



AFRICAN FOREST FORUM
a platform for stakeholders in African forestry

**AFF COMMUNITY OF PRACTICE ON NON-TIMBER FOREST
PRODUCTS (NTFPS) VALUE CHAINS**

**NTFPs of nutritional, medicinal and cosmetic
significance on the African continent - marketing
and trade**

Day 2: November 16, 2021



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Outline

- ❖ **NTFPs of nutritional significance** - *Contributions of forests and trees to nutrition*
- ❖ **NTFPs of medicinal significance** - *Contributions of forests and trees to health*
- ❖ **NTFPs of cosmetic significance** - *Contributions of forests and trees to cosmetics*
- ❖ **Questions for discussion**



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NTFPs of nutritional significance - *Contributions of forests and trees to nutrition*



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NTFPs of nutritional significance - *Contributions of forests and trees to nutrition*

Forests and trees outside forests (including trees in agroforestry systems, on farms and in non-forested rural and urban landscapes) contribute to all four dimensions of food security (***availability***, access, utilization and stability) through the provision of nutritious food, income, employment, energy and ecosystem services



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NTFPs of nutritional significance - *Contributions of forests and trees to nutrition*

Availability (the actual or potential presence of food).

- Worldwide, ***around 1 billion people*** depend to some extent on ***wild foods*** such as wild meat, edible insects, edible plant products, mushrooms and fish;
- Even though foods from forests have been estimated to represent less than 0.6 percent of global food consumption, they are key to ensuring the availability of ***nutrient-dense foods and important vitamins and trace elements*** in many communities.



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NTFPs of nutritional significance - *Contributions of forests and trees to nutrition*

Availability (the actual or potential presence of food).

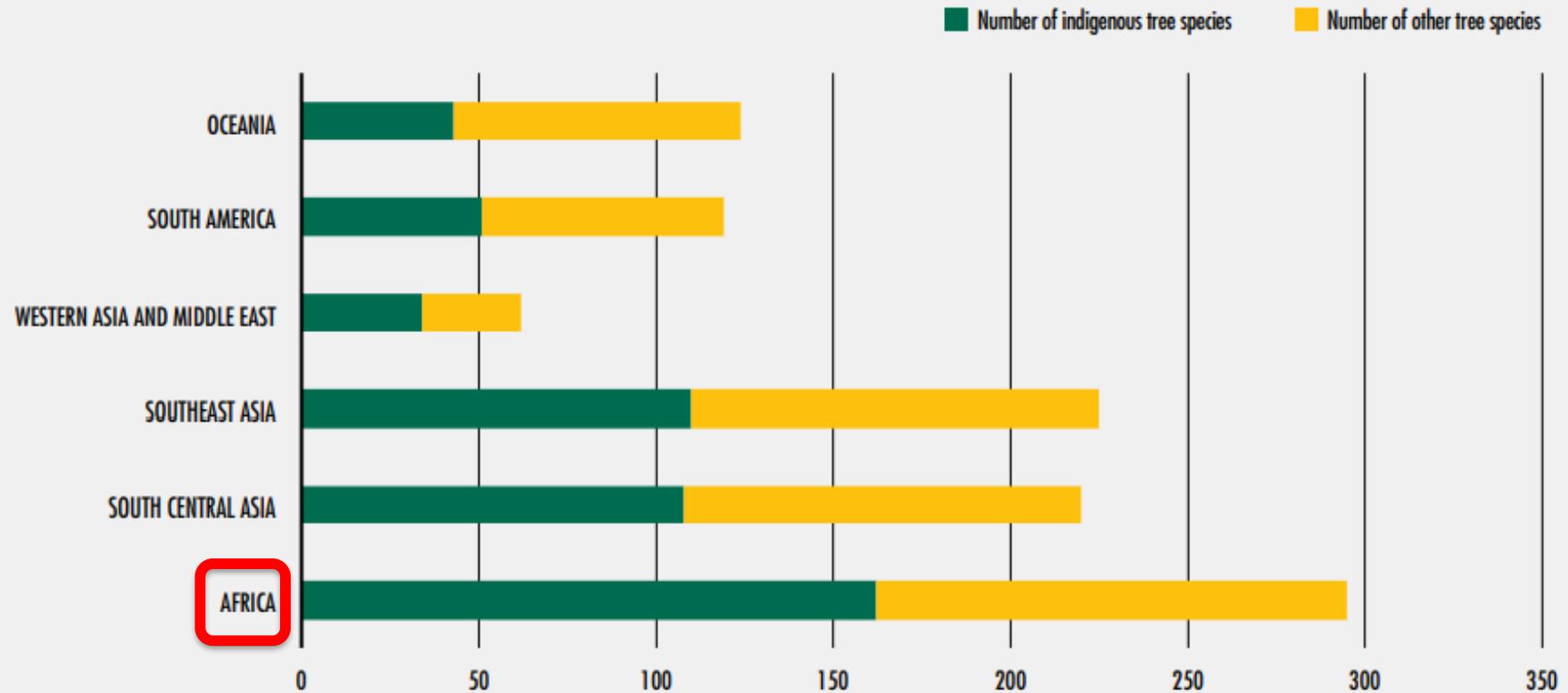
- Forests and trees outside forests also support food availability by providing fodder for livestock, either as browse or as animal feed:
 - ✓ livestock are a source of meat and milk and also
 - ✓ support agricultural production by providing draught power and manure
- *Fish richness and abundance*, in some places, are directly *associated with forest area*: fish provide primary sources of animal protein and essential nutrients (vitamin A, iron and zinc), particularly in developing countries.



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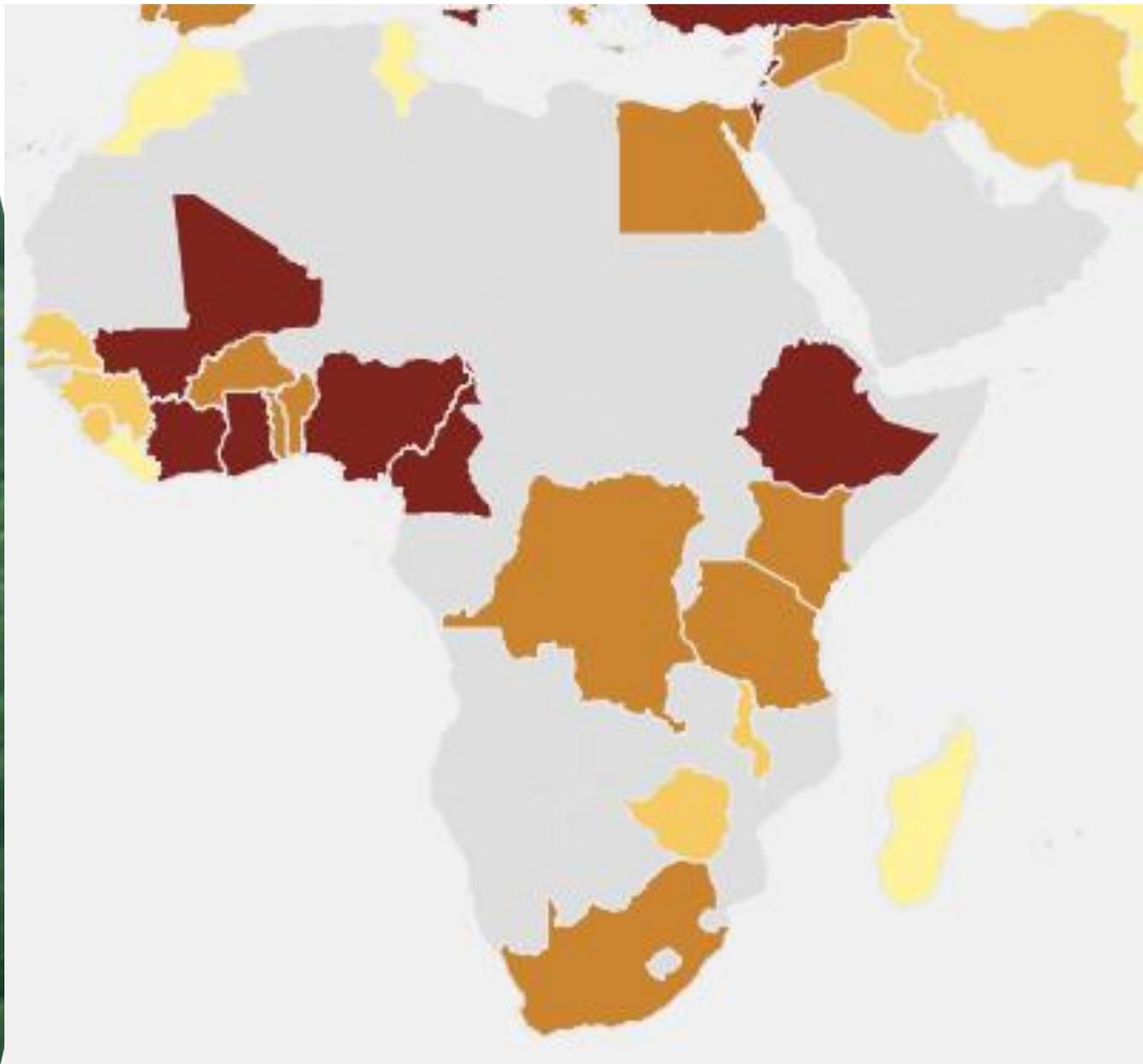
NTFPs of nutritional significance - *Contributions of forests and trees to nutrition*

NUMBER OF TREE SPECIES PROVIDING FOOD OF IMPORTANCE TO SMALLHOLDER LIVELIHOODS



FAO – 2020 State
of the world
forest

SOURCE: Based on data from the Agroforestry Database (World Agroforestry, 2009), cited in Dawson *et al.*, 2014.



PRODUCTION OF FOREST NUTS, 2017

Production figures include the following: chestnuts (*Castanea* spp), karite (*Vitellaria paradoxa*), kola (*Cola nitida*; *Cola vera*; *Cola acuminata*), brazil nuts (*Bertholletia excelsa*), tung nuts and the category “nuts nes”, which includes other forest nuts such as pine nuts, which are not considered a separate category. SOURCE: FAO. FAOSTAT. 2020

Production (tonnes)

- < 20 000
- 20 000–50 000
- 50 000–100 000
- > 100 000

Examples of NTFP – for nutrition

In West Africa, African locust beans (*Parkia biglobosa*) are fermented to obtain a nutritious food **rich in protein** (40 percent of dry matter) **and fat** (35 percent) – Production - 200 000 tonnes of beans are gathered each year in northern Nigeria alone



Figure 2. Examples of baobab products from the Malawian formal and informal markets. 1A–D: Baobab juice products; 1E: formally processed baobab ice-lollies; 2A: Informal baobab juice packaged in recycled plastic bottles; 2B: Baobab sweets sold in informal outlets; 2C,D: Informally processed baobab ice lollies; 2E: Packaged pulp in sacks for wholesale. 3A,F: Baobab oil; 3B: Baobab soap; 3C: Assorted lip balm; 3D: Baobab Spongi soap; 3E: Baobab body cream sold in high-end shops; 4A,C,E: Baobab pulp powder sold in pharmacies; 4B: Baobab coffee powder made from seeds; 4D,F: Baobab jam; 5A: Baobab sweets sold in supermarkets; 5B: Baobab chocolate sold in high-end flea markets; 5C: Baobab sweets sold in high-end markets; 5D: Baobab pulp powder sold in high-end flea markets.

Examples of NTFP - for nutrition

The baobab (*Adansonia digitata*): fruits and leaves

Dehydrated pulp of baobab fruits contains up to **300 mg of vitamin C per 100 g of fruit pulp = 6 X vitamin C of orange**, as well as **vitamins A, B1, B2 and B6**.

Daily consumption of **10 to 20 g of the fruit pulp** can meet the **vitamin C intake requirement of a child**.

Baobab leaves are also **high in calcium, protein and iron**

Some forest foods are widely traded. The global market for edible mushrooms, for example, many of which are collected from forests, is estimated to be worth USD 42 billion per year



Characteristics Processed baobab products in Malawi (Darr et al., 2020)

Product Type	Number of Products Identified	Main Product Features	Estimated Baobab Content	Main Retail Outlet
Baobab fruit powder	25	Packaged or in bulk, some products with organic certification.	100%	Open markets, street vendors, supermarkets.
Malambe sweets	12	Coloured sweetened pulp pieces, packaged in plastic bags (15–70 g).	90%–100%	Schools, supermarkets.
Baobab ice-lollies	11	Frozen baobab juice raw or sweetened and coloured, packaged in plastic tubes (35–50 g).	20%–30%	Street side vendors, churches, informal markets, schools.
Baobab juice, bottled	7	Packaged in 250–1000 mL PET or recycled PET bottles, with or without MBS certification.	40%–60%	Supermarkets, filling stations.
Baobab coffee powder	3	Packaged in branded plastic jars (180–200 g).	100%	Supermarkets, pharmacies.
Baobab jam	3	Packaged in branded plastic jars (350–500 g).	15%–20%	Supermarkets
Baobab pure oil	3	Packaged in 100 mL glass or PET bottles.	100%	Supermarkets, pharmacies.
Baobab lip balm	3	Packaged in wooden cases (12 g).	100%	Specialty shop, flea market.
Baobab soap	2	Packaged in plastic or branded paper wrap (110–170 g).	15%–50%	Specialty shop, high-end tourist gift shops.
Baobab delight smoothie	2	Packaged in PET bottles (250 mL).	30%	Supermarkets.
Baobab smoothie served in cups	2	Served in polystyrene cups (100–150 mL).	30%	Restaurants, fast-food shops.
Baobab wine	1	Packaged in 750 mL glass bottles.	10%–15%	Agriculture fair/ trade exhibits.
Malambe face powder	1	Plastic jar (25–40 g).	60%	Local markets.
Baobab body cream	1	Wooden jar (250 g).	30%	High-end tourist gift shops.
Baobab chocolate	1	White chocolate bar wrapped in paper.	15%	Flea markets, tourist centres.
Baobab body lotion	1	Imported from France.	100%	Drug stores, pharmacies.
Total	78			



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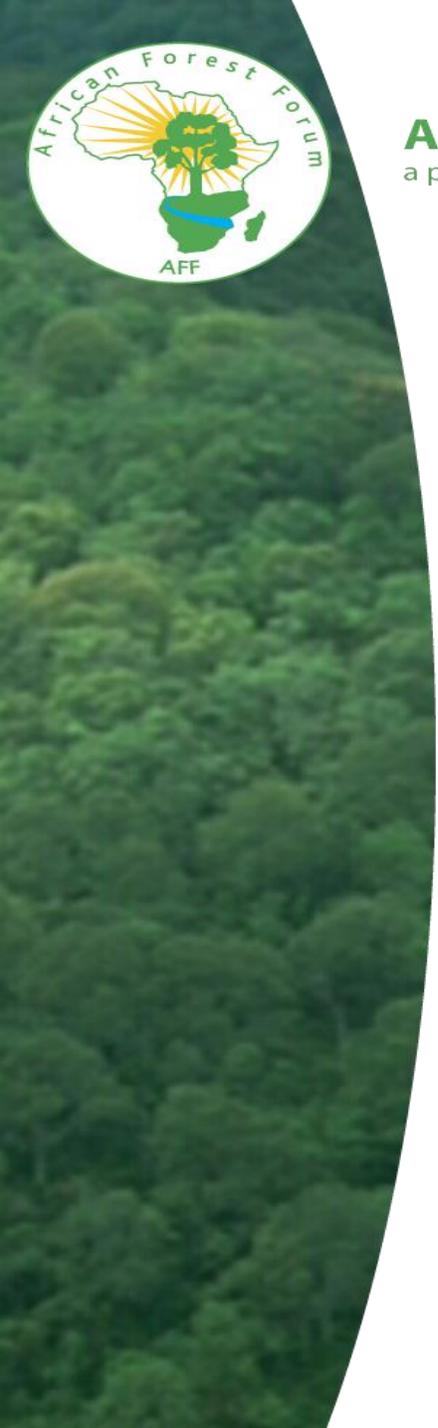
Examples of NTFP – for nutrition

Close to **1 800 species** of insects, mammals, birds, amphibians and reptiles ***used as wild meat*** around the world, many of these in tropical and subtropical forests

Wild meat accounts for at least **20 percent of animal protein in rural diets in at least 62 countries worldwide**. In the Amazon and **Congo basins**, wild-meat consumption delivers between **60 and 80 percent of communities' daily protein needs**

In the ***western region of Ghana***, Low-income households reportedly consume products gathered from forests, such as ***bushmeat*** (including the greater cane rat, *Thryonomys swinderianus*), snails, mushrooms, honey and fruits, ***five to six times a week***





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NTFPs of medicinal significance -

Contributions of forests and trees to health



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NTFPs of medicinal significance - *Contributions of forests and trees to health*

- ❑ Forest biodiversity also encompasses an enormous range of ***plant, animal and microbial material*** with known or potential ***medicinal values***;
- ❑ These substances are not only of local importance but are also ***commercialized on national and international markets*** or used as models to synthesize new medicines;
- ❑ More than ***28 000 plant species***, many of which are found in forest ecosystems, are currently recorded as being ***of medicinal use***;



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NTFPs of medicinal significance - *Contributions of forests and trees to health*

- ❑ Up to **80 percent of people in Africa** still rely on **traditional medicine** for their primary health care requirements;
- ❑ It is estimated that at least **1 billion people** use **herbal remedies to treat children's diarrhoea**;
- ❑ In **2010**, the world **market for herbal medicines** based on traditional knowledge was estimated at **USD 60 billion**;



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NTFPs of medicinal significance - Contributions of forests and trees to health

Benefits of forest for mental and physical health

- ❑ Exposure to natural environments has ***positive impacts on human physical and mental health***, particularly in urban areas;
- ❑ In industrialized countries and urban contexts, ***green environments*** can enhance the motivation for physical exercise and ***reduce health problems attributable to a sedentary lifestyle*** such as excess weight, chronic stress and attention fatigue;
- ❑ ***Visits to forest environments*** also appear to have ***positive physiological effects***, such as reduced blood pressure and pulse rate, increased cognitive control and even strengthened human immune responses



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NTFPs of medicinal significance - Contributions of forests and trees to health

Benefits of forest for mental and physical health

- ❑ More than 90 percent of the world's population lives in places where air pollution exceeds WHO guideline limits. Around 7 million people die every year from exposure to fine particles in polluted air. ***Forests benefit the entire population simply by improving air quality;***
- ❑ Forests and trees help mitigate many of the problems of living in urban areas, for example by ***reducing the urban heat island effect*** – which can be lethal during heat waves – and buffering noise.
- ❑ Forests also indirectly ***decrease the occurrence of food- and waterborne diseases*** by filtering water and providing woodfuel for cooking food and boiling water.

Note: Forest / NTFP-related health risks

The majority of new infectious diseases of humans are zoonotic, meaning that they originate in animals. Their emergence may be linked to change in forest area and the expansion of human populations into forest areas, both of which increase human exposure to wildlife and, in some cases, to the consumption of wild meat. HIV and Ebola have clear forest origins. SARS-CoV2 virus that caused the current COVID-19 pandemic is also assumed to be of zoonotic origin.



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NTFPs of cosmetic significance -

Contributions of forests and trees to cosmetics

NTFP of cosmetic significance -

Contributions of forests and trees to cosmetics

- ❑ There is **growing consumer interest in natural and/or organic cosmetics** with the major markets being Europe and North America.
- ❑ Currently, the global **supply is obtained from only about 15 plant species** out of nearly half a **million known** to man, highlighting the **greater potential**
- ❑ Creating markets for these non-timber forest products may play a role in conservation as increased economic importance of natural resources **may reduce destructive timber harvesting**



Fig. (A) Fruit and seeds of *Adansonia digitata*; (B) *Citrullus lanatus* fruit; (C) seeds of *Ximenia americana*; (D) women gathering fruits of *Sclerocarya birrea*; (E) pressed oil and seeds of *Adansonia digitata*; (F) seeds of *Trichilia emetica*; and (G) seeds of *Sclerocarya birrea* (Source: Vermaak et al., 2011).

NTFPs of cosmetic significance -

Contributions of forests and trees to cosmetics



- ❑ **Natural seed oils** are of interest to the cosmetics industry because they **contain a range of fatty acids** which contribute several beneficial properties in cosmetic and personal care products.
- ❑ **Linoleic acid is the most frequently used fatty acid in cosmetic products** as it moisturises the skin, aids in the healing process of dermatoses and sunburns and is used for the treatment of Acne
- ❑ Skin permeation enhancement effects were also recorded for linoleic, lauric, myristic and stearic acids, all of which are present in various seed oils



NTFPs of cosmetic significance - *Contributions of forests and trees to cosmetics*

Example - baobab

- ❑ In Southern Africa: baobab is commonly found in Malawi, Zimbabwe, Mozambique and South Africa especially in the warm parts of the Limpopo Province,
- ❑ In West Africa, it is found in Mali, Benin, Senegal, the Ivory Coast, Cameroon and Burkina Faso.
- ❑ In East Africa, the plant is found in countries such as Kenya, Uganda and Tanzania.
- ❑ It is believed that the centre of origin of the genus *Adansonia* is Madagascar

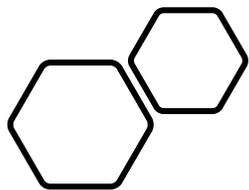


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NTFPs of cosmetic significance - *Contributions of forests and trees to cosmetics*

Example of modern day uses

- The oil is used in **wound care therapy and bath oil preparations**, as a moisturiser and massage oil, and hot oil soaks are used for **hair and nail conditioning**;
- Baobab oil has been included in a few **patented compositions**.
 - ✓ In one case, baobab oil may be included as a carrier/vehicle in a dermatological/cosmetic preparation containing an extract from baobab leaves.
 - ✓ Another patent for an oil absorbent wipe intended for use on the skin or hair, lists baobab oil as a possible ingredient
- In recent years, baobab oil has been added to the list of **fixed oils commonly included in cosmetic products**. Baobab oil will not burn the skin when applied as such, and it is said to be **nonirritating** as well as **non-sensitising**



NTFPs of cosmetic significance - Contributions of forests and trees to cosmetics

Fatty acid		<i>A. digitata</i>	<i>C. lanatus</i>	<i>S. rautanenii</i>	<i>S. birrea</i>	<i>T. emetica</i>	<i>X. americana</i>
<i>Saturated</i>							
Myristic	14:0	0.78	0.78	0.03	–	–	–
Palmitic	16:0	18.0–30.0	8.8–15.7	9.6–10.8	9.0–12.0	43.0–53.0	3.31
Stearic	18:0	2.0–9.0	5.6–13.8	3.04–7.7	5.0–8.0	3.0	4.0–15.4
<i>Unsaturated</i>							
Oleic	18:1	30.0–42.0	13.03–17.1	15.2–19.2	70.0–78.0	51.0	54.0–72.1
Linoleic	18:2	20.0–35.0	56.8–70.8	36.6–49.5	4.0–7.0	16.0	1.34–10.0
α Linoleic	18:3	1.0–3.0	0.46–1.1	–	0.1–0.7	–	–
Linolenic	18:3	–	0.46–1.6	16.7	–	16.0	10.31
Erucic	22:1n9	–	–	21.5	–	–	3.46
Arachidonic	20:4	–	–	–	0.3–0.7	–	0.60
References		Andrianaivo-Rafehivola et al. (1993) and Wren and Stucki (2003)	Mabaleha et al. (2007), Oluba et al. (2008), Ziyada and Elhussien (Nyam et al. (2009), Mariod et al. (2009) and Gaw et al. (2010)	Zimba et al. (2005), Juliani et al. (2007) and Chivandi et al. (2008)	Mariod et al. (2004), Zimba et al. (2005) and Ojewole et al. (2010)	Engelter and Wehmeyer (1970), Khumalo et al. (2002) and Van der Vossen and Mkamilo (2007)	Ligthelm et al. (1954), Badami and Patil (1981), Eromosele and Eromosele (2002), Řezanka and Sigler (2007) and Saeed and Bashier (2010)

Adansonia digitata (baobab), *Citrullus lanatus* (Kalahari melon), *Schinziophyton rautanenii* (manketti/mungongo), *Sclerocarya birrea* (marula), *Trichilia emetica* (mafura butter) and *Ximenia americana* (sour plum)

(Source: Vermaak et al., 2011)



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NTFPs of cosmetic significance - *Contributions of forests and trees to cosmetics*

Some figures on trade

2.5 million households harvest marula with a potential output of about 877 200 tonnes of products derived from the fruit (data of 2006).

Trade value (in 2006) and potential trade value of products of six plant species, from Southern African Developing Countries (SADC)

Species	Estimate in 2006 (\$)	Potential (\$)
<i>Adansonia digitata</i>	11 203 928	961 358 568
<i>Sclerocarya birrea</i>	425 000	263 001 008
<i>Ximenia americana</i>	58 500	37 566 884
<i>Citrullus lanatus</i>	58 500	21 126 226
<i>Trichilia emetica</i>	-	501 665 697
<i>Schinziophyton rautanenii</i>	-	19 677 684

Source: Vermaak et al., 2011)



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Questions for discussion

- In your experience, which NTFP on the African continent shows great and unique market potential? What are the challenges in making use of this potential? What needs to be done to make use of this potential?
- Any other aspect worth discussing