oil (in kg) will be limited to approximately 8-10% of the demand for powder (in kg). There is currently inadequate demand for baobab powder to drive sufficient volume of seed production to meet the market demand for baobab oil.

Baobab Market Size and Growth Rate

Although a large portion of the consumer population in the developed world is not familiar with baobab, it is considered one of the superfoods which are a key addressable market for the powder. Market research suggests that the global market for superfoods was approximately US\$137 billion in 2018 and growing at 5.9% annually.

An additional potential market for baobab is the dietary fiber market. Baobab powder has a very high fiber content (around 50%) which is becoming increasingly important as a prebiotic supplement to boost gut health and the microbiome. According to Grandview Market Research, the global dietary fibers market size was estimated at \$39.8 billion in 2019 and was expected to

livestock rise, does require that active planting and nurturing of baobab needs to be undertaken for the longevity of this resource." (source: BIZ Baobab Resource Assessment Study Nov 2013 - May 2014, pg 47)

³⁶ "How the Baobab industry developed - From emerging to maturing sector", ABioSA Case Study, June 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA-case-study-Baobab-emerging-to-maturing-industry-2021.pdf>

³⁷ Assumptions used: 60% harvesting offtake, 70% of trees are fruiting, average of 50 fruit per tree, average fruit size of 150 g

grow at a rate of 8.9% per year from 2020 to 2027.³⁸ In an interview we had with an important baobab powder company, the person mentioned that a big snack food manufacturer talked to them about wanting to use baobab powder in their products and asked if it was approved by the FDA as a dietary fiber; when they heard it was not approved they chose a different fiber source. A significant market could open up if that were to change.

Baobab oil is part of the market for natural cosmetic oils. As cited above, the global market for natural cosmetics was estimated at around US\$33 billion in 2015 and predicted to grow to US\$50 billion by 2019. That is the primary addressable market for baobab oil, although it can also be used as an edible oil.

Experts estimate that at least 600 tons of baobab powder is currently exported from Africa each year. It is sold in powder form directly to consumers or incorporated into a variety of food and beverage products. There is also a local market for baobab products, both formal and informal.

As with the other NTFPs, there is a broad range of estimates for the global baobab market size. The most likely range for baobab ingredients (powder and oil) is between US\$4.5 and US\$5.0 billion. Note that the export value of baobab products is a fraction of this global market value. Projected growth rates for baobab ingredients range from 3.0% for oil to 4.0% for powder; nutraceutical applications should grow at around 3.5% and food applications should grow at around 6.5% annually.³⁹

Structure of Baobab Value Chain

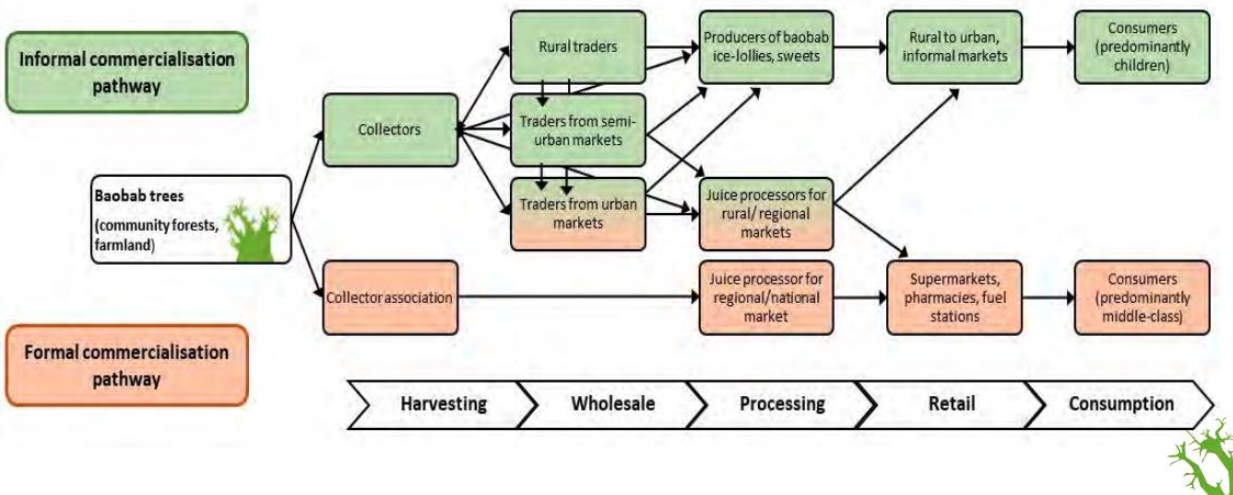
Below is a diagram illustrating the structure of the baobab value chain, illustrating the pathway that baobab fruits and derivative products take in getting to consumers' hands.⁴⁰ Although this diagram is for Malawi, the structure is similar in Zimbabwe. Informal consumers will mostly consume powder in the form of porridge, and formal consumers will mostly buy powder to mix with food or in beverages.

³⁸ Market Analysis Report on Dietary Fibers, Grandview Market Research, August 2020, <https://www.grandviewresearch.com/industry-analysis/dietary-fibers-market>

³⁹ Market research reports from Global Market Insights and Industry Arc

⁴⁰ "Commercialisation of Baobab (*Adansonia digitata* L.) Fruit Products as an Exemplary NTFP", November 2021, pg 15, https://foresthistor.org/wp-content/uploads/2021/11/IUFRO-Meinhold_Baobab_Commercialisation.pdf

Baobab value chain in Malawi



Profitability to Producers

As with most commodities, primary producers typically capture only a small percentage of the value of the end product. An analysis conducted in Malawi showed that wild harvesters captured only 15% of the export value of the fruit when selling whole fruits.⁴¹

According to a Cost-Benefit Analysis conducted by BIZ (adjusted by the consultants using average volumes per collector from industry participants), wild collectors earn approximately \$2.00 per day spent collecting the fruit, when they sell the whole fruit to baobab powder companies. Given the high labor requirements for extracting seed from the fruit, returns to labor for extracting the seeds alone and selling them to oil expressors is only around \$0.24 per day. As the earlier diagram showed, a typical baobab fruit yields about 25% of its mass in powder and about 2.1% of its mass in oil (roughly a ratio of 12:1). Thus, when breaking down the value of a baobab fruit, the powder is more economically important than the oil.

For whole fruit, total annual profit (excluding the value of labor) per collector averages around \$39/year. Baobab has the second lowest return to labor (daily income) and one of the lowest total annual profits among the NTFP fruits.

Key Issues

There are several issues which, if left unaddressed, will limit the growth potential of the baobab market. These are summarized below:

⁴¹ "Value Chain Analysis Of Baobab Products For Improved Marketing And Sustainability Of Their Trade In Malawi", Nellie Amosi, MSc Thesis, Mzuzu University, Malawi, May 2018, pg 67

- Consumer awareness of baobab and its health benefits is very limited
- Baobab has obtained US and EU regulatory approval as a food/beverage ingredient. However, it lacks regulatory approval in China and some other Asian countries. China has different dossier requirements than the US, EU, and rest of the world, increasing the cost and time required to gain approval. It also lacks US approval as a dietary fiber.
- Very limited scientific research exists validating health and nutritional claims for the powder and oil
- There are currently no common defined standards for baobab products
- Inconsistent quality of raw materials
- There is significant potential for contamination of fruit and kernels during home processing or storage, suggesting that more centralized processing may be required. However, this also reduces the opportunity for value addition by villagers.
- Inadequate traceability of raw materials from field through processing and aggregation points, to export. Traceability has become a very important requirement over the past 20 years, particularly for food ingredients.
- Resource mapping is limited and rather spotty and uncoordinated; inadequate data and monitoring limit understanding of the true quantity and sustainability of supply.
 - Supply which is adequate today may not be adequate in the future if market demand surges due to the inelastic supply base
 - There is some evidence of baobab trees dying at an increased rate, and also of limited natural seeding to replace aging trees
 - In certain wildlife areas, baobab trees are losing their bark to elephants and dying off as a result
- Extraction of fruit pulp and seed is a manual, time-consuming task which significantly reduces returns to labor for collectors that do processing at home.



Marula

The marula tree can be found in many countries and is native to the Miombo woodlands of Southern Africa, the Sudano-Sahelian range of West Africa and in Madagascar. See map below showing the distribution of marula in Southern Africa.⁴²

The tree can grow to a height of 20 meters and can produce as much as 500 kg of fruit annually, although averages are much lower. Only female trees produce fruit. African peoples have long

⁴² "Accessing international markets for Marula fruit & oil", April 2020, ABioSA

used the nut oil for cosmetic applications and the fruit for nutrition and beverages. Marula oil contains a similar fatty acid composition as olive oil but is 10 times more stable or resistant to oxidation than olive oil. Due to its superior chemical stability, marula oil is an exceptionally good ingredient for use in cosmetic products. The oil can also be used as a cooking oil.⁴³

Although marula fruit has long been used for nutrition and beverages in rural households and has been used in the Amarula liqueur (Distell) since 1989, the fruit is not approved for use in food or fresh juice beverages in Europe or the US. Any attempt to commercialize marula fruit products will first require a somewhat lengthy and costly process of applying for US FDA GRAS status and EU Novel Foods status. Only then will companies be able to safely commercialize food and beverage products, including marketing marula oil as a high-end cooking oil.

Marula oil has several key properties and benefits which make it a valuable ingredient to cosmetics and personal care manufacturers as well as consumers:

- Moisturizes and seals in moisture
- Non-comedogenic (won't clog pores)
- Anti-oxidant
- Anti-aging
- Anti-inflammatory
- High level of oxidative stability

Because of these attractive properties, the cosmetic industry has been using marula oil since 2002, with steady growth since then. The Body Shop “launched a cosmetic range containing it in 2002, and by 2012 marula oil featured in more than 140 of its products. In 2015, it featured in *Marie Claire* and *Cosmopolitan* ..., while ROK Stars’ Marula Pure Beauty Oil won a beauty Oscar, the Cosmetic Executive Women (CEW) Eco Beauty Award.”⁴⁴ Although there are many cosmetic products containing some marula oil as an ingredient, a high percentage of those products (including products from The Body Shop) are not directly marketed based on their marula oil content or the African story. This implies that “marula is not yet widely enough recognized by mass market consumers and the use of “Marula” as the key ingredient on the label would not encourage the consumer to lift the product off the shelf”.⁴⁵ On the other hand, there are some products from companies such as African Botanics which have launched products specifically focused on marula, its benefits, and the African story.

⁴³ “Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, https://www.importpromotiondesk.de/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_190107.pdf

⁴⁴ “Beauty industry wakes up to the benefits of marula oil”, April 2016, <https://www.cips.org/supply-management/news/2016/april/beauty-industry-wakes-up-to-the-benefits-of-marula-oil/>

⁴⁵ “Marula Oil Value Chain Analysis: Final Report, Millennium Challenge Corporation, December 2012, http://the-eis.com/elibrary/sites/default/files/downloads/literature/Marula%20Oil%20Value%20Chain_Dec2012_Final%20report.pdf

Marula Supply

The Eudafano Women's Cooperative (EWC) in Namibia is one of the largest producers of marula oil in the world. Up to date statistics are not available, but "in 2013 [EWC] ... produced 11 tonnes of virgin oil, mostly for European export, chiefly for the Body Shop. Botswana is producing around 15 tons per year, and Zimbabwe is producing 5-10 tons per year. Marula oil is also being produced in other SADC countries including Eswatini, and South Africa. In addition, Kenyan farmers Philip and Katy Leakey were producing 6 tons per year in 2014 from their farm.

While supply is currently adequate to meet demand, this may not continue to be true if the market demand expands significantly. Information from BIZ suggests that current supply is constraining growth in the marula market; cultivation may be needed to grow this value chain, particularly in some localized areas. The following quote also substantiates this concern:

"The principal bottleneck is supply capacity. Marula oil production will have to grow beyond the relatively small existing production centres in sub-Saharan African countries like South Africa, Kenya and Namibia, to meet future demand. An option might be the cultivation of the marula tree in suitable regions."⁴⁶

To augment supply, marula can be cultivated in plantations or orchards, and this is currently being done to a limited extent. Marula trees begin to bear fruit after seven years (from seed) or after five years (from grafted trees)⁴⁷, giving the marula tree a moderately elastic ability to respond to changes in demand. The National Biotechnology Authority (NBA) marula processing plant in Zimbabwe has established its own five hectare plantation of marula trees to supplement the wild-harvested fruits which it purchases from collectors. Kenyan farmers Philip and Katy Leakey have a marula plantation in Kenya⁴⁸. The Israelis were also working on developing a marula plantation, although the status of that plantation is unknown.

Tree inventory studies at varying levels of detail and breadth have been carried out in 11 districts⁴⁹ in Zimbabwe by BIZ, Practical Action, Southern Alliance for Indigenous Resources (SAFIRE), and by two graduate students as part of their Master's Degree dissertations. Most of the studies used multiple transect walks covering a total of 60-75 hectares (approximately 5 hectares in each transect walk) to calculate the number of marula trees per hectare and the ratio of fruiting trees to the total. In some of those studies, additional variables were gathered such as soil type, altitude, slope, rainfall, temperature, etc. and computer algorithms were developed to predict the number of trees across a wider area such as an entire province. The total area covered by each of these studies in the transect walks is not an adequate sample size to project to entire districts,

⁴⁶ "Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, https://www.importpromotiondesk.de/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_1_90107.pdf

⁴⁷ NBA claims to have developed a Marula hybrid which fruits in 3 years

⁴⁸ "Beauty industry wakes up to the benefits of marula oil", April 2016, <https://www.cips.org/supply-management/news/2016/april/beauty-industry-wakes-up-to-the-benefits-of-marula-oil/>

⁴⁹ Binga, Hwange, Beitbridge, Matobo, Lupane, Zvishavane, Gonarezhou National Park and surrounding communal areas, Bubi, Chivi, and Umzingwane

let alone an entire province. Thus, we cannot conclude anything definitive about the number of marula trees in the country, let alone the number of fruiting trees and harvestable quantities of marula fruit. Additional tree inventories will need to be conducted in all relevant provinces and districts where marula is likely to grow in any significant quantities to ensure that supply is adequate to meet demand in a sustainable manner.

Marula Market Size and Growth Rate

Marula oil is part of the market for natural cosmetic oils. As cited above, the global market for natural cosmetics was estimated at around US\$33 billion in 2015 and predicted to grow to US\$50 billion by 2019. That is the primary addressable market for marula oil, although it can also be used as an edible oil.

Currently the global market for marula is estimated to be around \$40-45 million. Growth rates have been around 4.0-4.5% annually but are projected to be around 6.0-6.5% per year for the next five to 10 years, with the market projected to reach \$58-60 million by 2030.⁵⁰

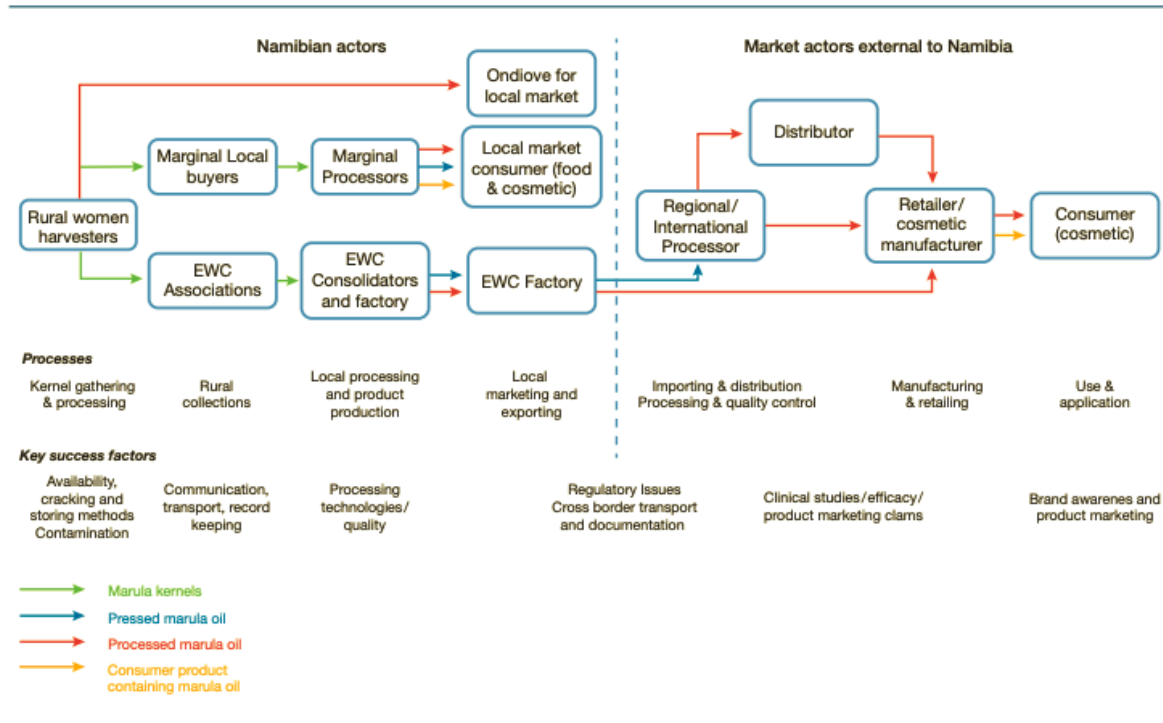
Structure of Marula Value Chain

The value chain structure varies somewhat from country to country and from company to company. However, generally it looks similar to the diagram below from Namibia.⁵¹ One of the largest players in the marula sector is the Eudafano Women's Cooperative (EWC) in Namibia. More than 2,500 women in northern Namibia collect marula fruit, extract and dry the kernels, aggregate their marula kernels through at least 26 associations (as of 2016) and sell to the EWC, which processes the kernels into oil in its factory and then sells to buyers in Europe and elsewhere. Buyers are oil processors and cosmetics manufacturers. EWC also sells a limited quantity of oil into the local market in Namibia but reserves the vast majority of its production for cosmetics customers such as The Body Shop.

⁵⁰ sources: <https://www.databridgemarketresearch.com/reports/global-marula-oil-market> and <https://www.persistencemarketresearch.com/market-research/marula-oil-market.asp>)

⁵¹ "Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, Page 16, https://www.importpromotiondesk.com/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_190107.pdf

FIGURE 3: NAMIBIAN MARULA OIL VALUE CHAIN 2017



Source: PhytoTrade Africa, Marula oil value chain analysis, 2012

Profitability to Producers

According to a Cost-Benefit Analysis conducted by BIZ (adjusted by the consultants using average volumes per collector from industry participants), wild collectors can earn a range of incomes collecting the fruit and selling whole nuts or kernels. The range in income depends on whether the collector sells dirty or clean whole nuts or cracks the nuts and sells kernels into the conventional, organic, or food-grade oil market. The returns to labor (daily income) and total annual profit per collector are shown in the table below:

Processing/Marketing Option	Return to Labor (\$/day)	Total Annual Profit/Collector (\$/year)
Whole Dirty nuts	\$2.85/day	\$10.70/year
Whole Clean nuts	\$2.76/day	\$27.58/year
Kernels - Conventional Oil	\$1.13/day	\$36.63
Kernels - Organic Oil	\$1.51/day	\$49.13

Kernels - Food Grade Oil	\$2.67/day	\$86.63
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Among the fruit NTFPs, marula has the lowest or second lowest return to labor and anywhere from the lowest total annual profit to the second highest total annual profit, depending on the options mentioned above.

Key Issues

The marula value chain struggles with many of the same issues that the baobab value chain faces. Achieving marula's growth potential will require addressing most of these issues.

- Consumer awareness of marula oil and its health benefits is very limited
- Very limited scientific research exists to validate health and nutritional claims for the oil and fruit pulp
- Marula food products lack EU & US regulatory approval. The process to obtain regulatory approval for food products is lengthy and expensive. However, marula could likely utilize the newer EU Traditional Foods process which should result in the process taking one to two years less than the full Novel Foods process.
- There are currently no common defined standards for marula products
- Inadequate traceability of raw materials from field through processing and aggregation points, to export. Traceability has become a very important requirement over the past 20 years, particularly for food ingredients.
- There is significant potential for contamination of fruit and kernels during home processing or storage, suggesting that more centralized processing may be required. However, this also reduces the opportunity for value addition by villagers.
- Extraction of fruit pulp and kernels is a manual, time-consuming task, with the marula nut being one of the hardest nuts to crack of all the NTFPs under investigation. This significantly reduces returns to labor for collectors that do processing at home.

Kalahari Melon Seed (KMS)

Scientists believe the Kalahari melon is the ancestor of the common, sweet watermelon, although the Kalahari melon is typically smaller in size, with pale yellow flesh and a bitter taste. The Kalahari melon is highly adapted to surviving in an arid, desert environment, where it needs very little water to survive. It grows easily in areas where most commercial crops struggle to grow without irrigation. The drought-resistance of the plant, its ability to grow in marginal lands, and its high oil yield (seed is roughly 50% oil, although extraction yields are typically less) makes KMS an attractive plant for commercial purposes. In addition, although it has a bitter taste when eaten raw, the pulp, rind, leaves, and seed cake can be used for human food and animal feed, adding to food security. The oil can also be used as an edible oil.

Kalahari melon plants can be easily cultivated and produce a crop each year, allowing for sustainable harvesting on a large scale. Unlike its oil competitors (e.g., baobab, marula, and argan

oil), the supply of KMS is highly elastic; production can expand and contract annually based on market demand. Thus KMS oil has an advantage over many tree nut oils used for cosmetic oil production, such as argan, baobab, marula or almond trees, which need 5-50 years to mature before they bear fruit, and therefore are not easily able to adjust to changing demands of the global market.⁵²

In addition to its ability to grow on marginal lands with highly elastic supply, KMS oil has several other attractive properties which enable it to easily be commercialized. It is a lightweight, fast-absorbing dry oil that will not clog skin pores. KMS is good for oily skin and perfect for acne and blemish prone skin types. Kalahari oil has the ability to restore elasticity to older skin, making it an outstanding choice for combating wrinkles and a good fit to address the growing market for anti-aging products. It is also a highly stable oil that resists oxidation and rancidity.

KMS is also a good source of an amino acid L-citrulline which has been demonstrated to have health benefits (improved oxygen and blood circulation, treatment of high blood pressure, relieve muscle fatigue, anti-oxidant properties, etc.). A Japanese company (Kyowa) has developed a product using L-citrulline from KMS that it sells into the pharmaceutical and nutraceutical industries.⁵³

KMS Supply

While KMS can be wild harvested, it is not found in the bush in significant quantities in Zimbabwe. However, some smallholders are cultivating it as a crop. KMS is a short-cycle (120-125 days) annual crop that grows on marginal lands which are abundant in the target geographic areas of Zimbabwe.

Key areas for production would include all of the drier areas of Zimbabwe. It grows naturally in grassland and bushland, mostly in sandy soils, often along water courses or near water. KMS does best on well drained, sandy-loam soils, especially those with good moisture retention capacity and high organic matter.⁵⁴

KMS Market Size and Growth Rate

KMS oil is part of the market for natural cosmetic oils. As cited above, the global market for natural cosmetics was estimated at around US\$33 billion in 2015 and predicted to grow to US\$50 billion by 2019. That is the primary addressable market for KMS oil, although it can also be used as an edible oil and also has some applications in the pharmaceutical industry as noted earlier.

⁵² Wikipedia; https://en.wikipedia.org/wiki/Kalahari_melon_oil

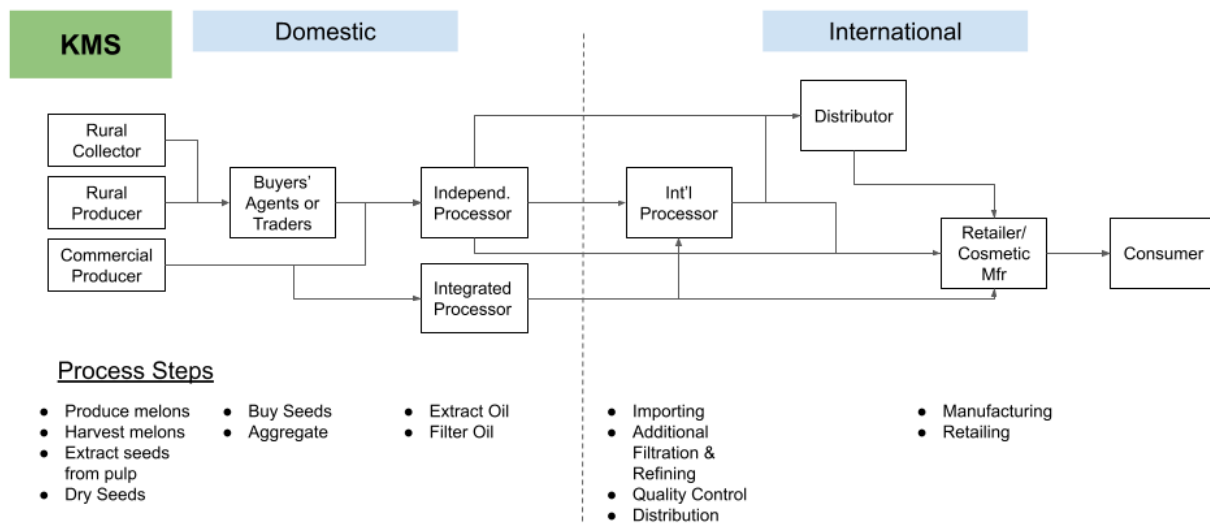
⁵³ Sources: "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 26, Livelihoods and Food Security Programme, UKAid; Kyowa company website: <https://www.kyowa-usa.com/ingredients/l-citrulline>

⁵⁴ "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 26, Livelihoods and Food Security Programme, UKAid

Through KII interviews and discussions with experts, the consultants estimate that currently the total market for KMS is less than \$7.5 million per year at retail prices (less than \$750,000 per year at export prices), and likely considerably less than that.

Structure of KMS Value Chain

Below is a diagram illustrating the conceptual flow of products and the various steps in the process from collecting the wild melons or cultivating the melons to the end-consumer.



Profitability to Producers

According to a Cost-Benefit Analysis conducted by BIZ, smallholder farmers planting KMS on one acre earn a profit (excluding value of labor) of approximately \$6.71 per day spent producing the fruit and extracting and selling seeds for oil. It is assumed that they use the rest of the melon for livestock feed or potentially for household nutrition. Total annual profit (excluding the value of labor) per farmer is approximately \$46.94 per acre per year. This is the highest return to labor (daily income) and a low-to-mid-range total annual profit among the NTFP fruits, depending on the amount of land dedicated to cultivating KMS.

Key Issues

The KMS value chain struggles with many of the same issues that the other fruit NTFP value chains face. Achieving KMS' growth potential will require addressing most of these issues. Many of these issues are common issues across all of the fruit NTFPs. However, two issues (low value-

to-weight ratio and cultivation vs. wild harvesting) are unique to KMS and will require some strategic choices by parties seeking to develop this value chain.

- Low value of seed per melon: High weight and large size makes it difficult to harvest wild melons or cultivate melons at any distance from the homestead. The seeds are the most valuable part of the melon but comprise roughly two percent of the weight (around 26 grams per 1.3 kg melon). The relatively large size, high weight, and low value-to-weight ratio suggests mechanized (or animal traction) transport would be highly desirable due to the volume and weight of melons required to produce sufficient seeds. Alternatively, the melons will need to be cultivated very close to the homestead.
- Cultivation vs. wild harvesting: Wild harvesting would require significant time searching for and transporting the melons back to the homestead for processing. In some areas they are not available in the wild. Given the ease with which KMS can be cultivated and the fact that it is a seasonal crop, it makes sense to cultivate KMS rather than harvest wild melons. Wild harvested melons would likely be a small fraction of the total volume. The downside risk of cultivation is that this does little to demonstrate value in the forests and may encourage further encroachment on woodlands. The upside benefit of cultivation is that the plant is very drought tolerant; cultivation would support a reliable supply chain (assuming no flooding) for processors and generate fairly reliable income and food security for farmers.
- Consumer awareness of KMS oil and its health benefits is even more limited than for baobab and marula
- Very limited scientific research exists to validate health and nutritional claims for the oil
- There are currently no common defined standards for KMS products
- Inadequate traceability of raw materials from field through processing and aggregation points, to export. Traceability has become a very important requirement over the past 20 years, particularly for food ingredients.
- Potential for contamination of fruit during cultivation if farmers use non-organic fertilizers, pesticides, or insecticides, whether on the KMS or other nearby crops.
- Potential for contamination of fruit and kernels during home processing or storage, suggesting that more centralized processing may be required. However, this also reduces the opportunity for value addition by villagers.
- Extraction of seeds is a manual, time-consuming task which significantly reduces returns to labor for collectors that do processing at home - tools or machinery could potentially make this process much more efficient.

As noted above, the issues of low value-to-weight and cultivation vs wild harvesting will require some strategic decisions. One of the largest players in the KMS value chain (African Origin Oils - AOO) has chosen to focus most of its production on a few large farms with cultivated KMS, rather than wild harvested KMS or scattered production by smallholder farmers. AOO has chosen to incorporate some mechanization into the process, particularly using tractors and wagons to haul the tons of fruit from the field to its captive/integrated processing factory.

Ximenia (Sour Plum)

Ximenia is a drought-resistant, spiny shrub that can be found in tropical climatic zones around the world in Africa, Central and South America, and Australia. The tree grows in woodlands and grasslands and on rocky outcrops from Tanzania to South Africa.

There are eight species, of which two are found in Zimbabwe: *Ximenia americana* and *Ximenia caffra*. *Ximenia americana* produces sour fruits about the size of a plum, while *Ximenia caffra* produces somewhat larger, more palatable fruits. The seeds of both species have high oil content; the oil is oxidatively stable and has excellent anti-inflammatory and moisturizing properties for cosmetic and hair care uses. Some KILs and literature pointed out the high potential for ximenia oil in cosmetic applications due to its unique chemical composition and the somewhat unique features of the oil. In fact, one website promoting ximenia states that “this colorful African fruit may be the next Argan oil. It's *that* good. Dare we say...it's even *better*.”⁵⁵

It is particularly good for moisturizing and nourishing dry and aging skin and improves skin elasticity; the long-chain fatty acids enable formulations to leave the skin with a velvety, soft, smooth texture. The oil can be used to make soap, and there are also potential food and pharmaceutical applications of ximenynic acid (a major and unique compound in ximenia oil). A 2002 patent filing by Loders Croklaan B.V. described the following pharmaceutical and biological health benefits from ximenynic acid:

- lowering or regulation of body weight;
- prevention or treatment of insulin resistance or related disorders such as diabetes;
- delaying the onset of symptoms related to development of Alzheimer's disease;
- improving memory function;
- lowering blood lipid levels;
- skin anti-aging benefits; and
- anti-cancer effects.

The food benefits described by Loders Croklaan include “properties that makes the acid very suitable to be used in compound systems, particularly in food systems to improve / enhance, hardness, texture, aeration, spreadability, oral properties, mouthfeel, flavour impact, colour, viscosity and easiness of processing”.⁵⁶

Ximenia Supply

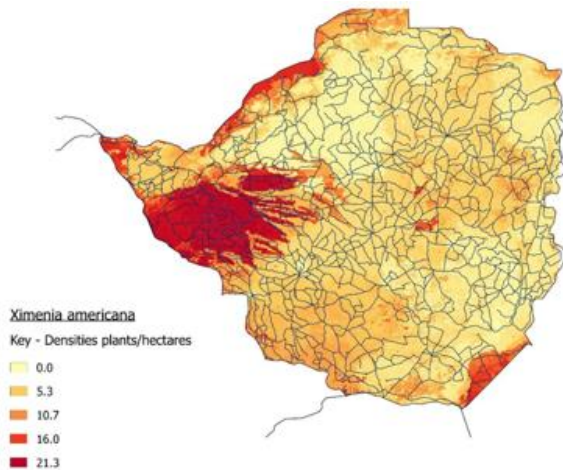
A study conducted by BIZ in 2015 surveyed several areas around the country, took inventories of both species as well as a number of other relevant metrics, and created an algorithm to predict

⁵⁵ <https://wabisabibotanicals.com/blogs/sensitive-skin-secrets/ximenia-oil-skincare-benefits>

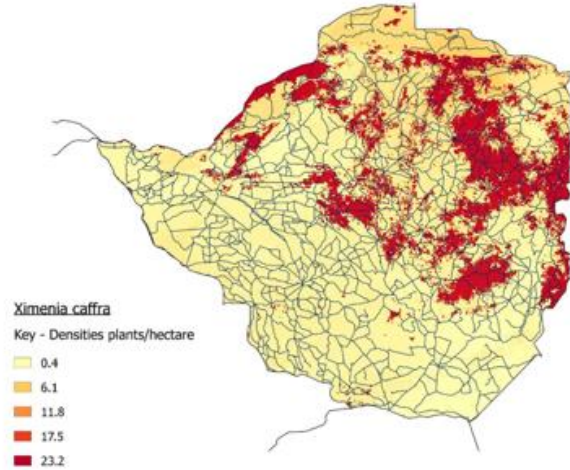
⁵⁶ European Patent Application for Ximenynic acid, Loders Croklaan, B. V., December 2002, <https://patentimages.storage.googleapis.com/39/64/77/cd709f91995b07/EP1402785A1.pdf>

tree density and tree populations across the country. Below are maps showing the predicted density of ximenia trees for each species.⁵⁷

Ximenia americana



Ximenia caffra



These maps suggest key areas for harvesting *X. americana* are in western Zimbabwe and in southeastern Zimbabwe in and around the Gonarezhou National Park. Key areas for harvesting *X. caffra* are in the north and eastern parts of Zimbabwe.

Using several assumptions suggested by BIZ regarding the percent that can be harvested (60% of trees), kilograms of fruit per tree (50 kg), ratio of seed to fruit mass (50%), yields of oil per kg of seed (0.25) we were able to calculate the available supply of fruit, seeds, and oil for each province. Below is a summary table for the entire country. Note that these numbers are based on limited surveying on the ground and rely heavily on a predictive computer model; thus, the numbers will need to be confirmed at a later date with additional resource mapping exercises. Using data from the predictive model combined with the assumptions noted above, a total of approximately 2,133 tons of oil can be produced from the nationwide supply of ximenia trees.

District	Tree Density/ km ²	Total Trees from BIZ Report	Total # kg fruit	Harvestable kg fruit	Harvestable kg Seed	Extractable Oil (kg)
Mashonaland East	4.1	34,407	1,720,350	1,032,210	516,105	129,026
Mashonaland West	4	56,322	2,816,100	1,689,660	844,830	211,208

⁵⁷ "A preliminary assessment of the sour plum (*Ximenia caffra* and *Ximenia americana*) resource in Zimbabwe", BIZ, April 2015, pages 27-28

Mashonaland Central	3.7	25,832	1,291,600	774,960	387,480	96,870
Midlands	4	50,406	2,520,300	1,512,180	756,090	189,023
Manicaland	3.6	27,216	1,360,800	816,480	408,240	102,060
Masvingo	3.8	51,003	2,550,150	1,530,090	765,045	191,261
Matabeleland North	12.1	224,807	11,240,350	6,744,210	3,372,105	843,026
Matabeleland South	6.4	99,016	4,950,800	2,970,480	1,485,240	371,310
Totals		569,009	28,450,450	17,070,270	8,535,135	2,133,784

Conversations with BIZ suggest that there is significant unmet market demand, and that the limited harvested supply is what is currently constraining growth in the market. Ximenia trees are thinly scattered over a wide area, increasing the costs and coordination challenges for the supply chain. In addition, the 2,100 MT of projected extractable oil is a relatively small quantity should this oil become popular with consumers and cosmetics (or pharmaceutical) companies⁵⁸. However, ximenia can be readily cultivated, grows about a half meter per year, and begins to produce fruit within about 3 years, giving ximenia a moderately elastic ability to respond to changes in demand.⁵⁹

Ximenia Market Size and Growth Rate

Ximenia oil is part of the market for natural cosmetic oils and that is its primary addressable market. As cited above, the global market for natural cosmetics was estimated at around US\$33 billion in 2015 and predicted to grow to US\$50 billion by 2019.

Through KII interviews and discussions with experts, the consultants estimate that the total market for ximenia is currently less than \$1 million per year at retail prices (less than \$100,000 per year at export prices).

Structure of Value Chain

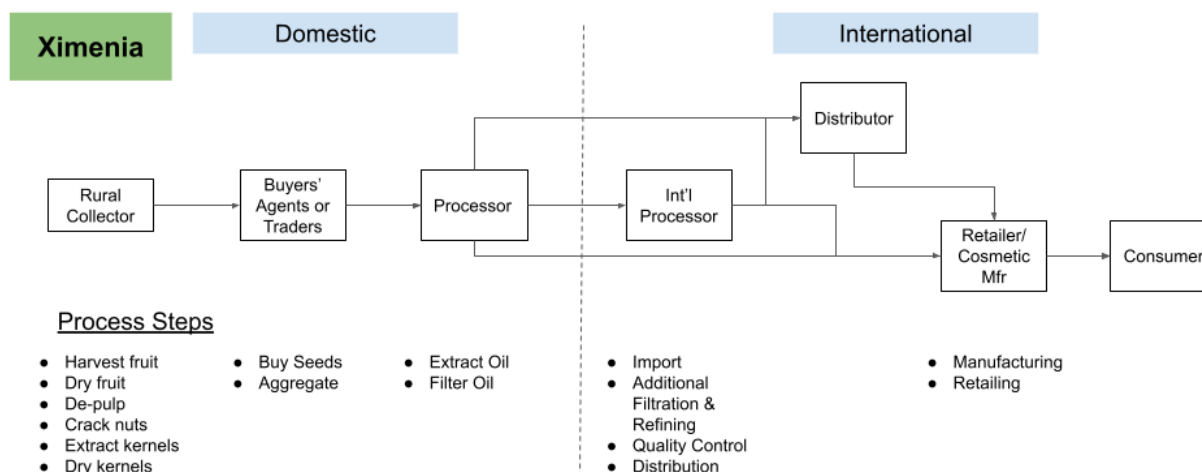
Ximenia fruits are usually harvested from the ground under trees after they ripen and fall, which generally takes place from December to February. Harvesters carry the fruit to their homesteads, where they are left to dry and are then stored. Decortication generally takes place later in the year, dried fruits are coarsely de-pulped before the nuts are cracked. They are commonly placed

⁵⁸ For example, about 17,000 MT of argan oil is exported from Morocco; about 56,000 MT of shea butter are exported from Ghana annually.

⁵⁹ "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 105, Livelihoods and Food Security Programme, UKAid

on a stone or hard surface and cracked carefully with a stick, to ensure that the kernel can be taken out in one piece. Kernels need to be dried and aerated for at least a week to avoid fungal infection after cleaning off the fruit pulp.⁶⁰

Below is a diagram illustrating this process and the various steps from collecting the wild fruit to the end-consumer.



Profitability to Producers

According to a Cost-Benefit Analysis conducted by BIZ (adjusted by the consultants using average volumes per collector from industry participants), wild collectors earn approximately \$3.58 per day spent collecting the fruit and selling seeds for oil. Total annual profit (excluding the value of labor) per collector is approximately \$143.15/year. This is a moderate return to labor (daily income) and the highest total annual profit among the NTFP fruits.

Key Issues

The ximenia value chain faces many of the same issues as the other fruit NTFP value chains. These will need to be addressed in order for ximenia to realize its growth potential.

- Limited consumer awareness of ximenia oil and its health benefits
- There are currently no common defined standards for ximenia products
- Inadequate traceability of raw materials from field through processing and aggregation points, to export. Traceability has become a very important requirement over the past 20 years, particularly for food ingredients.
- Very limited scientific research to validate health and nutritional claims for the oil

⁶⁰ "A preliminary assessment of the sour plum (*Ximenia caffra* and *ximenia americana*) resource in Zimbabwe", BIZ, April 2015, pages 21-22

- Extraction of kernels is a time-consuming task which significantly reduces returns to labor for collectors that do processing at home - tools or machinery could potentially make this process much more efficient
- The main constraint to more rapid growth is the fragility and unreliability of supply. At the moment, all ximenia oil in the market is supplied from wild-harvested sources and very few villagers collect ximenia for sale. In addition, the tree is not found in any significant population concentrations but is instead thinly scattered over a wide area.
- Potential for contamination of kernels during home processing or storage, suggesting that more centralized processing may be required. However, this also reduces the opportunity for value addition by villagers.
- Ximenia oil is difficult to process and purify because of the characteristics of the oil. The oil is very thick/viscous and difficult to filter using normal filtration processes and equipment.⁶¹

Ilala Palm (Baskets)

In Zimbabwe there are two species of Ilala palm, *Hyphaene petersiana* (called the Northern Ilala) and *Hyphaene coriacea* (called the Southern Ilala). The ilala palm is an erect, usually single-stemmed tree. Stems are rarely suckering to form clumps. It grows to an average height of around 18 meters. Leaves are crowded on top of the stem, fan shaped, up to 2.5 meters long. The leaves are used to make baskets and related products, while the sap is fermented to make wine. The hard, white kernel at the center of the fruit can be carved into ornamental shapes like ivory, and some parts of the fruit are edible as well.⁶²

Woven products include decorative and functional baskets, placemats, floor mats, wall hangings, bottle holders, food hampers, clothes hampers, and more. About 80% of the European imported baskets are made from natural materials such as bamboo, rattan, sea grass, jute, and ilala palm, with the vast majority being low-cost, mass produced products. In addition to their normal functional and decorative uses, some interior decorators repurpose baskets to function as lamp shades, lamp bases, and other items.

The market for Zimbabwean baskets includes the local market, international tourists, and export markets in the US, Europe, and other developed countries. Baskets can be marketed to retail shops and consumers, as well as designers and decorators working for clients building high-end homes, boutique shops, hotels, etc.

⁶¹ "A preliminary assessment of the sour plum (*Ximenia caffra* and *Ximenia americana*) resource in Zimbabwe", BIZ, April 2015, pg 20; also referenced in a couple of KIIs

⁶² "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 54, Livelihoods and Food Security Programme, UKAid

Ilala Palm Supply

Ilala palms prefer alluvial sands and are found in dry, sandy, lowland areas, often away from rivers. KIIs indicate that current supply of ilala palms is inadequate near weaving areas. KIIs and FGDs with weavers and the Binga Craft Centre pointed out that they often have to travel 80 km to another ward to harvest palm leaves to supplement their limited local supply, adding significant time and cost to the weaving process. The Lupane resource is widely scattered, and in the Southeast Lowveld supply is somewhat constrained due to restricted access to game parks. Large scale production of ilala palm products will likely require cultivation of ilala palms; however, the seeds are difficult to germinate, do not transplant well, and grow slowly, adding one leaf per year.⁶³

Key areas for producing palm baskets include Binga and Lupane. Some baskets are also produced in Darwendale, Chimanimani, Chipinge, and Chinoyi. In addition, some cane products are produced in the Birchenough Bridge area, and some bamboo products are produced in Honde Valley.

Woven Baskets Market Size and Growth Rate

Different market research reports have varying numbers for the size of the home decor market, which includes furniture, flooring, textiles, and other decorative items. The overall Home Decor market worldwide is quite large, with an estimated value in 2018/9 of anywhere from \$617⁶⁴ billion to \$663⁶⁵ billion. The US and Europe each comprise about 37-38% of the total market. Europe is the largest importer of products like baskets.⁶⁶ The US home decor market was approximately \$169 billion in 2019, up from \$129 billion in 2010. It is projected to reach about \$202 billion by 2024.⁶⁷ The “other decorative items” category (of which baskets is a part) is a relatively small percentage of the total Home Decor market. Furniture represents around 51% of the total market, with flooring and textiles making up the lion’s share of the rest. The overall market is expected to grow at a rate of around 4%, although China and Asia are expected to grow a bit faster.

⁶³ “Useful Plants of Zimbabwe With Potential as Smallholder Crops”, pg 56, Livelihoods and Food Security Programme, UKAid

⁶⁴ “Home Decor Market Size by Product Type”, Allied Market Research, May 2020, <https://www.alliedmarketresearch.com/home-decor-furnishing-market>

⁶⁵ “Home Decor Market Size, Share & Trends Analysis Report By Product (Furniture, Textile, Flooring), By Application (Indoor, Outdoor), By Region, And Segment Forecasts, 2019 - 2025”, Grand View Research, July 2019, <https://www.grandviewresearch.com/industry-analysis/home-decor-market>

⁶⁶ “What is the Demand for Home Decoration and Home Textiles in the European Market?”, CBI, Netherlands Ministry of Foreign Affairs, October 2021, <https://www.cbi.eu/market-information/home-decoration-home-textiles/what-demand>

⁶⁷ “Home Decor Market in the United States from 2010 to 2024”, Statista, <https://www.statista.com/statistics/1015171/home-furnishings-market-value-us/#:~:text=The%20value%20of%20the%20home,industry%20in%20the%20United%20States.>

The global handicrafts market (of which hand-made baskets are a part) had an estimated value of around US\$530 billion in 2017, with the US market being the largest market. Although there could be other potential markets (such as the green packaging industry estimated at about US\$260 billion in 2019⁶⁸), for the near-term, the handicrafts and home decor markets are the primary addressable markets for woven palm products.

To get a better handle on the size of the woven palm baskets market, we analyzed US and EU import data. US basket import values (Using the 4-digit Harmonized System (HS) code 4602 (Basketwork)) were about \$557 million in 2019, but this figure includes many types of woven products from many different materials including rattan, bamboo, jute, wicker baskets, etc. Using the 6-digit HS code 460219 (a bit narrower definition) shows US imports of \$226 million in 2019. Using more specific 8-digit Harmonized System codes (46021914 + 46021916 for woven palm products) showed US 2019 woven palm basket imports of about US\$5.5 million. EU import statistics are available at the 6-digit level (460219) but are not available at the more specific 8-digit HS code level. We estimated EU imports at the 8-digit level using the EU's 6-digit level import data multiplied by the US ratio of 8-digit imports to 6-digit imports. We also estimated the rest of the world imports assuming they are 33% of US/EU combined values (for home decor, the rest of the world is about 25% of the world market, or 33% of US/EU combined). See the table below for these estimates.

	4-digit HS Code 4602	6-digit HS Code 460219	8-digit HS Codes 46021914 & 46021916
	Plaited Baskets	Plaited Baskets of Other Veg Matls	Plaited Baskets of Palm Leaf
US - 2019	\$556.7 million	\$226.4 million	\$5.5 million
EU - 2019	\$401.9 million	\$229.4 million	\$5.1 million
Rest of World	\$320 million	\$152 million	\$3.5 million
Total Market	\$1,278 million	\$608 million	\$14 million

Based on these import statistics, we estimate the world market for woven palm baskets to be about \$10-15 million.

Based on Kilis with a number of industry participants, we estimate the Zimbabwean basket production to be around 21,000 - 22,000 baskets per year, with a value paid to weavers of approximately \$260,000.

⁶⁸ "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 56, Livelihoods and Food Security Programme, UKAid

Overall, US basket import growth has averaged around 3-5% per year over the last 10 years, with US imports of palm baskets increasing at a rate of almost 12% annually from 2010-2019. European basket imports actually declined slightly from 2010-2019.

Germany, the UK, France, the Netherlands, and Spain are the top five European importers of baskets. The leading source countries for imported baskets are China (42%), Vietnam (16%), and Indonesia (7.3%).⁶⁹ Eastern European countries such as Poland also supply significant volumes of baskets into Western Europe, due to their proximity and relatively low labor costs. Poland is famous for willow wicker baskets such as for taking on picnics. Bangladesh, though still a relatively small source of baskets for Europe, has come on strongly in recent years, tripling its exports to Europe from 2015 to 2019. Baskets from Bangladesh are primarily made of jute. Indian basket exports have also grown, more than doubling from 2015 to 2019. While basket weavers in all of these countries make beautiful decorative baskets, a large portion of the basket volume coming from these countries is more functional than decorative in nature and does not compete directly with baskets from Zimbabwe.

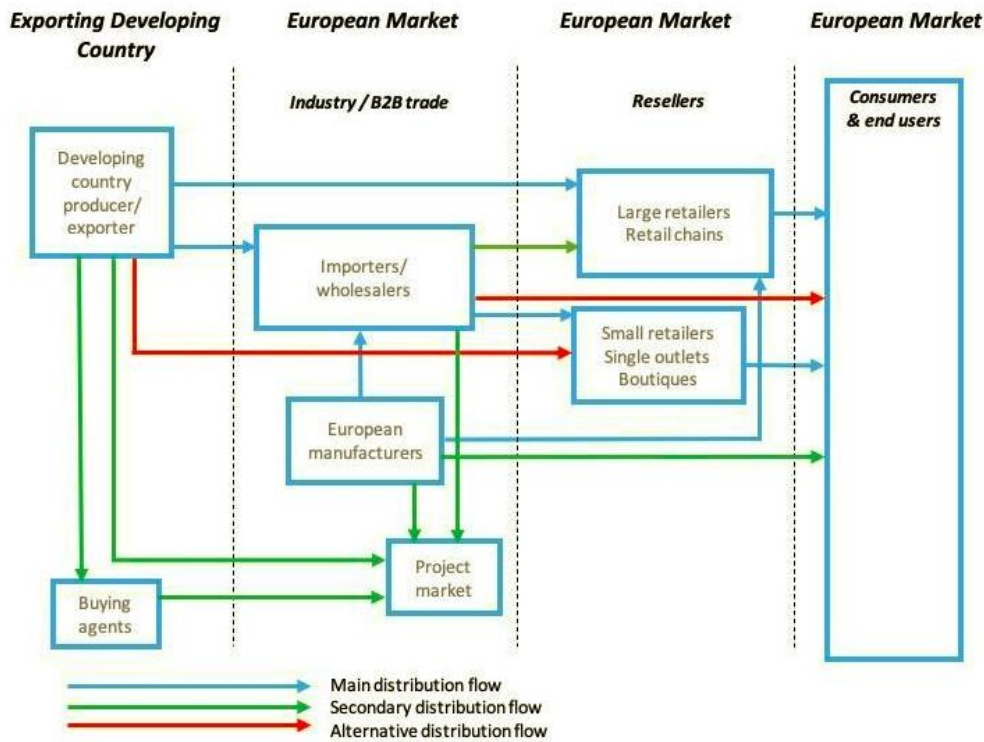
Structure of Value Chain

The diagram below illustrates a typical supply chain flow for baskets going to Europe.⁷⁰

⁶⁹ “The European Market Potential for Basketry”, CBI, Netherlands Ministry of Foreign Affairs, December 2020, <https://www.cbi.eu/market-information/home-decoration-home-textiles/basketry/market-potential>

⁷⁰ “Entering the European Market for Basketry”, CBI, Netherlands Ministry of Foreign Affairs, December 2020, <https://www.cbi.eu/market-information/home-decoration-home-textiles/baskets-boxes/market-entry>

Figure 2: Trade channels for basketry in Europe



As indicated by the diagram above, some large retailers will purchase directly from producers in developing countries. For example, the Macy’s department store chain had a direct buying relationship with basket weaving groups in Rwanda for a number of years. In addition, some smaller retailers that focus on niche markets have direct buying relationships and source directly from basket producers in various African countries. Several of the buyers with whom the team spoke in its KIIs buy directly from weaving groups in Zimbabwe and other African countries. Most retailers, however, buy baskets through wholesalers.

Retail prices for low end baskets are typically around \$10, for mid-range baskets between \$12 - \$60, and high-end and/or oversized baskets above \$60 per basket. Products going into the designer and decorator channels often carry much higher prices. According to one study, European consumer prices for baskets are 4-6.5 times the producer selling price. This margin includes logistics costs and VAT, as well as wholesaler and retailer costs and profit margins. This breaks down as follows:

- Logistics: shipping, import, handling costs: 25+%
- Wholesaler: 100+%
- Retailer: 100-150%
- VAT: 18-27% (depending on the country)

Margins for both the wholesaler and retailer are typically much lower for low-end products than for high-end products.⁷¹

Profitability to Producers

Information from KIIs with Binga Craft Center and Lupane Women's Development Trust indicate that basket weavers earn an average of around \$10 per basket, and are able to produce about 20 baskets per month. Thus, basket weavers affiliated with these weaving centers can earn \$200 per month or about \$2,400 annually. This is the highest daily and total annual income among the NTFPs included in this consultancy.

Certain international buyers and domestic buyers representing less than 20 percent of the total volume pay higher prices for the baskets they purchase, typically in a range of \$20-40 per basket. Thus, women producing baskets for those buyers earn more per basket, although their volumes may be lower because of higher quality requirements. The overall weighted average estimated selling price (for the weaver) is around \$11.83 per basket.

Key Trends in Home Decor and Basketry

Several trends are driving the home decor and basketry industry. These trends are quite favorable to the market potential for hand-made baskets from Africa:

- Increasing emphasis on sustainability, and on natural materials, renewable resources, etc. According to a survey conducted by the International Trade Centre, "98.5% of retailers consider sustainability as a factor in product sourcing decisions." Many European buyers are now requiring certification such as Business Social Compliance Initiative and Ethical Trading Initiative.⁷²
- Consumers are increasingly interested in Fair trade, labor conditions, etc. for the products they purchase.
- Home decor products in general, and basketry in particular, are often strongly linked to the story behind the products. This is key to marketing the product.
- A growing segment of consumers desires handmade products rather than mass-produced, machine-made products.
- With significant clutter in American homes, consumers are interested in products like baskets to help them declutter their homes in an attractive way.
- There is a growing movement towards using sustainable green packaging (degradable, recyclable and natural packaging materials). Several industries such as the food and beverage, fashion, cosmetics, and toiletry industries have begun to shift to green packaging. Woven palm packaging could be an interesting and very sustainable source of demand for ilala palm products, although mostly for high-end goods as it is considerably

⁷¹ "Entering the European Market for Basketry", CBI, Netherlands Ministry of Foreign Affairs, December 2020, <https://www.cbi.eu/market-information/home-decoration-home-textiles/baskets-boxes/market-entry>

⁷² "Entering the European Market for Basketry", CBI, Netherlands Ministry of Foreign Affairs, December 2020, <https://www.cbi.eu/market-information/home-decoration-home-textiles/baskets-boxes/market-entry>

more expensive than machine made packaging from recycled paper, wood chips, mushroom fungus, or bamboo.

Baskets from Zimbabwe fit well with these trends, and any effort to grow and better penetrate the basket market should leverage these trends in market messages.

An interesting idea proposed by Gus le Breton of BIZ would be to package basket making centers as tourist destinations where tourists could see baskets being made, buy baskets (possibly custom made for them), sample palm wine, and buy carved ilala ivory ornaments. There are similar tourist destinations set up in various parts of the world for other product categories, including tea, coffee, Amarula, pottery, etc.⁷³ Because of infrastructure constraints including roads, hotels, and restaurants, the Binga Craft Centre (a difficult 6 hour drive from Bulawayo) would be more challenging to develop into a tourist center than the craft center at the Lupane Women's Development Trust (an easy 2 hour drive from Bulawayo) with a restaurant and seven-room lodge currently providing some ancillary income.

Key Issues

Three key issues have been identified as important determinants of success in woven products. First is quality and design. There is a lot of competition in the woven products home decor market from other African countries as well as Asian countries. Virtually all high volume, low cost baskets come from Asia. Basket design and the skill of the weaver are critically important in determining the value of the basket, particularly for higher-end markets. KIIs indicated that, while Zimbabwe's baskets are good, they are not at the high end of the quality and design spectrum compared to baskets produced by weavers in some other countries. Several African countries produce higher quality baskets with better design elements than those produced in Zimbabwe. Zimbabwe will need to establish itself on the basis of quality and design, and potentially secure specific niche areas.

Second is shipping costs. Baskets have relatively high cubic volume to value ratios (unless they can stack well), making shipping costs high per unit. Large baskets can be especially expensive to ship. The location of the Binga Craft Centre (6 hours from Bulawayo via a difficult road, and then another 5-6 hours to Harare) makes it even more difficult and costly for baskets from Binga to get to market. An alternative would be to ship baskets via the relatively closer Victoria Falls, with its international airport and shorter road links to northern Botswana and road / rail links to southern Zambia.

Third is the sustainability of supply. KIIs with both the Binga Craft Centre and the Lupane Women's Development Trust suggest that the ilala palm resource base has declined, and the available trees are some distance away from where the weavers work (in the case of weavers in Binga Ward 15 and 16, roughly 80 kilometers away). This adds significant travel time and cost to

⁷³ "Useful Plants of Zimbabwe With Potential as Smallholder Crops", pg 56, Livelihoods and Food Security Programme, UKAid

the process of making baskets. It will likely be necessary to plant a few thousand palm trees near the basket weaving areas to ensure a sustainable supply.

Case Studies of Analogous NTFPs

To gain greater perspective on how large our target NTFPs could become with the right support, we researched a couple of analogous value chains. We studied shea butter and argan oil in some depth as interesting analogs for the oils value chains, and we studied açai and goji berries less in-depth as potentially useful analogs from the superfoods category for baobab powder. We also looked briefly at pomegranate juice as a potential analog for marula juice. These case studies are discussed below.

Shea Butter

Shea butter is extracted from shea nuts which grow on shea trees in 21 sub-Saharan African countries. Shea butter is used in the cosmetics (10-20%) and confectionary (80-90%) industries, with substantial demand from markets in Europe, America and Asia.

History and Growth of the Shea Industry

Shea butter has been used as a cosmetic oil for several decades. However, changes in EU regulations in 2000 allowed non-cocoa fat additions to chocolate products (limited to 5%) throughout the Eurozone (previously only a couple of countries allowed it), which led to a dramatic increase in the demand for a variety of vegetable fats including shea butter. By 2020/21, use of shea butter as a cocoa butter-equivalent (CBE) represented roughly 80-90% of the total market for shea butter.⁷⁴ In the mid 1990s, palm oil was the dominant oil used in CBEs, but over the next two decades shea butter made significant incursions into palm oil's CBE market share.

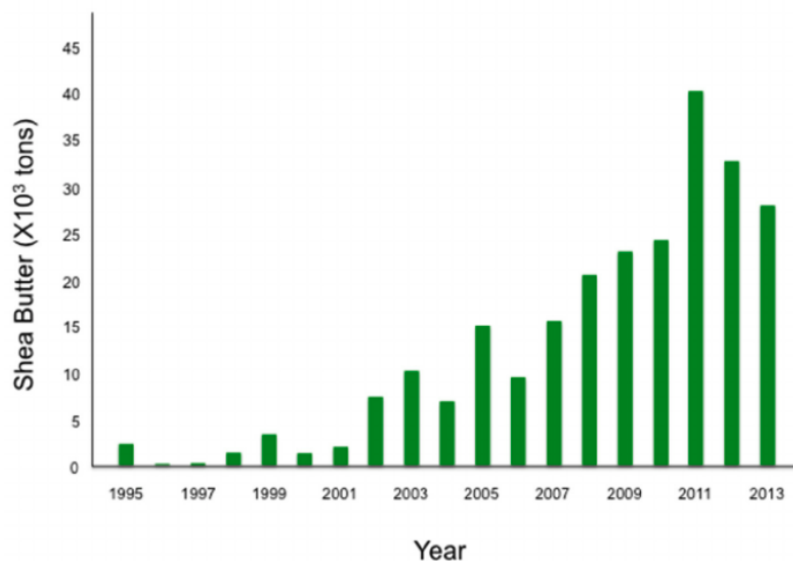
Estimates for the market size and growth rate of Shea butter are difficult to pin down. One study (Intel) pegged the global shea butter market at US\$1.19 billion in 2019 with a projection to reach US\$1.86 billion by 2026, expanding at a growth rate of around 6.6%.⁷⁵ Another study by Global Market Insights estimated the market size at US\$1.7 billion in 2020 with a projected growth rate of over 7.5% from 2021 to 2027. The raw or unrefined shea butter market size was around US\$430 million in 2020 and was projected to grow at an annual rate of 8% from 2021 to 2027. In

⁷⁴ Source: <https://www.slideshare.net/devkambhampati/dr-dev-kambhampati-usaid>

⁷⁵ source: <https://dataintel.com/report/she-a-butter-market/>

2020, the US shea butter market was valued around US\$240 million and is anticipated to grow at approximately 7% annually.⁷⁶

An independent study by LMC International (commissioned by the GSA and USAID) found that annual shea exports increased from 50,000 MT to more than 300,000 MT between 1997 and 2017, a compound annual growth rate of about 9.4% (see chart).⁷⁷ The growth was due to



Shea butter exports from 1995 until 2013 (with permission from LMC International [39]).

increased utilization of shea in global food and cosmetic markets. The increased exports are delivering US\$200 million in direct and indirect income for shea producing communities.⁷⁸ The shea butter and derivatives market is a large market with a history of strong growth and projected continued robust growth of 6-8% per year.

Ghana, one of the largest exporters of shea butter and derivatives, is an interesting illustrative case. It has seen substantial growth over the past 30 years, with its exports

growing from 2 tons in 1993, to 138 tons in 1996, to 504 tons in 1997, to over 55,000 tons/year by 2018, now valued at over \$90 million/year.⁷⁹ That represents a 31.38% annual growth rate in exports. Against that backdrop of significant growth in volumes, it is instructive to note that a study done of the Ghanaian shea butter industry in 1999 indicated that the industry struggled with several challenges including poor transport infrastructure, challenges obtaining required packaging, need to find markets for by-products, lack of working capital, rudimentary and

⁷⁶ source: <https://www.gminsights.com/industry-analysis/shea-butter-market>

⁷⁷ "The Evolution of Shea Butter's 'Paradox of paradoxa' and the Potential Opportunity for Information and Communication Technology (ICT) to Improve Quality, Market Access and Women's Livelihoods across Rural Africa", Julia Bello, Barry R. Pittendrigh, Sustainability, May 2015

⁷⁸ source: GSA Newsletter, December 2017, <https://www.globalshea.com/gsamain/storage/img/news/docs/GSA%20Newsletter%20-%20October%20-%20December%202017.pdf>

⁷⁹ "Shea butter markets: their implications for Ghanaian shea butter processors and exporters (NRI report no. 2403)", Chris Collinson and Abebeteh Zewdie-Bosuener, Natural Resource Institute, January 1999; And Ghana Export Authority, <https://www.gepaghana.org/market-report/shea-karite-oil-potential-markets-2018/>

inefficient technologies, and difficulties accessing international markets.⁸⁰ Many of these same issues constrain the growth of NTFP exports from Zimbabwe in 2022.

Global Shea Alliance

The Global Shea Alliance (GSA) was established in 2011 to help build a more competitive, sustainable, and profitable shea industry. It has more than 400 members from around the world, including the world's leading buyers of shea kernels and butter, traders, processors, service providers, women's groups, international brands and retailers, and non-profit organizations.⁸¹ It focuses on supporting and advocating for the growth of the shea industry, as well as supporting the development of industry members.

GSA offers the following services to its members.

- Direct member services:
 - Marketing linkages - facilitate at all levels of the value chain
 - Technical expertise on various topics related to processing, trade, packaging, labeling, etc.
 - Facilitate uptake of best practices & new trends
 - Facilitate networking in the industry
 - Enable members to participate in sustainability projects
 - Media & communication services
- Services to industry:
 - Promote use of shea worldwide, particularly in chocolate and confectionary products
 - Advocate to WTO and other multilateral bodies for shea interests
 - Advocate to national regulatory bodies for approval of shea products
 - Advocate to national governments for support of shea industry
 - Define common standards

The Global Shea Alliance has hosted international shea nut conferences for stakeholders since 2008. Currently the GSA hosts three international conferences, one in the US, one in Europe, and one in Africa. These conferences are widely attended by stakeholders in the confectionary and cosmetics industries.

Of the services mentioned above that GSA provides, several have been key to the membership and the success of the industry. For West African members these include:

- Market linkages
- Technical assistance
- Conference & convening power of GSA

For international brands they would include sustainability projects such as:

- Women's empowerment

⁸⁰ "Shea butter markets: their implications for Ghanaian shea butter processors and exporters (NRI report no. 2403)", Chris Collinson and Abebetch Zewdie-Bosuener, Natural Resource Institute, January 1999, pages 15-16

⁸¹ source: <https://www.usaid.gov/west-africa-regional/fact-sheets/global-shea-alliance>

- Protection of the ecosystem

There are several key lessons that GSA learned from the past 11 years that might be relevant to creation of a regional trade association for southern African NTFPs:⁸²

- Good governance is essential, along with an association that is inclusive of all stakeholders
 - GSA has an executive committee, a secretariat, and two standing working groups on sustainability and quality. The executive committee and working groups are composed of members representing different stakeholder groups and different geographic areas.
 - GSA has a chartered accountant as its Finance Director and all financial statements are audited by a large multinational audit firm
- Clearly define member services
- Demonstrate the value of the association to members
- Obtain adequate and consistent seed funding
 - Funding is necessary for a secretariat or coordinator (person or team);
 - Continuity of funding over time is more important than magnitude of funding;
 - Develop a funding plan to make the association independent over time through a combination of dues and fee-based services

Funding & Donor Support

All initial funding for the GSA came from USAID; over time other donors gradually began to support the GSA. Currently funding comes from a combination of membership fees⁸³ (a relatively small portion of revenue), sponsorship from larger companies (over and above their membership fees), and donor funding (the largest percentage of GSA's funding). GSA is also developing consulting services which it will offer to members for a fee. GSA's annual expenditures have grown from around \$243K in 2012 to over \$1.5 million in 2019.⁸⁴

Over the past 30 years substantial support has been provided by donors and industry in an effort to develop the shea industry, improve quality, ensure more equitable beneficiation on the part of women producers, and ensure the sustainability of shea resources. This support (see table below) has included the development and capacity building of cooperatives; establishment and capacity building for the Global Shea Alliance; training and capacity building for producers and cooperatives in quality, packaging, labeling, etc.; marketing support; planting shea trees; etc. Although the list of projects in the table below is not completely comprehensive and the total cost of all of the project assistance is not known, information on a variety of projects suggests donors and industry provided at least \$36 million in assistance to the industry since 2004, although the

⁸² Much of the material in this section on services provided and key lessons learned came from a KII with a representative of GSA.

⁸³ Membership fees range from \$50/year for cooperatives to \$150/year for national associations to \$1,500 for large corporates

⁸⁴ GSA's expenditures over the years were as follows: 2012: \$243K (98.6% from USAID); 2013: \$829K; 2014: \$979K; 2015: \$1,116K (77.5% from grants); 2016: \$1,058K (88.9% from grants); 2017: \$1,353K; 2018: \$1,270K; 2019: \$1,573K (source: various GSA annual reports (<https://www.globalshea.com/gsa-journals?page=MjE2NDA5NjQ3MC44NzM=/Annual%20Reports>))

number is likely much higher. GSA most likely directly received at least \$8-9 million in grants over the past 10 years, based on the information provided in the annual reports.

Donor	Type of Support	Timeframe	Value of Support
L'Occitane (private sector)	<ul style="list-style-type: none"> • Training, increasing efficiency and production while preserving and standardizing quality. • Establish a partnership with a collective to buy shea butter directly at a negotiated price that allowed the women to cover their true costs. 	Late 1980s	Unknown
Common Fund for Commodities & Gov of Netherlands	ProKarite Project: build a regional consensus on issues of product quality and certification through the 16 producer countries	2004	\$3.2 million
L'Occitane (private sector)	Launched the Shea Center in Ouagadougou, Burkina Faso and built a 4,300 square foot production facility to train women on butter neutralization to optimize quality and reduce losses	2007	Unknown
USAID West Africa Trade Hub	Establishment of the Global Shea Alliance	2011	Unknown
USAID West Africa Trade Hub	Housing the Global Shea Alliance Secretariat	2011 - ?	In-kind
USAID	Towards Inclusive Markets Everywhere (TIME): <ul style="list-style-type: none"> • Operated in Ghana, Burkina Faso, Côte d'Ivoire, and Nigeria. • Trained 12,000 women in quality shea processing, • Linked 272 women groups to 10 international buyers 	2014-2016	\$400,000
World Agroforestry Center (ICRAF)	Study on shea ecosystems and recommendations for potential work streams that will promote healthy shea tree populations, development of planting materials, and improved parkland management practices.	2014	Unknown

ICCO	<p>“Support to National Associations in West Africa”:</p> <ul style="list-style-type: none"> ● It operated in Ghana, Benin, and Mali. ● Established secretariat offices for three national associations in Ghana, Benin, and Mali ● Trained 45,000 women collectors in quality shea processing ● Facilitated 30% bonuses for selling quality shea kernels 	2013-2015	\$400,000
USAID & ICCO	<ul style="list-style-type: none"> ● GSA aims to provide over 5,000 women shea collectors from 250 women’s groups across West Africa training in quality, aggregation and market linkages. ● construct 50 warehouses by 2016. 	Unknown	Unknown
USAID West Africa Trade Hub and African Partners Network	GSA launched a one-year initiative to fund business development training for 20 women’s groups. Through the pilot project, 600 women learned about business development skills, cooperative development and management, shea kernel aggregation, and accounting and contract management.	2015	Unknown
USAID + other donors + industry	<p>Sustainable Shea Initiative:</p> <ul style="list-style-type: none"> ● Facilitate 1,191,710.28 MT of shea exports with a value of \$360,763,559. ● Facilitate investment of \$7,530,000 in the shea sector. ● Donate 334 warehouses for women shea collectors and processor groups. ● Increase income of shea collectors by \$7,442,625. ● Create 14,000 full time equivalent jobs. ● Plant 500,000 new trees and protect 10,000,000 existing trees. 	2016 - 2021	Approx. \$15 million
USAID + other donors + industry	As part of the Sustainable Shea Initiative, the GSA launched the Action for Shea Parklands initiative aimed at planting ten	2020 - 2030	Approx. \$17 million (including matching)

	million shea trees in ten years – a response to the continuous destruction of shea parklands. The initiative will operate in Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Nigeria, and Togo.		contributions from industry)
Total			\$36+ million

Argan Oil

Argan oil is extracted from the seed of argan fruit produced by argan trees in southwestern Morocco in an area covering roughly 800,000 hectares. That area was declared a Biosphere Reserve by UNESCO in 1998 because of its important environmental, economic, and health benefits. Berber women in and around the reserve harvest the argan fruits, extract the nuts, and press them to produce the valuable oil which is used for cosmetic purposes and cooking.

Historical Growth

Starting with the first US sales in 2003, demand soared, and production increased as a result of positive consumer experiences and studies suggesting health benefits. In 2005, export sales (less than 10% of production) were between 10-15 MT. By 2012 production was approximately 2,500 MT, and by 2014, volumes had increased to about 4,387 MT. Production was projected to reach 17,800 MT by 2022, with a value of around US\$1.79 billion.⁸⁵ This represents a growth in exports of 60-65% per year from 2005 - 2017, and about 28% per year from 2012 to 2022. One source put the export market value of argan oil around \$1.5 million in 2020.⁸⁶ Consultant calculations suggest the value may be lower, somewhere between \$650,000 - \$850,000 using an export price of \$40-50/liter (roughly one-third of the retail price of the oil).

As with shea butter, there is conflicting data on the market size of argan oil. Databridge Market Research estimates the global market for argan oil will grow from around \$116 million in 2022 to around US\$427 million by 2029, with an annual growth rate of around 20.4%.⁸⁷ Assuming production of about 17,800 MT, the current market value of the oil is probably closer to US\$1.79 billion than \$116 million, since the first value puts the value/liter at about \$100/liter, while the second value puts the value/liter at just \$6.5/liter.⁸⁸

Up until the late 1990s, most argan oil was “undifferentiated, had questionable purity, and was sold in reused plastic bottles (often at roadside stands).... Improvements in packaging and

⁸⁵ source: https://en.wikipedia.org/wiki/Argan_oil

⁸⁶ <https://www.tridge.com/intelligences/argan-oil/MA/export>

⁸⁷ source: <https://www.databridgemarketresearch.com/reports/global-argan-oil-market>

⁸⁸ Argan oil sells on Amazon for \$3.50 - \$10.99 per fluid ounce (roughly \$118 - \$372 per liter)

labeling were the first step to tapping high-value markets in the late 1990s”.⁸⁹ In the late 1990s, scientific validation of the chemical and functional claims for argan oil resulted in rapid growth in demand for argan oil. The growth in demand also resulted in improvements in hygiene practices as well as extraction, processing, and testing equipment to enhance efficiency and quality.⁹⁰ As a result of the increased demand, the price of argan oil increased from €2.5 to €25 per liter, significantly increasing incomes for the women, cooperatives, and trading companies. By 2014, around 5,000 women worked in the cooperatives, each of them earning about US\$5-8 per day.⁹¹

Donor & Government Support

This steady growth for argan oil was driven by consumer demand and industry incorporation of the oil into a variety of cosmetic and personal care products. However, it would likely have experienced much slower growth if donors and industry had not invested in the value chain. Over the past 20 years substantial support has been provided by donors, the Government of Morocco, and industry in an effort to develop the argan industry, ensure more equitable beneficiation on the part of the women producers, and ensure the sustainability of the argan forest. This support has ranged from the development and capacity building of cooperatives and consortia; training for producers and cooperatives in quality, packaging, labeling, etc.; development of quality standards; development of standardized contracts; marketing support; planting argan trees; construction of weirs to improve water access; etc. Although the project list is likely not comprehensive and the total cost of all of the project assistance is not known, donors provided at least \$61 million in assistance since 2013.

Donor	Type of Support	Timeframe	Value of Support
Canada’s International Development and Research Centre (IDRC)	<ul style="list-style-type: none"> ● Established 5 cooperatives with several hundred women members ● Introduced new technologies ● Capacity building ● developed and launched three new products: argan oil for cosmetic use, edible oil made from toasted seeds, and an edible spread made from argan, honey and almonds 	1998-2002	N/A
Government of	Replanting 1,400 hectares of argan trees	2005-2006	Unknown

⁸⁹ “Booming markets for Moroccan argan oil appear to benefit some rural households while threatening the endemic argan forest”, Travis J. Lybberta, Abdellah Aboudrareb, Deborah Chaloudc, Nicholas Magnand, and Maliha Nashc, Proceedings of the National Academy of Sciences of the US, August 23, 2011, vol. 108, no. 34

⁹⁰ “Market-based conservation and local benefits: the case of argan oil in Morocco”, Travis J. Lybbert, Christopher B. Barrett, Hamid Narjisse, Ecological Economics, January 2002, page 132

⁹¹ “Research turns oil into market hit, empowers women“, SciDevNet, May 2014, <https://www.scidev.net/global/features/research-oil-market-women/>

Morocco			
EU & Gov't of Morocco	Le Projet Arganier aimed to empower and improve the lives of rural women in the argan region and promote the protection and conservation of the forest by, among other things, supporting the expansion of argan oil cooperatives for women, introducing new machinery & processing standards; shifting marketing networks from local traders to international buyers	2003-2010	EU12 million (approx. US\$13.68 million)
Swiss Secretariat for Economic Affairs (SECO)	<p>PAMPAT:</p> <ul style="list-style-type: none"> ● Develop common vision for value chain ● Standardize contracts, strengthen linkages and partnerships ● Capacity building for 100 cooperatives & 30 enterprises helping them comply with national and international hygiene/sanitation requirements ● assisting coops/enterprises with packaging & labeling requirements ● obtaining special labelling for products such as Organic Certification and Geographical Indication ● Create export-oriented consortia (FIFARGANE & VITARGAN) ● Diversify markets & products ● Develop a good practices reference guide for producers focused on hygiene & safety ● Assistance to attend and present at international agricultural fair in Paris and another cooperative to participate in the Cosmoprof fair in Bologna ● Arranged a study tour for 2 export consortia to visit Tuscany 	2013 - 2017 (closing event was in 2019)	EU2.878 million (approx. US\$3.28 million)
UNDP	<p>CEP-SM Project:</p> <ul style="list-style-type: none"> ● Establish payments for ecosystem services ● Capacity building ● Strength organic producers ● Strengthen conservation of agro-biodiversity 	2014-2019	\$10.15 million
Green Climate Fund	<p>DARED Project:</p> <ul style="list-style-type: none"> ● Research domesticating argan trees 	2017 - 2023	\$39.2 million

	<ul style="list-style-type: none"> ● plant 43,000 hectares of argan orchards ● 2,000 hectares of alley cropping of aromatic & medicinal plants in association with rainwater collection techniques ● Construct 40 weirs & restore 16 weirs 		
Global Affairs Canada	<p>REFAM Project:</p> <ul style="list-style-type: none"> ● support women [in the argan value chain] in the expansion of their economic activities through better access to information and market opportunities at home and abroad, as well as through increased awareness of the gender barriers that hinder their contribution ● Development of a GIS system to support forest protection actions in the biosphere reserve. 	2019 - 2023	CAD\$11.5 million (approx. US\$9.085)
Total			\$75.4+ million

In addition to the formal monetary and project support listed in the table above, argan oil also benefited from non-monetary support, including declaration of the Argan Biosphere Reserve by UNESCO (in 1988), declaration of a Geographic Indication by the EU (in 2009), and declaration of May 10 as International Argan Day by the UN General Assembly (in 2021), all of which provided invaluable publicity for argan. Argan also benefited from substantial media attention; it has been featured in a French documentary, is showcased by many tourist publications on Morocco, and there are many websites dedicated to telling the argan story and promoting argan oil. In addition, social media has also delivered enormous free publicity, as evidenced by the more than 1.2 million Instagram posts using the hashtag #arganoil. “Across this broad array of media attention, one strand is nearly always woven into the argan story: the wonderful win–win it offers consumers to protect trees and help local women, all while enjoying the many virtues of this liquid gold.”⁹²

Key Takeaways from Shea & Argan Case Studies

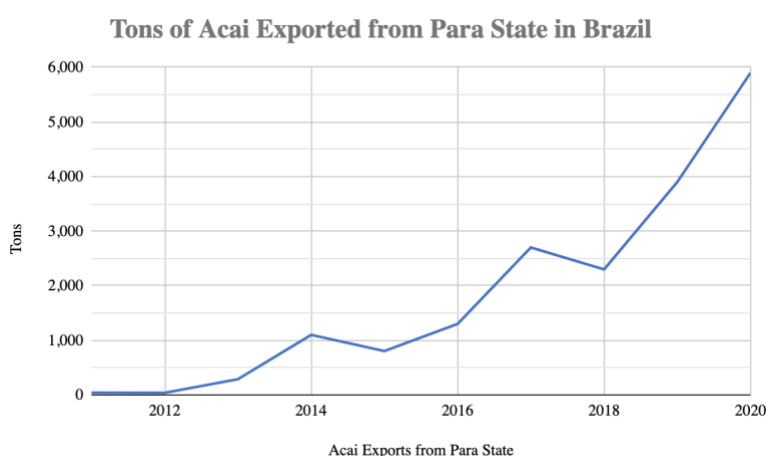
Roughly 25-30 years ago both shea and argan oil were immature industries that struggled with poor quality, adulteration, inefficient tools and equipment, challenges accessing the market, etc. Since the late 1990s, substantial donor support (more than \$35 million in each case) has been essential to the growth and sustainability of both of these value chains. In addition, long-term

⁹² “Booming markets for Moroccan argan oil appear to benefit some rural households while threatening the endemic argan forest”, Travis J. Lybberta, Abdellah Aboudrareb, Deborah Chaloudc, Nicholas Magnand, and Maliha Nashc, Proceedings of the National Academy of Sciences of the US, August 23, 2011, vol. 108, no. 34

support was essential as the market and supply chains gradually developed - donor support was provided over 15-20 years in both cases. Support provided to both value chains was quite similar, including training and capacity building; development and funding for industry associations, consortia, and cooperatives; marketing support; construction of hundreds of warehouses; research; development of improved tools; tree planting campaigns; etc.

Açaí

Açaí is a deep purple berry that grows on a type of palm tree in Brazil and several other countries in Latin America. Brazil is by far the largest producer and exporter of açaí berries and products. Açaí is widely viewed as a superfood or a superfruit, and has become quite popular throughout



the developed world. Since baobab powder is also considered a superfood, açaí might be an interesting analog to consider what is possible.

From 2011 to 2020, the value of açaí product exports from Brazil grew by a compound annual growth rate (CAGR) of 60%, while the unit volume of açaí product exports grew by a CAGR of 64%. The inflection point was 2013, when it gained market acceptance

outside of Brazil and exports really took off. From 2013 to 2020 there were 6 years when growth rates were above 150%.⁹³

There are many factors that contributed to the growth in popularity of açaí, including the general growing interest in superfoods and health foods, but two factors were especially critical. First, social media campaigns pushed açaí to the front of consumers' awareness. On Instagram, for example, the hashtag #açaibowl has about 1.8 million posts, and the hashtag #açaí has 2.9 million posts. Second, celebrities like Oprah Winfrey publicly endorsed Açaí and referred to it as a "superfruit". As a result of the growing popularity, smoothie cafes and restaurants began to offer products incorporating açaí as an ingredient or even offering products in which açaí is the central focal point, such as Açaí Bowls.⁹⁴ A key takeaway from this case study is that marketing,

⁹³ "Export of açaí grows almost 15,000% in ten years", <https://www.oliberal.com/liberalamazon/export-of-acai-grows-almost-15-000-in-ten-years-1.390194>

⁹⁴ "How Social Media Launched the Acai Craze", Social Hospitality, <https://socialhospitality.com/2019/11/how-social-media-launched-the-açaí-berry-craze/#:~:text=It%20also%20became%20a%20natural,when%20social%20media%20platforms%20emerged>. Updated Instagram statistics are from Instagram.

social media campaigns, and celebrity influencers like Oprah can have a huge impact on the popularity of products like baobab, marula, and açai.

Goji Berries

Goji berries are small red fruits native to Asia. They are also considered a superfood, with high levels of antioxidants, Vitamin C, Beta carotene, and many other micronutrients⁹⁵. Goji berries are quite popular in Asia and have been widely hailed as a superfood, garnering some media attention. The Los Angeles Times wrote a highly supportive article about goji berries in 2005, in 2006 Time Magazine named the goji berry the “superfruit of the year”⁹⁶, and the hashtag #gojiberry has about 450,000 posts on Instagram. But in spite of that publicity, they have not enjoyed quite the same level of success as açai berries in the western developed world. From 2003 - 2016 exports of Goji berries grew at a rate just over 6% per year, far lower than the explosive growth enjoyed by açai. Perhaps Goji berries would benefit from a more concerted social media and celebrity influencer campaign like açai.

Summary of Key Findings

Based on all of the above information and evidence from the KIIs, FGDs, data analysis, and literature reviews, the team has identified several key issues and findings which are summarized below.

Consumer and Industry Awareness

Consumer awareness is low for all of the fruit NTFPs; a bit higher for baobab and marula, and much lower for KMS and ximenia. KIIs suggest that industry awareness is moderately high in the cosmetics industry and medium in the food/beverage industry, although low in the smoothie industry. While growing, utilization of NTFPs in industry products is still quite low, both in absolute numbers and compared to competing oils. It will take time to incorporate these oils and baobab powder into cosmetics, personal care, and food/beverage products. Generally these ingredients will be introduced via new products rather than existing products, and new product development timelines range from 1-3 years.

⁹⁵ <https://www.downtoearth.org/articles/2009-03/32/goji-berries-ancient-remedy-finds-new-popularity>

⁹⁶ <http://freelifegojijuice.blogspot.com/2006/09/time-magazine-calls-himalayan-goji.html>

Scientific Research

Scientific evidence supporting claims of nutrition or biological benefits is scarce for the four fruit NTFPs. Several KIIs and multiple reports highlighted the need for scientific research and evidence-based marketing.⁹⁷ One specialty oils distributor with whom the team spoke indicated that when they get inquiries from cosmetics formulators they frequently need to provide efficacy data and clinical trials for each of the ingredients. He said that “If we could come up with clinical efficacy data it would take the [NTFP oils] products to the front of the queue; it would change everything about the conversation [he has] with formulators”⁹⁸. Scientific research is needed on both the technical attributes of the NTFPs (e.g., the chemical composition of oils) as well as the biological/functional benefits and efficacy of the oils and powders (e.g., demonstrating their effectiveness in terms of moisturizing skin or hair, improvement in skin elasticity, reduction in wrinkles, improvement in microbiome function, etc.). This will require both laboratory analysis as well as consumer testing under controlled conditions, possibly including clinical trials.

Quality and Standards

Domestic markets have relatively relaxed requirements related to the target NTFPs primarily due to a general lack of awareness of the importance of quality standards as well as the relatively high cost of certification. For most export markets, however, quality is a very important dimension in determining supply chain sources. Thus, sanitary conditions, chemical contamination, and oil particulate matter are important issues throughout the entire supply chain for all of the fruit NTFPs. This is certainly true for cosmetics manufacturers (impurities can cause oils to be rejected by cosmetics companies or reduce shelf life), but even more true for food and beverage manufacturers, with particular relevance for baobab powder and marula fruit pulp. See Annex F for EU and US regulations and requirements for registration, testing, packaging and labeling.

Among rural producers, small processors, and trading enterprises there is very limited knowledge of and ability to implement Good Agricultural Practices (Global G.A.P), Good Manufacturing Practices (GMP), and Hazard Analysis and Critical Control Point (HACCP) processes throughout the fruit NTFP supply chains. While wild collectors do not need to become experts in G.A.P, GMP or HACCP, they do however need to have an understanding of and apply basic good hygiene and storage practices. The industry is fragmented, poorly organized, and most participants are small, under-resourced, and ill-equipped to deal with sophisticated quality requirements, labeling requirements, import-export requirements, etc. Periodic training is needed in these fundamental areas to facilitate better access to sophisticated foreign markets and reassure the customer base regarding the quality and consistency of supply. Alternatively, as one company has chosen to do, an interim solution could be for the nuts or seeds to be shipped to Europe and processed in

⁹⁷ For example, “At present, although there is a significant body of scientific literature to suggest strong health benefits, many of the potential claims still need to be substantiated” from “A Two-Year Programme to Activate and Operationalise the African Baobab Alliance”, page 6, African Baobab Alliance, February 2022

⁹⁸ From a KII with a specialty oils distributor to the cosmetics industry, based in the UK.

a European facility, thereby leveraging the quality processes, equipment and reputation of the European processor, while developing local capacity to export finished, higher value products to foreign markets.

Another key quality issue is the challenge of ensuring consistency when merging batches from a variety of geographic locations. Indigenous plants often have variable profiles depending on soil, rainfall, temperature, etc. in each location. Variations in processing can also result in variations in the output. Because larger manufacturers either have volume requirements that exceed the production capacity of a single area or require multiple sources to diversify risk, they require consistency in the characteristics of the products they are sourcing regardless of source and batch. One possible solution is to develop stable clones that produce a consistently reliable product regardless of geographic location. However, this would necessarily exclude wild harvesting from the supply base.⁹⁹ Another potential solution that could address some of the consistency issues is to create common quality standards combined with high quality, reliable testing; currently there are no common standards for any of the NTFPs, although some efforts are underway to develop standards for marula and KMS.

Certification

There are many different international standards and certification schemes including NATRUE¹⁰⁰, COSMOS¹⁰¹, and Union of Ethical Bioproducts (UEBT)¹⁰² which are three of the better-known competing standards for natural, organic, and ethical cosmetics; and Fair Trade¹⁰³ and Fair Wild¹⁰⁴ (for wild-harvested ingredients). In addition, ISO 16128¹⁰⁵ is a self-certifiable standard for natural and organic cosmetics ingredients and products. The European Federation For Cosmetic Ingredients has also developed a good manufacturing practice standard¹⁰⁶ (based on ISO 9001) for cosmetic ingredients.¹⁰⁷ ISO 22000 is an international standard for food safety management that could be relevant to baobab powder and marula fruit pulp. It is a confusing landscape, with many overlapping standards systems. Each system is costly to implement and requires resources that are beyond the capacity of most small enterprises and producer organizations. In addition, due to the widely dispersed nature of the wild collectors and the trees from which products are

⁹⁹ “Collaborative models for sustainable bioproducts - Outgrowers, Hubs and Aggregators”, ABioSA Case Study, June 2021, <https://www.abs-bioproducts.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA-case-study-hub-and-aggregator-model-2021.pdf>

¹⁰⁰ <https://www.natrue.org/>

¹⁰¹ <https://www.cosmos-standard.org/>

¹⁰² <https://www.ethicalbioproducts.org/about-uebt>

¹⁰³ <https://www.fairtrade.net/>

¹⁰⁴ <https://www.fairwild.org/>

¹⁰⁵ <https://www.iso.org/standard/65197.html>

¹⁰⁶ “EFFCI GMP Certification”, <https://effci.com/?p=sec-gmp>

¹⁰⁷ “Marula Oil for Cosmetic Use in Europe, CBI Ministry of Foreign Affairs, Page 10, https://www.importpromotiondesk.com/fileadmin/user_upload/Publikationen/factsheet/zutaten/Marula_Oil_190107.pdf

harvested, it can be very difficult to certify some supply chains as completely organic, even though in practice they may be organic. One distributor with whom the team spoke indicated that some cosmetic formulators will accept a signed affidavit to declare that “to the best of our knowledge this product is all natural, organic, etc.” in lieu of organic, Halaal, ECOCERT, or COSMOS certifications.

Processing Efficiency

Most rural processing of NTFPs uses very rudimentary and inefficient tools such as rocks, axes, and machetes to extract seeds. This makes the extraction process very time consuming (reducing returns to labor) and somewhat hazardous. These processes could be improved in efficiency, safety, and quality through the use of relatively inexpensive tools and the provision of Protective Personal Equipment (PPE). Basket weavers could use protective gear such as gloves, along with improved knives or sickles for harvesting ilala palm leaves.

Sustainability of Supply

For most of the NTFPs, the supply is adequate for existing demand. In the case of baobab, current demand is roughly 5% of estimated Zimbabwe capacity. For marula, the story is a bit more mixed, with some concerns regarding adequacy of supply and sustainability. For ximenia, there appears to be plenty of harvestable supply to meet current demand, but it is thinly scattered across the country, making it more challenging to aggregate sufficient volume. Very little KMS is available in the wild, but it can readily be cultivated, making sustainability of supply dependent primarily on giving rural farmers sufficient incentive to grow the melons. Ilala palm is another value chain with questions regarding adequacy of supply. Currently there is an inadequate supply near weavers in Binga Wards 15 and 16. Thus, tree planting campaigns will likely be required for ilala palm, and may be required for marula and ximenia to some extent. Comprehensive tree inventories will be necessary to gain a more complete understanding of the sustainability of supply, and to what extent tree planting will be required.

Labor Issues

Generally labor is available to harvest and process the NTFPs (or weave baskets in the case of ilala palm). However, there is some competition for time among those who are farmers, since some of the activities correspond to the times of year when field work is being done. Hence, farmers will often fit NTFP harvesting activities around their farming chores, and then either process the nuts (in the case of oils) in the evenings or delay processing the nuts until later in the year when time is available. Since most of the work on NTFPs is done by women, household chores and childcare responsibilities also compete with NTFP harvesting and processing. This is especially true since so much of NTFP work is highly manual and very labor intensive. Any tools which can reduce the labor required (while maintaining the income) would improve the

attractiveness of these NTFPs to rural households. One study noted that “while there could be competition for their time they always manage to balance this time but in reality this means less time is allocated to NTFPs. For example, collectors of NTFPs said they allocate one or two days per week or every two weeks for going to the forest to collect NTFPs while processing is done during their rest time in the evening or on the weekends.”¹⁰⁸ Unless NTFPs can contribute a much more substantial and reliable income stream to the household economy they will continue to be relegated to spare time activities.

One area where baobab is not likely to gain much traction is in the Beitbridge area. One KII source from an important baobab company indicated that the residents around Beitbridge have more lucrative income sources such as cross-border trading and are not interested in collecting baobab fruits. Thus, that company has stopped operating in the Beitbridge area, even though that area has a large supply of baobab trees.

Lack of Working Capital

KIIs with buyers indicated that working capital requirements can be challenging for export enterprises, given the rather lengthy cash-to-cash cycles when exporting products to western buyers. These lengthy cash cycles, which extend up to nine months, can be quite onerous for enterprises without strong balance sheets.

KIIs and FGDs with the basket centers and weavers in Binga and Lupane also indicated that local buyers often lack cash to pay weavers and frequently resort to barter arrangements, using groceries and kitchen utensils as the medium of trade. These barter arrangements typically heavily discount the value of the baskets, dramatically reducing weavers’ incomes. Additionally, the centers themselves previously purchased baskets from weavers into their own inventory and then resold them, but a lack of cash has caused them to significantly curtail these purchases in favor of a “make to order” process. Access to low cost working capital solutions could potentially increase traded volumes in NTFP value chains.

Policy Framework

The term NTFP (non-timber forestry product) was developed some 20-30 years ago, serving donors and academics as a catch-all acronym for indigenous bioresources available to communities as a food alternative and/or socio-economic uplifter.

“Unfortunately the term is not well recognized by the political establishments that oversee NTFP management, harvest and trade, specifically ministries of forestry, agriculture,

¹⁰⁸ “Study of the Impact of Non-Timber Forest Product Collection on Household and Community Resilience”, Final Report, Development Solutions, December 2020, page 42

taxation, trade and health. Therefore NTFPs often fall into a no-man’s-land in policy-making, subject to a variety of laws and policies at the international, national and local levels”.¹⁰⁹

The above statement accurately characterizes the ambiguous policy framework governing exploitation of NTFPs within the Zimbabwean context. GoZ regulations covering the harvesting of NTFPs are mainly enshrined in the Communal Land Forest Produce Act chapter 19:04 of 1987, which regulates the harvesting and protection of forest produce within communal land. Under the Act, harvesting of forest products is permissible for household use but requires a permit when harvesting is being done for resale.

The Rural District Council (RDC) issues annual harvesting permits which are “endorsed” by the Forestry Commission who then issues movement permits for harvested produce to leave the forest. During the harvesting process the Forestry Commission monitors the harvesting process and the quantities harvested. Harvesting permits are specific in time and location (village and ward). The Environmental Management Agency (EMA) provides monitoring and enforcement of RDC by-laws and national environmental laws. EMA also liaises with Forestry Commission, RDC, and village-level Resource Monitors to ensure the protection of these bioresources.

However, this working structure is not watertight and has gaps which need to be addressed to ensure the viability of NTFP value chains. Traditional laws apply to some NTFPs considered to be sacred. Fines may be imposed through traditional leadership structures. The Natural Resources Act chapter 20:13 of 1996 and the Rural District Councils Act of 1988 also govern the exploitation of NTFPs along with other legislation detailed in the table below.¹¹⁰

Regulation	Main Theme and Provisions
Forest Act of 1982	<ul style="list-style-type: none"> • Provides mandates for the Forestry Commission as a forestry authority to protect and conserve forests for the benefits of the nation - including control, management and leasing of state forests - and to regulate and supervise timber extraction by private landholders and concessionaires
Communal Land Forest Produce Act chapter 19:04 of 1987	<ul style="list-style-type: none"> • Restricts use of forest products in communal lands to own use • Provides for rural district councils (RDCs) to grant licenses to concessionaires to harvest forest products for commercial purposes • Restricts movement of produce from communal areas • Prohibits use of forest products from protected forest areas and reserved tree species

¹⁰⁹ Laird, S.A., McLain, R.J. and Wynberg, R. (eds) (2010). *Wild product governance: finding policies that work for non-timber forest products*. London; Washington, DC: Earthscan (People and Plants International conservation series)

¹¹⁰ Nhira, C., Baker, S., Gondo, P., Mangono, J.J. and Marunda, C. (1998). *Contesting Inequality in Access to Forests. Policy that works for forests and people series no. 5: Zimbabwe*. Centre for Applied Social Sciences and Forestry Commission, Harare and International Institute for Environment and Development, London.

	<ul style="list-style-type: none"> • Prohibits removal of trees from within 100 meters of riverbanks
Natural Resources Act chapter 20:13 of 1996	<ul style="list-style-type: none"> • Allows for the formation of Natural Resource Management Committees with powers to levy taxes and seek grants and loans • Empowers the Department of Natural Resources to monitor use of communal resources • Calls for clear quantification of costs in monetary and environmental terms for any development projects, limiting unnecessary clearing of woodlands in development projects
Communal Lands Act of 1982	<ul style="list-style-type: none"> • Puts control of communal lands under the President through RDCs rather than traditional leaders • RDCs are allowed to develop land use plans that override customary land claims • RDCs are empowered to control cutting of trees • Provides for RDCs to grant permits to communities for the use of natural resources • Empowers RDCs to enact natural resources management by-laws
Rural District Councils Act of 1988	<ul style="list-style-type: none"> • Provides for RDCs to enact by-laws to regulate natural resource use • Issues licenses for commercial extraction of forest products • Empowers natural resources management committees to enforce the Natural Resources Act • Makes RDCs responsible for long-term planning and development
Traditional Leadership Act chapter 5:1	<ul style="list-style-type: none"> • This is a new act with the objective of empowering traditional leaders to become custodians of natural resources, including land, is not yet fully understood and accepted.

This policy ambiguity creates ideal conditions for conflict over resource access rights, elite capture and potential for corruption. Addressing national policy gaps and overlaps as well as RDC by-laws & their enforcement are key areas of intervention in order to successfully commercialize NTFPs.

Two additional issues are worth mentioning in this policy context. First, currently Nagoya Protocol Access and Benefit Sharing in Zimbabwe is a policy rather than a reality driven by legislation. There are no specific procedures for companies to follow or ABS agreements that are required. Second, harvesting permits specify quantities that may be harvested, but these are not based on any tree inventories or research into sustainable harvesting quantities. Thus, over-harvesting is an ever-present risk for many of these NTFP species.

Attractiveness of the Opportunity

We looked at the attractiveness of the five NTFPs and the opportunity facing Zimbabwe from three different points of view. First is the uniqueness and competitiveness of the NTFPs compared to other alternatives. Baobab powder is considered one of the superfoods and competes against Açaí, Goji Berry, Spirulina, Echinacea, and other products in the superfoods and supplements categories. Baobab powder has very high levels of vitamins and antioxidants, but other superfoods do as well. Perhaps the most distinguishing characteristic of this superfruit is that it has a very high fiber content which is becoming increasingly important as a prebiotic supplement to boost gut health and the microbiome. If baobab powder were approved by the FDA as a recognized fiber source, an additional large addressable market could open up.

NTFP oils are quite competitive compared to other vegetable oils such as shea butter, argan oil, coconut oil, and olive oil. They are excellent moisturizers and have important antioxidant properties. KMS has very low comedogenic ratings, is unlikely to clog pores, and is therefore an excellent oil for acne-prone skin. Ximenia has some important technical features that make it stand out from the other oils - it has excellent anti-aging properties and is a very good oil for night creams. It also has properties which may be very attractive in pharmaceutical, nutritional supplement, and food products. In addition, several of the oils have excellent oxidative stability that make them stand out from other oils. This is important in terms of both shelf life for cosmetics as well as health benefits for culinary oils. In spite of these benefits, one KII indicated that cosmetic formulators can easily blend multiple oils together to get most of the benefits provided by these oils, and at a cost that is lower than these oils. Thus, the mass market consumer products are not likely to be important sources of demand for these oils in the near future. Niche, higher-end, natural and organic consumer products are the more likely target markets.

As noted elsewhere, Zimbabwean baskets are good quality but not the highest in quality or design when compared to baskets from other countries. Baskets from Ghana, Rwanda, and South Africa are considered more competitive in terms of some combination of price, quality, design, and/or consumer familiarity. The general sense is that Zimbabwean baskets are competitive, but not at the top of the pecking order. Thus, in order to substantially grow the market for Zimbabwean baskets, some improvements in design and quality may be necessary, without substantially increasing price.

The second dimension in terms of attractiveness is the financial attractiveness of the NTFPs to the wild harvesters, producers, and weavers. With the exception of basket weavers, generally income from fruit NTFPs is a relatively small but important part of a rural household's total annual income. One study indicated that sales of NTFPs were consistently ranked at the bottom of household cash income sources in all FGDs with collectors. However, in spite of the relatively low contribution towards household income, NTFPs were viewed as a supplemental income source and an important income diversifier, especially as a means of mitigating the risks of

drought and crop failure.¹¹¹ In contrast to wild fruit collectors, basket weavers are able to earn a much higher income from their skill. With a potential income of approximately \$1,500-2,400 per year, basket weaving is very attractive and an important source of household income. An important added bonus is that women tend to generate and control this income, giving them increased autonomy and respect.

Third is the magnitude of the aggregate opportunity for each NTFP in Zimbabwe. The consultants estimated projected unit and dollar volumes out to 2042 using current estimated baseline values grown at various growth rates informed by the research. For woven ilala products, the 10-year NPV of the stream of increased sales for woven products ranges from \$750,000 (Likely Case) to \$3.3 million (High Case), and the 20-year NPV ranges from \$2.2 million (Likely Case) to \$8.5 million (High Case). For the oils cluster, the 10-year NPV ranges from \$3.3 million (Likely Case) to \$10 million (High Case), and the 20-year NPV ranges from \$11.8 million (Likely Case) to \$69 million (High Case). For baobab powder, the 10-year NPV ranges from \$7.8 million (Likely Case) to \$11.3 million (High Case), and the 20-year NPV ranges from \$25 million (Likely Case) to \$42.8 million (High Case). Especially when viewed from the perspective of a 20-year horizon, the net present values warrant investment to facilitate growth in the market for these products.

Recommendations for Funding Assistance

As noted above, donor and industry assistance is needed in order to achieve the potential that these NTFPs offer to Zimbabwe and the region. Some of the support can be targeted specifically at Zimbabwean producers, processors, and exporters, but much of it is general support that will benefit producers and companies throughout the region. Therefore, it would be appropriate for USAID Zimbabwe to discuss jointly funding the initiatives with other USAID country missions as well as other like-minded donors (e.g., SECO, the EU, and UKAid). Although the recommended initiatives described below are separated into various categories, in many cases they are interdependent and mutually supportive of each other. Thus, though some of the items may be optional, most of these initiatives should be thought of as part of a comprehensive package. Additionally, while it is possible for various donors to fund different components of the package, it is essential that they be developed and implemented in an integrated way, with effective communication and collaboration throughout the entire process.

Provide Budgetary Support for Trade Associations

Trade associations perform much-needed support functions for the industry, and often take the lead in government advocacy and addressing key industry challenges. Each of the trade associations will require financial backing, likely over a decade or more) in order to employ high-quality staff and provide them with the tools and funding required to perform their functions

¹¹¹ “Study of the Impact of Non-Timber Forest Product Collection on Household and Community Resilience”. Final Report, Development Solutions, December 2020, pages 9-10, 59

effectively. While membership dues can provide some funding, evidence from the case studies suggests that membership dues will provide only a small percentage of necessary funding, especially during the early years. Beyond general budgetary support, some funding could potentially be provided to trade associations for implementation of project activities such as those described below (scientific research, market development, regulatory approvals, etc.).

Underwrite Scientific Research

Scientific research is needed on both the technical attributes of the NTFPs (e.g., the chemical composition of oils) as well as the biological/functional benefits and efficacy of the oils and powders (e.g., demonstrating their effectiveness in terms of moisturizing skin or hair, reduction in wrinkles, improvement in microbiome function, etc.). For each of the fruit NTFPs, USAID Zimbabwe should consider funding laboratory analysis as well as consumer testing under controlled conditions, possibly including clinical trials.

In addition, it is possible to improve the yields from some of the fruit NTFPs, particularly KMS and possibly marula or ximenia, through selective breeding or good agricultural practices. USAID Zimbabwe should consider funding research on yield-improvement technologies and practices which will not harm the biodiversity or destroy the credibility of the marketing story behind these products.

Fund Consumer Awareness and Market Development Initiatives

Consumer awareness of all of the fruit NTFPs is very low, and will inhibit growth of these value chains as long as that is true. Industry awareness and utilization of these products is also low. USAID Zimbabwe should consider funding market development initiatives at several levels. First, support for the trade associations (as mentioned above) will create a very useful foundation for development of the markets and supply chains. Second, each value chain as a whole requires a well-conceived marketing strategy and plan. Sector-level marketing plans should be developed in conjunction with the trade associations and affiliated stakeholders. Each individual company participating in the value chains also requires its own individual marketing strategy and plan. These marketing plans will identify the best target markets and necessary investments in marketing personnel, advertising campaigns, marketing tools such as brochures, websites, videos, participation in trade shows, new product development efforts, etc.

Third, USAID Zimbabwe should fund consumer awareness initiatives, including advertising, social media campaigns using influencers, etc. These will need to be wide in scale and long term in order to significantly move the needle on consumer awareness. Fortunately, there are relatively inexpensive ways to utilize social media to gain widespread exposure, particularly to younger audiences. On the other hand, older consumers and to some degree rural communities are much less likely to be influenced by social media; alternative advertising media, techniques, or influencers may be required to reach them.

Fourth, trade shows are important venues to identify and connect with potential customers. Many value chain participants (including trade association personnel) will require funding to participate in trade shows, develop effective marketing collateral, etc. Relevant international trade shows include: In Cosmetics, Beyond Beauty (Paris, France), SANA (Bologna, Italy), Vivaness for organic producers (Nuremberg, Germany), Cosmoprof (several B2B trade shows in US, Europe, India, and China), Natura (organic foods), and Supply Side West (Las Vegas; food/beverage ingredients). There are many more held each year around the world in a variety of countries. In addition, there are a number of handicrafts trade shows and expositions held in various countries each year. We recommend that USAID Zimbabwe fund participation in a couple of trade shows at the local, regional and international level and fund travel, booths, and marketing collateral for several participants each year. Participants will also need coaching and training in order to maximize their effectiveness at these trade shows.

Support Policy Advocacy & Regulatory Approvals

As noted above, baobab powder has a very high fiber content (around 50%) which is becoming increasingly important as a prebiotic supplement to boost gut health and the microbiome. Although baobab powder has not been approved by the FDA as a recognized fiber source, an important market could open up if that were to change. In addition, obtaining Chinese regulatory approval for baobab powder as a food ingredient could open a large market for that product. Further research is needed to determine whether the market for marula fruit products such as juices and jams would be attractive; commercialization of these products through the export market will require US, EU, and Chinese regulatory approvals. These regulatory approval processes require technical expertise, and are lengthy and costly processes. For example, the process to get EU Novel Foods approval for baobab powder took four years and cost about \$600,000. This cost will have to be heavily subsidized by donors as individual producers are not able to bear the cost.

In addition, each country has specific regulatory requirements related to registration, packaging and labeling which are difficult for small companies to meet. It is recommended that assistance is provided to Zimbabwean exporters to understand and meet these requirements.

Support Quality, Standards, Certifications, Traceability

Common standards do not exist at a national or regional level for any of the fruit NTFPs. To facilitate international trade and the growth of these value chains, it is necessary to work with industry stakeholders to develop common standards at the national and international level for each NTFP. Once standards have been established, local testing capabilities will be helpful to ensure adherence to the standards. Local laboratories do exist, but additional equipment, training, and certification may be required by those laboratories.

Beyond the standards, producer organizations will require capacity development on a variety of

quality issues and systems such as Good Agricultural Practices, Good Manufacturing Practices, Hazard Analysis and Critical Control Point, etc. These capabilities are especially important for ingredients that go into food and beverage products. In order to meet quality standards producer organizations may need to upgrade their processing plants and will likely require some form of financial support to make this happen. Traceability is also frequently required for food and beverage ingredients, but beyond the capabilities of small enterprises and producer organizations. USAID Zimbabwe should consider funding the development and installation of traceability capabilities and systems from the collection/production site through processing facilities to export.

Certifications such as natural/organic (COSMOS or NATRUE) and Fair Trade are required by some international buyers, and are very helpful in establishing credibility and supporting marketing messages. However, they are quite expensive to obtain and maintain on an annual basis, and beyond the reach of small enterprises and producer organizations. Hence, many participants in these value chains do not have any certifications. Further research will be required to determine which certifications would be the most helpful, and then subsidies will be required to help industry participants obtain and maintain these certifications.

Fund Tree Inventory Studies and Tree Planting

The sustainability of supply is essential, both to the long-term success of the value chains and for the conservation of biodiversity. One important prerequisite to answering the sustainability question is developing a thorough understanding of the existing resource base and sustainable harvesting levels. Some tree inventories have been conducted in localized areas on a relatively small scale. Additionally, computer algorithms have been developed to predict the number of trees in certain districts and provinces for some of the NTFP species. However, the ground-truthing that has been done is very small in scale and in only a few geographical areas; national or provincial projections are subject to a high margin of error. USAID Zimbabwe should consider providing funding to conduct more detailed and comprehensive nationwide studies of tree inventories and sustainable harvesting levels for each of the target NTFP species to satisfy the Convention on International Trade in Endangered Species (CITES) and the Convention on Biological Diversity (CBD). Based on the findings from these comprehensive resource base studies, it may be necessary to fund the establishment of tree nurseries and transplantation in the field for one or two NTFP species. One additional question that could be researched is whether there is potential to sell carbon credits to partially fund tree planting efforts.

Co-Fund Infrastructure and Tools

Appropriate and effective infrastructure and tools are essential to improve the efficiency and quality of the NTFPs, including post-harvest processing and storage of the fruit products. Secure warehouses with pallets and proper air flow are required to reduce moisture, mold, and pesticide contamination, thereby ensuring the quality of products. USAID Zimbabwe should also consider

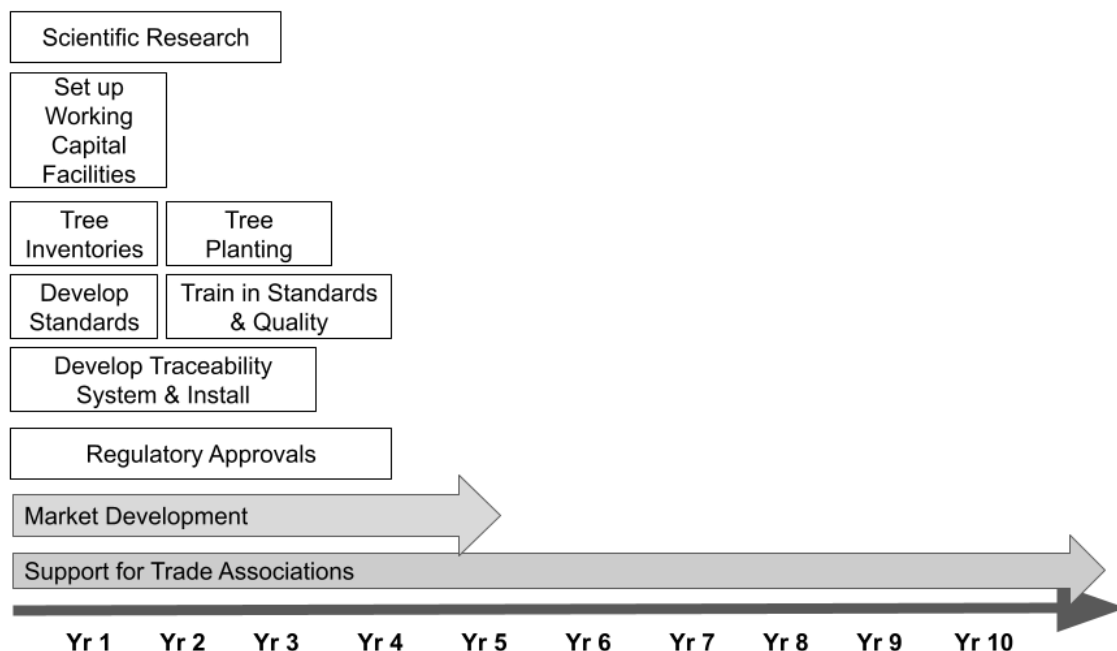
researching the effectiveness of using hermetically sealed PICS bags to store baobab powder and seed kernels to minimize mold and insect infestations. Inexpensive but efficient tools for cracking nuts and extracting kernels could greatly improve the return on labor for rural harvesters. USAID Zimbabwe should consider co-funding or subsidizing the development and distribution of these tools and protective gear, as well as co-funding the construction of local collection points and warehouses.

Create Working Capital Facilities

As noted above, working capital requirements can be challenging for small enterprises without strong balance sheets. This is true for both export-oriented businesses as well as domestic-facing businesses. We recommend that USAID Zimbabwe consider a two-pronged approach to solving this challenge. In conjunction with the US Development Finance Corporation, the African Export-Import Bank, and local commercial banks, USAID Zimbabwe should consider funding inexpensive trade finance facilities collateralized by confirmed export orders. USAID Zimbabwe should also consider partnering with a local bank or MFI to establish a low cost revolving working capital fund to support the working capital needs of domestic producers, processors, and traders.

Need for Long-term Support

Most of the target NTFPs are in a fairly nascent stage of development. Reflecting on the shea butter and argan oil case studies presented earlier, support will likely be required for at least 10 years, and likely longer. Some developmental assistance can be funded and completed in 1-3 years, other types of support will require a much longer commitment. The diagram below illustrates this conceptually, although during implementation the timelines for each will undoubtedly be somewhat different from what is shown below.

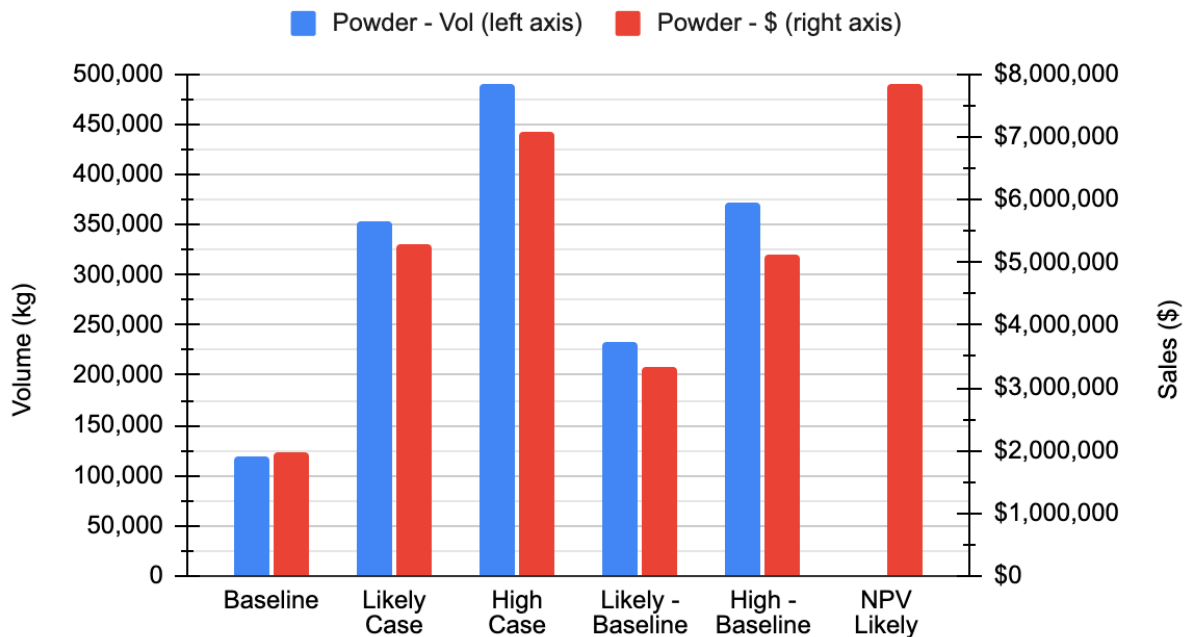


Zimbabwe Potential Growth in the NTFPs

In the previous section of this report we recommended some key initiatives in which we suggest that USAID Zimbabwe and its partners invest. But an important question remains: What is the growth potential that is available if an investment is made in these initiatives? To answer this important question, the team started with the estimated baseline Zimbabwe sales for baobab powder, the oils, and woven baskets. The team then used its judgment, informed by market research studies, projected market growth rates, and the case studies described earlier, to select growth rates for a “Likely” case scenario and a “High” case scenario for each value chain. Each baseline was grown for 20 years at the specific growth rate for each scenario. The team calculated the incremental sales above baseline for each year and then calculated the 10-year and 20-year net present values using a 10% discount rate. These results are shown below. See Annex A for the 10-year projected sales volumes and NPV calculations for both the Likely and High case scenarios.

Baobab Powder

Baobab Powder - Zimbabwe Potential 2032 Volume/\$



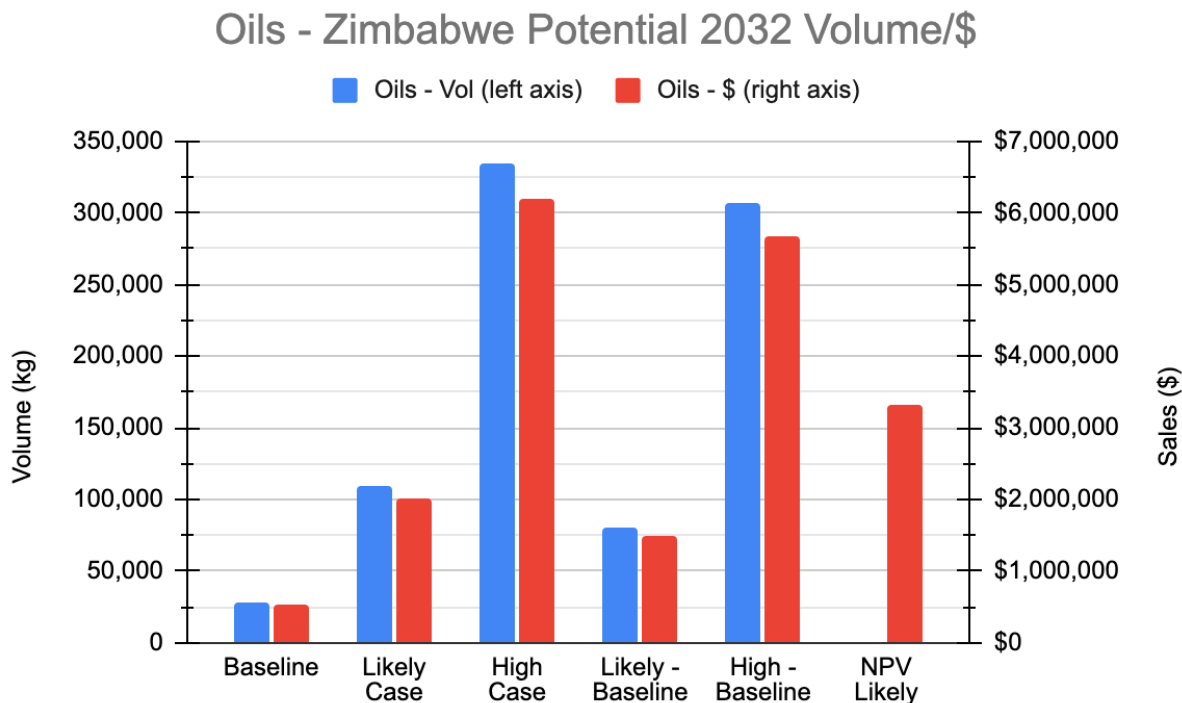
The CAGRs used for baobab powder are 10.4% for the Likely Case, and 13.7% for the High Case. In 2032, we project that Zimbabwe could sell the following amounts and dollar value of baobab powder.

Case	Baseline (kg)	Baseline \$ Value	2032 Volume	2032 \$ Value	Incremental \$ in 2032
Likely Case	120,000	\$1,959,000	353,000	\$5,284,000	\$3,325,000
High Case	120,000	\$1,959,000	491,000	\$7,092,000	\$5,133,000

The net present value (discounted at 10%) for 10 and 20 years of incremental sales over baseline are shown in the table below. Note that these NPV calculations do not take into consideration the investments that will need to be made to achieve these increased sales.

	10-Year NPV (2023 - 2032)	20-Year NPV (2023 - 2042)
Likely Case	\$7,832,996	\$24,965,889
High Case	\$11,268,013	\$42,840,405

Oils Cluster



The CAGRs used for oils are 14.4% for the Likely Case, and 28% for the High Case. In 2032, we project that Zimbabwe could sell the following amounts and dollar value of oils.

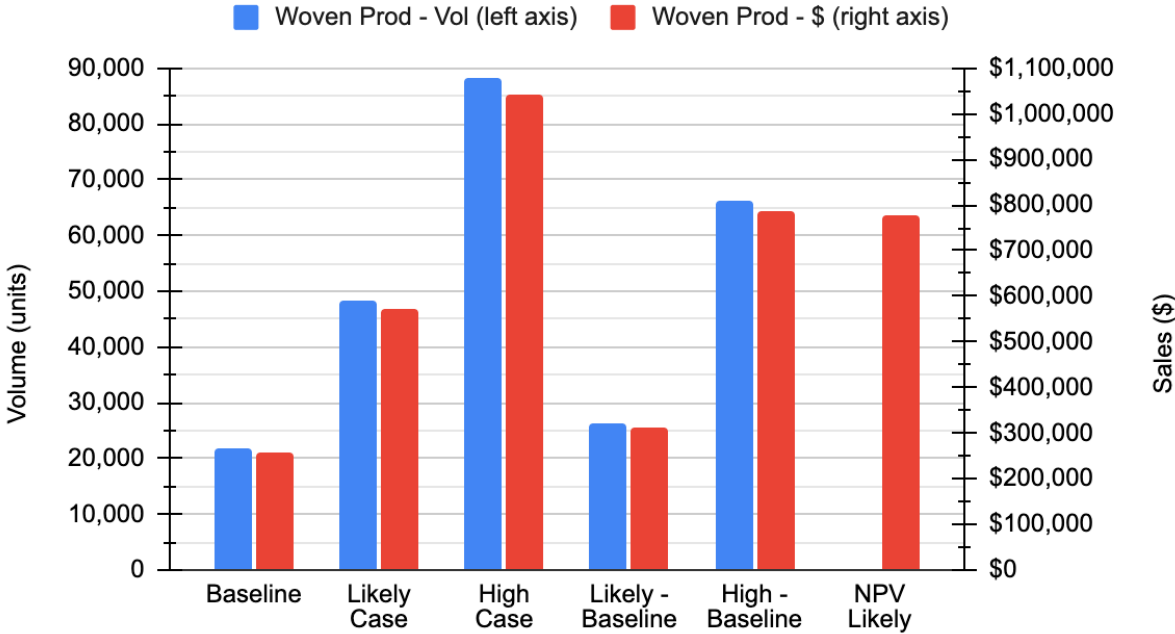
Case	Baseline (kg)	Baseline \$ Value	2032 Volume	2032 \$ Value	Incremental \$ in 2032
Likely Case	28,000	\$525,000	109,000	\$2,000,000	\$1,475,000
High Case	28,000	\$525,000	335,000	\$6,200,000	\$5,675,000

The net present value (discounted at 10%) for 10 and 20 years of incremental sales over baseline are shown in the table below. Note that these NPV calculations do not take into consideration the investments that will need to be made to achieve these increased sales.

	10-Year NPV (2023 - 2032)	20-Year NPV (2023 - 2042)
Likely Case	\$3,324,152	\$11,770,497
High Case	\$10,017,825	\$69,034,113

Ilala Palm Woven Products (Baskets)

Woven Prod - Zimbabwe 2032 Potential Volume/\$



The CAGRs used for woven products are 8.25% for the Likely Case, and 15% for the High Case. In 2032, we project that Zimbabwe could sell the following amounts and dollar value of woven products.

Case	Baseline (kg)	Baseline \$ Value	2032 Volume	2032 \$ Value	Incremental \$ in 2032
Likely Case	22,000	260,000	48,000	\$570,000	\$310,000
High Case	22,000	260,000	88,000	\$1,000,000	\$740,000

The net present value (discounted at 10%) for 10 and 20 years of incremental sales over baseline are shown in the table below. Note that these NPV calculations do not take into consideration the investments that will need to be made to achieve these increased sales.

	10-Year NPV (2023 - 2032)	20-Year NPV (2023 - 2042)
Likely Case	\$779,391	\$2,182,499

High Case	\$3,321,482	\$8,502,124
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Domestic Market Potential

Although much of the focus of this report has been on the export market potential, the team sees very real, and in some cases, significant potential in the domestic Zimbabwe market, as well as the regional market in countries surrounding Zimbabwe. The potential exists in commercial production and marketing of five primary categories of products:

- Cereals and porridges
- Preserves
- Snack foods
- Juices and other beverages
- Cosmetic oils

To varying degrees, companies like Glytime Foods, Hutano Foods, Tia Organics, Afro Essentials, Bespoke Delights, and others are already marketing products today in these categories, but much more is possible. The team used a higher CAGR assumption for baobab powder in the domestic market to reflect this opportunity.

In addition, there are potential opportunities in low-cost therapeutic and supplemental feeding products used in both treatments for malnutrition as well as preventive school feeding programs. These products would be mostly marketed through donor-funded projects.

Furthermore, there is very real potential to increase rural household use on a non-commercial basis of these and other NTFP products to enhance their household nutrition. These and quite a few other NTFP products can be readily harvested at varying times throughout the year and incorporated into meals. Some training in the nutritional value of these products as well as cooking demonstrations and the development and dissemination of recipes are examples of interventions that may be warranted by Feed the Future Zimbabwe, Resilience Food Security, and Health/Nutrition activities to encourage increased household utilization.

Finally, the seedcake from most of the oil seeds is high in protein and other nutrients. The seed cake can be used in stock feed formulations as well as human food applications. Use of multiple parts of the NTFP fruit (as well as possibly leaves and other parts of the tree) can significantly increase value chain profitability, and therefore the appeal of these NTFPs as investment targets. Future efforts to grow these NTFP product categories should consider incorporating investments in domestic product development and market development to capture these opportunities.

Risks

As the previous section illustrated, there is much potential opportunity in these product categories, but there are a number of risks that could foil attempts to seize those opportunities. Although most of the NTFP species are reasonably drought tolerant, environmental changes in temperature or rainfall patterns (whether increases or decreases), if significant enough, could negatively affect yields. Additionally, overharvesting or deforestation could imperil biodiversity, sustainability of the species, and future income from the NTFPs.

Weak and unreliable supply chains, if not strengthened, will lead commercial buyers in developed countries to reduce their risk by selecting other products or sourcing from other countries. Weaknesses in the supply chains include irregular quality, seasonality of supply, inability of producers and processors to supply adequate quantities demanded by larger companies, and unreliable shipping and logistics. A couple of the NTFPs either currently lack adequate supply or most likely would lack adequate supply if demand were to increase substantially. Unfortunately, future consumer demand is unknowable, and there are risks from both low demand and high demand. Low demand would reduce return on investment and potentially cause both collectors and processors to stop collecting/buying a particular NTFP and shift to alternative, more attractive opportunities. High demand could outstrip supply, causing frustrated buyers to shift to other sources. Trade associations and other stakeholders may need to monitor consumer and commercial trends and responses to market development initiatives, and ensure that supply is matched with demand. For some value chains, some level of aggregate, multi-year demand planning and benchmarking may be required in conjunction with large commercial buyers around the world. This will not be easy, given a history of mistrust and unwillingness on the part of industry participants to share data. Supply-demand matching is also complicated by the varying elasticities of supply across the different NTFPs. Within some range, supply can expand to match demand through more extensive harvesting efforts. Beyond that range, tree planting may be required. Except in the case of KMS, supply can take anywhere from 3-30 years (depending on the species) to respond to increased demand signals and expand via tree planting initiatives. Comprehensive tree inventories throughout the region would be helpful to support supply-demand planning.

In the political realm, political disruptions, policy changes, or conflict over resources could introduce additional uncertainty and temporarily halt supply chains, restrict supply, lengthen lead times, or increase costs. Overeager regulators could excessively increase supply chain costs or reduce availability of supply. One KII source noted that South Africa's approach to the Nagoya Protocol and Access and Benefit Sharing (ABS) is burdensome and onerous, threatening to increase costs to buyers throughout the entire value chain. Unless changed, some companies may avoid sourcing natural products from South Africa. If Zimbabwe were to follow South Africa's lead with regard to ABS, it would chill commercial enthusiasm for Zimbabwe's NTFPs.

Elite capture is also an ever-present risk that can siphon resources off for the benefit of the elite, leaving behind the people USAID Zimbabwe seeks to help. Vigilance will be required to ensure that rural communities benefit from NTFP development efforts.

Finally, Zimbabwe is not the only country with these species, and it will have to compete vigorously for its share of the international market. Many of the recommended investments (e.g., support to trade associations, US/EU/China regulatory approvals, scientific research, and market development) will create public goods available to anyone in any country with these NTFP species. For example, the Baobab Fruit Company in Senegal benefited from PhytoTrade Africa's work 15-20 years ago (with donor support) to obtain regulatory approval and develop the market for baobab powder. It is now a significant supplier of baobab powder to European markets. Similarly, NTFP suppliers in other countries across Africa have benefited from PTA's market development efforts. Because of this competition from other countries, even if the market develops as anticipated there are no guarantees that Zimbabwe will garner its "fair share" of the market and reap the expected rewards, and it is certain that the benefits will not accrue solely to Zimbabwe.

If not managed effectively, these risks could negatively impact Zimbabwe's ability to capitalize on the NTFP opportunities. Some of the recommendations in this report are focused on addressing several of these risks. Other risks will require periodic monitoring and management or at least skillful navigation by industry players and the trade associations.

Conclusion

We believe that the potential for growth in the NTFPs is real, and substantial gains are possible if USAID Zimbabwe, other donors, and industry stakeholders invest appropriately. As pointed out in the case studies, though, support will likely be needed on a sustained basis over ten-plus years to adequately build capacity and address the barriers and current limitations.

Each of the NTFPs discussed in this report has attractive attributes in terms of the strategic dimensions that are important to USAID Zimbabwe. However, none of the NTFPs is uniformly superior on all attributes and dimensions. Some consideration by the Mission of strategic priorities is warranted in determining whether to invest in all of these NTFPs or to be more selective based on which NTFPs best fulfill specific Mission priorities¹¹². In addition, it might be worthwhile for the Mission to consider scaling planned funding based on the net present value of expected increased sales for each NTFP.

¹¹² Note that Mission priorities with regard to NTFPs could be different between the Economic Growth Office and the Humanitarian Assistance and Resilience Office.

Annexes

Annex A: Potential Gains from Investing in NTFPs

Baobab Powder

Total Baobab Powder Projections												
Assumptions:												
Total Current Zim Exp Powder Market (kg)	70,000											
Total Current Zim Dom Powder Mkt (kg)	50,000											
Export Price (\$/kg)	\$20.00											
Domestic Price (\$/kg)	\$11.18											
High Case:												
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Zim Production (Exp) - Volume (kg)	70,000	77,000	84,700	93,170	102,487	112,736	124,009	136,410	150,051	165,056	181,562	
Zim Production (Dom) - Volume (kg)	50,000	60,000	72,000	86,400	103,680	124,416	149,299	179,159	214,991	257,989	309,587	
Zim Production - Value (USD)	\$1,959,000	\$2,210,800	\$2,498,960	\$2,829,352	\$3,208,882	\$3,645,685	\$4,149,350	\$4,731,202	\$5,404,622	\$6,185,444	\$7,092,420	
Export Growth Rate:	10%											
Domestic Growth Rate:	20%											
Increase in sales		\$251,	\$539,	\$870,	\$1,24	\$1,68	\$2,19	\$2,77	\$3,44	\$4,22	\$5,13	

over Baseline		800	960	352	9,882	6,685	0,350	2,202	5,622	6,444	3,420
10-Yr NPV of increase in sales (@ 10%)	\$11,268,013										
20-Yr NPV of increase in sales (@ 10%)	\$42,840,405										
Likely Case:											
Zim Production (Exp) - Volume (kg)	70,000	75,600	81,648	88,180	95,234	102,853	111,081	119,968	129,565	139,930	151,125
Zim Production (Dom) - Volume (kg)	50,000	57,500	66,125	76,044	87,450	100,568	115,653	133,001	152,951	175,894	202,278
Zim Production - Value (USD)	\$1,959,000	\$2,154,850	\$2,372,238	\$2,613,766	\$2,882,379	\$3,181,408	\$3,514,625	\$3,886,305	\$4,301,296	\$4,765,099	\$5,283,962
Export Growth Rate:	8%										
Domestic Growth Rate:	15%										
Increase in sales over Baseline		\$195,850	\$413,238	\$654,766	\$923,379	\$1,222,408	\$1,555,625	\$1,927,305	\$2,342,296	\$2,806,099	\$3,324,962
10-Yr NPV of increase in sales (@ 10%)	\$7,832,996										
20-Yr NPV of increase in sales (@ 10%)	\$24,965,889										

Oils

Total Oils Projections (Baobab, Marula, KMS, Ximenia)											
Total Zim oils market (tons)	28.33	Based on information from KIIs with a number of industry players									
Export Price/kg	\$18.50	Based on information from KIIs with a number of industry players									

High Case:											
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Zim Production - Volume (kg)	28,333	36,267	46,421	59,419	76,057	97,353	124,611	159,502	204,163	261,329	334,501
Zim Production - Value (USD)	\$524,167	\$670,933	\$858,795	\$1,099,257	\$1,407,049	\$1,801,023	\$2,305,309	\$2,950,796	\$3,777,019	\$4,834,584	\$6,188,268
Argan Growth Rate:	28.0%	(argan oil CAGR from 2005 - 2017 was 35%; CAGR from 2005 - 2022 was 28%)									
Increase in sales over Baseline		\$146,767	\$334,628	\$575,091	\$882,883	\$1,276,856	\$1,781,143	\$2,426,629	\$3,252,852	\$4,310,418	\$5,664,101
10-Yr NPV of increase in sales (@ 10%)	\$10,017,825										
20-Yr NPV of increase in sales (@ 10%)	\$69,034,113										
Likely Case:											
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Zim Production - Volume (kg)	28,333	32,413	37,081	42,420	48,529	55,517	63,512	72,657	83,120	95,089	108,782
Zim Production - Value (USD)	\$524,167	\$599,647	\$685,996	\$784,779	\$897,787	\$1,027,069	\$1,174,967	\$1,344,162	\$1,537,721	\$1,759,153	\$2,012,471
Shea Growth Rate:	14.4%	(using average of Argan Oil CAGR, Shea Butter CAGR, and Natural Cosmetics/AntiAging/Natural Skincare CAGR)									
Increase in sales over Baseline		\$75,480	\$161,829	\$260,613	\$373,621	\$502,902	\$650,800	\$819,995	\$1,013,555	\$1,234,986	\$1,488,304
10-Yr NPV of increase in sales (@ 10%)	\$3,324,152										
20-Yr NPV of increase in sales (@ 10%)	\$11,770,497										

Woven Products (Baskets)

Total Woven Products Projections												
Assumptions:												
Total Current Zim Basket Market	21,800	Based on information from KIIs with a number of industry players										
Export Price (\$/kg)	\$11.83	Based on information from KIIs with a number of industry players										
High Case:												
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Zim Production - Volume (tons)	21,800	25,070	28,831	33,155	38,128	43,848	50,425	57,988	66,687	76,690	88,193	
Zim Production - Value (USD)	\$258,000	\$296,700	\$341,205	\$392,386	\$451,244	\$518,930	\$596,770	\$686,285	\$789,228	\$907,612	\$1,043,754	
Handicrafts Growth Rate:	15.00%	(using rate 50% higher than projected growth rate of handicrafts market)										
Increase in sales over Baseline		\$296,700	\$341,205	\$392,386	\$451,243	\$518,930	\$596,770	\$686,285	\$789,228	\$907,612	\$1,043,754	
10-Yr NPV of increase in sales (@ 10%)	\$3,321,482											
20-Yr NPV of increase in sales (@ 10%)	\$8,502,124											
Likely Case:												
Zim Production - Volume (tons)	21,800	23,599	25,545	27,653	29,934	32,404	35,077	37,971	41,104	44,495	48,165	
Zim Production - Value (USD)	\$258,000	\$279,285	\$302,326	\$327,268	\$354,268	\$383,495	\$415,133	\$449,381	\$486,455	\$526,588	\$570,031	
Blended Growth Rate:	8.25%	(using blended projected growth rate of home decor & handicrafts markets)										
Increase in sales over Baseline		\$21,285	\$44,326	\$69,268	\$96,268	\$125,495	\$157,133	\$191,381	\$228,455	\$268,588	\$312,031	
10-Yr NPV of increase in sales (@ 10%)	\$779,391											

20-Yr NPV of increase in sales (@ 10%)	\$2,182 ,499											
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Annex B: Industry Interest in NTFPs

NTFP Mentions in Food/Bev/Nutrition Journals

The following two tables show the cumulative number of mentions for NTFP across eleven food, beverage, and nutrition journals. The first table shows the absolute number of mentions and the second table shows the indexed level of mentions.

Number of Mentions for Each NTFP In Food/Bev/Nutrition Journals								
	Chia Seeds	Acai	Spirulina	Goji Berries	Moringa	Baobab	Marula	Camu Camu
Better Nutrition	172	92	82	72	31	28	10	15
Food and Nutrition	50	9	4	5	1	0	0	0
nutritionaloutlook.com	10	13	25	3	3	7	21	3
Wholefoodsmagazine.com	164	156	97	40	49	32	9	14
Nutraceuticalsworld.com	71	81	67	71	25	5	7	49
Baking Business	231	74	42	25	21	16	1	2
foodbeverageinsider.com	45	4	5	17	3	1	0	0
newfoodmagazine.com	4	6	16	6	3	2	0	0
foodnavigator.com	1153	70	100	380	26	58	0	9
Bevindustry.com	34	368	39	36	11	13	4	22
foodprocessing.com(articles)	77	64	96	26	4	21	0	7
Median	71	70	42	26	11	13	1	7
Indexed Number of Mentions for Each NTFP In Food/Bev/Nutrition Journals								
	Chia Seeds	Acai	Spirulina	Goji Berries	Moringa	Baobab	Marula	Camu Camu
Better Nutrition	100.0%	53.5%	47.7%	41.9%	18.0%	16.3%	5.8%	8.7%
Food and Nutrition	100.0%	18.0%	8.0%	10.0%	2.0%	0.0%	0.0%	0.0%

nutritionaloutlook.com	40.0%	52.0%	100.0%	12.0%	12.0%	28.0%	84.0%	12.0%
Wholefoodsmagazine.com	100.0%	95.1%	59.1%	24.4%	29.9%	19.5%	5.5%	8.5%
Nutraceuticalsworld.com	87.7%	100.0%	82.7%	87.7%	30.9%	6.2%	8.6%	60.5%
Baking Business	100.0%	32.0%	18.2%	10.8%	9.1%	6.9%	0.4%	0.9%
foodbeverageinsider.com	100.0%	8.9%	11.1%	37.8%	6.7%	2.2%	0.0%	0.0%
newfoodmagazine.com	25.0%	37.5%	100.0%	37.5%	18.8%	12.5%	0.0%	0.0%
foodnavigator.com	100.0%	6.1%	8.7%	33.0%	2.3%	5.0%	0.0%	0.8%
Bevindustry.com	9.2%	100.0%	10.6%	9.8%	3.0%	3.5%	1.1%	6.0%
foodprocessing.com (articles)	80.2%	66.7%	100.0%	27.1%	4.2%	21.9%	0.0%	7.3%
Average	77%	52%	50%	30%	12%	11%	10%	10%

NTFP Mentions in Cosmetics Journals

The following two tables show the cumulative number of mentions for NTFP across six cosmetics and personal care journals. The first table shows the absolute number of mentions and the second table shows the indexed level of mentions.

Number of Mentions for Each NTFP In Cosmetics & Personal Care Products Journals							
	Shea	Argan	Moringa	Baobab	Marula	KMS	Ximenia
Cosmetics & Toiletries	363	131	61	40	30	9	5
Global Cosmetics Industry (gcimagazine.com)	462	215	65	46	52	13	2
Cosmeticsdesign.com	117	61	23	18	12	3	0
happi.com (household & personal products industry)	79	83	77	59	52	18	4
wwd.com Beauty Industry News	303	166	23	39	37	10	2
premiumbeautynews.com	61	45	7	10	6	2	1

Average # Mentions	230.8	116.8	42.7	35.3	31.5	9.2	2.3
Indexed Number of Mentions for Each NTFP In Cosmetics & Personal Care Products Journals							
Cosmetics & Toiletries	100.0%	36.1%	16.8%	11.0%	8.3%	2.5%	1.4%
Global Cosmetics Industry (gcinmagazine.com)	100.0%	46.5%	14.1%	10.0%	11.3%	2.8%	0.4%
Cosmeticsdesign.com	100.0%	52.1%	19.7%	15.4%	10.3%	2.6%	0.0%
happi.com (household & personal products industry)	95.2%	100.0%	92.8%	71.1%	62.7%	21.7%	4.8%
wwd.com Beauty Industry News	100.0%	54.8%	7.6%	12.9%	12.2%	3.3%	0.7%
premiumbeautynews.com	100.0%	73.8%	11.5%	16.4%	9.8%	3.3%	1.6%
Average Indexed Score	99%	61%	27%	23%	19%	6%	1%

The following table shows the data for one journal (Cosmetics & Toiletries) from 2006 - 2021 to illustrate trends over time.

# Historical Mentions Over Time in Cosmetics & Toiletries							
Year	Shea	Argan	Moringa	Baobab	Marula	KMS	Ximenia
2021	55	13	12	9	10	2	2
2020	42	17	6	3	5	2	1
2019	16	11	6	2	3	1	1
2018	42	17	6	2	2		
2017	22	5	2	3			
2016	11	7	3	2			
2015	10	3	2				
2014	3	1		1			
2013	9	5	2	2	2	1	
2012	6	2		1			
2011	8	3					
2010	5	1	1				
2009	11			1			

2008	17	3		3	2		1
2006	3						

Annex C: Key Informant Interviews and Focus Group Sessions Conducted

Key Informant Interviews

Organization	Value Chain	Country
Ilala Palm Weavers & Related Companies/Cooperatives		
Baskets from Africa	Ilala Palm weavers	US
Meltonka	Ilala Palm weavers	Zimbabwe
Collaborative Craft Projects (CCP)	Ilala Palm weavers	Zimbabwe
Ilala.co (UK)	Ilala Palm weavers	UK
Binga Craft Center	Ilala Palm weavers	Zimbabwe
Lupane Women's Development Trust	Ilala Palm weavers	Zimbabwe
Oil & Powder-Related Companies (Including Food & Snack Companies)		
The Zola Collective	Oils & Baobab Powder	UAE/Kenya
Kupanda	Oils & Baobab Powder	South Africa
B' Ayoba	Baobab Powder & Oil	Zimbabwe
Kaza Natural Oils	Oils	Zimbabwe
Hutano Foods	Foods & snacks	Zimbabwe
Afro Essentials	Oils & Baobab Powder	Zimbabwe
Parwizi Organix / Nendhoro Brands	Oils & Baobab Powder	Zimbabwe

Tamale Products	Oils & Baobab Powder	Zimbabwe
Tia Organics	Oils & Baobab Powder	Zimbabwe
Glytimes	Foods, Snacks	Zimbabwe
Baobab Foods	Baobab powder & oil wholesaler	US
Celebratio Vitae Organics	Oils Retailer	US
3CayG	Oils Retailer	US
TreeCrops Ltd (Malawi) (not in business anymore)	Baobab powder & oil	Malawi
Unifect	Specialty Oils Distributor to Cosmetics Ind.	UK
DLG Naturals (Botswana)	Oils	Botswana & US
Aurum Africa	Oils	Europe (sourcing from Namibia & Zim)
African Origin Oils & Neo Sephiri	Kalahari Melon Seed Oil	South Africa / UK
NBA Mupfura Plant - Rutenga Plant Manager Plant Operations Head	Marula Plant Look and Learn Visit	Zimbabwe
Bespoke Delights	Oils and Ingestibles	Zimbabwe
Smoothie Bar Companies		
Kwench Juice Cafe	Baobab Powder	US
Green Fix Smoothies	Baobab Powder	US
Drink Fit Cafe	Baobab Powder	US
Financial Services Companies		
FMC Microfinance - Chiredzi	Micro finance	Zimbabwe

First Mutual Micro Finance	Micro Finance	Zimbabwe
Transportation & Logistics Companies		
Chimhiti Haulage - based in Chivi	Transportation of NTFPs	Zimbabwe
Mucharwa Logistics - based in Mudzi close to Rutenga	Transportation of NTFPs	Zimbabwe
NGOs and Trade Associations		
PhytoTrade Africa Biotrade Ventures	Oils & Baobab Powder	South Africa
Bioinnovations Zimbabwe	Oils & Baobab Powder	Zimbabwe
Bioinnovations Zimbabwe	Oils & Baobab Powder	Zimbabwe
Biohub Trust - Beitbridge	All NTFPs and NTFP value chain assessment	Zimbabwe
SVC Ecologist-Baobab census	Baobab resource	Zimbabwe
Global Shea Alliance	Shea Butter	Ghana
Standards Assoc. Of Zimbabwe	All	Zimbabwe
Government - National		
Forestry Commission	Tree Inventory / Resource Mapping	Zimbabwe
ZimTrade	All	Zimbabwe
Ministry of Industry & Commerce	All	Zimbabwe
Government - District and Local		
Bikita district Rural District Council (RDC)	All NTFPs	Zimbabwe

Planning and Environment Department		
Bikita district Environmental Management Agency (EMA)	All NTFPs	Zimbabwe
Bikita district Agricultural Technical Extension Services Department (AGRITEX)	All NTFPs	Zimbabwe
Beitbridge district Forestry Commission	Baobab powder and juice Marula products	Zimbabwe
Beitbridge district Agricultural Technical Extension Services Department (AGRITEX)	Baobab powder and juice Marula products	Zimbabwe
Chiredzi District - Agritex	All NTFPs	Zimbabwe
Chiredzi District - EMA	All NTFPs	Zimbabwe
Chiredzi District - Forestry Commission	All NTFPs	Zimbabwe
Chiredzi District - Planning and Environment	All NTFPs	Zimbabwe
Binga District - District Agritex Extension Officer Binga District - Agritex Extension Specialist	All NTFPs	Zimbabwe
Binga District Environmental Officer	All NTFPs	Zimbabwe
Binga District Forester Binga District Clerk	All NTFPs	Zimbabwe
Binga District Livelihoods Officer	All NTFPs	Zimbabwe
Binga Rural District Council CEO	Courtesy Call and Briefing	Zimbabwe
Binga District Development Coordinator	Courtesy Call and Briefing	Zimbabwe
Binga District Community Development Officer - Ministry of Women Affairs and SME's	Courtesy Call and Briefing	Zimbabwe
Beitbridge District Administrator (DDC) represented by Administration Officer	Courtesy call & Briefing	Zimbabwe
Bikita RDC CEO	Courtesy call & Briefing	Zimbabwe
Bikita Asst. District Administrator	Courtesy call & Briefing	Zimbabwe

(DDC)		
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Focus Group Discussions

Focus Group Discussions			
Focus Group Discussion 1	Chiredzi - Nyanganmbe Ward 23	All NTFPs	Zimbabwe
Focus Group Discussion 2	Chiredzi - Tshovani Ward 10	All NTFPs	Zimbabwe
Focus Group Discussion 3	Chipinge - Mahenye Ward 30	All NTFPs	Zimbabwe
Focus Group Discussion 4	Chipinge - Mutandahwe Ward 29	All NTFPs	Zimbabwe
Focus Group Discussion 5	Binga - Kariyangwe Ward 15	Ilala Palm weavers	Zimbabwe
Focus Group Discussion 6	Binga - Chinonge Ward 16	Ilala Palm weavers	Zimbabwe

Annex D: Key Informant Interview Discussion Guides

The team used several different discussion guides for different KIIs. Variations on these KII Discussion Guides were used for interviews with NGOs, Trade Associations, Shipping Companies, and Financial Services Companies.

KII Discussion Guide #1 - for NTFP Buyers

KII Interview with XXXXX
Based in XXXXX
Phone #: XXXXX
Email: XXXXX

Participants: XXX from company
XXX (Consultant)

Date: 1/12/2022

- Background on Company
 - How long has the company been in business?
 - What products do you buy/produce/sell?
 - How many employees?
 - Have you done business in Zimbabwe?
- What is the source of the products you buy/produce/sell?
 -
- How do you source from them? Do you source products directly from the producers or do you have a middleman/agent who sources the product for you?
 -
- Is the supply of products consistent and reliable?
 -
- Are there any other challenges you have experienced in sourcing from Zimbabwe?
 -
- What volume do you sell/year (in dollars and/or units, preferably both)?
 -

- How much is your volume growing from year to year?
 -
- Is there unmet demand - could you sell more if you had greater supply?
 -
- What is your estimate of the relative market size? Local and International.
 -
- Who buys your product now?
 -
- How do you advertise/market your products now to those buyers?
 -
- Are there additional tactics you could use to market and grow your business?
 -
- Quality - are there standards? Are you happy with the quality? What are the quality problems you have experienced?
 -
- Regulatory issues - what regulatory obstacles or challenges do you experience if any? Are the right government policies in place? What would you like to see changed?
 -
- Logistics & Distribution - what are the logistical issues involved in delivery of products you buy or distribution of products you sell?
 -
- Pricing
 - How do you determine the price you pay your suppliers?
 - How do you mark up the cost to determine your selling price?
- Would you like additional sources of product from Zimbabwe?
 -
- Any general thoughts on the potential to grow this product category sourced from southern Africa?
 -

KII Discussion Guide # 2 - for Oil Retailers

KII with Oil Retailers

Date: 2/10/2022

Phone #: XXX

Email: XXX

Participants: XXX

John Macy or Cyril Moyo (consultant)

- What oils do you sell?
 - Argan oil (Morocco)
 - Baobab oil (?)
 - KMS oil (?)
 - Marula (?)
 - Moringa (?)
 - Ximenia (?)
 - Mafura butter (?)

- How long have you been selling each of these oils?
 - Baobab:
 - Marula:
 - KMS:
 - Ximenia:
- Can you give me the rough proportions of your sales of the following oils (for example, baobab 40%, marula 30%, KMS 20%, ximenia 10%)? If you would be willing to give me the annual or monthly sales volumes for each that would be very helpful.
 - baobab
 - marula
 - KMS
 - Ximenia
 - shea butter
 - argan oil
 - moringa oil
- How rapidly are your sales volumes growing for these oils?
- What challenges have you experienced in sourcing these oils?
- What are the trends you are seeing in consumer awareness and interest in each of these oils?
- USAID is interested in investing in the development of the market for these oils so that rural households in arid zones have more reliable, stable sources of income. What are one or two things that you think USAID could do to help with market development for these oils?

KII Discussion Guide #3 - for Baskets Companies

KII with Ilala

Date: 2/11/2022

Phone #:

Email:

Participants: XXX (owner)
John Macy or Cyril Moyo (consultant)

- Background on company
 - How long in business?
 - What products do you sell?
 - Who are your customers?
 - Where do you source your products?
- What is your sourcing model for the baskets? Do you source directly from the artisans themselves? Or do you work with a trader or middle-man in the process?
 - X
- Where do the designs come from? Do the artisans develop the designs or do you suggest designs to them?
 - X
- What challenges have you experienced in sourcing your baskets?
 - X
- What are the trends you are seeing in consumer awareness and interest in woven decorative and functional baskets? How much is your volume growing year over year?
 - X
- Pricing
 - X
- USAID is interested in investing in the development of the market for these baskets so that rural households in arid zones have more reliable, stable sources of income. What are one or two things that you think USAID could do to help with market development for woven baskets?
 - Marketing:
 - X
 - Research:
 - X
 - Tools:
 - X
 - Quality:
 - X
 - Supply Chain & Logistics:
 -

Annex E: Focus Group Discussion Guide

Community FGD – community members involved in the harvesting of NTFPs, female and male representatives, youth representatives

Date:

District:

Ward:

Village:

Venue:

Number of participants:

Female:

Male:

Youth F:

Youth M:

Questions

1. What is the main source of income in this community (probe females, males and youth)?
2. Are there any markets available for the produce from this ward? Who are the buyers?
3. Which of these mentioned species can be found in the ward? (in grazing lands, forests and communal areas) In which villages? Quantify abundance.
 - a. Umkhono -
 - b. Umganu -
 - c. Umthunduluka -
 - d. Amajodo/Amakiliwani (probe cultivated vs. wild gathered) -
 - e. Ilala -
4. What percentage of produce is retained for household / village use and what percentage is sold?
 - a. Umkhono -
 - b. Umganu -

- c. Umthunduluka -
 - d. Amajodo/Amakiliwani -
 - e. Ilala -
5. Do you have any challenges/barriers (*besides laws*) harvesting any of the species mentioned above?
6. Is harvesting done as a family or as a community? What distances do you have to travel to harvest? How much is harvested per day, per month, year? Which months are the harvesting season?

Quantities harvested

Species	Day	Month	Year	Distance to harvest
Umkhono				
Umganu				
Umthunduluka				
Amajodo/Amakiliwani				
Ilala				

Harvesting Season

- a. Umkhono -
 - b. Umganu -
 - c. Umthunduluka -
 - d. Amajodo/Amakiliwane –
 - e. Ilala -
7. Are there any rules or regulations within the ward on who can harvest these species and how much can be harvested and where harvesting should be done? Are the species easily accessible to all? (probe females, males and youth)
8. Is any training required for harvesting or harvesting is based on indigenous knowledge systems? Has any organisation provided such training in the past?
9. Is there any primary processing taking place at community level for the following? Please describe processing for each product below where applicable. What tools are used to crack shells / nuts and to extract seeds.
- a. Umkhono -
 - b. Umganu -
 - c. Umthunduluka -

- d. Amajodo/Amakiliwani -
- e. Ilala -

10. If produce has to be stored, where is it stored? For how long?

- a. Umkhono -
- b. Umganu -
- c. Umthunduluka -
- d. Amajodo/Amakiliwani -
- e. Ilala -

11. What packaging is used for transporting these products?

- a. Umkhono -
- b. Umganu -
- c. Umthunduluka -
- d. Amajodo/Amakiliwani -
- e. Ilala -

12. Who buys these products?

- a. Umkhono -
- b. Umganu -
- c. Umthunduluka -
- d. Amajodo/Amakiliwani -
- e. Ilala -

13. What form does payment take?

- a. Umkhono -
- b. Umganu -
- c. Umthunduluka -
- d. Amajodo/Amakiliwani -
- e. Ilala -

14. What are the selling prices for the following?

- a. Umkhono -
 - b. Umganu -
 - c. Umthunduluka -
 - d. Amajodo/Amakiliwani -
 - e. Ilala (probe price per piece) -
15. How is the price determined? Are prices fairly determined? How much profit do you make at these prices? Which are the most profitable products in rank order?
16. Do you have direct access to the market, or you have to go through an agent?
17. Are there logistical challenges involved in accessing the market? What distances are involved? What are the modes of transport?
18. What is the cost of transport?
19. If you were to receive funding support to extract better value from your harvest, how would you utilize the funding?
20. Are there conflicts between villages and/or outsiders as to who owns the resources and who can harvest these products?

Annex F: Registration, Testing, Packaging and Labeling Requirements

In this annex we include references to a number of helpful documents discussing the registration, testing, packaging, and labeling requirements in both the EU and the US.

EU Registration, Testing, Packaging, and Labeling Requirements

Packaging requirements for oils include the following¹¹³:

- Using polythene-lined boxes, plastic canisters or aluminum, lined or lacquered steel containers as they do not react with the components of oil.
- Ensuring the packaging materials used are clean and dry before they are filled with oil.
- Filling the headspace of packaging materials with gasses such as nitrogen or carbon dioxide, as these do not react with the components of the oil.
- Storing oil in temperature conditions above 18 degrees in sealed packaging away from light, heat and humidity. A failure to do so can result in triglyceride rubbers developing which reduces the quality of the oil.

Labeling and documentation requirements for oils include the following¹¹⁴:

- International Nomenclature Cosmetic Ingredient (INCI) name and product name
- Name and address of exporter
- Batch code
- Place of origin
- Date of manufacture
- Best before date
- Net weight
- Recommended storage conditions
- Organic certification number along with the name/code of the certifying inspection body if you export organic oil.

In general, companies selling oil products to European cosmetics companies will need to be prepared to supply information about the oil's physical, chemical, microbiological, and toxicological characteristics, including any test results available.¹¹⁵

¹¹³ "Entering the European Market for Baobab Oil", CBI, Netherlands Ministry of Foreign Affairs, September 2020, <https://www.cbi.eu/market-information/natural-ingredients-cosmetics/baobab-oil/market-entry>

¹¹⁴ *ibid*

¹¹⁵ *ibid*

“Good Manufacturing Practices (GMP) for the Biotrade Cosmetics Sector: Minimum requirements to ensure quality”, ABioSA Guide, July 2021, https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/LISAM_SMME_Webinars/ABioSA-Guide-Good-Manufacturing-Practices-2021.pdf

Note that ABioSA also has made available a number of Good Manufacturing Practices resources including more detailed guides and checklists.

“Cosmetic Products in Europe: EU Regulation EC 1223/2009”, ABioSA Guide, September 2021, https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA_Guides_August_2021/ABioSA-guide-Cosmetic-products-in-EU-Regulation-EC-1223-2009-2021.pdf

“Technical and product data for vegetable and essential oil EU compliance”, ABioSA Guide, June 2021, https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA_Guides_August_2021/ABioSA-Guide-Technical-and-product-data-for-vegetable-and-essential-oil-EU-compliance-2021.pdf

“Tests for EU Compliance: Minimum analysis required for oils and cosmetic products”, ABioSA Guide, September 2021, https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA_Guides_August_2021/ABioSA-guide-Tests-EU-compliance-Minimum-analysis-required-for-oils-and-cosmetic-products-2021.pdf

“Order of analyses for cosmetic products: Ensuring safety and compliance in the EU market”, ABioSA Guide, June 2021, https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA_Guides_August_2021/ABioSA-guide-order-and-analyses-for-cosmetic-products-compliance-EU-market-2021.pdf

“Complying with REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals”, ABioSA Guide, August 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/Complying-with-REACH-2021.pdf>

“Product Information File: Regulatory documents and information needed to create a PIF”, ABioSA Guide, September 2021, <https://www.abs-biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/Product-Information-File-2021.pdf>

“Classification, Labelling and Packaging: Compliance with EC regulation 1272/2008”, ABioSA Guide, August 2021, <https://www.abs->

biotrade.info/fileadmin/Downloads/1.%20PROJECTS/ABioSA/Repository/ABioSA_Guides_August_2021/ABioSA-guide-Classification-Labeling-and-Packaging-CLP-2021.pdf

US Registration, Testing, Packaging, and Labeling Requirements

FDA Cosmetics Labeling Guide, <https://www.fda.gov/cosmetics/cosmetics-labeling-regulations/cosmetics-labeling-guide>

FDA Summary of Cosmetics Labeling Requirements, <https://www.fda.gov/cosmetics/cosmetics-labeling-regulations/summary-cosmetics-labeling-requirements>

Registration and Testing Requirements:

Under the law, manufacturers are not required to register their cosmetic establishments or file their product formulations with the FDA, and no registration number is required to import cosmetics into the United States. However, the FDA encourages cosmetic firms to participate in the FDA's Voluntary Cosmetic Registration Program (VCRP) using the online registration system.¹¹⁶

The FDA does not have the legal authority to approve cosmetic products and ingredients (other than color additives) before they go on the market. FDA also does not have a list of tests required for any particular cosmetic product or ingredient. However, a manufacturer or distributor of a cosmetic is legally responsible for ensuring that a marketed product is safe when consumers use it according to the directions in the labeling or in the customary or expected way. The FDA can take action against the manufacturer of a cosmetic on the market if we have reliable information to show that a cosmetic does not meet the legal requirement for safety.¹¹⁷

Product Testing of Cosmetics, <https://www.fda.gov/cosmetics/cosmetics-science-research/product-testing-cosmetics>

“FDA Authority Over Cosmetics: How Cosmetics Are Not FDA-Approved, but Are FDA-Regulated”, <https://www.fda.gov/cosmetics/cosmetics-laws-regulations/fda-authority-over->

¹¹⁶ <https://www.fda.gov/cosmetics/cosmetics-laws-regulations/fda-authority-over-cosmetics-how-cosmetics-are-not-fda-approved-are-fda-regulated#:~:text=Under%20the%20law%2C%20manufacturers%20are,cosmetics%20into%20the%20United%20States.>

¹¹⁷ <https://www.fda.gov/cosmetics/cosmetics-science-research/product-testing-cosmetics>

[cosmetics-how-cosmetics-are-not-fda-approved-are-fda-regulated#:~:text=Under%20the%20law%2C%20manufacturers%20are,cosmetics%20into%20the%20United%20States.](#)

“Voluntary Cosmetic Registration Program”, <https://www.fda.gov/cosmetics/voluntary-cosmetic-registration-program>

Annex G: Responses to RFI Questions

USAID Zimbabwe recently published a Request for Information related to an upcoming planned procurement. That Request for Information listed a number of questions for which the Mission was seeking answers and insight. The consultants have provided some responses to these questions below to supplement responses obtained from other organizations.

1. Based on market analyses, potential competition and financial viability of investments, which of the NTFPs in Zimbabwe are commercially viable?
 - a. There is currently a market for many of the NTFPs, including baobab powder & oil, marula fruit & oil, KMS oil, ximenia oil, and ilala palm baskets and other woven products
 - b. At the present time, the biggest international markets are for baobab, marula, mongongo and palm baskets; KMS and ximenia are sold commercially with cosmetic products being sold in Europe and the US but are in a much more nascent stage of development.
 - c. In terms of the domestic market, baobab, marula, moringa, zumbani, makoni, resurrection bush, rosella and mopane worms have the biggest market in terms of ingestibles while marula oil, mongongo oil, moringa oil along with KMS oil and ximenia lead the cosmetic products.
2. What are the constraints of commercializing these products in Zimbabwe?
 - a. Consumer awareness and demand is very low in the US and also low in Europe
 - b. Industry utilization is also quite low. Lengthy new product development pipelines mean it will take years to see new products on store shelves
 - c. Supply chain - inconsistent quality, seasonality of supply, competition for labor with other value chains that need weeding or harvesting at the same time, limited packaging options and high cost of imported packaging, accessibility & local transportation constraints
 - d. Low and erratic volumes make it difficult to supply high-volume needs of large western buyers
 - e. Tree 'ownership' and absence of definitive "property rights" on the product source may mean entry into product area by outsiders cannot always be resisted effectively. (Cases of macimbi/mopane worms invasion from "outsiders" in Matebeleland South)
 - f. Inadequate resource base for some value chains threatens the sustainability of supply. A dearth of robust, country-wide resource maps for various species of NTFPs makes it difficult to ascertain the supply base with any certainty. This is a necessary requirement for full scale commercialization.
 - g. Demand for organic & Fair Trade certifications is very challenging and costly to meet, and it may not always be possible with wild-harvested products. In addition, organic certification may be impossible in some locations where malaria spraying or crop spraying takes place (e.g., high levels of DDT have been found in some products).

3. What steps can entities such as donors, civil society, private sector, public sector take to address these constraints?
 - a. Build consumer awareness:
 - i. leverage the internet, social media, and social influencers to educate consumers about these products and build interest
 - ii. conduct scientific research to prove benefits of these products which can be used in marketing and advertising
 - b. Fund certification processes
 - c. Coinvest along with commercial buyers in building robust supply chains, with appropriate storage, processing technologies, etc.
 - d. Create a subsidized trade finance mechanism for exporters and a low-cost working capital revolving fund for domestic buyers in these value chains.
 - e. Train collectors and processors in quality standards, hygiene, proper harvesting, processing, and storage methodologies
 - f. Fund large-scale resource mapping exercise
 - g. Encourage sustainable harvesting of products, including conservation of existing tree stocks, planting of new trees, conservation of wetlands
 - h. Enforcement/policing of natural resources management by-laws by local authorities and traditional leaders
 - i. Coordinate with various donors on chemical spraying to reduce the risk of contamination for these NTFP products

4. Which low-cost technologies can be adapted in Zimbabwe for production, harvesting, processing, storage and transportation of NTFPs?
 - a. Cracking nuts is very labor intensive and can be hazardous - Safe, efficient, low-labor nut cracking tools could be introduced either for the individual to use, or as a shared tool for a group, or as a business service for youth to operate
 - b. Possible portable pulp/seed separator for baobab to do that in the field - could be run by the buying company or as a business service for youth to operate
 - c. Mold and yeast can be a problem with baobab pulp/powder - PICS bags (low cost, hermetically sealed) could reduce mold and other quality problems with baobab pulp
 - d. Screw-type mechanical hand operated oil press
 - e. Balance hanging scales
 - f. Communal seed drying racks
 - g. Energy-efficient nut roasting ovens / stoves
 - h. Improved filtration systems, possibly operated as a shared resource, especially for ximenia but also for other oils
 - i. Carrying heavy loads long distances has been noted as a hindrance for many women to collect NTFPs. Wheeled carts to haul NTFPs back to homestead could be helpful.

5. Which districts of Zimbabwe should be of focus in the commercialization of NTFPs?

District	Baobab	Marula	KMS	Ximenia	Ilala Palm
Beitbridge	X	X		X	X
Bikita	X	X		X	
Binga	X			X	X
Bulilima	X	X			
Chipinge		X	X		X
Chiredzi		X		X	X
Hurungwe	X			X	X
Lupane		X		X	X
Matopos	X	X			
Mudzi	X		X	X	
Mutoko	X		X	X	

6. What will be the impact of commercializing NTFPs on households and the communities?

- a. Reduced poverty
- b. Enhanced resilience
- c. Improved nutrition and food security
- d. Diversified livelihoods
- e. Improved women's empowerment. Women collectors report being empowered through more respect in the home, improved gender relations in the home, improved respect and status in the community, greater control over money, and improved self-confidence and self-worth¹¹⁸
- f. Employment creation for youth
- g. Improved conservation of indigenous bioresources

7. Who are the appropriate commercial partners that are willing to invest in the proposed NTFP business?

¹¹⁸ Based on findings in "Study of the Impact of Non-Timber Forest Product Collection on Household and Community Resilience", Final Report, page 45, Development Solutions, December 2020

- a. Companies currently involved in NTFPs: B’Ayoba, Kaza Natural Oils, Kupanda, African Origin Oils
 - b. Beverage manufacturers and brewers: Delta Beverages, Beitbridge Juice Company, Mazoe Ltd, Tanganda tea
 - c. FMCG actors: Unilever, Cairns Foods, Glytimes, Probrands
 - d. Health foods sector: El Shaddai Natural Products, Utsanzi Foods, Four Seasons Foods, Hutano Foods, Chimani Delights, Pomona Farmers Market
 - e. Spas and wellness centres: African Apothecary, Tayana Health Spa, Amara’s Spa, The Skin Spa
 - f. Food technology firms and research institutions: Parragate, National Biotechnology Authority, BIZ, BioHub Trust, Fambidzai Permaculture Centre, AbioSA Zim
 - g. Micro lenders: First Mutual Micro Finance, ZB MicroFinance
 - h. Agroforestry players: My Trees, Rift Valley Farming, Matanuska, Global Green Africa, Green Canopy Enviro Care
8. How best can a NTFP market-led activity serve to support resilience, biodiversity conservation, climate change adaptation, and reduced Human-Wildlife conflict?
- a. Resilience
 - i. Diversification of income streams - “Despite current low real incomes from NTFPs, they were viewed as a means of diversifying income sources especially in times of frequent droughts and crop failure. NTFPs were viewed as drought resistant and therefore able to provide some much needed income when on-farm agricultural crops fail. Thus, NTFPs are helping households build adaptive capacities....”¹¹⁹
 - ii. Increased income streams
 - iii. Increased ability to pay school fees and meet basic food and non-food needs - “In general, income from NTFPs is not used in a different way from the main household income but contributes to meeting gaps in basic expenditure needs for the household”¹²⁰
 - iv. Building social capital through formation of collector groups
 - b. Biodiversity conservation & climate change adaptation
 - i. Higher income streams from forest fruits will cause people to value the fruit trees
 - ii. Leverage collector groups to encourage policing, preservation and disease-monitoring of the forest/fruit trees and planting new trees
 - iii. Some NTFPs are fairly drought-tolerant; yields may decline, but communities can still eat the fruits and sell the nuts even when other crops fail

¹¹⁹ Based on findings in “Study of the Impact of Non-Timber Forest Product Collection on Household and Community Resilience”, Final Report, page 44, Development Solutions, December 2020

¹²⁰ *ibid*

- iv. Trading of carbon credits through reforestation and afforestation programs using NTFP seedlings such as marula, ximenia, and llala palm.
 - c. Human-Wildlife Conflict
 - i. Could use chili bombs, chili fences, and other non-lethal chili pepper-based tools/techniques to keep elephants and possibly other wildlife away
 - ii. By virtue of the distances traveled to harvest NTFPs, collector groups could act as early warning system when dangerous wildlife encroach on communal areas
 - iii. Elephant damage to baobab trees- not sure how this could be used...
9. How can a new NTFP activity best coordinate with and leverage other USAID and donor activities on the ground?
- a. Layering opportunity with other USAID / donor programs through the following:
 - i. Natural resource management trainings for individual community members and natural resource management groups within communities
 - ii. Nutrition training and cooking demonstrations illustrating how to incorporate NTFPs in household meals.
 - iii. Leveraging VS&Ls and MFI financing and financial literacy programs.
10. How can USAID best incorporate youth and gender sensitive programming in a future NTFP activity?
- a. Currently the vast majority of NTFP fruit collection is done by women; similarly, virtually all basket weaving is done by women; very few youth or men are involved
 - b. Demonstrating the high value of NTFPs will attract the youth to participate. This is especially true of basket weaving for young girls.
 - c. Introducing tools that make NTFP collection/processing more efficient will be more gender & youth friendly (see low cost technologies above)
 - d. Could introduce new business opportunities for youth to be involved in processing by operating nut cracking or baobab processing machines for a fee
 - e. Gender issues are tricky as there is evidence that men have historically left NTFPs (and the income generated from them) to women, but as men see the income from NTFPs increasing they become interested and want to either collect NTFPs themselves or control the money generated by the sale of NTFPs. This will require appropriate programming to address gender issues, gender relations, and minimize gender conflict. "... as incomes increase male dominance over the income also increases leading to conflicts and increased incidences of GBV therefore gender needs to be a central focus going forward."¹²¹

¹²¹ Based on findings in "Study of the Impact of Non-Timber Forest Product Collection on Household and Community Resilience", pages 60-61, Development Solutions, December 2020