CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Seventeenth meeting of the Conference of the Parties
Johannesburg (South Africa), 24 September – 5 October 2016

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Listing of the species *Adansonia grandidieri* in CITES Appendix II.

We propose that the listing should be limited to the seeds, fruits, oils and living plants and that the listing be annotated accordingly.

B. Proponent

Madagascar*:

C. Supporting statement

1. Taxonomy

1.1 Class: ROSIDAE

1.2 Order: MALVALES

1.3 Family: MALVACEAE

Former family: Bombacaceae (Judd & Manchester 1997; Alverson *et al*. 1999)

1.4 Section: Brevitubae

1.5 Genus, species or subspecies, including author and year:: *Adansonia grandidieri* Baillon(1893)

1.6 Common names: French: Baobab
English: Baobab, bottletree
Malagasy: Renala, Reniala

1.7 Code numbers::

2. Overview

There are nine species of baobab in the world (Pettigrew *et al*, 2012). The species are distributed in Africa, Madagascar and Australia, seven of them being found in Madagascar and six of them being endemic, namely *A. grandidieri, A. madagascariensis, A. perrieri, A. rubrostipa, A. suarezensis* and *Adansonia za*; There are two species in Africa: *Adansonia digitata* and *A. kilima,* and one species in Australia: *Adansonia gibbosa*. The nine species are distributed over three different taxonomic sections: Adansonia, Brevitubae

* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

and Longetubae, but the present proposal concerns only the species *Adansonia grandidieri* in the Brevitubae section.

Adansonia grandidieri is already classified as endangered (EN) according to IUCN criteria (2013).

As a corollary to that situation, the species is continuously and massively exploited and its products are traded both domestically and internationally. The fruit and the seeds are the most prized. The rise in market demand has placed the species at serious threat of extinction as a consequence of harmful exploitation of it and the destruction of its habitat.

3. Species characteristics

3.1 Distribution

Adansonia grandidieri has a very restricted or localized range, limited to two sectors of South-Western Madagascar (Baum, 1995a, b, Baum, 1996; Razanameharizaka, 2009; Leong Pock Tsy, 2013):

- The Morondava sector (Bekonazy, Andranomena, Marofandilia on the road that leads to Belo sur Tsiribihina, Antonga).

- The Morombe sector (between the Mangoky river and Lake Ihotry, Befandriana Sud and Andavadaoka)

3.2 Habitat

Adansonia grandidieri generally occupies areas to the west and the south (Baum, 1995a).

The populations of this species are found in varying habitats ranging from dense dry deciduous forests in the Menabe region to the xerophytic bush on sand in Morombe with a semi-arid bioclimate and rainfall ranging from 400 à 600 m (Razanameharizaka, 2009). Local distribution is strongly impacted by the availability of water (Baum, 1995) on alluvial soils, in particular in the forests of Tandila near the ponds that form during the rainy season, the Mangoky lowlands on alluvial soil (temporary banks or low-lying area), the buttes of Ambatomainty on basaltic soils and the deciduous forests of Andavadaoka and Antonga on salt sand.

The majority of the populations are located in anthropized formations resulting from deforestation, close to villages and fields.

3.3 Biological characteristics

Flowering takes place from May to August. The visitors and potential pollinators of the species are hawkmoths (*Nephele comma*), bees (*Apis mellifera*), birds (*Nectarinia souimanga*) and bats (*Eidolondupreanum*) (Andriafidison *et al.* 2006; Rasoamanana, 2015). *A. grandidieri* flowers only in the dry season. Phenological studies over a period of three years (2008 to 2010) have shown that within a population, all the specimens of this species do not all flower at the same time from one year to another (Andriamalala, 2010). Natural regeneration is becoming more and more difficult (Razanameharizaka, 2009; Andriatsaralaza, 2015). At the present time, the baobabs are contending with low levels of recruitment of young individuals. One of the reasons for the weak regeneration of baobabs in natural surroundings is the poor management of water by the seedlings and their difficulty in adapting to dry conditions (Randriamanana *et al.* 2012). This situation is worsened by the anthropic pressures which also cause shortcomings in the recruitment of young specimens (Razanameharizaka, 2009)

3.4 Morphological characteristics

Tree 30 m in height, massive and large-diameter trunk, soft wood, smooth grey-coloured bark, flattened crown, plagiotropic branches.

Compound palmate leaves having 9–11 leaflets, densely green, downy with star-shaped hairs somewhat elliptical and lanceolate.

Single flower, ascending. Calyx with five joined sepals, curved and twisted, chestnut-colour on the outside face and off-white on the inside face. Corolla with five free petals, white, twisted. Numerous stamens, white, joined. Short staminal tube (0.8 to 1 cm long), free filaments 4 to 7 cm in length, white style above.

The fruit is a globular berry, ovoid in shape and chestnut red in colour, with pericarps 2.5 to 4 mm thick, reddish brown hairs, white pulp containing numerous longitudinal fibres, on average holding 50 to 60 seeds.

3.5 Role of the species in its ecosystem

The trees of *Adansonia grandidieri* serve as hosts and refuges for animals such as bats and small nocturnal lemurs (Baum, 1995b). Their disappearance leads or could lead to the disappearance of these pollinators from the range of the species. The work of Andriafidison *et al.* (2006) has shown that the flowers of *Adansonia grandidieri* are pollinated by fruit-eating bats endemic to Madagascar: *Eidolondupreanum* and *Rousettus madagascariensis*. The biology and the floral phenology of this species play a fundamental role in attracting these pollinators and in their behaviour (Rasoamanana, 2015).

4. Status and trends

4.1 Habitat trends

The habitat of *Adansonia grandidieri* is threated by its conversion into agricultural land and by “slash-and-burn” agriculture or “hatsake”, a traditional practice used for a very long time in western Madagascar.

4.2 Population size

The population density at Andranomena is 37.11 individuals per hectare in the Special Reserve and 3.17 individuals per hectare outside the protected area, respectively (Ranjevasoa, 2003), while in Bekonazy, it is 1.24 ind/ha in the protected site and 0.98 ind/ha in the site that is not yet protected (Fanamby, 2008).

4.3 Population structure

The increase in the level of anthropization is causing an aging of the populations of *A. grandidieri*. This aging is marked by the rarity of young specimens with a diameter at chest height < 64 cm (Razanameharizaka, 2009). The rate of natural regeneration is generally very low: 33,33 % in the Andranomena Special Reserve and 130% in the Ankazomena classified forest, rate <300 according to Rollet’s scale (1979)(Ranjevasoa, 2003).

A. grandidieri may have a very high germinative capacity (90%) without any prior scarification of the seeds, and the seeds do not demonstrate tegumentary dormancy (Razanameharizaka, 2009).

4.4 Population trends

An aging of the population can be observed; the number of adult trees larger than 70 cm is high whereas young trees between 10 and 70 cm in diameter are becoming ever more rare (Ranjevasoa, 2003). The extinction or the increasing rarity of dispersing animals may be reducing the success of seed dispersion.

4.5 Geographic trends

Madagascar has been considered as the country of origin of the baobabs, with its six endemic species (Flannery, 2003) but a study has recently revealed that the species originated in Africa, with *A. digitata*, the range of which spread from West Africa to East Africa and then on to Madagascar and the neighbouring islands in the Indian Ocean (Léong *et al.*, 2009). Throughout its range, ecological studies of the species have shown an aging of the population, due to a shortage of recruitment for the first three stages of development, namely seeding, regeneration and juveniles (Wilson, 1988; Razanameharizaka, 2009).

5. Threats

The principal threats to the population of *Adansonia grandidieri* are:

* massive harvesting and exploitation of its fruit and seeds,

* complete felling of trees for harvesting of the bark

* ongoing modification and destruction of its naturel habitat due to “slash-and-burn” agriculture, the hunt for cultivable ground and pasture for cattle

6. Utilization and trade

6.1 National utilization

The fruit of *Adansonia grandidieri* is considered to have the best taste among all baobab fruits, and has for a long time been prized for its juice (Baum, 1995b). Also, the pulp of the fruit of this species has an energetic value higher than 300 kcal for 100 g of fresh matter (Rakotonindrainy, 2008) and is rich in ascorbic acid, vitamins A and C, proteins, calcium and phosphorus (Diop *et al.* 2005; Wickens and Lowe 2008; De Caluwé *et al.* 2009). It is highly appreciated by the population which gathers it for its own consumption or to sell.

The seeds rich in lipids (Gaydou *et al.*, 1983, Andrianaivo-Rafehivola *et al.*, 2012) contain approximately 37% of oils which are extracted and used by the local population for cooking (Baum, 1995b). The seeds have recently been subjected to massive exploitation, for an annual demand of around 4 000 kg by the rapidly expanding Renala company, for its food and cosmetic products.

The bark, 0.5 to 4 cm in thickness (Ravaomanalina, 2011; Sandratriniaina, 2015), is used in traditional medicine, by way of decoction, to cure hypocalcaemia. The fibre-rich bark, known locally as “hafotse” is used in rope form for attaching walls and roofs in the construction of traditional cabins of the Sakalava and the Mikea and the making of baskets and craft mats (Baum 1996; Wickens & Lowe 2008).

The wood of *A. grandidieri* is spongy and clammy, composed of concentric fibre rings, easy to separate, which correspond to the years of growth of the tree (Wickens, 2008; Ravaomanalina, 2011). These fibrous rings, known locally as “voroke,” can be used for roofing the cabins and construction of temporary dwellings out in the fields.

6.2 Legal trade

The quantity exported of all species is summarized in the following table (Source, DGEF 2016):

Species	Year	Seed oil	Fruit
A. grandidieri	2014	150 ml	1
A. grandidieri	2015	35 kg	0

The only applications for legal export of seed oil, amounting to 150 ml, were submitted by Renala in 2014.

6.3 Parts and derivatives in trade

The species is exported in the form of living plants, fruit, seeds and seed oil.

6.4 Illegal trade

No data have been recorded.

6.5 Actual or potential trade impacts

The intensity and frequency of the harvesting of the fruit and seeds are endangering the natural regeneration of the species and are causing germination problems. The local population gathers the fruit before it has fallen to prevent animals from eating it (Wickens, 2008), which creates a serious problem for regeneration because there are now practically no seeds reaching the ground to ensure germination.

The intensive exploitation of the fibres of the bark is leading to a reduction in density and to an aging of the population, as a result of the frequent felling of trees. This exploitation could result in the species becoming extinct. The future decline of the species has been calculated at 80% (Ranjevasoa, 2009).

7. Legal instruments

7.1 National

7.2 International

Adansonia grandidieri is classified as endangered (EN) according to IUCN criteria (2013), primarily owing to the degradation in the quality of its habitat. According to Vieilledent *et al.* (2013) this species is highly vulnerable to climate change.

8. Species management

8.1 Management measures

A. grandidieri is classified as endangered (EN) according to the criteria of the IUCN Red List (2013).

8.2 Population monitoring

There is no published report on ongoing population monitoring for the species of Adansonia *grandidieri* in its range.

8.3 Control measures

8.3.1 International

Listing of the species *Adansonia grandidieri* in CITES Appendix II would make it possible to ensure that any export is accompanied by a CITES permit attesting that the specimens have been harvested in conformity with the laws in force and using methods not detrimental to the survival of the species.

8.3.2 Domestic

8.4 Captive breeding and artificial propagation

8.5 Habitat conservation

The population of *Adansonia grandidieri* has a number of subpopulations, generally few in number, within its range (Ranjevasoa, 2003). Some populations of the species are located in protected areas such as the Andranomena Special Reserve and the Kirindy Mitea National Park. Baobab Avenue in Bekonazy Morondava has recently been classified as a protected area, with the sole objective of preserving the *Adansonia grandidieri* trees.

8.6 Safeguards

Attempts at propagation by direct seeding and vegetative propagation have been recorded at the CIRAD and the University of Antananarivo and showed very slow growth in the young stages (Razanameharizaka, 2009).

9. Information on similar species

Adansonia suarezensis is a species that might be confused with *A. grandidieri* since both are in the Brevitubae section. However, the fruit of *A. suarezensis* is not even consumed, and it can be distinguished from *A. grandidieri* on the basis of its geographical distribution, which is located solely in the extreme north of Madagascar.

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Old *Adansonia grandidieri* tree

Adansonia grandidieri flower

Baobab Avenue, Morondava