



The Little BIG BAOBAB Book

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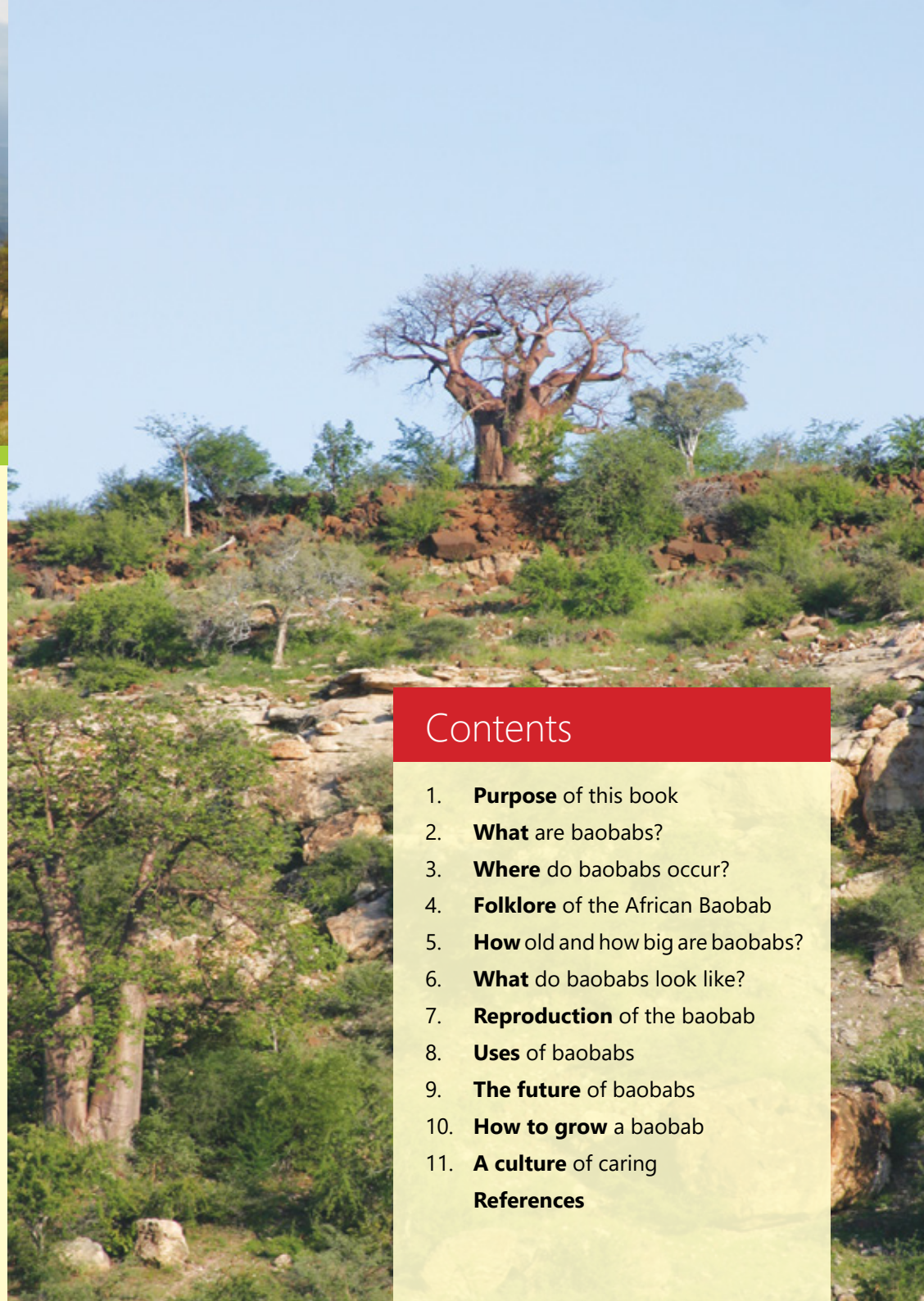


DR SARAH VENTER



Note from Dr Sarah Venter:

This book was inspired by my PhD research on baobab trees. I felt that the research which appears in scientific papers and theses is not available to most people, especially to the VhaVenda people whose lives are so closely linked to the baobab trees of South Africa. I have worked closely with many people during my research and in making baobab fruit a source of income for many rural women in the area. The TshiVenda edition of this book will be distributed to their communities and schools. It is my hope that everyone will learn what a valuable tree the baobab is and be motivated to become a custodian of this magnificent species.



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1. Purpose of this book

This book aims to provide an easy-to-read source of facts and interesting information about the African baobab with clear photos and diagrams of these special trees. It also highlights the importance of baobabs in the lives of rural people and suggests ways to conserve them by promoting their growth through a culture of caring.

2. What are baobabs?

African baobabs, scientifically known as *Adansonia digitata*, are the oldest living organisms in Africa. These trees manage to outlast every plant and animal around them. Baobabs contain enormous amounts of water. This water is stored in the cells of their trunks, giving the trees their characteristic swollen-looking shape. This helps them survive in some of the driest areas in Africa.

The name 'baobab' is derived from buhobab (an Arabic phrase roughly meaning 'having many seeds') which was used centuries ago in Cairo by the merchants who sold baobab fruit traded from further south. There are many local names for the baobab. In South Africa the TshiVenda word for baobab is muvhuyu. In Afrikaans it is known as kremetartboom, meaning cream of tartar tree, this is because the whitish powder in its fruit was mistakenly thought to be cream of tartar.

All over Africa, baobabs are used for many different purposes. Where they occur, they sustain people both culturally and nutritionally and are important to local healing practices.

3. Where do baobabs occur?

Baobabs originated in West Africa millions of years ago and over time spread to other parts of the world where they divided into new species. In Madagascar, six baobab species occur which are found nowhere else. One species of baobab, *Adansonia gregorii*, occurs in Australia where it is called the 'Boab tree'. In Africa, baobabs are very widespread occurring in most Savannah ecosystems from the Limpopo Province of South Africa to west Africa and the desert of Eritrea in North Africa.



This wide distribution indicates how well baobabs tolerate different temperatures, rainfall and soil types. Humans have played an important role in the distribution of baobabs as they are used for food, gifts or plant them where they settle. Baboons and elephants also disperse seeds. They eat the fruit and the seeds are deposited in their droppings.

4. Folklore of the African baobab

Baobabs form part of the traditions and beliefs of many African cultures. They have been credited with a range of spiritual powers, and many tales have been woven around these trees. Because of its shape, stories of the tree's creation often describe the tree growing upside down with roots in the air. Indeed, the baobab is often referred to as the "upside down tree".

Legend has it that, at the time of creation, God planted the baobab in the Congo basin. The baobab was unhappy there and complained to God that it was too hot and humid. God transferred it to the high Ruwenzori mountains, but there the baobab complained it was too cold, snowy and foggy. God then planted it in the Sahara desert where it would be warm and dry but the baobab complained again, saying it was too hot. God lost patience, plucked it out of the ground, and threw it away over his shoulder. It landed upside-down in the savannas of Africa, where of course it lives happily to this day – and if one looks at the Map, showing where baobab occur, this story explains the gaps in its distribution.

Stories about how water can be extracted from the trunk of a baobab are also common. One story claims that, if a tap were to be pushed into the trunk of a baobab, turning it on would result in water pouring out. This story is clearly just a myth.



THE 'SAGOLE TREE'

5. How old and how big are baobabs?

Scientists use carbon-dating to determine the age of baobab trees. Old baobab trees, are usually hollow, so carbon-dating uses the wood that is left in the trunk to determine the age of the tree.

The oldest dated baobab, which has now collapsed, was the 'Glencoe Tree' just outside Hoedspruit in the Limpopo Province of South Africa. It was approximately 1800 years old.

The two largest living baobabs in the world are also found in Limpopo province, South Africa. These are the 'Sagole Tree' which is approximately 1200 years old, 22 meters high and has a circumference of 33 meters. This tree is the biggest baobab in the world by its volume and is the largest flowering plant in the world.

The second largest baobab is the 'Sunland Tree', approximately 1060 years old. It is a two stemmed tree and has a total circumference of 34.11 meters and a height of 19 meters.



6. What do baobabs look like and what are their uses?



BAOBAB FRUIT ON THE TREE

Fruit

The fruit (or pod) has a hard shell and is covered with short velvety hair. Their shape can vary from elongated to round. Large pods can weigh over 2kg and contain more than 400 seeds; smaller ones can be the size of an apple with only a few seeds. Inside the shell there is a dry, chalky fruit powder in which the seeds are held in a loose network of red fibres. Because of this powder, the baobab fruit is now known as 'Africa's superfruit' as it contains high concentrations of vitamins and minerals.

The fruit take 4-5 months to mature and when ripe fall to the ground where they may be cracked open by humans or baboons.



OPEN AND RIPE BAOBAB FRUIT

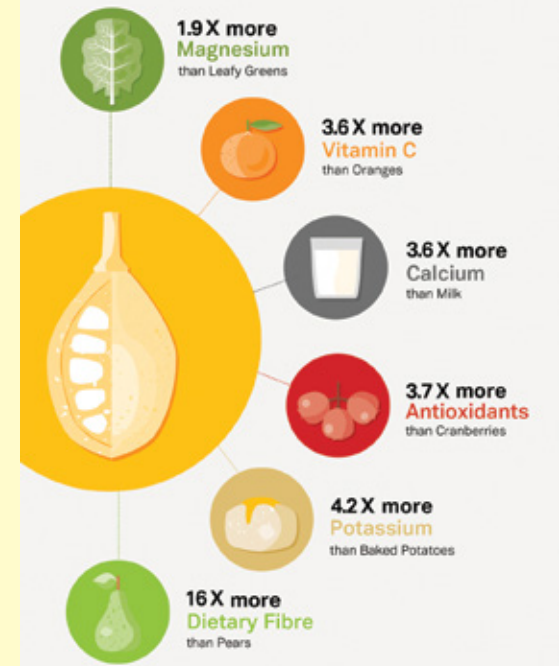
Baobab Fruit Powder – Africa's Superfruit!

The fruit powder has been used as a nutritious food in Africa for millennia. Although the tree is not native to Egypt, baobab fruit were found in Egyptian tombs and this is why they must have been known to ancient Egyptians.

The fruit powder has a lemony flavour. It is very nutritious with calcium and magnesium, and particularly high in vitamin C. In fact baobab powder is one of the richest known natural plant-derived sources of vitamin C and calcium in the world. Baobab powder also contains potassium, iron and dietary fibers, all of which are important in human health.

Baobab powder can be eaten on its own or added to drinks or foods as a nutrient-rich supplement. Many people living in baobab areas mix the powder with water to make a drink; with milk to make a type of yoghurt; or mix it into porridge for extra flavour. In East Africa it is used to flavour and thicken curries.

BAOBAB POWDER GIVES YOU MORE



What is the Kremetartboom?

The Afrikaans people of South Africa used to believe that baobab fruit was filled with cream of tartar. Cream of tartar is a white powder which was originally a byproduct of winemaking. It has many uses in food preparation and a similar acidic taste to baobab fruit powder – this is why the baobab was called the kremetartboom (cream of tartar tree). While the fruit powder does contain a small amount of tartaric acid, it has a very different composition to cream of tartar.

Seeds

The seeds are dark brown/black and kidney-shaped. They are usually about a centimeter long with a soft, nutty-flavoured centre. They are used in traditional dishes. Oil can also be extracted from the seeds and used in cosmetics.



BAOBAB SEEDS

Baobab Seed Oil – Africa's Best Kept Secret

The seeds contain small quantities of oil which, once pressed out, can be used as an effective skin moisturizer and balm. This oil is also used in the cosmetics industry to make lotions, creams, hair conditioners and other personal care products. It absorbs into the skin easily and is rich in Omega 6 & 9 Fatty Acids.

After the oil has been extracted, the remaining 'seed cake' is nutritious enough to be used as a supplement in animal feeds.

The seeds themselves are also nutritious, being rich in protein and potassium. They do, however, need to be cooked before they can be eaten.



BAOBAB LEAVES



BAOBAB FLOWER AND BUD

Leaves

The leaves have four to nine finger-like leaflets. The 'breathing holes' (stomata) on the underside of the leaf are larger than those of other trees, resulting in higher water loss. To limit this, leaves drop off in the dry season. The trees usually remain in leaf for about five months. In Southern Africa this is from November to March.

In some parts of Africa, mostly West Africa, the leaves are dried and/or boiled and eaten like spinach. When dried they can be kept for many months before being eaten. They are high in amino acids, vitamins and minerals and are also used for animal fodder.

Flowers

The flowers are large and white with a strong smell. These flowers appear just before and during the rainy season (November to January). The bud of the flower is about the size of a golf ball and is covered by a hard protective layer (the calyx), so it is often mistaken for a small fruit. Baobab flowers open at night and only last 18 hours before the petals wilt and fall off.

In dry areas baobabs can be as old as 200 years before they produce their first flowers. However, if a tree is watered every day it could flower within 23 years.





COLLAPSED DEAD BAOBAB TREE

Trunk

The trunk looks swollen and spongy but is really quite hard to the touch. About 70% of the trunk is water, which is stored in individual cells. This ensures that there is enough water during the dry season to keep the tree alive and to be used to produce new leaves at the beginning of the wet season. As the dry season progresses, baobab trunks can shrink slightly in circumference. The water also helps to keep the tree upright. When a tree dies, the trunk dries out and finally collapses into a heap of woody fibres.

Mature trees are often hollow, but seem to suffer no ill-effect from this. If the trunk is damaged when young, another stem or two will be produced and these often become fused to the main trunk as it grows. This gives the impression of separate trees growing very close to each other.

The hollows in baobabs are often used as storage places and shelters for humans and small animals. In the past, these hollows had a variety of official uses, ranging from informal post offices to prisons! Holes and hollows in some trees act as reservoirs for water which people and animals can use during the dry season.

Wood

Due to its high water content, the wood is light and porous, and thus not suitable for firewood or building material. It is, however, used to make items such as canoes, bowls and floats for fishing nets.

Bark

Baobab bark is grey, often with a copperish or brownish tint. The bark has an amazing capacity to heal after it has been damaged or stripped. It often forms interesting bulges and ridges as a result of earlier human bark-stripping or elephant damage.

The under-bark fibres are often used by humans and elephants find the bark nutritious. Just below the grey surface is a layer of green. It is thought that this green layer helps the tree use sunlight to make food (photosynthesize).



DRYING BAOBAB BARK



BARKHARVESTING



TRUNKSHOWINGBARKHARVESTINGSCARS



BAOBAB AT SUNSET

The bark contains fibrous material used for rolling rope or twine, and even weaving fabrics. Baobabs can survive having their bark stripped as it easily regenerates to produce more bark. The layer just below the green chlorophyll contains the useful fibre. This is pulled off in strips, then soaked in water and twisted together to form cords or rope. Baobab rope is strong and can be used for a range of items such as harnesses for donkeys, nets, hats, baskets and mats.

Roots

The first major root produced by the young baobab seedling is a tap root. It is sent straight down by the young tree and then other roots start spreading laterally as the tree matures. The root system is shallow but very extensive to make the most of whatever rain may fall and keep the huge trunk upright. Roots are often exposed above the soil surface due to soil erosion around the tree, or if the root grows over rocks.



BAOBAB IN A VILLAGE

Traditional healing

Wherever baobabs grow, they are important in traditional healing as they contain certain medicinal compounds. These are extracted from the fruit, wood, bark and leaves.

Religious or ancestral beliefs often centre around baobabs and many tales exist about the spirits that live in these trees. It is no coincidence that a baobab tree often forms the centre of a village, where meetings take place in its shade.



BAOBAB POWDER BEING POUNDED OFF THE SEED

Importance for birds, animals and insects

The large, untidy nests of the red-billed buffalo weaver birds are commonly seen in baobabs, particularly on the western side of the tree. The rare mottled spinetail bird is also associated with baobabs, and the famous Sagole Tree supports the largest colony of this species in South Africa. Elephants often gouge out parts of the trunk for its moisture and nutrients. Baboons are often seen amongst the branches eating the fruit.

Bats, bush babies and insects all enjoy the nectar of the baobab flowers. Livestock and buck eat the young leaves and fallen petals. Bats often roost in hollow baobabs, and the grooves and cracks in the bark of the trees provide shelter for numerous insects and other small creatures. Honeybees commonly nest in baobabs, making their hives in clefts or holes in the trunk.

RED-BILLED BUFFALO WEAVER AND ITS NEST





HAWKMOTH AND BAOBAB FLOWER

7. Reproduction of the baobab

Pollination

It is thought that bats and hawkmoths are the main pollinators of baobab flowers. The pollen sticks to their bodies as they lick the sweet liquid (nectar) from the flowers. The nectar is situated behind the petals, which increases the chances of pollen transfer. Baobab flowers are specifically adapted for bat pollination in the following ways: they are large and robust; they are situated at the ends of the branches and therefore easy for the bats to reach and they are open at night when the bats are active. In order to promote cross-pollination, only some of the flowers open each night which encourages bats and hawkmoths to move from tree to tree to look for nectar. Birds and insects are also known to feed on the nectar, and is likely to play a role in pollination.



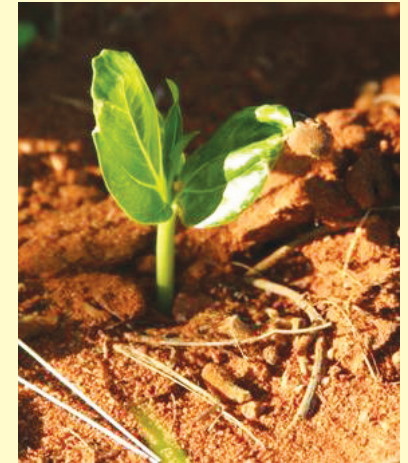
WAHLBERG'S EPAULETTED FRUIT BAT

Fertilisation

Once pollination has occurred, the pollen moves down the long tube of the flower's style and fertilises the ovum (eggs) within the ovary. Successful fertilisation results in the formation of a tiny pod, which encases a capsule of tiny white seeds. This then develops into a new baobab fruit.

Germination

Little is known about what percentage of the seed actually start to grow (germinate). What is clear, however, is that seedlings in higher rainfall areas grow much faster than those in low rainfall areas. Baobab seedlings start by producing simple leaves totally unlike the divided leaves of the mature trees. The young trees (saplings) have smooth bark and slender stems and so look very different to the huge giants that they can become.

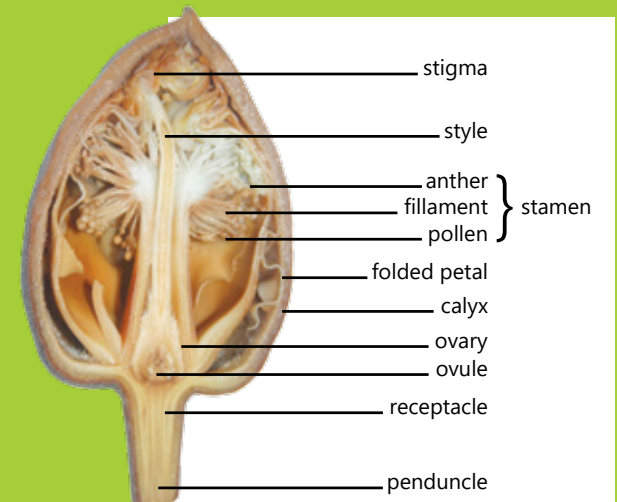


BAOBAB SEEDLING

Cross section of a Baobab Bud

Look around a baobab and you will often find something interesting such as a bud, flower or fruit (small or large). If you find a bud or flower use the illustration to identify the parts.

If you are lucky enough to find a fruit, open it and suck the delicious powder off the seed.





YOUNG CHILDREN STANDING UNDER A BAOBAB IN THEIR VILLAGE

9. The future of baobabs

Many things can have a negative effect on the baobab – on the fruit, on the seedlings and on the tree itself. In fact, any survival of the mature trees is almost certainly due to the fact that their moist wood is unsuitable for burning or building. Also, it is difficult to chop down a large baobab, as an axe will either bounce off the spongy trunk or get stuck in the soft wood.

Probably the greatest cause of decrease in the numbers of baobab trees is the destruction of the seedlings. More domestic animals, particularly goats and cattle, mean that any seedling is likely to be eaten before it can reach a safe height. Also, many of the environments in which baobabs naturally occur are fast being converted to new uses.

While baobabs have the rare ability to grow new bark over wounds, over-harvesting of the bark can result in a tree's death. The reason for this is that the tree loses water, which weakens it and makes it susceptible to disease and drought. When a baobab tree is stressed in this way, a dark mould often covers the tree, giving it a black, charred look.

Even though such a tree may look dead, it will recover if there is enough rainfall and bark harvesting is stopped. Elephants also can be destructive. Where they do too much damage to the trees with their tusks, the tree dies. The over-harvesting of leaves as well as of the fruit, coupled with low rainfall, also negatively affects the production of seeds and therefore the future of the baobab.

South Africa is one of the few countries in Africa with laws that protect baobabs. The Forest Act forbids baobabs to be cut down. South Africa also has the 'Champion Trees' project which gives special protection status to individual trees in the country which are historically or environmentally important. The Sagole and Sunland baobabs are included on that list.

10. How to grow a baobab

Baobab trees are easy to grow. The seed germinates quickly when soaked in boiling water or its hard coat pricked to encourage germination. Plant the seed in a deep planting bag with very sandy soil. The deep bag is to accommodate the long taproot that first grows. Keeping soil around the seed moist is important, and watering is essential once germination has started. Once the first leaves and shoots appear, it is important to protect seedlings from goats and cows by building a fence around them.

Not all conditions will suit baobab trees. They will not do well in very cold areas or very damp areas, and need a lot of sunlight. When they are grown outside of areas where they grow naturally, they need a lot more care. Some people use the young plant as a house-plant or grow them into bonsais.

BAOBAB SEEDLINGS IN HOMESTEAD GARDEN



11. A culture of caring

Embracing a 'culture of caring' for these very special African trees is crucial to their survival. This can be done through projects that encourage the planting of baobab seeds and the protection of the young seedlings from livestock, as well as the protection of adult trees.

The Baobab Foundation is aimed at promoting an awareness of baobab ecology and the long-term conservation of the trees. The initiative encourages rural women to grow the seedlings themselves and to become the "baobab guardians" of the future.



ANNAH MUVHALI HOLDING BAOBAB FRUIT



MASHUDU RAMMBASA, A BAOBAB GUARDIAN, PLANTS HER FIRST TREE

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For more information see: <http://www.baobabfoundation.co.za>

