Use of Non Wood Forest Products by local people bordering the "Parc National Kaboré Tambi", Burkina Faso

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Abstract: *In the French-speaking countries of Africa, strategies of conservation, inherited from the colonial time, exclude the bordering people in the management of the national parks plant resources. Today, policies and legislation try to reconcile forest conservation and development by associating local people. As a consequence, approaches of participatory planning of forest management schemes have become necessary. A major challenge has been the issue of how to (use?) scientific knowledge and local knowledge in the most appropriate way. This article provides an account of a contribution to addressing this issue in the case of the "Parc National Kaboré Tambi" in Burkina Faso, by proposing a combination of ethno-botanical surveys and botanical inventories. The article analyses the importance of the park plant species, identify the constraints faced by local people to harvest the park plant products, analyse the park vegetation structure and assess the degree of regeneration of the main useful species. The surveys reveal that bordering people consider the park as their granary, their pharmacy, their pasture, their place of religious worship, and the source of the strength of their territory. They harvest in the park Non Wood Forest Products (NWFPs), although the Forest Code bans free access. About one hundred plants species are used, but the pattern of extraction of the products or some plant parts could destroy the resource base. Technically, conservation by domestication of the source species and improved harvest of Non Wood Forest Products could be combined for sustainable management of the park. Finally, the process toward an integration of ecology, silviculture, law, economy and decentralisation in order to achieve the park sustainable forest management is of great importance. The success of this process will depend on all actors including policy makers, technicians, local people, researchers and funding agencies.*

Key words: Ethnobotany, Non Wood Forest Products, Forest Policy and Legislation, "Parc National Kaboré Tambi", Burkina Faso, PETREA.

Résumé: *Dans les pays francophones d'Afrique, les stratégies de conservation, héritées de l'époque coloniale, excluent les populations riveraines dans l'aménagement et la gestion des ressources forestières des parcs nationaux. De nos jours, les lois et législations forestières essaient de concilier la conservation des ressources et le développement en associant les populations. Par conséquent, des approches de planification participative en matière d'aménagement forestier sont devenus nécessaires. Un défi majeur dans ces approches est de trouver des stratégies pour intégrer les connaissances locales aux connaissances scientifiques de manière appropriée. Cet article représente une contribution à ce défi dans le cas du "Parc National Kaboré Tambi"en proposant une démarche basée sur des enquêtes ethnobotaniques et des inventaires de la végétation. L'article analyse l'importance du parc pour les populations riveraines et identifie les contraintes auxquelles font face les populations pour accéder aux produits forestiers non ligneux dudit parc. Il analyse la structure de la végétation du parc et estime le degré de régénération de certaines espèces. Les résultats montrent que les populations riveraines considèrent le parc comme leur grenier, leur pharmacie, leur lieu de culte, leur pâturage et la source de la force de leur terroir. Bien que le Code Forestier leur interdit l'accès libre, les populations continuent de fréquenter le parc. Environ une centaine de plantes ont été recensées comme pourvoyant des produits utilisés par les hommes et pour les soins de santé animale. Cependant, le mode d'extraction des produits pourrait compromettre la pérennité de certaines espèces. Techniquement, la conservation des espèces à travers leur domestication et l'amélioration des méthodes d'extraction des produits pourraient être combinées pour une utilisation et une gestion durable des ressources du parc. En fin de compte, le processus vers une intégration de l'écologie, la sylviculture, la législation forestière, l'économie et la décentralisation dans la gestion durable du parc est d'une grande importance. Le succès de ce processus dépendra de tous les acteurs y compris les décideurs, les techniciens, les populations riveraines, les chercheurs et les agences de financement.*

Mots clés: Ethnobotanique, Produits Forestiers Non Ligneux, Législation forestière, "Parc National Kaboré Tambi", Burkina Faso, PETREA.

Introduction

In Africa, local communities depend on forests and plants for their daily needs including goods and services. These needs are principally food, medicine, wood, fodder for animals, shade, soil fertilization or reclamation, ornamentation and practices of rituals and customs. Therefore, to limit the possibilities of exploitation of these products, either through a restriction of access or through a reduction of their availability will have a negative impact on the wellbeing of the communities (IIED, 2003; Dahlberg, 2005). For most of the poor people, natural resources and trees are tangible assets (Chambers et al., 1991, Chambers, 1995). Even if forest resources are available, the competition in relation to their exploitation often creates conflicts (Gregersen et al., 1995). This is not a new phenomenon, but with the undergoing globalisation, democratization and decentralization of natural resource management in Africa, it has become a critical issue for policy makers, technicians and researchers (Dahlberg, 2005).
Classified forests and national parks in the Sahel represent particular situations in which local people and forest administration are in perpetual conflict for the access and the control of the resources (IIED, 2003). No one denies the fact that forest reserves must be protected for the benefit of present and future generations, but the ways in which this protection should be assured are open to debate (Dahlberg, 2005). Until some 10-15 years ago, forests classification in French speaking Western Africa was governed by the decree of July 04, 1935 (République de Côte d'Ivoire, 1949). According to this decree, forest classification has the aim to purge all or a part of lands and forest from human use. Since local communities are seen as a threat to the environment, the location of villages close to the classified forests should not be allowed if it could be avoided, (Foury, 1948). After Independence (in 1960), forest codes of the new states took over the principles of the 1935 Decree, establishing forests as the property of the state (Bertrand, 1991).

Until recently, the importance of Non Wood Forest Products (NWFPs) for local people seems to be ignored so that the access to national parks for NWFPs

harvesting is subject to strict restrictions. Practice is far from theory, and forest administration has great difficulties to prevent the use of the protected zones resources, especially when the bordering villagers are highly dependent on these resources that can only be found in the protected areas. It is the case of "Parc National Kaboré Tambi" at Nobéré in Burkina Faso.

Nowadays, the necessity to conciliate natural resource conservation with social issues is more and more recognized (Lanly, 1992; Ribot, 1999; Kjaer & Nathan, 2000). In this respect, nearly all programs on natural forests and reserves management of Burkina Faso include NWFPs promotion and valuation for the benefit of local people when possible. NWFPs valuation is a component of the current Rural Development Strategy by 2005 (Burkina Faso, 2003), the Forest Resources Management Framework (Ministère de l'Environnement et du Cadre de Vie, 2004) and the current Strategic Poverty Reduction Framework (Ministère de l'Economie et du Développement, 2002). Understanding human preference on plant products and assessment of the pattern of extraction can contribute to a better understanding of the scope and nature of problems faced by local people relying on plants for they daily life (Bognounou, 1996; Lykke, 1998; Cunningham, 2001; Madsen, 2004; Lykke et al., 2004; Kristensen et al., 2004).

In the case of tropical forests, the way in which local people needs must be integrated in the management process has been much debated over the years (Sheil, 2006). Concerning the "Parc National Kaboré Tambi", earlier studies were limited to the description of the park focussing either on wild animals or on plants (Toni, 1991; Naturama, 1998 2003). Studies which integrate natural and social sciences aiming to understand the human - plants interaction in the context of the park are lacking. Sustainable management of the park encompasses good regulation governing the use of the plant resources, better identification of the NWFPs collected in the park, good harvesting of the products and better plant species regeneration strategies and techniques.

In this paper we present results from a study aimed at examining the use of NWFPs by bordering people of the "Parc National Kaboré Tambi". The analysis moves away from simple plant inventories, and instead examines the complexity of the relation between local people and the park in terms of NWFPs used in traditional and modern legislation contexts.

Specifically, our goals were to:
- analyse the importance of the park for local people through the determination of NWFPs collected and source species including the methods of extraction of the products;
- identify the constraints faced by local people to harvest the NWFPs in the park;
- analyse the park vegetation structure and assess the regeneration of the main useful species.

We will then discuss how to ensure sustainable harvest of NWFPs in the park and propose method of propagation for each selected plant species.

This study took place within the framework of a multidisciplinary study carried out in the People Tree and Agriculture Africa (PETREA) programme in Burkina Faso from 2001 to 2005. This research programme focuses on how trees and other woody species can be brought into wider use by rural people in Africa. Identification of people's needs and priorities, the development of locally adapted techniques and strategies for domestication, management and use of useful plant species in co-operation with local people were planned in the programme (Nathan, 2002). Nobéré village territory has been selected to conduct the PETREA research programme. It is hoped that the experiences described in the article and recommendations presented will be useful for researchers, rural development agents including foresters who support the equitable access to plant resources in protected areas.

The article is organised in the following way. First, a description of the study site is given, followed by an introduction of the methodologies used for the ethnobotanical surveys and the botanical inventories respectively. Following results including NWFPs harvested in the park, source species and methods of harvesting are presented. The findings are analysed with respect to vegetation structure, species regeneration and NWFPs harvest constraints. In the following section, the validity and reliability of the data are discussed, some possible interpretations of the findings suggested, and some reflections are made as to what lessons can be learned for conservation and develop-

ment strategies from the study. The article ends with some concluding remarks about the unsustainable resource use presently practised by the local population near the national park and the need for institutional innovation, technical training of the local population, and further research on a number of issues.

Description of the study zone

The study was conducted at Nobéré, located in the province of Zoundweogo (figure 1) which is part of the Centre South region of Burkina Faso, at 113 km from the capital Ouagadougou, between latitudes 11°25' and 11°45' North and longitudes 1°20' and 1°84' West.

Figure 1: *Study site location. The park is presented in green colour.*

fires. The natural vegetation is wooded savannahs and woodlands. Agricultural landscapes are dominated by parklands woody species, such as Vitellaria paradoxa, Parkia biglobosa, Tamarindus indica, Sclerocarya birrea, Lannea microcarpa, Adansonia digitata and Faidherbia albida.

Picture 1. *Parkia biglobosa (Locus bean) in a field of sorghum at Nobére. Picture: Sié Kambou.*

The predominant ethnic groups are Mossi who live with Bissa, Gourounsi and Fulani. Religions include indigenous beliefs, Muslim and Christian. Traditional local knowledge and beliefs contribute to the regulation of natural resources uses. The population density is 61.8 inhabitants per km². About 93 % of the population is engaged in (mainly subsistence) agriculture which is highly vulnerable to variations in rainfall. Sorghum and millet are the dominant crops. Other activities include animal husbandry and trade. Literacy level in the in the area is generally low. The proportion of people living below the poverty line (8,2672 CFA francs or 126 euros in 1998) is 66% for the entire Centre south region to which belongs the study area (Ministère de l'Economie et du Développement, 2005). People rely on wood for cocking and trees for food, medicine, construction, animal fodder, making pressure on natural vegetation.

With its 155,500 ha surface, the park borders many villages including Nobéré and provides forest products and bush meat for the villagers. The Nazinon River crosses the park from North - West to the South - East direction contributing to maintain riparian forest communities.

Before the classification of the park, its management was based on customary law. Started in 1936, this classification ended in 1976. From this time on, local people lost their access rights (Naturama, 2003). The strategy of pure conservation or integral conservation as defined by Kjær & Nathan (2000) was applied. Such an approach creates conflicts with local communities (Sambou et al., 2003), who wish to use the park resources according to their will and needs. Despite the restrictions, villagers collect forest products in the park because some of these products are not available or have become scarce in the village vicinity (in parklands and fallow) (PETREA-Burkina Faso, 2002). For these reasons, local people and herders who consider the resources of the park as their property are perpetually in conflict with the communal forest service, which is committed to protecting the park and its biodiversity.

Methodology

Our study is concerned with inventorying the nature of Non-Wood Forest Products (NWFPs) available to local populations, identification of species used,

and how they are managed. NWFPs consist of goods of biological origin other than wood, derived from forests or wooded land and trees outside forests (FAO, 2001). The term NWFPs differs from the commonly used non-timber forest product (NTFP) in excluding all wood while NTFP includes wood for uses other than for timber, although there are still many grey areas. In this article, toothpicks for example are considered as NWFP.

Ethnobotanical methods

Ethnobotanical methods are useful for working with local communities to learn about their knowledge and uses of the plant world, for example to determine which social groups within a village use which species of plants in what quantities and for what purposes. Ethnobotanical studies can help identify conservation issues, such as in cases where rates of harvest of plants exceed rates of regrowth. The fact that ethnobotany is a collaborative venture between people in local communities and scientists means that a start can be made to explore solutions to conservation and development issues, even as information on plant use is being collected (Martin 2004). In this study ethnobotanical surveys were used to help local communities define their needs for plant resources more clearly, thus assisting them to state their cases for continued access to certain areas of land or for provision of alternatives to wild gathering. Ethnobotanical studies can also play useful roles in rescuing disappearing knowledge and returning it to local communities.

Ethnobotany is by its very nature an interdisciplinary subject, demanding a holistic approach which integrates techniques from biology, anthropology, ecology, economy, sociology and many other fields. Techniques borrowed from these fields can be combined to carry out a systematic survey of the traditional botanical knowledge in a single community or region. Although originally developed to guide and evaluate development initiatives, many of the research tools used in the approach of Participatory Rural Appraisal (PRA) are readily applicable to ethnobotanical studies as well. Thus, even though ethnobotany began largely with direct observations about the ways in which people used plants and consisted mainly of the compilation of lists more recently, these subjects have adopted a much more scientific and quantitative methodology.

In this study, we use a blend of qualitative and quantitative methods to investigate how local people manage their environment. Thus, ethnobotanical data is combined with an ecological approach. Data were collected using informal talks, structured interviews, free listing of plants, observation as well as forest and tree walks in Nobéré commune and botanical and ecological inventories in the park. Data was collected from June 2004 to January 2005. Informal talks are important to establish a rapport with the community. The structured questionnaires served to provide quantitative data on categories of plant use as well as on species used. Hence, it is possible to compare the relative usefulness of the plants, and rank the priorities of people in relation to utilization of natural resources within the National Park. Free listing exercises often add more species than mentioned in structured interviews. In the same way forest walks serve to remind informants of species and uses that were not recalled during the interview in the village. Observations of harvest and products found in household can verify information given in interviews and may be used to distinguish between potentially useful species and species actually used. The tree walk provides a number of repeated and independent events. Uses of a specific set of trees can be compared for particular user groups based on ethnicity, age, or gender. This method will tell which species are most valuable for specific uses and whether different social groups attach different importance to certain species.

Eight categories of plants uses (CPU) based on Bosch et al. (2002) and Belem (2000) are considered in the survey; these are human food, medicine, construction, commerce, art and craft, fodder for animals, customary rituals and traditional veterinary uses. Determination of the plant uses within the first 7 categories was realised by survey (observations and interviews) in the villages of Bisboumbou, Koakin, Nobéré and Passintinga while the ethnomedicine survey was carried out in the villages of Donsin, Tewaka and Passintenga.

Ethnobotanical information was collected within the first 7 of CPU using of a formal questionnaire. Questions include the following aspects: What species are subject to collection? What parts of plant other than wood do you use? Where can you find them? (In fields, in fallows or in the park?). In each village, a sample of 30 households has been chosen

making a total of 120 for the 4 villages. The sample is composed of 89% of Mossi, 8% of Fulhani, 3% of Gourounsis and 2% of Bissa. (There are more than 60 ethnical groups in Burkina Faso). The number of informants was respectively men and women 81 and 39. Ethnomedicine survey was conducted using a "tree walk" so that each of the 30 informants, 15 Mossi and 15 Fulhani male herders were asked about the traditional veterinary uses of each of the 40 trees. Informal forest walks and excursions were also organised. Opportunities for observation included witnessing harvesting of NWFPs in the park and markets visits. Some information is also gathered from casual conversation. The park history, local people's rights and use of the park plant species are examples of some of the topics discussed with the forest service, development agents in the region and village leaders. Recommendations made by the bordering people and presented during the final PETREA workshop in December 2005 in Denmark were also taken into account in this paper. The workshop was organized by the Roskilde University, the Institute of Anthropology, University of Copenhagen and the Royal Veterinary and Agricultural University (nowadays Faculty of Life Sciences, part of the University of Copenhagen) in collaboration with research institutes in Burkina Faso and Tanzania.

Names of NWFPs and sources Species were recorded in moré (the main language of the zone inhabitants). Additional names in fulhani (language of the cattle herders in the area) were used in the case of the ethnomedicine survey.

The national host institution of the study was the Burkina Faso National Tree Seed Centre. The Centre is known to the local population as being a part of the forestry authorities, backing the local forest service that normally has the role of enforcing the forestry legislation and fining local people who are caught harvesting forestry products from the national park without permit. Therefore, establishing relations of confidence between researchers and local informants on the subject of their (illegal) uses of NWFPs was quite a challenge at the outset. We introduced and explained our goals to the community. Efforts were made to informally interact with, and relate to, the communities during the research period, and a significant degree of trust was established.

Botanical inventories

The main NWFPs used by Nobéré villagers are harvested in the northern part of the park, therefore the vegetation study focussed in this part. The objectives of the botanical inventories are to record the different plant species of the park and assess their abundance. These studies are based on the description of the plant communities encountered in the park through plant life forms and dominant species. The identification of plant communities is guided by the physiognomy and structure of the vegetation and then by the prevalence or dominance of certain species. The approach in the vegetation description follows African vegetation nomenclature of Yangambi in 1956 adopted by Aubreville (1957). Determination of type of vegetation and life forms of the species follow Aubreville (1963) adapted in Burkina Faso vegetation by Guinko (1984). This first step led to recognition of three vegetation entities or vegetation communities; these communities are: riparian forest (galerie forestière in french), woody savannah (Savane boisée) and savannah dominated by srhubs (savane arbustive). A stratified random sampling design was used. In each of the three identified plant communities, 1 to 3 circular plots of 1000 meters square (17.84 m radius) were randomly established. For all the three plant communities, twenty three plots were established. In each plot, all trees, shrubs and lianas were listed using scientifical names following Bosch et al. (2002) and Arbonnier (2000). Reference was made to the works of Nacoulma-Ouédraogo (1996) and Peverelli (2002) to identify respectively plant names in Moré and Fulani. When a plant was unknown, its part or organ was collected for botanical identification using specialized floras, Hutchinson & Dalziel (1958), Berhaut (1967) and Arbonnier (2000).

Quantitative parameters include the relative density (abundance), the relative dominance, the relative frequency and the species regeneration. Within the plots, all trees, shrubs and lianas with a diameter over 5 cm were measured (diameter and height) and preliminary identifications made. Height was recorded separately for each of six classes sizes (SC). Defined size classes are presented in appendix 1. Species regeneration was assessed based on the number of seedlings or young trees/shrubs recorded in each plot.

Data were analysed with the MINITAB Software version 13.31. MINITAB is a computer program designed to perform a variety of data analysis and presentation functions, including statistical analyses and graphical presentation of data. More information on the software can be found at http://www.minitab.com

Results

The results of the study are presented under five headings: (1) perceived importance of the park to local people and NWFPs collected, (2) source species, 3) species products extraction, (4) vegetation structure and species regeneration and (5) NWFPs harvest constraints in the park and local people's hopes (aspirations?).

(1) Perceived importance of the park to local people and NWFPs collected

Nearly all our 120 informants consider the park as their granary, their pharmacy, their place of worship, and their pasture. Reasons, which explain why people want to have access to the park resources, are diverse. The search of food products is ranked first (37% of interviewees). The search of straw for the construction is the second reason (22% of informants). Medicinal plants collection is the third reason (11% of informants). The same percentage said they enter the park because nothing else is found in the village landscape. Collection of products for sale is the reason expressed by 9% of the informants; the search of fodder expressed by 6% and 1% of the informants said they enter the park because it is forbidden. These last informants think that they have the rights to get access in the park to collect plant products because this entity belongs to their ancestors and therefore to them. According to these informants administration, by creating a wildlife reserve and protecting it from villagers access give more importance to elephants, monkeys, lions, birds.

(2) Source species

When considering all CPU, about 134 plant species belonging to 44 families and 103 genera are collected in the park. Scientific names of the species including authors and uses are presented in appendix 2. In the human food, medicine, construction, commerce, art and craft, fodder for animals and customary rituals categories of plant uses, 100 species belonging to 40 families and 85 genera are recorded. The 10 top ranked species with the number of time the species is mentioned include: Parkia biglobosa (114), Vitellaria paradoxa (109), Vitex doniana (108), Tamarindus indica (106), Bombax costatum (97), Paullinia pinnata (97), Sarcocephalus latifolius (97), Sclerocarya birrea (97), Saba senegalensis (95) and Adansonia digitata (94). The herbaceous species providing straw (mainly Andropogoneae) are ranked in second position (93). In the traditional veterinary category of plant uses, investigation revealed that (93 %) of farmers use part of plant for animal health care. 39 woody species belonging to 35 genera and 22 families are recorded; these species representing 44% of the woody plant species of the Park. The most used species include Adansonia digitata, Anogeissus leiocarpus, Balanites aegyptiaca, Parkia biglobosa, Pterocarpus erinaceus, Sclerocarya birrea, Sterculia setigera and Vitex doniana. About 122 different uses for traditional veterinary purposes have been recorded.

Picture 2. *Vitellaria paradoxa (shea tree). Picture: Bassirou Belem.*

Picture 3. *Ftuits of Vitellaria paradoxa (shea tree). Picture: Bassirou Belem.*

Picture 4. *Flowers of Parkia biglobosa. Picture: Bassirou Belem.*

Picture 5. *Edible fruits, pulp and seeds of Parkia biglobosa. Picture: Sié Kambou.*

Picture 6. *Parkia biglobosa fermented seeds used as spice for sauces. Picture: Bassirou Belem.*

Picture 7. *Farmer with straw of Andropogon sp collected in the park and transported by bucycle. Picture: Bassirou Belem.*

Picture 8. *Farmer making rope with straw of Andropogon sp. Picture: Bassirou Belem.*

Edible fruit species are represented mainly by 34 species including Vitellaria paradoxa, Adansonia digitata, Tamarindus indica, Lannea microcarpa, Detarium microcarpum, Parkia biglobosa, Strychnos spinosa, Ximenia americana, Capparis sepiaria, Ziziphus mauritiana. Wild vegetables include Afzelia

Africana, Vitex doniana, Adansonia digitata, Ceiba pentandra, Leptadenia hastata, Strychnos spinosa, Senna tora, Tamarindus indica, Balanites aegyptiaca, Maerua angolensis, Annona senegalensis, Pavetta crassipes Edible flowers plants are represented by Bombax costatum, Balanites aegyptiaca and Tamarindus indica while tubers are represented by Dioscorea sp. Leaves of Vitex doniana, Leptedania hastata and Senna tora are considered as famine foodstuffs, only consumed if nothing else is available (table1).

Table 1. List of edible fruits, leaves or flowers species.

Edible fruit or seeds species	**Vegetable including edible flowers**	**Edible tuber plant species**
Acacia macrostachya	*Adansonia digitata*	*Dioscorea sp*
Adansonia digitata	*Afzelia Africana*	
Annona senegalensis	*Annona senegalensis*	
Balanites aegyptiaca	*Balanites aegyptiaca*	
Boscia senegalensis	*Bombax costatum*	
Capparis sepiaria	*Boscia senegalensis*	
Ceiba pentandra	*Leptedania hastata*	
Detarium microcarpum	*Maerua angolensis*	
Diospyros mespiliformis	*Moringa oleifera*	
Ficus sur	*Paveta crassipes*	
Ficus sycomorus subsp. Gnaphalocarpa	*Piliostigma reticulatum*	
Gardenia erubescens	*Piliostigma thonningii*	
Grewia flavescens	*Strychnos spinosa*	
Grewia venusta	*Tamarindus indica*	
Lannea acida		
Lannea microcarpa		
Lantana rhodesiensis		
Parinari curatellifolia		
Parkia biglobosa		
Saba senegalensis		
Sarcocephalus latifolius		
Sclerocarya birrea		
Strychnos spinosa		
Tamarindus indica		
Tapinanthus globiferus		
Vitellaria paradoxa		
Vitex doniana		
Ximenia Americana		
Ziziphus mauritiana		

The number of species that are used for human health care is 66. Medicinal plants are used to treat frequent diseases like malaria, cough, headache, diarrhoea, gastric pain, tooth pains, eye diseases, gastric parasites, haemorrhoids, rheumatism, sterility, stomach ache, backache, asthma, jaundice, ulcers and children's diseases. House construction use material (poles, posts…) from 14 species. Products which are sold are provided by 12 species. Straw of Viteveria nigritana and branches Flueggea virosa are used for baskets and beds making while wadding of fruits of Ceiba pentandra is used to make mattress and pillows and the leaves of Indigofera tinctoria are used in the manufacture of a bluish dye. The main fodder species are Andropogon gayanus, Pterocarpus erinaceus, Lonchocarpus laxiflorus, Balanites aegyptiaca, Khaya senegalensis, and Andropogon pseudapricus. Plants which are used for traditional rituals (birth or death ceremonies) include 8 species. For example in case of death, smoke produced by burned Cymbopogon schoenantus straw that eliminates bad odours. Species like Khaya senegalensis, Eleusine indica are used against undesirable fates. Crotalaria retusa could force chance when a man wants to marry a girl or when he goes for hunting.

For traditional veterinary uses, branches of Acacia erythrocalyx are used against animal tooth pains, to cure wounds and snake bites. Bark of Anogeissus leiocarpus combats diarrhoea, intestine parasites and wounds. Bark and leaves of Balanites aegyptiaca are used against placenta retention, wounds and insects attacks. Leaves and fruits of Bauhinia rufescens are used to increase milk production and abortion while bark of Khaya senegalensis is used against constipation. Bark, leaves and fruit of Parkia biglobosa are used against snake bites, placenta retention and intestine parasites. Bark and leaves of Pterocarpus erinaceus and Sterculia setigera are used in case of snake bites. Bark of Sclerocarya birrea is used when animal horn is broken.

Some species are multipurpose so that they are recorded in many categories of plan uses.

Access to the resources of the park may often cause destruction of plant species, mainly the most valuable and therefore, harvest pressure could be a major conservation concern. Rational solutions cannot be found without identification of pattern of extraction and constraints faced by farmers in collecting these products in the park.

3) Species products extraction

Sustainable use means the use of biological resources in a way and at a rate that do not lead to long-term decline of biodiversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. When addressing NWFP, extraction, harvest and exploitation are used as synonyms (Kristensen et al., 2004). In many researches, sustainable extraction is defined as a level of extraction that maintains the plant diversity, allows species regeneration and without disturbing species composition. The harvested plant parts or organs and the way the products are extracted can have negative consequences on the resource base itself (vegetation structure and plants survival).

Several patterns of plant collection in the park can be found. **Pruning** is practiced to collect Bombax costatum flowers (for the preparation of sauce), Pseudocedrela kotchyi (branches as toothpicks), Khaya senegalensis, Pterocarpus erinaceus, Lonchocarpus laxiflorus and Balanites aegyptiaca (for animal fodder). **Fruits** that reach their physiological maturity and that fall on the soil are sometimes collected. But there are also cases, where immature fruits from species such as Parkia biglobosa, Vitellaria paradoxa, Vitex doniana, Diospyros mespiliformis, Detarium microcarpum, Saba senegalensis, Vitex doniana, Tamarindus indica, are picked up. The exploitation of fruits, seeds or flowers could deprive species with seeds for regeneration. **Bark** is extracted to get fibers for cordage and material for medicinal peels or to enable the exudation of gum that is sometimes used as incense. The main species concerned by this practice are Bombax costatum, Khaya senegalensis, Sclerocarya birrea, Piliostigma thonnongii and Parkia biglobosa. Practiced without particular precautions this pattern of exploitation encourages infections or death of tree if they are girdled. The **extraction of roots** concerns species of the Dioscoreaceae that are exploited for their tubers. Roots extraction for medicinal purpose targets species like Annona senegalensis, Cochlospermum planchonii, Cochlospermum tinctorium, Sarcocephalus latifolius, Boswelia dalziellii, Acacia gourmaensis, Acacia seyal, Sclerocarrya birrea, Securidaca longepedunculata, Trichilia emetica, Grewia cissoides, Maytenus senegalensis, Ozoroa insignis, Lannea velutina, Ximenia Americana, Ziziphus mauritiana and of the herbaceous as Sansevieria liberica, Indigofera nigritana, Eleusine indica and Elionurus pobeguini.

The scarcity of plant species like Ximenia Americana, Sarcocephalus latifolius, Annona senegalensis, Boswelia dalziellii, Securidaca longepedunculata...in fields and in fallows may be caused by the overexploitation of their roots or by removal during cultivation. Cochlospermum sp (known as dribala in Dioula and sonsè in Moré) provides roots that are widely used in Burkina Faso against malaria and jaundice. Roots of Securidaca longepedunculata are anti-venomous and used against bites of snakes or scorpions.

Picture 9. *Cochlospermum planchonii. Picture: Bassirou Belem.*

Picture 10. *Cochlospermum tinctorium. Picture: Bassirou Belem.*

Picture 11. *Ximenia Americana. Picture: Bassirou Belem.*

Picture 12. *Securidaca longepedunculata. Picture: Bassirou Belem.*

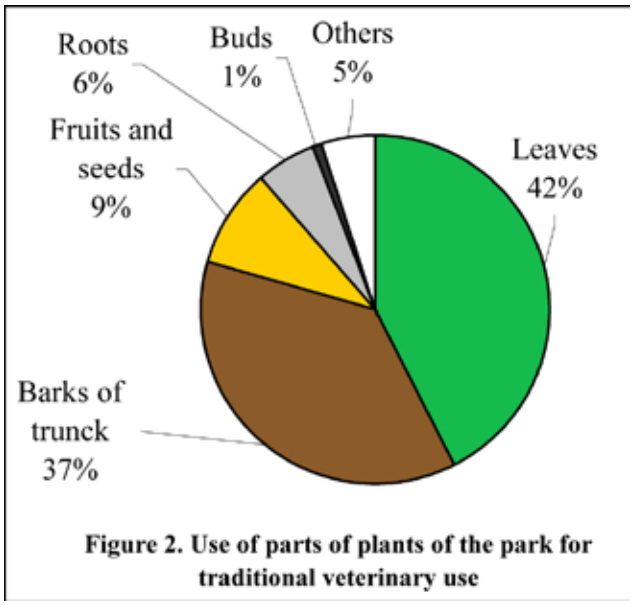

Figure 2. Use of parts of plants of the park for traditional veterinary use

Figure 2*: Presents the proportion of used parts of plants in the traditional veterinary category. For some species including Anogeissus leiocarpus, Parkia biglobosa, Sclerocarya birrea and Sterculia setigera barks are exploited mainly for medicinal purposes. For Adansonia digitata, Balanites aegyptiaca and Pterocarpus erinaceus leaves and bark are harvested. Vitex doniana is exploited solely for bark and root. However, in most cases bark harvesting is frequent.*

(4). Vegetation structure and species regeneration

Our study has recorded 97 species that are distributed within 73 genera and 33 families. The distribution of the park's whole woody species by class of diameter and by height is presented in the figures 3 and 4. As it can be seen, young trees and shrubs dominate aged ones; the recruitment - new individuals joining the population, i.e. through birth or germination is good.

Individual species inventories show that the degree of regeneration varies from one species to another. Among the important species, Adansonia digitata, Saba senegalensis, Vitex doniana, Paullinia pinnata and Sarcocephalus latifolius are not recorded in the plots. Balanites aegyptiaca, Bombax costatum, Parkia biglobosa, Pterocarpus erinaceus, Sclerocarya birrea, Tamarindus indica and Sterculia setigera present a less than one individual seedling (d<5cm) per hectare. Only Anogeissus leiocarpus and Vitellaria paradoxa have respectively 9 and 10 seedlings (d<5cm) per ha.

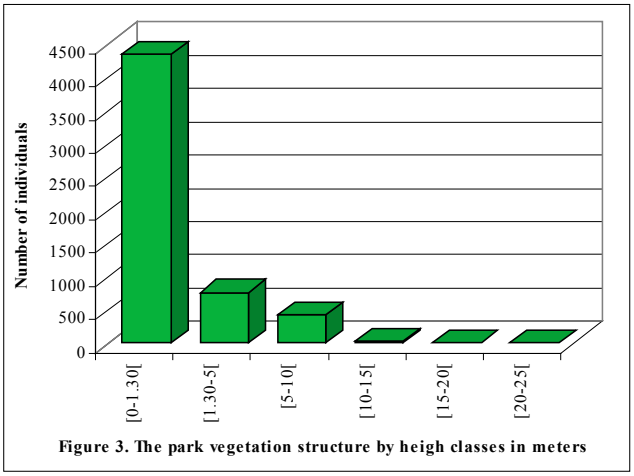

Figure 3. The park vegetation structure by heigh classes in meters

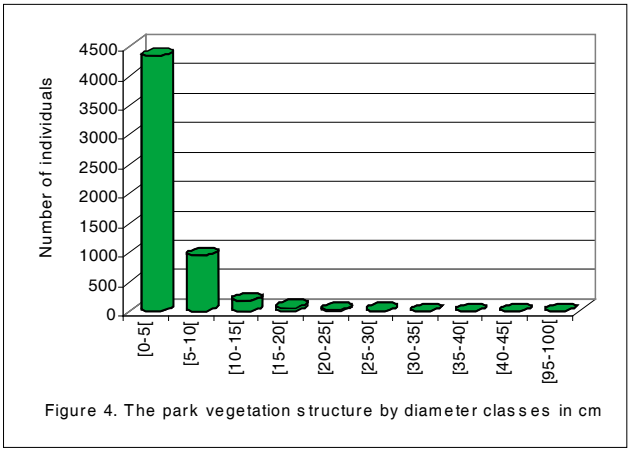

Figure 4. The park vegetation structure by diameter classes in cm

(5). NWFPs harvest constraints in the park and local people's uspirations

Restriction from the Forest Code is perceived as the main constraint to plant products collection in the park; this reason has been mentioned by 57% of the informants. They think that only hunting should be forbidden and collection of plants allowed. Indeed, as Burgess et al. (2005) argue, none of the acts on natural area conservation in the South of the Sahara Africa during the colonial time intended to protect plants, but originally these acts were directed towards the protection of fauna.

Despite the various constraints faced by local people in having access to the park plant resources, some farmers enter the park. Texts ruling plant products harvesting in the park are enforced by the forest service but their efficiency is doubtful due to few human and financial resources. As poaching is frequent, illegal extraction of plant products from the park occurs. The fact that the park is a state property does not facilitate its management (Naturama, 1998), and 22.5% of the informants think that the park must be an open/free access resource. Fortunately, the majority of interviewees think that the park must remain because it is useful for present and future generations.

To solve the problems related to the park management, Burkina Faso benefited financial support from the Global Environment Facility (GEF) and the World Bank. The Participatory Management of Natural Ecosystems Project (PAGEN) in Burkina Faso integrated the park in its program. Naturama foundation has been granted the concession of the park since September 1999. Through a contract of service and a protocol of collaboration signed with the PAGEN, the project named PAGEN/Parc National Kaboré Tambi took place. Naturama started a process of organization of the bordering people at village and provincial level. As a result of this organization process, a federation of the bordering provincial associations of the park will be set up and be the future concessionaries of the park in replacement of Naturama. The challenge remains to determine the tasks of foresters in this new convention. A lot of questions also still remain mainly, those concerning the place and role of the customary rights in the process of the park management.

Discussion

The exercises we conducted have helped clarify reasons for people to access in the park. Products used by local people, source species, and patterns of harvest have been identified contributing to understand the inextricable link between people and the park. Results from structured interviews have revealed which categories of plant use are of importance to most people. Likewise, the number of time a species is cited by the informants can inform on its importance (utility) to local people. Further studies are needed to quantify the extraction of NWFPs from individual species and the income it generates to local people. Combined with the vegetation surveys, such quantitative data can be used to determine whether harvest exceeds sustainable levels. The information would not only indicate plants of conservation concern but also identify NTWPs with greatest potential for increased incomes through improved harvesting methods or propagation and cultivation.

Even though quantitative methods are recommended for future studies, we must keep in mind that quantitative techniques cannot replace the need for careful qualitative description and observations of how people use the plant species and the products (Martin, 1995; Cotton, 1996; Theilade, 2005). Results from ethnobotanical investigations on the use of plant species depends on the skill and knowledge of the informant, the period of the investigation (either corresponding or not at the time of the availability of the products). The probability that the informant will reveal the source species, that is subject to harvesting in a protected zone influence the results as well as the experience of the researcher and the way he conducts him/herself (respect for local people) during the investigation.

The number of times a species is cited by the informants may indicate its conservation status However, importance for conservation is relative – if a species is heavily used and rare, the need for conservation measures is high; if the species density is high and regenerates easily, the need for conservation may be low. The latter kind of species has not been found in our study. Potentially important species may not be cited if they are rare in the park so that residents won't find them easily. Another reason could be the fact that the species has no uses or little uses. Erosion of the traditional knowledge on the use of plant species could be an additional reason. Knowledge about certain plant uses could only be known by a few individuals of a population, generally the elder ones.

There is a wide range of species from which products are collected in the park; this illustrates the importance of the park biodiversity. The presence of species usually encountered in fields and fallows in the park can be explained by the fact that some zones of the park were villages and fields until the 1970s; humans enabled the regeneration of species like Vitellaria paradoxa, Adansonia digitata and Tamarindus indica. When comparing the useful species (according to our informants) and those actually recorded in the plots, we conclude that 72% of source species of NWFPs are available in the park. Without the park, bordering people needs on NWFPs are not fully satisfied. This finding suggests that the park management in collaboration with the local people is a priority task for the government.

Inventories in the park show that some useful species recorded in the plots are scarce with low density. But plant species decline cannot only be attributed to NWFPs extraction only. The scarcity of some savannah plant species may merely reflect that these species for a long period have occurred at a low density, because of lack of suitable habitat, because of competition amongst plants, or because of fire and rambling animals (Kristensen et al., 2004). Inventories show also that young species are more abundant in our plots suggesting that regeneration takes place; this good regeneration occurs with Anogeissus leio-

Picture 13. *Good regeneration of Anogeissus leiocarpusin the park Picture: Bassirou Belem.*

carpus and Vitellaria paradoxa. One can argue that the current conservation measures undertaken by Naturama allow the regeneration of the plant species. But good regeneration may not be common for all the park vegetation units because we only worked in plots where plant collection takes place.

For some important species like Adansonia digitata, Saba senegalensis, Vitex doniana, Paullinia pinnata and Sarcocephalus latifolius, regeneration is scarce. For these species, limiting plant harvesting combined with in-situ conservation through either stimulation of the natural regeneration of the plant species or by direct sowing of seeds collected from mother trees found in the park may deserve more attention. Ex-situ conservation by creation of nurseries to produce seedlings of the rare plant species (especially those that are frequently mentioned by farmers) with subsequent plantation in fields and in orchards should deserve a particular attention.

In the village vicinities, Bombax costatum individuals are quite old, suggesting a lack of regeneration. The species' low regeneration has been found to be caused by over harvesting its flowers, depriving the species with seeds to allow regeneration (Guinko, 1984; Kristensen et al., 2004). Vegetative regeneration by coppicing which occurs naturally must be induced artificially for in-situ conservation of the species.

Picture 14.*Bombax costatumin the park Picture:*

Picture 15. *Flowers of Bombax costatum. Picture: Bassirou Belem.*

Lessons learned

Despite these restrictions, the study shows how strongly bordering households depend on the park for their daily needs for NWFPs. As the study reveals it, there are some conflicts between the administration and the bordering people; the conflicts taking root from the fact that the full integration of these people in the park management is not yet a reality. The expansion of human populations around the park will inevitably result in greater demands from people for agricultural land and for the resources that the Park seeks to conserve. Thus, it seems that conflict between the Park and the people whose livelihoods depend on park's resources will intensify. Conflicts create resistances (Gausset et al., 2003) and lead to local problems. Indeed, according to Chen et al. (2005), conflicts between biodiversity conservation and community development are caused by factors including traditional perception of environment, illiteracy, poverty and weak social mechanisms of the local people. Poor households who struggle to meet their basic needs may not respond to conservation programs even if they are aware of the long-term benefits associated with conservation (Shrestha et al., 2006). But as argued Leonard & Longbottom (2000), in land use system, conflicts can be a catalyst for change and bring practices up to date. It is an integral part of social dynamics because it can institutionalize certain social behaviour patterns by demonstrating clearly the emergence of contradic-

tory interests which then prompts changes in rules and practice.

To solve the problems related to the park management, Burkina Faso benefited financial support from the Global Environment Facility (GEF) and the World Bank. The Participatory Management of Natural Ecosystems Project (PAGEN) in Burkina Faso integrated the park in its program. The Naturama foundation has been granted the concession of the park since September 1999. Through a contract of service and a protocol of collaboration signed with the PAGEN, the project named PAGEN/Parc National Kaboré Tambi took place. Naturama started a process of organization of the bordering people at village and provincial level. As a result of this organization process, a federation of the bordering provincial associations of the park will be set up and be the future concessionaries of the park in replacement of Naturama. The challenge remains to determine the tasks of foresters in this new convention. A lot of questions also still remain mainly, those concerning the place and role of the customary rights in the process of the park management.

For conservation and valuation purposes, we think that the most frequently cited species may deserve more attention in conservation strategies, because they are probably used by a large number of people. But we should keep in mind that the conservation may not focus only on the species which are the most frequently cited. For biodiversity conservation purposes, rare species should also deserve attention. The diversity of plants which are used and the utility of each species suggest that NWFPs valuation must take into account this diversity and carefully select the target product/species. In species selection we must keep in mind that product preferences may vary according to the economic context and the possibility of farmers to get local substitutes for each product. The park management may be coupled with ecosystems outside the park restoration (fallow, field, open access forests). Park management must also seek to develop fully functional co-management relationships with the local communities who are nowadays the users of the park resources and are central for managing the external ecosystems and their components mainly land and trees.

The importance of valuation of NWFPs trough domestication and marketing of the products can contribute to direct NWFPs valuation process. In this respect some activities have been undertaken by the PETREA project through growing the medicinal species in a nursery and plantation by traditional healers. This activity was well appreciated by the villagers who think that they will be able to plant their desired trees in the village's landscape and safeguard the park plants species.

The NGOs Tree Aid and Naturama together are developing village Tree Enterprise in the study zone. This new programme is important for poverty alleviation and need support through the dissemination of the results of our study.

Follow-up

Our work underlines that local communities have complex relationships with the park that need to be respected, understood, and taken into account in all relevant decision-making and policy making and implementation.

What needs further attention is the transfer of the results of our study to:

- farmers in order to stimulate their participation in the park management;
- Decision-makers in a manner that will increase their attention and application.

The results of the study can be disseminated to local stakeholders in various ways including posters describing the main plant species and their uses. In this process, Naturama and other NGOs may be contacted for help because they work closely with the villagers. The results of the study should be presented when possible in workshops dealing with sustainable land use.

Unsustainable NWFPs harvesting in the park is a great concern and solutions are needed. In this respect, a popular article will be prepared and disseminated in newspapers of Burkina Faso. Studies are in progress in the CNSF nursery and in forests and fields to propose simple techniques of regeneration (by seed or by vegetative propagation) of some important species like Bombax costatum, Boscia senegalensis, Securidaca longepedunculata and many other species. The preliminary results are promising and will be published and transmitted to the park managers for application.

For the case of forest policy and legislation, this article shed light in the complexity to apply forest laws in local context. The results of our study suggest that the old paradigm in forest classification (national park creation) need to be revisited.

Conclusion

The bordering people depend on the park resources for their daily needs but the sustainability of the plant parts extraction is questionable. Instead of species conservation, local people's pressure/activities could contribute to destroy some plant species. This situation does not only constitute a threat for the biodiversity, but also a threat for the survival of the communities that depend on the resources. Nowadays, the park management doesn't satisfy all the stakeholders in particular the villagers who rely heavily on forest products from the park for their daily needs.

Conciliating environment and development for achieving sustainability necessitates that administrators of the park try to re-establish dialogue and confidence with the local people by integrating their points of view in the definition of the management plan. Information and advice of the bordering populations on the protection of the park is fundamental. It would be necessary to train organized farmers to take on the management of the park in collaboration with the forest service and Naturama.

Further research in the park could be centred among others on: (a) the determination of the seasonal availability of the NWFPs; (b) the identification of the preferences of social user groups (men, women, traditional healers, tradesmen…); (c) the determination of sustainable extraction techniques of the plant products; (d) the development of simple techniques of in-situ and ex-situ conservation (sowing, stem or root cutting…) of targeted species. Appendix 2 containing the list of the plant species presents possible methods of dissemination of each species; these results could be the starting points of conservation strategies development; (e) Botanical inventories to determine the dynamic and the productivity of different vegetation types in the park are to be carried out periodically; these inventories might take into account all plant life forms and not only ligneous plant species. Yield determination is a useful tool for conservation and valuation of NWFPs.

Improved regulation of the park plant products use, improved harvest methods of NWFPs and domestication of the useful plant species may be combined for sustainable management of the park in poor people context. Therefore the challenge is how to integrate ecology, sylviculture, law, economy and decentralisation in the park management process. The success of this process will depend on all actors including policy makers, technicians, local people, researchers and funding agencies.

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Appendix 1. Plants size class definition.

SC1: [0-1.30[; SC2: [1.30-5[; SC3: [5-10[; SC4: [10-15[; SC5: [15-20 and SC6: [20-25[. Diameter were assessed using ten size classes in cm: sc1: [0-5[; sc2: [5-10[; sc3: [10-15[; sc4: [15-20[; sc5: [20-25[; sc6: [25-30[; sc7: [30-35[; sc8: [35-40[; sc9: [40-45[and sc10: [95-100].

Appendix 2 Species exploited in the "Parc National Kaboré Tambi" their uses and possible method of artificial propagation

Scientific name	Local name (more)	Family	Uses	Mechanism of dissemination
1. *Acacia dudgeonii* Craib ex Hall.	Gon-payandga	Mimosaceae	Hmed	Seed, Shoot
2. *Acacia erythrocalyx* Brenan		Mimosaceae	Tvet	Seed, Shoot
3. *Acacia gourmaensis* A. Chev.	Gon-sabliga	Mimosaceae	Hmed; TVet	Seed, Shoot
4. *Acacia hockii* DeWild.		Mimosaceae	Hmed	
5. *Acacia macrostachya* Reichenb. ex DC.	Zamanega	Mimosaceae	Hf; TVet	Seed, Shoot
6. *Acacia polyacantha* Willd. subsp. *campylacantha* (Hochst. ex A. Rich.) Brenan	Kan-pèlga	Mimosaceae	Hmed; Tvet	Seed, Shoot
7. *Acacia seyal* Del.		Mimosaceae	Tvet; Const; Art	Seed, Shoot
8. *Acacia sieberiana* DC	Koumbrissaka	Mimosaceae	Tvet; art	Seed, Shoot
9. *Adansonia digitata* L.	Tohèga	Bombacaceae	Hf; Hmed; Com; TVet	Seed
10. *Afzelia africana* Smith. Ex Pers.	Kankalga	Caesalpiniaceae	Hf	Seed, Shoot
11. Agelanthus dodoneifolius		Loranthaceae	Tvet	Seed
12. *Albizia chevalieri* Harms		Mimosaceae	Tvet; const; Art	Seed, Shoot
13. *Allophyllus africanus* P. Beauv.		Sapindaceae	Hf; Art	Seed,
14. *Andropogon pseudapricus* Stapf	Gnindparga	Poaceae	Fod; Const	Seed, Shoot
15. *Andropogon* sp	Pitri	Poaceae	Fod; Const; Com	Seed, Shoot
16. *Andropogon* sp.	Kangré	Poaceae	Hmed; Const	Seed, Shoot
17. *Andropogon tectorum* Schumach. & Thonn.	Buka	Poaceae	Const	Seed, Shoot
18. *Annona senegalensis* Pers.	Barkudga	Annonaceae	Hf; Hmed; Rit, TVet	Seed, Shoot
19. *Anogeissus leiocarpus* (DC.) Guill. & Perr.	Siiga	Combretaceae	Hmed; Tvet	Seed, Shoot
20. *Azadirachta indica* A. Juss.	Nim	Meliaceae	Tvet; const	Seed, Shoot
21. *Balanites aegyptiaca* (L.) Del.	Kyeguelga	Balanitaceae	Hf; Fod; Hmed; Rit; Art; TVet	Seed, Shoot, sucker
22. *Bauhinia rufescens* Lam.		Caesalpiniaceae	Tvet; Fod; Const	Seed, Shoot
23. *Bombax costatum* Pellegr. & Vuillet	Voaka	Bombacaceae	Hf ; Fod; Hmed; Com	Seed, Shoot, sucker
24. *Boscia senegalensis* (Pers.) Lam. ex Poir	Lambotga	Capparidaceae	Tvet; Hf	Seed, Shoot, stem cutting
25. *Boswellia dalzelii* Hutch.	Gonbregneongo	Burseraceae	Hmed	Seed, Shoot
26. *Burkea Africana* Hook. F.		Caesalpiniaceae	Tvet	Seed, Shoot
27. *Calotropis procera* (Ait.) Ait. f.	Putrepuga	Asclepiadaceae	Hmed; Tvet	Seed, Shoot
28. *Capparis sepiaria* L.	Lamboy	Capparaceae	Hf	Seed, Shoot
29. *Cassia sieberiana* DC.	Kumbrissaka	Caesalpiniaceae	Hmed; const	Seed, Shoot
30. *Ceiba pentandra* (L.) Gaertn.	Gunga	Bombacaceae	Hf; Art	Seed, Shoot
31. *Chamaecrista mimosoides* (L.) H. S. Irwin & Barneby	Tingiundoiga	Caesalpiniaceae	Hmed	Seed, Shoot
32. *Cissus populnea* Guill. et Perr.	Paloanga	Vitaceae	Art; TVet	Seed
33. *Cochlospermum planchonii* Hook. F.	Sonsè	Cochlospermaceaea	Hmed; TVet	Seed, Shoot
34. *Cochlospermum tinctorium* A. Rich.	Sonsè	Cochlospermaceaea	Hmed; Art; TVet	Seed, Shoot
35. *Cola laurifolia* Mast.		Sterculiaceae	Const	Seed, Shoot
36. *Combretum collinum* Fresen.		Combretaceae	Hmed	Seed, Shoot
37. *Combretum fragrans* F. Hoffm.	Kiuginga	Combretaceae	Hmed	Seed, Shoot
38. *Combretum glutinosum* Perr. ex DC.		Combretaceae	TVet	Seed, Shoot
39. *Combretum molle* R. Br. ex G. Don	Parwiga	Combretaceae	Hmed	Seed, Shoot
40. *Crossopteryx febrifuga* (Afzel. ex G. Don) Benth.	Kumbruwanga	Rubiaceae	Hmed; Rit; TVet	Seed, Shoot
41. *Crotalaria retusa* L.	Wendlébendaga	Fabaceae	Hmed	Seed
42. *Cymbopogon giganteus* Chiov	Wam	Poaceae	Const	Seed, Shoot
43. *Cymbopogon schoenanthus* (L.) Spreng	Sompiiga	Poaceae	Const; Rit	Seed, Shoot
44. *Daniellia oliveri* (Rolfe) Hutch. & Dalz.	Aonga	Caesalpiniaceae	Hmed; TVet	Seed, Shoot
45. *Detarium microcarpum* Guill. & Perr.	Kagadéga	Caesalpiniaceae	Hf; Com; TVet	Seed, Shoot
46. *Dichrostachys cinerea* (L.) Wight & Arn.	Susutga	Mimosaceae	Hmed	Seed, Shoot
47. *Dioscorea* sp	Tantagnoui	Dioscordiaceae	Hf	Root shootting

48. Diospyros mespiliformis Hochst. ex A. Rich.	Gaaka	Ebenaceae	Hf; Hmed; Com; TVet	Seed, Shoot
49. Dipcadi logifolium (Lindl.) Baker	Toctaba	Liliaceae	Hmed	Seed
50. Eleusine indica (L.)Gaertn.	Targanga	Poaceae	Hmed; Rit	Seed, Shoot
51. Elionurus sp	Mosaala	Poaceae	Hmed	Seed, Shoot
52. Entada africana Guill. & Perr.	Séonega	Mimosaceae	Hmed	Seed, Shoot
53. Erythrinia senegalensis DC.	Kulintiga	Fabaceae	Hmed	Seed, Shoot
54. Euphorbia poissonii Pax	Tacsendo	Euphorbiaceae	Hmed	Shooting
55. Faidherbia albida (Del.) Chev.	Zaanga	Mimosaceae	Hmed; Fod	Stem cutting, sucker
56. Feretia apodanthera Del.	Kitinga	Rubiaceae	Hmed; TVet	Seed, Shoot
57. Ficus sur Forssk.	Womsèèga	Moraceae	Hf; Hmed	Seed, Shoot
58. Ficus sycomorus subsp. *gnaphalocarpa* (Miq.) C. C. Berg	Kankanga	Moraceae	Hf	Seed, Shoot
59. Flacourtia indica Willd.	Kuduntabga	Flacourtiaceae	Hmed	Seed, Shoot
60. Flueggea virosa (Roxb. ex Willd.) Voigt	*Sugdin-daaga*	Euphorbiaceae	Hmed; Art	Seed, Shoot
61. Gardenia aqualla Stapf et Hutch.		Rubiaceae	TVet	Seed, Shoot
62. Gardenia erubescens Stapf et Hutch.		Rubiaceae	Hf; TVet	Seed, Shoot
63. Gardenia ternifolia Schumach. et Thonn.	*Lambr-zuundga*	Rubiaceae	TVet	Seed, Shoot
64. Gmelina arborea Roxb.	Melina	Verbenaceae	Hmed	Seed, Shoot
65. Grewia cissoïdes Huth. & Dalz.	Somcondo	Tiliaceae	Hmed	Seed, Shoot
66. Grewia flavescens Juss.		Tiliaceae	Hf; TVet	Seed, Shoot
67. Grewia venusta Fresen.	Yoal-rataaga	Tiliaceae	Hf ; Const	Seed, Shoot
68. Guiera senegalensis J. F. Gmel.	Wilinwiiga	Combretaceae	Hmed; TVet	Seed, Shoot
69. Heteropogon contortus (L.) Roem. & Chult	Kuwéré	Poaceae	Const	Seed, Shoot
70. Hyptis spicigera Lam.	Tintigliga	Lamiaceae	Hmed	Seed
71. Indigofera nigritana Hook	Buguan-yénèga	Fabaceae	Hmed	Seed
72. Indigofera tinctoria L.	Garga	Fabaceae	Art	Seed
73. Jasminum obtusifolium Bak.		Oleaceae	TVet	Stem cutting
74. Khaya senegalensis (Desr.) A. Juss.	Kuka	Meliaceae	Fod; Hmed; Rit; TVet	Seed, Shoot
75. Lannea acida A. Rich.	Sabtulga	Anacardiaceae	Hf; Hmed	Seed, Shoot
76. Lannea microcarpa Engl. & K. Krause	Sabga	Anacardiaceae	Hf	Seed, Shoot
77. Lannea velutina A. Rich.	Wam-sibi	Anacardiaceae	Hmed	Seed, Shoot
78. Lantana rhodesiensis L.	Liulisibi	Verbenaceae	Hf	Seed
79. Launaea sp.	Cotiga	Asteraceae	Hmed	Seed, Shoot
80. Lepidagathis anobrya Nees	Gnug-nakida	Acanthaceae	Hmed	Seed, Shoot
81. Leptedania hastata (Pers) Decne.	Lelongo	Asclepiadaceae	Hf; TVet	Seed
82. Lippia chevalerii Moldenke	Wisaw	Verbenaceae	Const	Seed, Shoot
83. Lonchocarpus laxiflorus Guill. & Perr.	Yiiga	Fabaceae	Fod	Seed, Shoot
84. Maerua angolensis DC.	Zilgo	Capparaceae	Hf	Seed, Shoot
85. Maytenus senegalensis (Lam.) (Lam.) Exell	Tokvugri	Celastraceae	Hmed; TVet	Seed, Shoot
86. Mitragyna inermis (Willd.) Kuntze	Yil-yendé	Rubiaceae	Rit; TVet	Seed, Shoot
87. Moghania faginea (G. et Perr.) O. Kze		Fabaceae	Hmed; TVet	Stem cutting ?
88. Moringa oleifera Lam.	Arzantiiga	Moringaceae	Hf; TVet	Seed
89. Nelsonia canesens (Lam.)	Nagkiim-pusga	Asteraceae	Hmed	Seed
90. Opilia celtidifolia (G. & Perr.) Endl. ex Walp.	Wagsalga	Opiliaceae	Hmed	Uk
91. Ozoroa insignis Del.	Nin-nooré	Anacardiaceae	Hmed	Seed, Shoot
92. Parinari curatellifolia Planch. ex Benth.	Piinobga	Chrisobalanaceae	Hf; Hmed	Seed, Shoot
93. Parkia biglobosa (Jacq.) R. Br. ex G. Don	Roanga	Mimosaceae	Hf; Hmed; Rit; Com, TVet	Seed, Shoot
94. Paullinia pinnata L.	Nus-a-nu	Sapindaceae	Hmed; Com	Seed, Shoot
95. Pavetta crassipes K. Schum.	Mokbiisri	Rubiaceae	Hf; Hmed	Seed, Shoot
96. Pennisetum pedicellatum Trin	Kimbogo	Poaceae	Const	Seed, Shoot
97. Piliostigma reticulatum (DC.) Hochst.	Banguin-gu	Caesalpiniaceae	Hf; Const; TVet	Seed, Shoot
98. Piliostigma thonningii (Schumach.) Milne-Redh.	Banguin-gnaanga	Caesalpiniaceae	Const; Hf	Seed, Shoot
99. Prosopis africana (Guill. et Perr.) Taub.		Mimosaceae	TVet	Seed, Shoot
100. Pseudocedrela kotschyi (Schweinf.) Harms	Siguédré	Meliaceae	Hf; Hmed; Com; TVet	Seed, Shoot
101. Pteleopsis suberosa Engl. Diels	Guirga	Combretaceae	Const	Seed, Shoot
102. Pterocarpus erinaceus Poir.	Noiga	Fabaceae	Fod; TVet	Seed, Shoot

103. Rytigynia senegalensis Blume		Rubiaceae	TVet	Uk
104. Saba senegalensis (A. DC) Pichon	Wedga	Apocynaceae	Hf; Const; Com	Seed, Shoot
*105. Sansevieria liberica Ge*rome & Labroy	Kaantoabga	Agavaceae	Hmed	Shoot
106. Sapium grahamii (Hochst.) Par	Tièlme	Euphorbiaceae	Hmed	Shoot
107. Sarcocephalus latifolius (Smith) Bruce	Gwiinga	Rubiaceae	Hf; Hmed; TVet	Seed, Shoot; Stem cutting
108. Sclerocarya birrea (A. Rich.) Hochst.	Noabga	Anacardiaceae	Hf ; Hmed; Com; TVet	Seed, Shoot; Suchering
109. Securidaca longepedunculata Fres.	Pèlga	Polygalaceae	Hmed; TVet	Seed, Shoot
110. Senna siamea (Lam.) Irwin et Barneby	Cassia	Caesalpiniaceae	Tvet; Const	Seed, Shoot
111. Senna singueana (Del.) Lock	Gelponsé	Caesalpiniaceae	Hmed	Seed, Shoot
112. Spermacoce stachydea DC.	Yod-raaga	Rubiaceae	Hmed	Seed, Shoot
113. Sporobolus pyramidalis P. Beauv.	Gansaaga	Poaceae	Const; Com	Seed, Shoot
114. Sterculia setigera Del.	Putermuka	Sterculiaceae	Hmed; TVet	Seed, Shoot
115. Stereospermum kunthianum Cham.	Ninhilenga, Yoabga	Bignonaceae	Hmed	Seed, Shoot
116. Strychnos spinosa Lam.	Katrin-poaga	Loganiaceae	Hf	Seed, Shoot
117. Stylosanthes erecta P. Beauv.	Sakuisabliga	Fabaceae	Fod	Seed
118. Taccazea apiculata Oliv.		Asclepiadaceae	TVet	Uk
119. Tamarindus indica L.	Pusga	Caesalpiniaceae	Hf; Hmed; Com	Seed, Shoot
120. Tapinanthus globiferus	Welbre	Loranthaceae	TVet	Seed
121. Terminalia avicennioides Guill. et Perr.		Combretaceae	TVet	Seed, Shoot
122. Terminalia laxiflora Eng.		Combretaceae	TVet	Seed, Shoot
123. Terminalia macroptera Guill. & Perr.	Koond-poko	Combretaceae	Hmed	Seed, Shoot
124. Trichilia emetica Vahl	Kinkirs-taanga	Meliaceae	Hmed	Seed, Shoot
125. Uapaca togoensis Pax		Euphorbiaceae	TVet	Uk
126. Vetiveria nigritana Stapf.	Ruduma	Poaceae	Art	Seed
127. Vitellaria paradoxa Gaertn. f.	Taanga	Sapotaceae	Hf; Hmed; Com; TVet	Seed, Shoot
128. Vitex chrysocarpa PLanch. ex Benth		Verbenaceae	TVet	Seed, Shoot
129. Vitex doniana Sweet	Andga	Verbenaceae	Hf; Com; TVet	Seed, Shoot
130. Vitex simplicifolia Oliv.	Conpoandga	Verbenaceae	Hmed	Seed, Shoot
131. Xeroderris stuhlmannii (Taub.) Mendonça et E.P. Sousa		Fabaceae	TVet	Uk
132. Ximenia americana L.	Leenga	Olacaceae	Hf; Hmed, TVet	Seed, Shoot
133. Ziziphus mauritiana Lam.	Mugunuga	Rhamnaceae	Hf	Seed, Shoot
134. Ziziphus mucronata willd.		Rhamnaceae	TVet	Seed, Shoot, layering, grafting

Legend. Hf: Human food; Fod: fodder; HMed: Human medicine; Const: Construction; Rit: Rituals; Art: Art and craft; Com: Commerce; TVet: traditional veterinary; Uk: unknown.

HB 38_Belem
Species exploited in the "Parc National Kaboré Tambi" their uses and possible method of artificial propagation

1. Acacia dudgeonii Craib ex Hall.	Gon-payandga	Mimosaceae	Hmed
2. Acacia erythrocalyx Brenan		Mimosaceae	Tvet
3. Acacia gourmaensis A. Chev.	Gon-sabliga	Mimosaceae	Hmed; Tvet
4. Acacia hockii DeWild.		Mimosaceae	Hmed
5. Acacia macrostachya Reichenb. ex DC	Zamanega	Mimosaceae	Hf; TVet
6. Acacia polyacantha Willd. subsp. *campylacantha*(Hochst. ex A. Rich.) Brenan	Kan-pèlga	Mimosaceae	Hmed; Tvet
7. Acacia seyal Del.		Mimosaceae	Tvet; Const; Art
8. Acacia sieberiana DC	Koumbrissaka	Mimosaceae	Tvet; art
9. Adansonia digitata L.	Tohèga	Bombacaceae	Hf; Hmed; Com; TVet
10. Afzelia africana Smith. Ex Pers.	Kankalga	Caesalpiniaceae	Hf
11. Agelanthus dodoneifolius		Loranthaceae	Tvet
12. Albizia chevalieri Harms		Mimosaceae	Tvet; const; Art
13. Allophyllus africanus P. Beauv.		Sapindaceae	Hf; Art
14. Andropogon pseudapricus Stapf	Gnindparga	Poaceae	Fod; Const Seed,
15. Andropogon sp	Pitri	Poaceae	Fod; Const; Com
16. Andropogon sp.	Kangré	Poaceae	Hmed; Const
17. Andropogon tectorum Schumach. & Thonn.	Buka	Poaceae	Const
18. Annona senegalensis Pers.	Barkudga	Annonaceae	Hf; Hmed; Rit,
19. Anogeissus leiocarpus (DC.) Guill. & Perr.	Siiga	Combretaceae	Hmed; Tvet
20. Azadirachta indica A. Juss.	Nim	Meliaceae	Tvet; const
21. Balanites aegyptiaca (L.) Del.	Kyeguelga	Balanitaceae	Hf; Fod; Hmed; Rit; Art;
22. Bauhinia rufescens Lam.		Caesalpiniaceae	Tvet; Fod; Const
23. Bombax costatum Pellegr. & Vuillet	Voaka	Bombacaceae	Hf ; Fod; Hmed; Com
24. Boscia senegalensis (Pers.) Lam. ex Poir	Lambotga	Capparidaceae	Tvet; Hf
25. Boswellia dalzelii Hutch.	Gonbregneongo	Burseraceae	Hmed
26. Burkea Africana Hook. F.		Caesalpiniaceae	Tvet
27. Calotropis procera (Ait.) Ait. f.	Putrepuga	Asclepiadaceae	Hmed; Tvet
28. Capparis sepiaria L.	Lamboy	Capparaceae	Hf
29. Cassia sieberiana DC.	Kumbrissaka	Caesalpiniaceae	Hmed; const
30. Ceiba pentandra (L.) Gaertn.	Gunga	Bombacaceae	Hf; Art
31. Chamaecrista mimosoïdes (L.) H. S. Irwin & Barneby	Tingiundoiga	Caesalpiniaceae	Hmed
32. Cissus populnea Guill. et Perr.	Paloanga	Vitaceae	Art; TVet
33. Cochlospermum planchonii Hook. F.	Sonsè	Cochlospermaceaea	Hmed; TVet
34. Cochlospermum tinctorium A. Rich.	Sonsè	Cochlospermaceaea	Hmed; Art; TVet
35. Cola laurifolia Mast.		Sterculiaceae	Const
36. Combretum collinum Fresen.		Combretaceae	Hmed
37. Combretum fragrans F. Hoffm.	Kiuginga	Combretaceae	Hmed
38. Combretum glutinosum Perr. ex DC.		Combretaceae	TVet
39. Combretum molle R. Br. ex G. Don	Parwiga	Combretaceae	Hmed
40. Crossopteryx febrifuga (Afzel. ex G. Don) Benth.	Kumbruwanga	Rubiaceae	Hmed; Rit; TVet
41. Crotalaria retusa L.	Wendlébendaga	Fabaceae	Hmed
42. Cymbopogon giganteus Chiov	Wam	Poaceae	Const
43. Cymbopogon schoenanthus (L.) Spreng	Sompiiga	Poaceae	Const; Rit
44. Daniellia oliveri (Rolfe) Hutch. & Dalz.	Aonga	Caesalpiniaceae	Hmed; TVet
45. Detarium microcarpum Guill. & Perr.	Kagadéga	Caesalpiniaceae	Hf; Com; TVet
46. Dichrostachys cinerea (L.) Wight & Arn.	Susutga	Mimosaceae	Hmed
47. Dioscorea sp	Tantagnoui	Dioscordiaceae	Hf

48. Diospyros mespiliformis Hochst. ex A. Rich.	Gaaka	Ebenaceae Hf; Hmed; Com; TVet
49. Dipcadi logifolium (Lindl.) Baker	Toctaba	Liliaceae Hmed
50. Eleusine indica (L.)Gaertn.	Targanga	Poaceae Hmed; Rit
51. Elionurus sp Mosaala		Poaceae Hmed
52. Entada africana Guill. & Perr.	Séonega	Mimosaceae Hmed
53. Erythrinia senegalensis DC.	Kulintiga	Fabaceae Hmed
54. Euphorbia poissonii Pax	Tacsendo	Euphorbiaceae Hmed
55. Faidherbia albida (Del.) Chev.	Zaanga	Mimosaceae Hmed; Fod
56. Feretia apodanthera Del.	Kitinga	Rubiaceae Hmed; TVet
57. Ficus sur Forssk.	Womsèèga	Moraceae Hf; Hmed
58. Ficus sycomorus subsp. *gnaphalocarpa* (Miq.) C.C. Berg	Kankanga	Moraceae Hf Seed, Shoot
59. Flacourtia indica Willd.	Kuduntabga	Flacourtiaceae Hmed Seed, Shoot
60. Flueggea virosa (Roxb. ex Willd.) Voigt	Sugdin-daaga	Euphorbiaceae Hmed; Art Seed, Shoot

61. Gardenia aqualla Stapf et Hutch. Rubiaceae TVet Seed, Shoot
62. Gardenia erubescens Stapf et Hutch. Rubiaceae Hf; TVet Seed, Shoot
63. Gardenia ternifolia Schumach. et Thonn. *Lambr-zuundga* Rubiaceae TVet Seed, Shoot
64. Gmelina arborea Roxb. Melina Verbenaceae Hmed Seed, Shoot
65. Grewia cissoïdes Huth. & Dalz. Somcondo Tiliaceae Hmed Seed, Shoot
66. Grewia flavescens Juss. Tiliaceae Hf; TVet Seed, Shoot
67. Grewia venusta Fresen. Yoal-rataaga Tiliaceae Hf ; Const Seed, Shoot
68. Guiera senegalensis J. F. Gmel. Wilinwiiga Combretaceae Hmed; TVet Seed, Shoot
69. Heteropogon contortus (L.) Roem. & Chult Kuwéré Poaceae Const Seed, Shoot
70. Hyptis spicigera Lam. Tintigliga Lamiaceae Hmed Seed
71. Indigofera nigritana Hook Buguan-yénèga Fabaceae Hmed Seed
72. Indigofera tinctoria L. Garga Fabaceae Art Seed
73. Jasminum obtusifolium Bak. Oleaceae TVet Stem cutting
74. Khaya senegalensis (Desr.) A. Juss. Kuka Meliaceae Fod; Hmed; Rit; TVet Seed, Shoot
75. Lannea acida A. Rich. Sabtulga Anacardiaceae Hf; Hmed Seed, Shoot
76. Lannea microcarpa Engl. & K. Krause Sabga Anacardiaceae Hf Seed, Shoot
77. Lannea velutina A. Rich. Wam-sibi Anacardiaceae Hmed Seed, Shoot
78. Lantana rhodesiensis L. Liulisibi Verbenaceae Hf Seed
79. Launaea sp. Cotiga Asteraceae Hmed Seed, Shoot
80. Lepidagathis anobrya Nees Gnug-nakida Acanthaceae Hmed Seed, Shoot
81. Leptedania hastata (Pers) Decne. Lelongo Asclepiadaceae Hf; TVet Seed
82. Lippia chevalerii Moldenke Wisaw Verbenaceae Const Seed, Shoot
83. Lonchocarpus laxiflorus Guill. & Perr. Yiiga Fabaceae Fod Seed, Shoot
84. Maerua angolensis DC. Zilgo Capparaceae Hf Seed, Shoot
85. Maytenus senegalensis (Lam.) (Lam.) Exell Tokvugri Celastraceae Hmed; TVet Seed, Shoot
86. Mitragyna inermis (Willd.) Kuntze Yil-yendé Rubiaceae Rit; TVet Seed, Shoot
87. Moghania faginea (G. et Perr.) O. Kze Fabaceae Hmed; TVet Stem cutting ?
88. Moringa oleifera Lam. Arzantiiga Moringaceae Hf; TVet Seed
89. Nelsonia canesens (Lam.) Nagkiim-pusga Asteraceae Hmed Seed
90. Opilia celtidifolia (G. & Perr.) Endl. ex Walp. Wagsalga Opiliaceae Hmed Uk
91. Ozoroa insignis Del. Nin-nooré Anacardiaceae Hmed Seed, Shoot
92. Parinari curatellifolia Planch. ex Benth. Piinobga Chrisobalanaceae Hf; Hmed Seed, Shoot
93. Parkia biglobosa (Jacq.) R. Br. ex G. Don Roanga Mimosaceae Hf; Hmed; Rit; Com, TVet Seed, Shoot
94. Paullinia pinnata L. Nus-a-nu Sapindaceae Hmed; Com Seed, Shoot
95. Pavetta crassipes K. Schum. Mokbiisri Rubiaceae Hf; Hmed Seed, Shoot
96. Pennisetum pedicellatum Trin Kimbogo Poaceae Const Seed, Shoot
97. Piliostigma reticulatum (DC.) Hochst. Banguin-gu Caesalpiniaceae Hf; Const; TVet Seed, Shoot
98. Piliostigma thonningii (Schumach.) Milne-Redh. Banguin-gnaanga Caesalpiniaceae Const; Hf Seed, Shoot
99. Prosopis africana (Guill. et Perr.) Taub. Mimosaceae TVet Seed, Shoot
100. Pseudocedrela kotschyi (Schweinf.) Harms Siguédré Meliaceae Hf; Hmed; Com; TVet Seed, Shoot
101. Pteleopsis suberosa Engl. Diels Guirga Combretaceae Const Seed, Shoot
102. Pterocarpus erinaceus Poir. Noiga Fabaceae Fod; TVet Seed, Shoot
103. Rytigynia senegalensis Blume Rubiaceae TVet Uk

104. Saba senegalensis (A. DC) Pichon Wedga Apocynaceae Hf; Const; Com
*105. Sansevieria liberica Ge*rome & Labroy Kaantoabga Agavaceae Hmed Shoot
106. Sapium grahamii (Hochst.) Par Tièlme Euphorbiaceae Hmed Shoot
107. Sarcocephalus latifolius (Smith) Bruce Gwiinga Rubiaceae Hf; Hmed; TVet Seed, Shoot; Stem cutting
108. Sclerocarya birrea (A. Rich.) Hochst. Noabga Anacardiaceae Hf ; Hmed; Com; TVet
109. Securidaca longepedunculata Fres. Pèlga Polygalaceae Hmed; TVet Seed, Shoot
110. Senna siamea (Lam.) Irwin et Barneby Cassia Caesalpiniaceae Tvet; Const Seed, Shoot
111. Senna singueana (Del.) Lock Gelponsé Caesalpiniaceae Hmed Seed, Shoot
112. Spermacoce stachydea DC. Yod-raaga Rubiaceae Hmed Seed, Shoot
113. Sporobolus pyramidalis P. Beauv. Gansaaga Poaceae Const; Com Seed, Shoot
114. Sterculia setigera Del. Putermuka Sterculiaceae Hmed; TVet Seed, Shoot
115. Stereospermum kunthianum Cham. Ninhilenga, Yoabga Bignonaceae Hmed Seed, Shoot
116. Strychnos spinosa Lam. Katrin-poaga Loganiaceae Hf Seed, Shoot
117. Stylosanthes erecta P. Beauv. Sakuisabliga Fabaceae Fod Seed
118. Taccazea apiculata Oliv. Asclepiadaceae TVet Uk
119. Tamarindus indica L. Pusga Caesalpiniaceae Hf; Hmed; Com Seed, Shoot
120. Tapinanthus globiferus Welbre Loranthaceae TVet Seed
121. Terminalia avicennioides Guill. et Perr. Combretaceae TVet Seed, Shoot
122. Terminalia laxiflora Eng. Combretaceae TVet Seed, Shoot
123. Terminalia macroptera Guill. & Perr. Koond-poko Combretaceae Hmed Seed, Shoot
124. Trichilia emetica Vahl Kinkirs-taanga Meliaceae Hmed Seed, Shoot
125. Uapaca togoensis Pax Euphorbiaceae TVet Uk
126. Vetiveria nigritana Stapf. Ruduma Poaceae Art Seed
127. Vitellaria paradoxa Gaertn. f. Taanga Sapotaceae Hf; Hmed; Com; TVet Seed, Shoot
128. Vitex chrysocarpa PLanch. ex Benth Verbenaceae TVet Seed, Shoot
129. Vitex doniana Sweet Andga Verbenaceae Hf; Com; TVet Seed, Shoot
130. Vitex simplicifolia Oliv. Conpoandga Verbenaceae Hmed Seed, Shoot
131. Xeroderris stuhlmannii (Taub.) Mendonça et
E.P. Sousa Fabaceae TVet Uk
132. Ximenia americana L. Leenga Olacaceae Hf; Hmed, TVet Seed, Shoot
133. Ziziphus mauritiana Lam. Mugunuga Rhamnaceae Hf Seed, Shoot
134. Ziziphus mucronata willd. Rhamnaceae TVet Seed, Shoot, layering, grafting

Legend. Hf: Human food; Fod: fodder; HMed: Human medicine; Const: Construction; Rit: Rituals; Art: Art and craft; Com: Commerce; TVet: traditional veterinary; Uk: unknown.

Data were analysed with the MINITAB Software version 13.31. MINITAB is a computer program designed to perform a variety of data analysis and presentation functions, including statistical analyses and graphical presentation of data.
More information on the software can be found at http://www.minitab.com

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Edible fruit or seeds species	Vegetable including edible flowers	Edible tuber plant species
Acacia macrostachya	*Adansonia digitata*	*Dioscorea sp*
Adansonia digitata	*Afzelia Africana*	
Annona senegalensis	*Annona senegalensis*	
Balanites aegyptiaca	*Balanites aegyptiaca*	
Boscia senegalensis	*Bombax costatum*	
Capparis sepiaria	*Boscia senegalensis*	
Ceiba pentandra	*Leptedania hastata*	
Detarium microcarpum	*Maerua angolensis*	
Diospyros mespiliformis	*Moringa oleifera*	
Ficus sur	*Paveta crassipes*	
Ficus sycomorus subsp. Gnaphalocarpa	*Piliostigma reticulatum*	
Gardenia erubescens	*Piliostigma thonningii*	
Grewia flavescens	*Strychnos spinosa*	
Grewia venusta	*Tamarindus indica*	
Lannea acida		
Lannea microcarpa		
Lantana rhodesiensis		
Parinari curatellifolia		
Parkia biglobosa		
Saba senegalensis		
Sarcocephalus latifolius		
Sclerocarya birrea		
Strychnos spinosa		
Tamarindus indica		
Tapinanthus globiferus		
Vitellaria paradoxa		
Vitex doniana		
Ximenia Americana		
Ziziphus mauritiana		