

## ***Parkia biglobosa* (Jacq) R.Br.ex G.Don and *Prosopis africana* (Guill. & Perr.) Taub. as a panacea for poverty reduction – case of Makurdi local government area**

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### **Abstract**

*Poverty is on the increase in the country. It is a grave social problem; one of the millennial goals that Man is earnestly fighting. This study examines the contribution of *Parkia biglobosa* and *Prosopis africana* to poverty reduction. Applying a multistage sampling technique, 120 respondents were randomly selected from the area and interviewed. Focus Group Discussions (FGDs) were also held on appointed dates to elicit the peoples' collective assessment of the role of these species in poverty reduction. The socio-economic variables were assessed using simple descriptive statistics while Net Incomes, Gross Ratio and Rate of Return on Investment were used in evaluating financial benefits. *Prosopis africana* and *Parkia biglobosa* contributed to poverty reduction through: the provision of basic socio-economic benefits; income generation sources, employment opportunities, medicinal services, environmental protection services, and household energy among others. The weekly net income values showed that both producers and traders are living above the World Bank poverty line of ₦47560/year, equivalent to \$570/year. Financially, *Prosopis africana* products that had higher rate of return on investment were adjudged more beneficial in poverty reduction than *Parkia biglobosa*. For the sustenance of these benefits, intensified establishment of the species in plantations and improved pricing policies were recommended.*

**Key words:** Poverty, *Parkia biglobosa* and *Prosopis africana*, Poverty reduction, Socio-economic Benefits

### **Introduction**

Poverty is a pandemic. It is a multidimensional phenomenon that affects the socio-cultural, political, and economic wellbeing of the people. In the view of World Bank (2001), poverty is a pronounced deprivation of wellbeing. It can be related to lack of materials and income, low level of education and health, vulnerability and exposure to risk, lack of opportunity to be heard and powerlessness. Mafimisebi (2002) identified three forms of poverty namely: physiological deprivation, social deprivation and human freedom deprivation. The net effect of these forms of poverty on the society is indeed grave as it affects wide spectra of human endeavours.

Scholars (Mafimisebi, 2002; Popoola, 2002; Aigbokhan, 2000; FOS, 1999 and Olaniran, 2002) have shown that poverty in Nigeria exhibits geographical and occupational differentials in its incidence, depth and severity. Considering the above and the basic requirements of life like adequate food and health, income and

education; poverty is mainly prevalent in the countryside among the informal sector. The intractability of poverty in this area is passionately vicious. Much outside help is therefore needed to wade it off. The federal and various state governments have expressed concern over the increasing wave of poverty in the country. There has been adoption of many programmes to address this menace. Among these are; employment of the citizenry under the poverty alleviation programme, training of youths through the National Directorate of Employment (NDE), and poverty emancipation through Family Support Programme (FSP). Contrary to expectations, most of these programmes failed. This is because the rural communities, which were the expected beneficiaries of the programmes, were not involved in their planning and execution. Furthermore, the non inclusion of the local resource components in the planning of these programmes did not help matters.

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According to Popoola and Maishanu (1995), Non-Timber Forest Products (NTFPs) have vital contributions to the wellbeing of the rural poor. For instance, they provide income sources and raw materials for cottage industries that have supplied life sustaining strategies in the rural economies. Furthermore, forest foods are essential dietary supplements especially during lean agricultural production periods or in times of emergency. The Nigeria Environmental Study/ Action Team (NEST) (1991), submits that: leaves, fruits, nuts and oils of wild plants have provided food for humans, livestock and wildlife in many parts of the country. Again, most NTFPs are naturally medicinal and their importance is reflected in the global interest in herbal or non-synthetic medicine (FOS, 1997). Most plants either singly or in combination with others have been found potent in the treatment of many ailments: malaria, typhoid, asthma, diabetes, tuberculosis, hypertension and impotence among others. The dependence of the rural poor, who do not have access to the synthetic medicine and modern health care, on nature's pharmacy cannot therefore be exaggerated. In spite of the seemingly lack of standards, their medicine have saved several lives.

Benue State is located in a transitional region, on the southern guinea savannah ecological zone of Nigeria. These therefore explain the reliance of the inhabitants on agriculture and forestry for sustenance, health, wellbeing and enjoyment of life. The people derive food, medicines and industrial products from the wild and domesticated components of plants and animals.

This study seeks to determine the people's socio-economic values and high demand for NTFPs. Particular reference is made to *Parkia biglobosa* and *Prosopis africana* as a means of income earnings, household consumption, medicinal support and other social and economic needs. It is most obvious that, the massive production and processing of these species could be beneficial in poverty reduction and rural transformation.

### Statement of the Problem

Poverty remains the major social problem that man attempts to solve. Efforts to find solutions to the problem of poverty using micro finance have met with the question of how this institution can attain

financial sustainability. Also the inability of people to harness the natural resources around them to improve their living conditions has dismantled their hopes of life rather than build it. There is therefore need to rekindle people's hopes.

In the Nigerian savanna, farmers traditionally maintain mixtures of trees such as *Parkia biglobosa*, *Prosopis africana*, *Vitellaria paradoxa*, and *Adansonia digitata* together with other crops. The system is expected to make full use of the soil improving potentials of trees to rehabilitate degraded areas and also conserve soil resources needed for production. Furthermore it is expected to sustain high yield of wood as well as food from land while satisfying other needs of the population.

This study therefore seeks to explore how *Prosopis africana* and *Parkia biglobosa* have fared in the aforementioned areas and poverty reduction. It evaluates and quantifies the contribution of *Prosopis africana* and *Parkia biglobosa* to poverty reduction in the area. Specifically the study:

- i. identifies the various products from both *Parkia biglobosa* and *Prosopis africana* and their respective uses and benefits in Makurdi local government area.
- ii. determines the level of income generation from *Parkia biglobosa* and *Prosopis africana* products in the study area.

### Methodology

This study was conducted in Makurdi local government area (LGA) of Benue State situated in the northeastern part of the state between Latitude 7° 20' to 8° N and longitude 8° 20' to 9° E. Makurdi experiences a typical tropical climate with two distinct seasons: the Rainy season (April to November) and the Dry season (December to March). Furthermore, it lies within the Southern Guinea Savannah zone and rich in alluvial soils. The common or dominating native tree species are: *Dantella oliveri*, *Prosopis africana*, *Vitex doniana*, *Vitellaria paradoxa*, *Parkia biglobosa* and *Azelia africana*. The presence of these species vis-à-vis the inhabitants that are predominantly farmers prompted the choice of the area for the study. It has 11 council wards namely: Agan, Ankpa / wadata, Baar, Central South Mission, Fiidi, Mbalagh, Market Clerk, Modern Market, North Bank I and II and Wailomayo. The presence of these

council wards made simple the sampling process.

The population for the study comprises mainly the producers, traders and consumers of *Prosopis africana* and *Parkia biglobosa* products. Through a multistage sampling technique a sample size (n) of 120 respondents was drawn and interviewed. Firstly, four out of eleven council wards were purposively selected for the study based on the presence of organized markets. These are markets in which the operations of producers, marketers and consumers of products of the species under study were very common. From these council wards, four of these markets were selected to sample respondents; thirty from each of the market. These was to ensure normal distribution in the selected samples. Primary data for the study was collected with the aid of pre-tested questionnaires, which were administered during focus group discussions (FGDs) and personal interviews between May and September, 2006. Within the same period, market retail prices of products per unit were being collected on weekly basis. These were supplemented with secondary data from journals, books, conference proceedings, ministries and parastatals, as well as other published and unpublished works.

Data analysis was accomplished using simple descriptive statistic such as means, frequency distribution, percentages and tabular presentations. Gross income, Net income and Rate of return on investment were utilized in determining the financial benefits from these species.

## Result and Discussion

### Socio-economic Characteristics of Respondents

The result summarized in Table 1 revealed that the production and marketing of *Parkia biglobosa* and *Prosopis africana* is dominated by females (90%). Since women are home makers, their greater involvement in these activities is a manifestation of their efforts towards sustaining household needs and the larger communities in which they are part. Furthermore, the greater proportion (74.17%) of the respondents that are in the production and marketing of *Parkia biglobosa* and *Prosopis africana* were married, 19.16% widowed, 4.17% separated and 2.5% single. The high proportion of married people in these activities suggest that it is a means of sustained livelihood. The money generated and other benefits from these species will be of help in solving pressing family needs. On education, the result revealed that 66.67% of the respondents had informal education. The remaining 25.83%, 5%, and 2.5% respectively had primary, secondary and tertiary education respectively. This means majority of the respondents did not acquire formal education. In spite of this low level of formal education, the production and marketing of *Parkia biglobosa* and *Prosopis africana* products supplied them with life's self-sustaining means. In essence, these species are capable of securing employment, income, food, good health and raw materials for the informal sector while simultaneously minimizing

**Table 1: Socio-Economic Characteristics of Respondents** n= 120

Socio-economic Variable	Category	Percentage
Sex	Male	10
	Female	90
Marital Status	Single	2.5
	Married	74.17
	Separated	4.17
	Widow	19.16
Educational Level	Non-formal	66.67
	Primary	25.83
	Secondary	5.0
	Tertiary	2.5

the rural-urban drift with its attendant consequences. However, to enhance their abilities and access to useful information in the utilization of these resources, their level of education has to be improved (Frischmuth, 1997).

**Products of *Parkia biglobosa* and *Prosopis africana* in the study area**

The result of the focus group discussion (FGD) and personal interviews (PIs) established that *Prosopis africana* seeds, fuelwood, charcoal, and medicines were extensively available (Table 2). Seeds and medicines from *Parkia biglobosa* were also extensively available. This was the view of most participants. Many participants ascertained the availability of Fuelwood and Mortars/pestles from *Parkia biglobosa* and *Prosopis africana* respectively. Charcoals and mortars/pestle made of *Parkia biglobosa* were sparingly available. This is evident from the survey as only just some participants confirmed the presence of these products. Tannins from both *Parkia biglobosa* and *Prosopis africana* were scarce, and only few

participants established its availability in the area. This means it is not widely utilized in the area. Many reasons could be responsible for this poor utility prominent among which could be poor awareness of its uses.

Again, the categorization of products into; *most essential, very essential, essential* and *important* signifies the relative level of importance of the commodity or product in poverty reduction. This means; seeds, fuelwood, and medicines from these species were the most vital products in poverty reduction in the area. Charcoal from *Prosopis africana* was also most essential. Other scholars (Azeke, 2002 and Attah, 2001) also arrived at similar findings in their respective studies on the importance of forestry in human development. Although the importance of tannins received marginal acceptability, it requires further research attention. Research intensification and creation of more awareness on the importance of these products will appreciate their values and utility.

**Table 2: Index Distribution of Respondents based on Products from the species**

Name of Product	<i>Prosopis Africana</i>	<i>Parkia biglobosa</i>
Seeds	****	****
Fuelwood	****	***
Charcoal	****	**
Medicines	****	****
Mortars/Pestles	***	**
Tannins	*	*

Key: \*\*\*\* represent most participants/most essential  
 \*\*\* represent many participants/ very essential  
 \*\* represent some participants/essential  
 \* represent few participants/important

**Benefits of *Prosopis africana* and *Parkia biglobosa***

The result of the study revealed that every one of the respondents benefited from at least two or more uses of *Prosopis africana* and *Parkia biglobosa* products. These uses

were categorized in to five principal benefits namely: food supply, employment/income generation, medicinal uses, energy supply or fuelwood, and environmental benefits. The distribution of respondents according to these benefits is shown in Table 3.

**Table 3: Benefits Derived from *Parkia biglobosa* and *Prosopis africana*. n=120**

Benefits	<i>Parkia biglobosa</i> (%)	<i>Prosopis africana</i> (%)
Food supply	78.3	80.0
Employment/Income	77.9	72.5
Medicinal uses	80.0	70.8
Energy sources	80.8	47.5
Other benefits	67.5	57.5

**Food supply:** *Parkia biglobosa* and *Prosopis africana* seeds are widely utilized in the area as condiments for human consumption. From this study, 78.3% and 80.0% of the respondents processed and utilized *Parkia biglobosa* and *Prosopis africana* seeds respectively as *Nune* and *Gbaaye*. These are traditional spices or condiments that serve as sweeteners and thickeners in traditional relishes. The research findings by Fagbemi (2002) also corroborate the findings from this study. The study revealed that, *Parkia biglobosa* and *Prosopis africana* seeds are fermented locally for production of spices and condiments, and employed industrially in the production of "Dadawa" and "Maggi". These spices have been reported to contain high nutritional values of minerals, vitamins and oils necessary for sustaining life. According to the need reduction theory propounded by Maslow (1970), physiological needs such as food are fundamental to human functioning and performance. Without satisfying the physiological needs of life, other demands in life cannot be actualized.

Young leaves, shoots and fresh pods from these species are also used in feeding livestock which in themselves are food for Man. Farming implement handles made from these plants also support food production.

**Income and Employment:** Output from this study revealed that 72.5% and 77.9% of the respondents generated a great deal of income from *Prosopis africana* and *Parkia biglobosa* respectively. Income is generated through sales of products: seeds (raw and processed), fuelwood, medicines, mortars/pestles and charcoals. Along the marketing channels, many marketing services like loading and offloading, storage, packaging, and transporting offered employment opportunities and hence income. In the same way, the production of products also offered employment to many of the interviewees in this study. The marketing agents render

services from which they also derive a margin for sustaining life.

The income generated from these activities is in the end utilized in solving other family needs such as sponsoring children in schools and securing their clothing. In this way poverty incidence on the family is reduced.

**Medicinal benefits:** The results of the UNDP sponsored studies in 1997, identified lack of good health as a serious poverty threat in developing countries. Information elicited from Focus Group Discussions (FGDs) and Private Interviews (PIs) in this study revealed that these species have overwhelming medicinal benefits. *Nune* and *Gbaaye* (fermented seed products) are individually mixed with oil in warm water and taken for stomach ache and/or disturbances. Rashes, fire burns and other skin infections are also treated using the barks of these trees. Similarly, the husk is taken in cold water as astringent for diarrhea, while leprosy is prevented by the use of the young flower buds. The roots are used in curing measles and piles. The leaves when soaked in water for seven days and then used on infants hastens their time of starting walking. Finally, the dry outer covering of *Parkia biglobosa* fruits mixed with some of its burnt seeds serve as repellent against biting insects.

For many families who cannot and even those who can afford the cost of western medicines, these traditional and natural medicines from the species have proven effective. Health is wealth, and so the importance of these species in poverty reduction cannot be exaggerated. In all, 70.8% and 80.0% of the respondents for *Prosopis africana* and *Parkia biglobosa* respectively affirmed this assertion.

**Energy sources:** From the study greater proportion (80.8%) of the respondents made use of *Prosopis africana* for household energy supply than *Parkia biglobosa*, which polled only 47.5% of the respondents. This is

because most respondents reported that fuelwood and charcoal made from *Prosopis africana* produces better flames than those from *Parkia biglobosa*, and so are more efficient. They burn slowly and produce strong flames/amber that lasts for a long time once ignited. Fuelwood and charcoal are relatively cheaper than the alternative energy sources like Kerosene stoves and Gas cookers. So, this placed fuelwood at advantage over the substitute energy sources by saving household income expenditures on energy for other needs. All these go far off in reducing household poverty. Silviconsult, 1991 and Amaza, 1999 assert that low level of income among fuelwood consumers make it difficult for the majority of the consumers to afford the cost of fuelwood substitutes. It is the main energy source for the poor.

Again, fuelwood is utilized within the household in the area, for cooking, heating and ironing clothes. Furthermore, it supplies energy in the industrial production of "Burukutu," local liquor, baking bread and other confectionaries, as well as in burnt bricks production. Its supply thus encourage industrial development and diversification of income sources in the study area no matter how little, and hence poverty reduction.

**Other benefits:** Other benefits derived from this species and primarily *Prosopis africana* is in the making of mortars and pestles, hoe and cutlass handles, stools and chair arms and mallets for beating dyed clothes. Furthermore, tobacco pipes are constructed from wood obtained from these species. The barks and twigs are also burnt and the ashes are used in making native soaps (black soda) locally called in Tiv *chahur-mtse*.

Another benefit is in the area of environmental service functions. In the study area, these trees are found scattered on farmlands, and farmers have observed that soils around them are generally fertile. Therefore, they plant food crops around the stands of these species for obvious reason of improving their crop yield. The roots of these trees are known for their ability in fixing Nitrogen to the soil. Also nutrients are added through the debris and leaf falls. In so doing,

the fertility of the soil is enhanced and hence productivity of the crops. According to Okoruwa and Oni (2002) increased crop productivity implies improved household food, security, income and hence purchasing power. Improvement in these parameters or indices is sine-qua-non to improved livelihood, and so, poverty reduction.

In another dimension, these plants or tree species act as buffer against the effects of strong wind or surface run-off, which may cause damage to the crops and the soil. They have high potentials in agroforestry (Popoola and Galaudu, 2000), a veritable land management strategy for improved crop yield and environmental amelioration.

#### **Determination of Income Generation from *Parkia biglobosa* and *Prosopis africana***

*Parkia biglobosa* and *Prosopis africana* have many products; however, only seeds, firewood, and charcoal were utilized in this study for determining net incomes. The choice of these products was based on their more organized market structures than the other products like chair handles, stools, mortars/pestles and medicines.

#### **Income Generation by Producers**

The outcome of the study presented in Table 4 revealed that the greater proportion of respondents is involved in the production of seeds than fuelwood and charcoal. The weekly net incomes (NIs) by producers from *Parkia biglobosa* products were: seeds (₦16380), fuelwood (₦9000), and Charcoal (₦1680). Similarly, producers' NIs from *Prosopis africana* were: ₦18800, ₦17200 and ₦3480 for seeds, fuelwood and charcoal respectively. Per unit valuation of these products revealed that in both species, seeds values in the upwards of ₦8000/bag, fuelwood: ₦3000/pick-up load and charcoal: ₦200/bag.

According to Hauser and Pilgram, 1999 and World Bank, 1990; a person is poor if he is living on an income of \$370/year or \$1.01/day equivalent to ₦47360/year or ₦128/day. Based on this assertion,

**Table 4: Weekly Net Income Generation by Producers of products from *Parkia biglobosa* and *Prosopis africana*.**

Product	Number of traders	Mean qty of sales	Mean Producer Price	Total Gross income (A)	Transport cost/Unit qty	LGA tax/unit qty	L&off cost/unit qty	Labour cost/unit qty	TVC (B)	Net Income (A)-(B)
<b><i>Parkia biglobosa</i></b>										
Seeds (Bags)	94	2	9100	18200	200	350	60	300	1820	16380 (900)
Firewood (Pickup load)	55	3	5600	16800	1500	200	500	400	7800	9000 (115.38)
Charcoal (Bags)	66	8	450	3600	100	50	40	50	1920	1680 (87.5)
<b><i>Prosopis Africana</i></b>										
Seeds (Bags)	94	2	10500	21000	200	450	100	350	2200	18800 (854.55)
Firewood (Pickup load)	80	4	7100	28400	1500	350	500	450	11200	17200 (153.57)
Charcoal (Bags)	87	12	600	7200	100	70	40	100	3720	3480 (93.55)

**Note:** Equivalent weight of 1 bag of *Parkia biglobosa* = 136 Kg  
 Equivalent weight of 1 bag of *Prosopis africana* = 177 Kg  
 Equivalent weight of 1 bag of charcoal = 35 Kg  
 Values in the bracket represent rate of return on investment.  
 L&off = Loading and offloading. TVC represent Total Variable Cost.

the net incomes generated by the producers therefore shows that they are living above poverty line. That notwithstanding, to ensure the sustenance of these benefits, deliberate efforts at the establishment of plantations of *Parkia biglobosa* and *Prosopis africana* on farmlands is recommended. This is against the backdrop of the rickety supply of the products from these species, which are in themselves limited in supply from their natural state.

#### **Income Generation by Traders**

The result on net incomes from both *Parkia biglobosa* and *Prosopis africana* (Table 5) revealed that seeds yielded higher net incomes. This was followed by fuelwood and charcoal last. Relatively, net incomes from *Prosopis africana* products were higher than those of from *Parkia biglobosa*. It was also observed that most respondents had higher propensity for seed trade than fuelwood and charcoal trade. This later outcome could be attributed to the relatively higher returns (net incomes) from seeds than the counterpart fuelwood and charcoal. Fundamentally, the net incomes from these products suggest that respondents are living above poverty line of \$370 per year (World Bank, 1990; Hauser and Pilgram, 1999).

From the foregoing, both producers and traders in the study area were adjudged living above poverty line based on the net income values. However, producers derived higher net incomes from their production activities than the traders. This could be explained. While traders' benefits represent only the marginal values of products as they move from producers to the consumers,

producers' benefits represents the original value of the commodities less production costs. Computation of rate of return to investment suggests that seeds were more economical than fuelwood and charcoals. They yielded higher rates of return on investment and thus hastens the recovery rate of the capital invested. In the same vein, *Prosopis africana* could be more beneficial for poverty reduction than *Parkia biglobosa* based on the same criterion. It could therefore be recommended if choice is to be made in between the two.

#### **Conclusion**

*Parkia biglobosa* and *Prosopis africana* are vital to poverty reduction in this study. The fundamental benefits from these species that led to enhanced livelihoods of the people and hence poverty reduction is numerous. These include; food supply, income and employment, household energy supply, medicinal services, improved soil fertility, environmental protection and raw materials for local crafts and other enterprises. Incomes generated by the people from products of these species showed that they are living above the minimum poverty line set by World Bank and the UNDP. These benefits could be sustained if the establishment of these tree species in plantations is encouraged. Similarly, improved pricing policies and enhanced processing and marketing for value addition will appreciate greatly these benefits.



**Table 5. Weekly Net Income Generation by Traders of products from *Parkia biglobosa* and *Prosopis africana*.**

Products	Number of traders	Mean weekly sales	Unit selling price	Mean Gross income (2x1)=3	Purchase price/unit	Transport cost/unit	Lsoff cost/unit	LGA Tax/unit	Storage cost	Total Variable Cost 1x(4+5+6+7+8)=9	Net Income (3-9)=10
		1	2		4	5	6	7	8		
<b><i>Parkia biglobosa</i></b>											
Seeds	85	3	11000	33000	9100	200	40	350	50	29220	3780
Fuelwood	57	4	7000	28000	4500	1500	500	200	20	26880	1120
Charcoal	65	6	700	4200	350	100	60	50	20	3480	720
<b><i>Prosopis Africana</i></b>											
Seeds	79	2.5	13500	33750	10500	200	500	400	50	29125	4625
Fuelwood	69	5	9100	45500	6100	1500	600	350	30	42900	2600
Charcoal	48	14	900	12600	450	100	100	160	20	11620	980

Note: See Table 5.

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