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Socio-Economic Characterization of the *Parkia Biglobosa*'s Exploitation and Local Management in the Rural Communes of Sare Bidji and Medina Elhadji, Kolda (Senegal)

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***Abstract* – Non-Timber Forest Products mitigate food insecurity, especially in rural areas. The natural region of Casamance, where the level of poverty is one of the highest in Senegal, contains most of the country's ligneous species. Parkia biglobosa is one of the most privileged species because of its availability and its utility. However, we notice a weakening of its ecosystems, following both anthropic and natural causes. This study was conducted in the communes of Medina Elhadji and Sare Bidji, with 71 households. The surveys allowed to understand impact of the exploitation and management of this tree. The results showed that: Parkia biglobosa's parks come from natural regeneration and the exploitation of the latter is rather ensured by women. According to the respondents, the pulp and the seed have dietary, medicinal and commercial interest and the shell is used as an insecticide. Leaves, roots, flowers and bark have therapeutic importance. The wood is used for cooking. Most of these products are from trees growing in the bush fields; picking begins at the opening of the campaign, in mid-April and stops in June-July, at the beginning of the rainy season, to make way for pickup. Trees of Parkia biglobosa are protected from bush fires by firewalls, cutting bans and action of monitoring committees.**

***Keywords* – Parkia Biglobosa, Parks, Exploitation, Management, Kolda, Senegal.**

I. INTRODUCTION

In Senegal, forest fruit trees play an important role in the food security of population (Djihounouck et al., 2019). The nutritional importance of their production is also underlined by Sourou et al. (2016) who highlighted their multiple uses. However, the socio-economic impact of these forest resources varies depending on the product, the potential of the production's areas and the demand. Thus, the natural region of Casamance, mainly recognized for its agrosilvopastoral vocation, has experienced dry years which have weakened the possibilities of food crops such as rice, millet, maize and sorghum (Manga, 2003).

Senegalese people, like many Sahelians, pick wild fruits that are used, in particular, as supplementary food or consumed during the lean season (Boffa, 2000) to compensate the deficit in food products. Thus, rural population of the southern eco-geographic zone of Senegal (Casamance), which has a biological diversity advantage compared to the rest of the country (Bassene, 2016) find it easier to overcome the lean period. Indeed, at each period of the year (dry or rainy season), NTFPs are available and used by rural population. Parkia biglobosa is one of the preferred woody species in Casamance, due to its availability, accessibility and multiple uses (CSE, 2009). Indeed, the presence of this species is remarkable, both in forests and in cultivated and fallow plots (Goudiaby, 2013).

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However, the numerous diagnoses made in the country (Dia and Duponoit, 2010) indicate a weakening of the ecosystem of this forest species. The main causes of this phenomenon are of natural and anthropogenic origin such as drought, the introduction of new farming practices that do not care much about the preservation of the environment, the overexploitation of resources for food and commercial purposes and the effects negative effects of climate change (CSE, 2009). Consequently, we are witnessing a significant decrease in *Parkia biglobosa* and the management of the exploitation and the sustainability processes of forest species of this species are carried out in an anarchic manner (Mahamat-Saleh *et al*., 2016).

It is in this context that our research takes place, the general objective of which is to contribute to the socio-economic study of the exploitation and management of *Parkia biglobosa* in Haute Casamance. Specifically, it involves first analyzing the benefits of harvesting *Parkia biglobosa* products and then analyzing the effects of management methods on the sustainability of this woody tree. After presenting the material and the methods, we - results which will be presented and discussed, before drawing a conclusion and perspectives.

II. MATERIAL AND METHODS

2.1. *Study Area*

The study was conducted in the Kolda region which lies between 12 ° 20 and 13 ° 40 North latitude, and 13 ° and 16 ° West longitude (NASD, 2017). It covers an area of 13,721 km², or 7% of the national territory. It is therefore made up of three departments, namely Kolda, Velingara and Medina Yoro Foula (NASD, 2015). The department of Kolda covers 26% of the regional surface and has 15 municipalities among which, Sare Bidji and Medina el Hadji. This region is bounded to the East by the region of Tambacounda, to the West by the region of Sedhiou, to the North by the Republic of Gambia and to the South by the Republic of Guinea Bissau and. Its climate is Sudano-Guinean, receiving rainfall from June to October, with a maximum intensity in August and September (NASD, 2015). Precipitation generally begins in May and ends in October. The average rainfall varies between 800 mm, in a deficit year, and 1000 to 1200 mm, in a normal year.

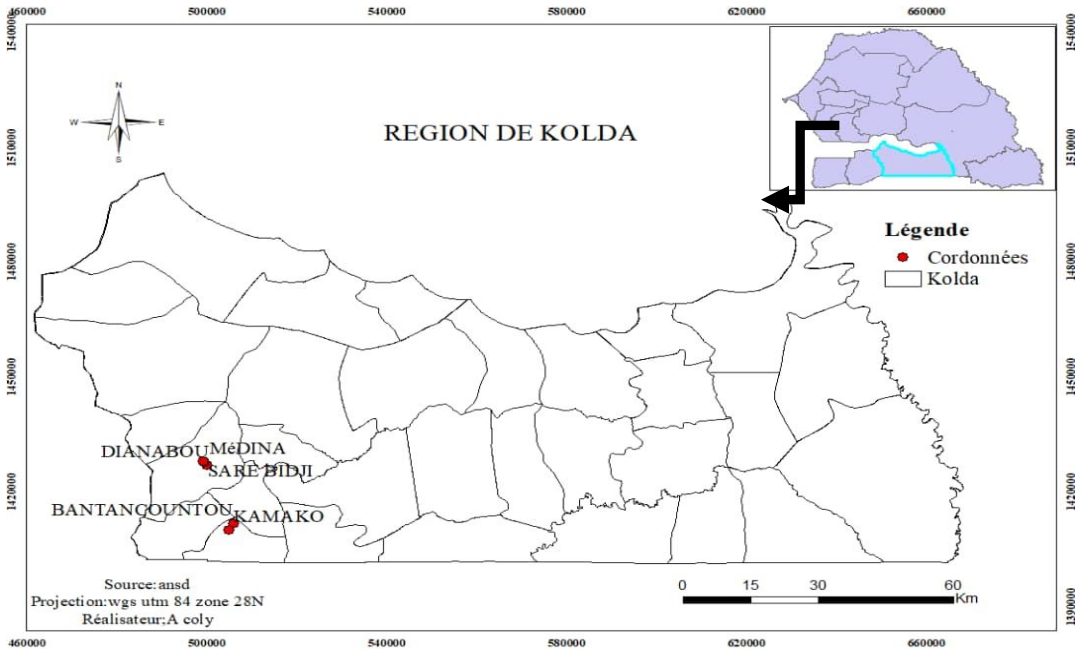

Fig. 1. Map of the situation of the surveyed areas in the Kolda region (Source: NASD, 2015).

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Figure 1 shows the Kolda region's map and the study area on its South West side with the five involved villages.

2.2. *Data Collection*

The methods used are documentary research to collect secondary data and quantitative and qualitative surveys among target households in the study villages. The size of the sample to be surveyed was determined using Fisher's formula, on the basis of the total number of households in the study area, i.e. 241.

For each village, this number was determined on the basis of the total number of households in the study area by using the tax roll held by its leader. Thereby, nf = n / (1 + n / N), with:

- $n = 1 / d^2$,

- nf = sample size,

- d = degree of error = 10%; and,

- N = total number of households.

The application to our population gives: n = 1 / 10-2 = 100 nf = 100 / (1 + 100/241) = 71

Then, the sample size, in the five selected villages, is 71 households. In addition, concerning the determination of the number of households to be interviewed per village, we proceeded by an allocation in proportion to the number of households in the village, with the following formula:

X = (nf * y) / N, with:

- X = sample size per village; and,

- Y = Number of households per village.

The results obtained are presented in Table 1, below, showsing that Bantancountou Mawde and Kamako Sansakoton, the two villages of the Medina El Hadji's commune, represent the more important part of the sample, with 20 people to survey in each of them. For the Sare Bidji's commune, the greater village is Sare Bidji, with 16 persons represented in the sample and, the less represented villages of this second commune are Kamako Sansakoton and Medina Sadiom, with, respectively, 8 and 7 personas represented in the sample.

Table 1. Sample's size by village.

Village	Number of Householdes	Size in the Sample
Sare Bidji	52	16
Medina Sadioma	24	7
Dianabou	27	8
Bantancountou Mawde	70	20
Kamako Sansakoton	68	20
Total	241	71

Source: authors.

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2.3. *Data Analysis*

The Sphinx plus² software was used to prepare the survey questionnaires, as well as for the analysis of the collected data. The results presented in the form of graphs and tables were directly generated by this software. These results allowed to: identify the constraints and opportunities for the exploitation and management of Parkia biglobosa's products; analyze potential markets and products presenting positioning opportunities on the local, national, regional or even international market; and, formulate specific recommendations on the areas of intervention and improvement of productivity and competitiveness.

III. RESULTS

3.1. *Demographic Characteristics of the Respondents*

3.1.1. *Distribution of Respondents by Sex and Age of Respondents*

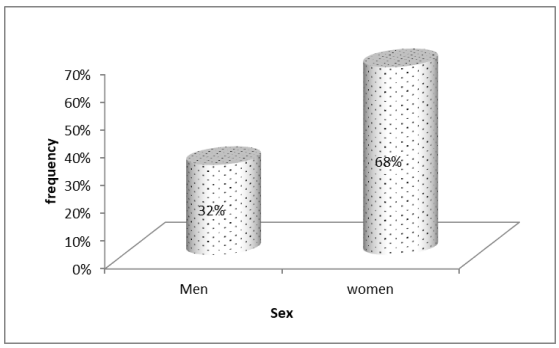

Fig. 2a. Distribution of respondents by sex

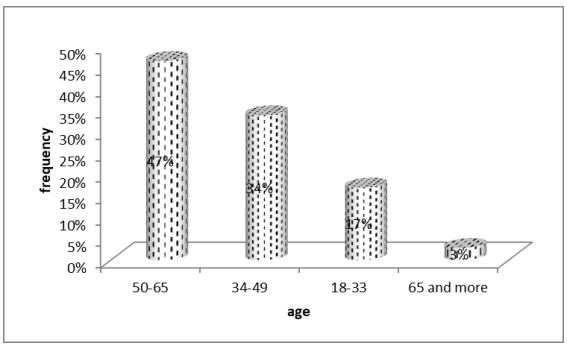

Fig. 2b. Distribution of respondents by age.

Source: authors.

Figures 2a and 2b show, respectively, the distribution of people surveyed according to sex and then age. Analysis of this Fig. 2a reveals that, of the 71 people surveyed in the five study villages, 48 (or 68%) are women and 23 (or 32%) 2% are men. With regard to age, we see that, overall, the people surveyed are between 18 and 70 years old. The classification we have constructed (Fig. 2b) shows that 12 (i.e. 17%) are aged 18 to 33, 24 (i.e. 34%) are aged 34 to 49, 33 (i.e. 47%) are between 50 and 65 years old and only 2 (or 3%) are over 65 years old.

3.1.2. *Distribution of Respondents According to the Size of their Household and their Overall Annual Income*

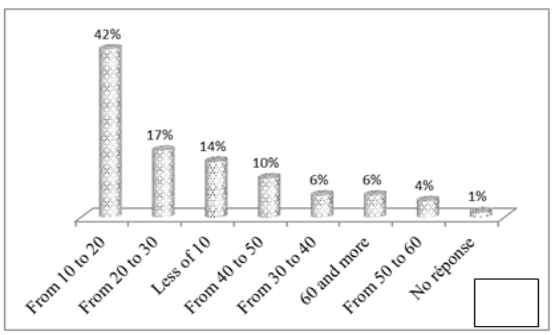

Fig. 2a. Distribution of respondents by sex

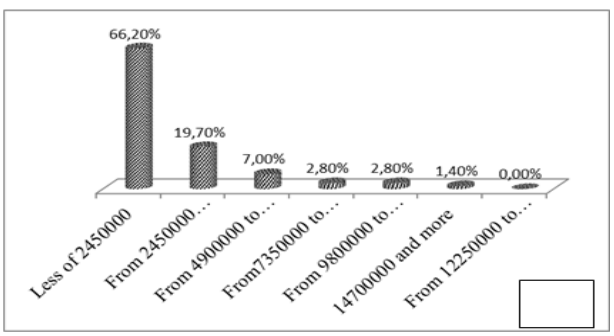

Fig. 2b. Distribution of respondents by age.

Source: authors.

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The distribution of respondents according to the size of their household is represented by Fig. 3a, the analysis of which shows that 30 (i.e. 42%) of respondents belong to a household with between 10 and 20 people, 12 (i.e. 17%) are members of a household of 20 to 30 individuals; 10 (or 14%) live in a household of less than 10 people and, 8 (or 10%), in a household of 40 to 50 people. For the remaining 11 people, 4 live in a household of 30-40 people, 4 in a household of 40-50 people and, 3, in a household of 50-60 people. Regarding their level of income, it emerges from the analysis of Fig. 3b that 47 (i.e. 66.2%) of the population have an overall annual income of less than 2 450 000 FCFA, 13 (i.e. 19.7%)) receive 2 450,000 to 4,900,000 FCFA annually, 6 (or 7.0%) have between 4,900,000 and 7,350,000 FCFA, 2 (or 2.8%) earn between 7,350,000 and 9,800,000 FCFA, the same number earns between 9,800,000 and 12,250,000 FCFA and, only 1 (i.e. 1.4%) has an overall annual income of more than 14,700,000 FCFA.

3.1.3. *Distribution of Respondents According to their Sex and Profession*

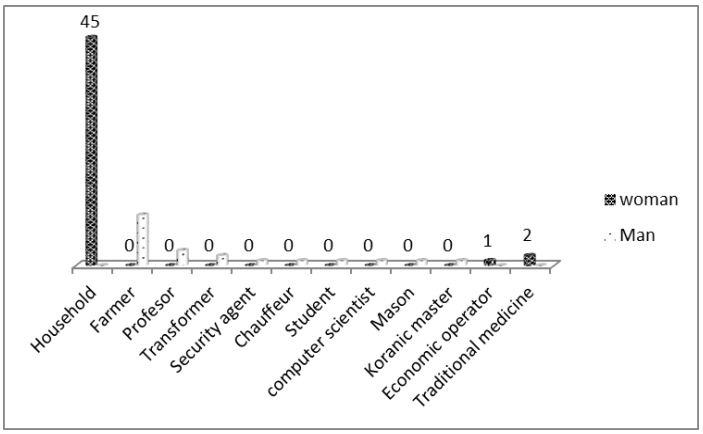

Fig. 4. Distribution of respondents according to their sex and profession. (Source: authors).

For women, it emerges from analyze of Fig. 4 that, among the 48 respondents, 45 are housewives and the remaining 3 are 2 traditional healers and 1 economic operator. Among the men surveyed, there are 10 farmers, followed by 3 breeders, school teachers and processors, each with 2 people. The other professions (driver, student, computer scientist, mason, Cornish master) are each represented by 1 individual.

3.2. *Use of Parkia biglobosa's Products and Income from its Exploitation According to the Respondents*

3.2.1. *Use of the Various Products of Parkia Biglobosa*

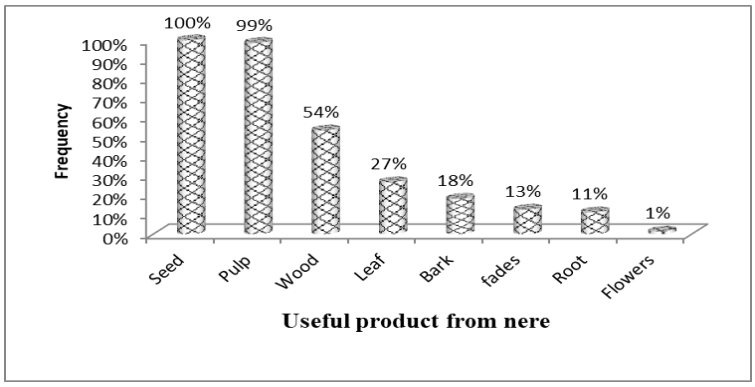

Fig. 5. Frequency of use of Parkia biglobosa's products. (Source: authors)

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Fig. 5 shows the frequency of use of *Parkia biglobosa*'s products. All the people surveyed used the seeds of the *Parkia biglobosa* and only one did not consume the pulp. In addition, 54% of respondents use the wood of *Parkia biglobosa*. The other products collected are used by 50 respondents, including 27% for the leaves, 18% for the bark, 13% for the tops 11% for the roots and 1.4% for the flowers.

3.2.2. *Ecosystem Services Provided by Parkia Biglobosa*

The data in Table 2 revealed that there are several goods and services that *Parkia biglobosa* provides to this population. Thus, we see that all its products are used in the traditional pharmacopoeia, seeds are concerned by the other listed uses, except as fodder and bait energy source for fishing, pulp is also consumed and marketed, wood is used as a source of energy for cooking, leaves are used as fertilizer and fodder, tops, as fertilizer, insecticide and bait for fishing.

Table 2. Consumed parts of Parkia biglobosa according to uses.

Product / Use	Pulp	Seed	Fades	Flowers	Leaves	Bark	Wood	Root
Alimentary	69	71	0	0	0	0	0	0
Transformation	0	30	0	0	0	0	0	0
Trade	38	57	0	0	0	0	0	0
Pharmacopoeias	20	20	1	1	15	13	1	9
Fertilizer	0	1	1	0	11	0	0	0
Feed	0	0	0	0	9	0	0	0
Insecticide	0	2	7	0	0	0	0	0
Energy	0	0	0	0	0	0	36	0
Fishing bait	0	0	1	0	0	0	0	0

Source: authors.

3.2.3. *Collection Area for Parkia Biglobosa Products, Depending on the Agrarian System*

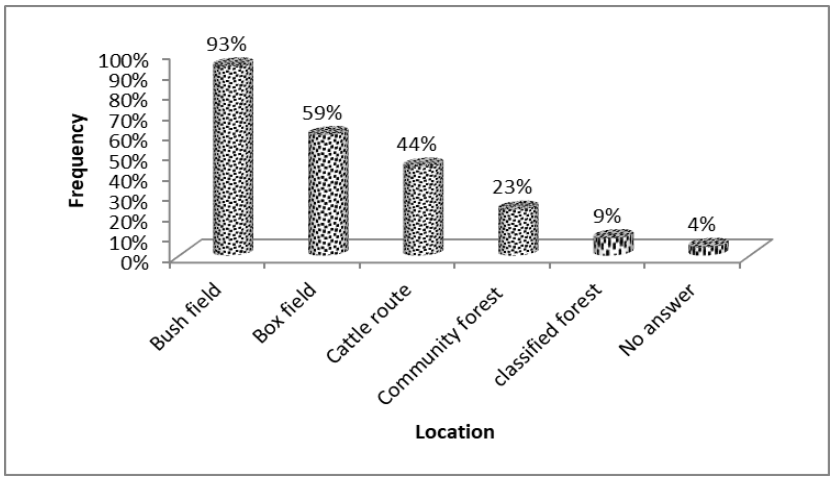

Fig. 6. Collection area for Parkia biglobosa products according to the agrarian system (source: authors)

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Fig. 6 shows that 93% of respondents exploit *Parkia biglobosa* found in bush fields, 59%, those in hut fields, 44%, those on cattle routes, 23%, those in community forests and, finally, 9%, those of classified forests. 4% of respondents did not answer this question.

3.2.4. *Periods of use of Parkia Biglobosa Derivatives*

Table 3 shows that the periods of use of the products vary with the seasonal calendar. Thus, in the mid-dry season and in the rainy season, their use is much more frequent. On the other hand, at the start of the dry season, there is little use of these products, except for seeds and wood. Precisely, we see that:

- Seeds are frequently used in all seasons, with 97.2% of respondents, during the dry season and the semi-dry season and 95.8% of respondents during the rainy season:
- Pulp is used much more during the rainy season (88.7% of respondents) and the mid-dry season (63.4% of respondents); and,
- Wood is practically used by the same number of respondents during the three identified periods (47% of respondents, in the rainy season, 45.1%, in the mid-dry season and 40.8% at the start of the dry season).

Table 3. Periods of use of Parkia biglobosa products.

Season / Product	Rainy Season	Start of the Dry Season	Mid-Dry Season
Pulp	63	9	45
Leaves	15	5	12
Seed	68	69	69
Wood	34	29	32
Barks	3	7	7
Root	3	6	5
Fade	9	1	7
Flowers	1	1	1

Source: authors

From the analysis of Table 4, it can be seen that the seeds are sold almost throughout the year. Regarding the other parts listed below a few individuals are selling throughout the year.

Table 4. Sales period for Parkia biglobosa products.

Season / Product	Rainy Season	Start of the Dry Season	Mid-Dry Season
Pulp	63	9	45
Leaves	15	5	12
Seed	68	69	69
Wood	34	29	32

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Season / Product	Rainy Season	Start of the Dry Season	Mid-Dry Season
Barks	3	7	7
Root	3	6	5
Fade	9	1	7
Flowers	1	1	1

Source: authors.

3.2.5. *Selling Prices of the Pulp and Seeds of Parkia Biglobosa*

The results of Table 5 reveal the different selling prices of the products of Parkia biglobosa depending on. They show that prices vary depending on quantity, product and other criteria.

Table 5. The selling prices of the pulp and seeds of *Parkia biglobosa*.

Price and quantity of each product in CFA Franc			
Products	**1 kg**	**Basin**	**Bac of 50 kg**
Pulp	100 ; 200 ; 300	2000; 2500 ; 3000	5000 ; 10000
Raw seed	250 ; 300 ; 500 ; 400		
Processed seed	1000 ; 1500 ; 2000 ; 2500 ; 6000	30000 ; 45000 ; 60000 ; 90000	50000 ; 75000 ; 100000 ;
Ground processed seed	3000 ; 9000		

3.2.6. *Market for Parkia Biglobosa Products*

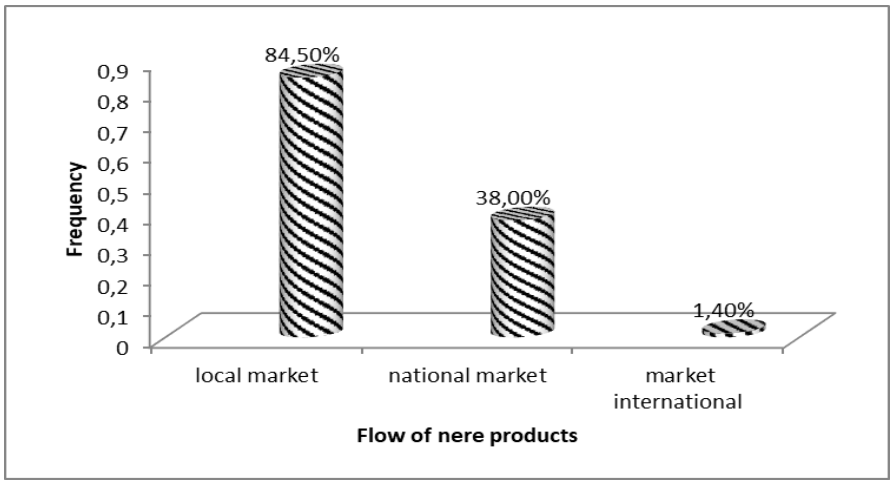

Fig. 7. The markets for Parkia biglobosa's products (Source: authors)

Fig. 7 shows the different commercial destinations of *Parkia biglobosa*'s products: 84.5% of respondents sell their products in local markets, that is to say weekly or *louma* markets and urban markets; 38% of respondents go beyond local markets and sell them in other regions; and only 1.4% of respondents manage to export the products.

3.2.7. *Distribution of Respondents According to Income from the Exploitation of Parkia Biglobosa*

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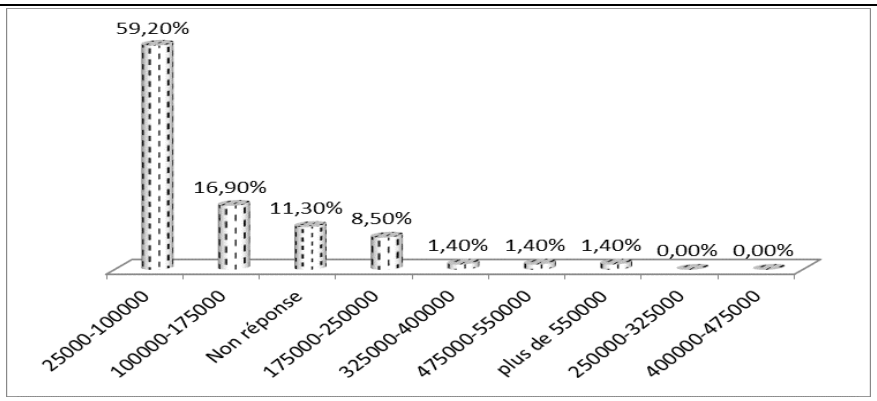

Fig. 8. Revenue generated by the sale of Parkia biglobosa's products (Source: authors)

It emerges from the Fig. 8 that 59.2% of the population earns between 25,000 and 100,000 FCFA from the farm, 16.9% receive 100,000 to 175,000 FCFA, 8.5% have between 175,000 and 250,000 FCFA, 1.4% earn between 325,000 and 400,000 FCFA, the same number earn between 475,000 and 550,000 FCFA and, only 1 (i.e. 1.4%) has an overall annual income of more than 14,700,000 FCFA.

3.2.8. *Evolution of Populations of Parkia Biglobosa in Time and Space*

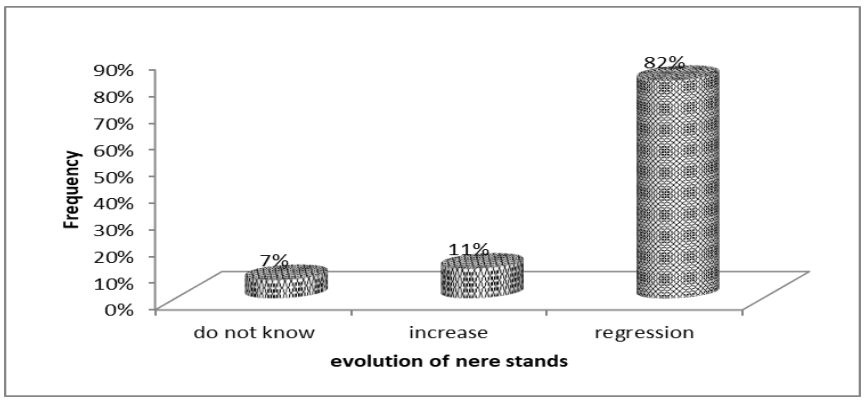

Fig. 9. Current status of Parkia biglobosa stands. (Source: authors)

Fig. 9 reports that 82% of respondents observed a decline of *Parkia biglobosa* in parks. Only 11% of respondents answered the opposite and 7% made no findings.

3.2.9. *Local Management Practices of Parkia Biglobosa's Parks*

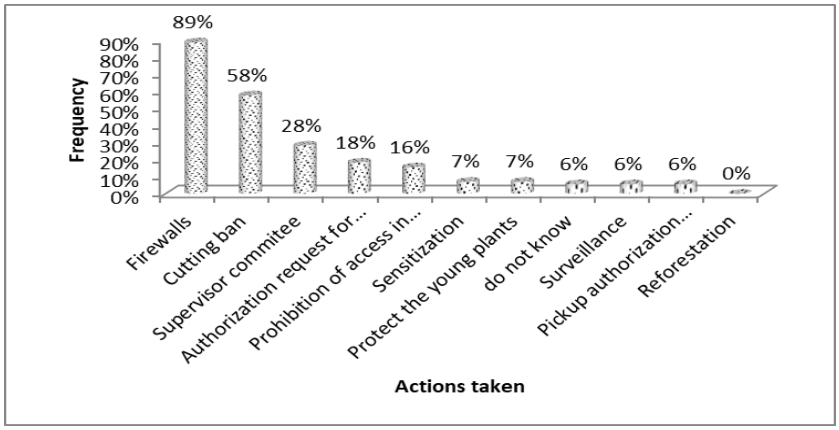

Fig. 10. Local conservation practices of the Parkia biglobosa's park. (Source: authors)

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Fig. 10 illustrates the management practices adopted by the respondents. Respondents cited several *Parkia biglobosa* parks conservation's practices that we have reported in this Fig. This involves awareness-raising, the development of firewalls, committees for monitoring and combating bush fires and the delimitation of operating zones.

3.2.10. *Modes of Regeneration of Parkia Biglobosa's Plants in Parks*

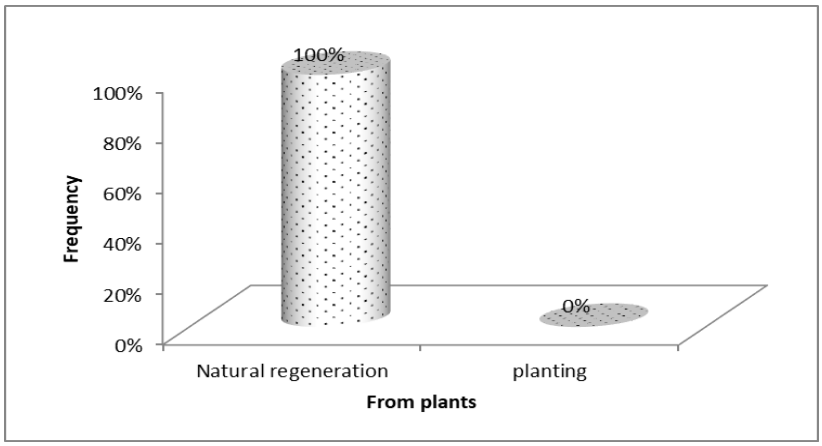

Fig. 11. Regeneration modes of *Parkia biglobosa* (Source: authors)

The results in Fig. 11 show that all the *Parkia biglobosa* are the result of natural regeneration.

3.2.11. *Parkia Biglobosa Parks' Management Constraints*

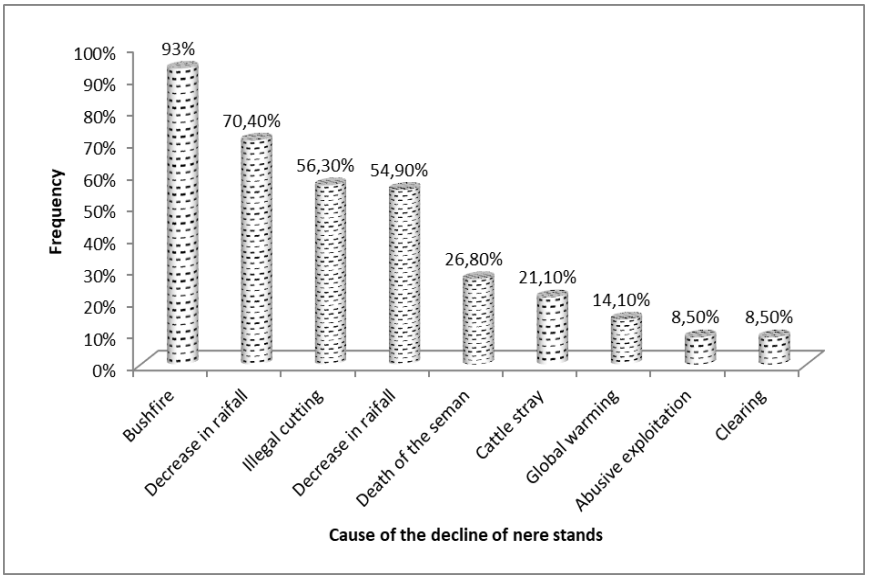

Fig. 12. Constraints linked to the management of Parkia biglobosa's parks (Source: authors)

The causes of the decline in *Parkia biglobosa* parks are shown in Fig. 12. It reveals that bush fires are the major cause, cited by 93% of respondents. In addition to these, there is the decrease of rainfall and regeneration with, respectively, 54.9% and 70.4% of respondents. In addition, other causes are also cited, including illegal cutting with 56.3% of respondents, death of seed growers with 26.8%, cattle straying 21.1%, global warming 14.1%, land clearing and abuse with each 8.5%.

3.2.12. *Number of Plants of Parkia Biglobosa in Fields*

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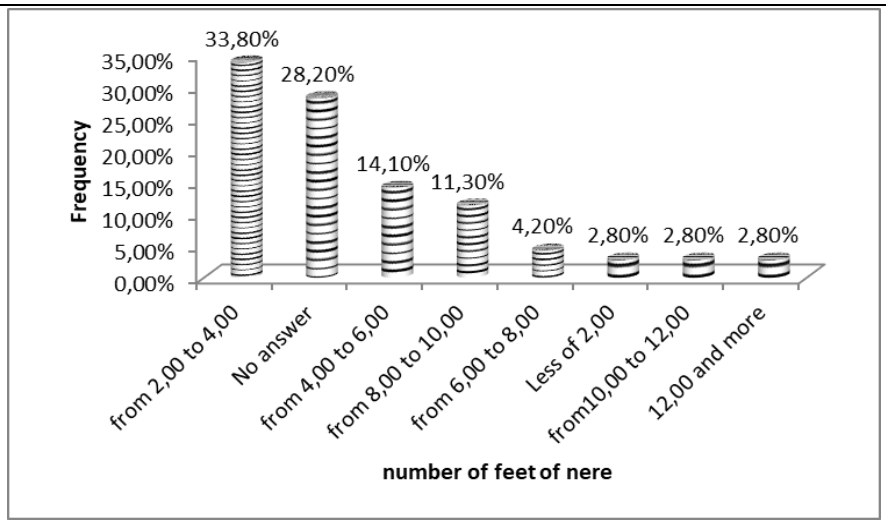

Fig. 13. Number of plants of Parkia biglobosa in the fields (Source: authors).

Fig. 13 illustrates the number of feet of Parkia biglobosa in the fields of each respondent. Thus, 2.8% of respondents have less than 2 born in their fields. 33.8% have between 2 and 4; 14.1% have between 4 and 6; 4.2 count between 6 and 8; 11.3% have between 8 and 10; 2.8% have between 10 and 12 and 2.8%, count 12 or more.

IV. DISCUSSION

Our survey made it possible to estimate and discern the reasons for the exploitation of *Parkia biglobosa* products in the five study villages and to sift through the effects of local management methods on the sustainability of *Parkia biglobosa*). The results obtained on the composition of the predominantly female sample could be explained by the fact that women are the main actors in the exploitation of non-wood products in this area. This is in agreement with the study by Toure (2013), who reports that in Upper Guinea, the exploitation of *Parkia biglobosa* is a task reserved for women. Moreover, the predominance of the 50-65 age group in the sample could be linked to the fact that, in these villages, it is the heads of households (male or female) who were interviewed because they held the most information relating to their household's activities and sources of income. These statements are supported by the work of Goudiaby (2013) according to which, in Bignona, heads of household are the main holders of information on the needs of their household. Regarding the use of *Parkia biglobosa*, the pulp and seeds, are referred to by all respondents as the parts of *Parkia biglobosa* that they prefer to consume and sell. As a food product, they pointed out that the pulp is very easy and quick to prepare, very rich in vitamins, filling and preventing malaria. These results are similar to those of Matig *et al.* (2006) who explains that in Cameroon, the pulp and seeds have a high nutritional value (source of vitamins and proteins). They also join those of Gutierrez and Juhe-Beaulaton (2002) who affirm that afitin is appreciated by consumers. Still, on the commercial level, our results have shown that the pulp and seeds constitute an important source of income and are sold in local, national and even international markets. This correlates with the results of Gutierrez (2002) who mentioned that afitin was marketed even in the large urban centers of Benin, Guinea, Ivory Coast, Chad and Niger. For the wood of *Parkia biglobosa*, we have seen that most of the respondents use it only as a source of energy for cooking because they classify it in the category of bad service wood because of its fragility in the face of cortical insects and bad weather, especially in the winter season. These results are confirmed by those of Matig *et al.* (2006) who deduce that the fragility of this wood is the cause of its non-use

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in carpentry and that it is reserved for cooking meals in Cameroon. The low use of other parts of the *Parkia biglobosa* (leaves, bark, tops, roots and flowers) could be explained by the fact that these parts are reserved for traditional pharmacopoeia and for the protection of crop fields. In addition, the work of Dumas *et al.* (2010) indicated that the *Parkia biglobosa* has several properties ranging from traditional medicine to the protection of fields.

In terms of collection methods and sales period, our results have shown that the *Parkia biglobosa*'s fruits are harvested, from April until the arrival of the first rains, in June-July. However, stopping the picking corresponds to the start of collecting the pods, which aims to remove the *Parkia biglobosa*'s seeds. Selling and processing often takes place throughout the year. These results are in agreement with those of Gutierrez *et al.* (2006) who showed that in Benin picking is seasonal and, selling, permanent. Finally, the removal of bark, roots and leaves is considered by the interviewees as an activity that falls under traditional healers, men or women, and traditional pharmacopoeia. Regarding the origin of products according to agrarian systems, the results of the survey showed that the majority of households using wood report that it is part of the wood collected in agroforestry parks and in community forests. . Indeed, it is obtained from dead trees, felled or from the remains of branches from pruning on old trees deemed unproductive. The results also revealed that the respondents use more of the parks in *Parkia biglobosa* located in the bush fields because the sylvicultural operations carried out there allow a higher yield to be obtained than in other areas such as classified forests which are, moreover, , banned from logging and community forests whose logging requires the approval of the authorities. As an insecticide, among the respondents, failing to obtain industrial phytosanitary products, use the tops and water from the transformation process of *Parkia biglobosa*'s seeds to protect their crop fields against termite attacks. Regarding the management method, all of the respondents confirmed that the stands of *Parkia biglobosa* are the result of natural regeneration. They justified their answer, for the case of the natural regeneration, by the paradigm of local religious belief which says that "it is the Good Lord who is responsible for maintaining the park by the fact that it is He Who Brings the rain and makes the trees grow ". However, even if they come from natural regeneration, some subjects benefit from the assistance of the populations, through the practice of sylvicultural operations and the planning of fruit picking campaigns. More than half of the respondents say that in addition to the ANR that they practice, it is the state programs to fight against bush fires and the repression exercised by forest agents against arsonists, which have helped to perpetuate the agro forestry parks.

Their response may be influenced by the reforestation activities of endangered local species and the creation of monitoring committees in the municipalities. The populations respect the management rules established by the State and the village authorities by raising awareness of the importance of forest species in their environment from an economic, social and medical point of view. Similar results were obtained from Dumas *et al.* (2010) who explain that the preservation of *Parkia biglobosa* by populations is due to the fact that it provides them with a multitude of goods and services. The income from the exploitation of its products is used to meet the children's needs for school supplies, health care in case of illness and for daily expenses. The fact is that exploitation and processing are much more important in the Mandingo who make large quantities of it. This is because the needs in these households are very high and they live in very large households with no other source of income apart from agriculture. These diagnoses correlate with the results of Tapsoba (2018) who reports that poverty is one of the factors that encourage the population to exploit NTFPs in Burkina Faso. These observations, supplemented by the answers of the surveyed about the local conservation practices of the species, lead us to say that the

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integration of *Parkia biglobosa* in the agrarian landscape is not only a deliberate will of the peasant owners land tenure, but also from an experience which seems to have been acquired after several years of tree conservation practices. Similar results were held by Lamien *et al.* (2011) who explain that despite the fact that the *Parkia biglobosa* are not planted by the populations they receive assistance from the latter in sub-Saharan Africa. Anthropogenic actions, bush fires are cited by most of the respondents, some report that the repetitive bush fires recorded during years of rainfall deficit, overexploitation of resources, clandestine abusive cutting of tree parks and the straying of livestock causes a lot of damage and prevents natural regeneration in the forest, these ecosystems. Similar results were held by Avana-Tientcheu *et al.* (2019) who underlines that bush fires and overexploitation of resources are the causes of population regression in Chad. Natural disasters are cited by all the individuals interviewed, who believe that the decrease in rainfall, global warming, the wind cause the death of trees in natural forests on both land and mudflats. These results are in line with those of Dotchamou *et al.* (2016) which revealed that climatic deteriorations are responsible for the upheaval of the *Parkia biglobosa* parks in Benin. In addition to natural disasters, aging is cited by respondents who believe that most trees are old. These trees, which we have had the opportunity to see, are threatened with extinction, as no artificial regeneration has been noted on the spot. These results agree with the comments of Matig *et al.* (2002) who say that the aging of species constitutes a constraint to the sustainability of the species in Cameroon.

V. CONCLUSION

At the end of this study of the characteristics of the exploitation and the local management of *Parkia biglobosa* in six villages of the region of Kolda, in Senegal, it was found that this woody tree is a multifunctional tree. In this area, the exploitation of *Parkia biglobosa*'s products is more the responsibility of women. This tree plays a fundamental role in meeting the basic needs of local households. Summarizing all the information collected, it can be said that it is mainly non-wood forest products that are collected in the *Parkia biglobosa* parks. Their exploitation is intended not only for own consumption, but also for marketing. The income derived from them makes it possible to partially cover the budget deficits of the players in the sector. The positive correlation between the benefits of the exploitation of non-timber forest products and the improvement of the socio-economic conditions of the population has inspired the Water and Forestry agents to carry out a participatory management plan. However, artificial regeneration is absent and this is due to the paradigms of local religious belief. The carbonization of the forest and the overexploitation of the products are the main constraints for the sustainable management of this woody species. These various results, drawn from a diagnosis made on the current organization of the exploitation of this agro-forestry plant, have led to some recommendations. Indeed, a sustainable exploitation of *Parkia biglobosa* cannot be done with a limited resource. Therefore, in the area of local elected officials, the adoption of the initiative to create industrial plantations would ensure the sustainability of the resource. Also, the creation of community parks created by the communities is a way to explore to establish a system of protection and sustainable management. In addition, compliance with standards and traceability (quality certification and fair trade) would increase the added value derived from products from *Parkia biglobosa*. Finally, the value chain approach based on the analysis and development of local markets should be adopted by state decision-makers to allow, using market information systems, to instruct the agent-producer on benchmarks. Credible related to quality standards and technology used in the manufacturing process.

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