Assessment of the Socio-Economic Potentials of *Bombax costatum* (Red Flower Silk-CottonTree) in Giwa, Kaduna State, Nigeria

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ABSTRACT

The study was conducted in Giwa Local Government Area of Kaduna State, Nigeria with a focus on the assessment of socio-economic importance of Bombax costatum locally known as Gurjiya. A total of 120 respondents were selected from 8 villages in all the administrative wards of Giwa Local Government using a combination of purposive and random sampling techniques. Data was collected through self-administered questionnaires and analyzed using descriptive statistics, including frequency distribution tables and percentages. The findings revealed that most respondents (84.2%) could identify the tree and 67.5% recognized the economic importance of Bombax costatum. Parts of Bombax costatum used by respondents included the bark (54.2%), flowers (48.3%), and fruit (27.5%) primarily for food, fodder, and herbal medicine. Furthermore, 92.5% of respondents expressed willingness to plant Bombax costatum seedlings on their farms. Parts of the constraints confronting the sustainability of Bombax costatum in the study area include deforestation for fuelwood and charcoal production (2.5), Insecurity (1.75), lack of extension support services (1.5). It was concluded that Bombax costatum has enormous socio-economic potentials, but its sustainability is being threatened in the study area. The study therefore recommended the provision of extension support services to farmers, provision of seedlings of Bombax costatum to farmers for re-afforestation and increased surveillance by forest guards to reduce the level of over-exploitation of the species and ensure its sustainability.

INTRODUCTION

Bombax costatum is a threatened species partly because of its poor regeneration (Ouédraogo *et al.*, 2014), caused by intensive harvesting of flowers for domestic and commercial use as vegetable (Belem *et al*, 2008). Despite increasing endeavors to document the uses and socioeconomic importance of B. costatum and its regeneration potential in Western African countries, the gap of scientific knowledge of the species is still wide is an example, *B. costatum* does not appear either on the list of trees used for food in tropical Africa (Grubben and Denton, 2004), nor in the report on the biodiversity of leafy vegetables (Chweya and Eyzaguire, 1999). In the current context of climate smart agriculture, countries in regions expected to face drastic changes in the climate must explore and identify the best species that will facilitate adaptation of agriculture to climate change (Fandohan *et al.*, 2015).

Despite the socioeconomic benefits of *Bombax costatum* to the people ranging from sources of medicinal herbs to enhancement of household income, the species remains neglected by the people due to lack of proper forest extension services. Also, *Bombax costatum* is of crucial importance to both individuals, government and animals. The product of this species serves as an important industrial raw material that can yield foreign exchange for the country. The main objective of this study is to assess the socio-economic potentials of *Bombax costatum* in Giwa, Kaduna State, Nigeria.

MATERIALS AND METHODS

The Study Area

Giwa Local Government Area of Kaduna State lies between 11.20º and 11.5º North and longitude 7.0º and 7.5º East of the equator (Babajo, *et al*., 2018). It is bounded in the north by Funtua Local Government area in Katsina state, while in the west by Birin Gwari and Igabi Local Government area of Kaduna State as well as Dandume and Sabuwa Local Government in Katsina State. Wet seasons begin between April/May and usually end for five and a half months, and dry season starts November and ends around late march, annual rainfalls vary between 1100 and 1500mm and mean maximum ambient temperature varies from 27º-35º depending on the season (Yakubu and Abbass, 2009).

The people of Giwa Local Government Area are predominantly farmers and farming system in the area is mainly dominated by sole and mixed cropping (Suleiman and Kasimu , 2022).

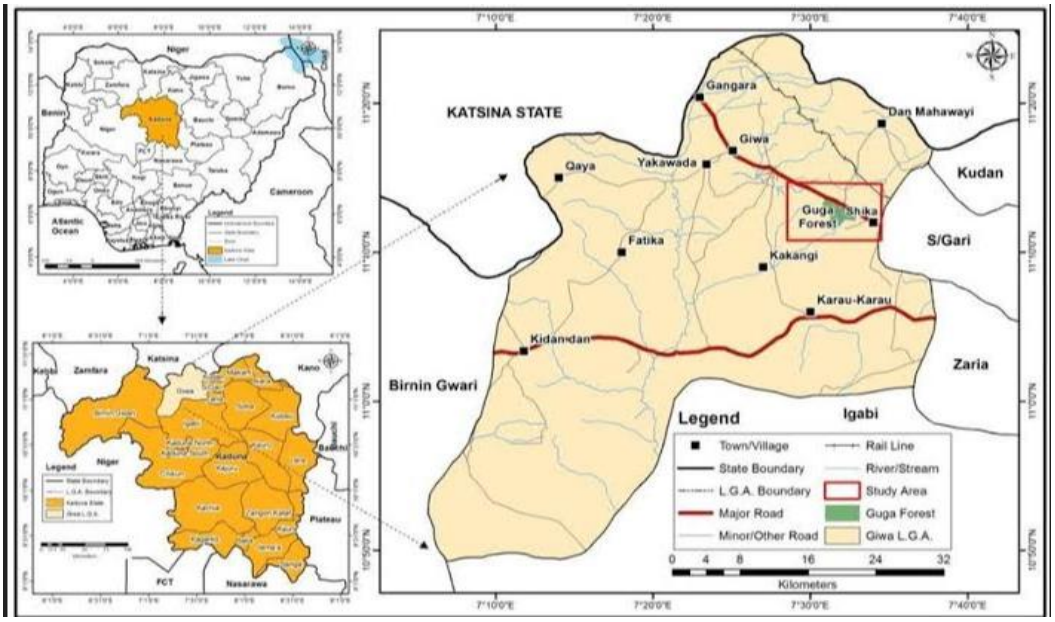


Figure 1: Map of Kaduna State with the surrounding States adapted from the administrative of Kaduna State

Sample Size and Sampling Procedure

Purposive and random selection techniques were employed in the selection of farmers in the study area. Giwa Local Government Area was purposively selected since it is one of the Local Government Area of Kaduna State where *Bombax costatum* is predominantly found in the wild. Eight (8) villages were purposively selected from the existing eight (8) administrative wards in Giwa Local Government where fifteen (15) farmers were randomly selected from each selected village totaling 120 respondents in all.

Data Collection and Analysis

Primary data was collected using self-administered questionnaire. The questionnaire contained two (2) sections which include socio-demographic characteristics of the respondents as well as the section for the identification of *Bombax costatum* and the resultant constraints faced by farmers in the study area. Data was

analysed with the use of descriptive statistics such as frequency distribution tables, percentages, graphs and charts.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Result obtained as shown in table 1 show that majority (76.7%) of the respondent were male while the remaining 23.3% were female. The reason was that more of the male are engaged in farming while the females are engaged more in processing of the product. The distribution of respondents according to their occupation revealed that majority of respondents representing 35.8% were engaged in farming as their primary occupation followed by trading which accounted for 29.2%, 6.7% were students, 13.3% were artisans and 3.3% were civil servants.

The result revealed that 33.3% of the respondents fall within 40-49 years which implies that they are at a middle and economically active phase of their lives that could impact positively on their level of living. Majority of the sampled respondents (76.7%) were married while 15.8% were single and this indicates that married people in the study area are more knowledgeable about the importance of *Bombax costatum.*

Table 1: Socio-economic Characteristics of Respondents

S/N	Variable	Frequency	Percentage
1	Sex Distribution of Respondents		
	Male	92	76.7
	Female	28	23.3
	Total	120	100
2	Marital Status		
	Married	92	76.7
	Single	19	15.8
	Divorced	9	7.5
	Total	120	100
2	Age Distribution		
	< 20	8	6.7
	21-29	16	13.3
	30-39	31	25.8
	40-49	40	33.3
	50-59	17	14.2
	60 and above	8	6.7
	Total	120	100.0
3	Educational Qualification		
	Non Formal	64	53.3
	Adult education	1	8
	Primary education	10	8.3
	Secondary education	27	22.5
	Tertiary education	18	15.0
	Total	120	100.0
4	Occupation of Respondents		
	Civil service	4	3.3
	Trading	35	29.2
	Fishing	14	11.7
	Artisan	16	13.3
	Farming	43	35.8
	Student	8	6.7
	Total	120	100.0
5	Identification of *Bombax costatum*		
	Yes	101	84.2
	No	19	15.8
	Total	+	100.0

Source: Field Study, 2023

Beneficial Parts of *Bombax costatum*

Table 2 indicated the beneficial parts of *Bombax costatum* where majority of the respondents (54.2%) use the bark for traditional medicine, 48.3% make use of the flower as food in soup condiment and as a natural substitute for *Ogbonno (Irvingia wombulu)*, 27.5% use the fruit, 8.3% use the leaves while 7.5% use the root.

Table 2: Beneficial Parts of *Bombax costatum*

Parts of Bombax costatum	Frequency	Percentage
Flower	58	48.3
Leaves	10	8.3
Bark	65	54.2
Fruit	33	27.5
Root	9	7.5
Total	175	145.8

Source: Field Study (2023) ***Multiple responses

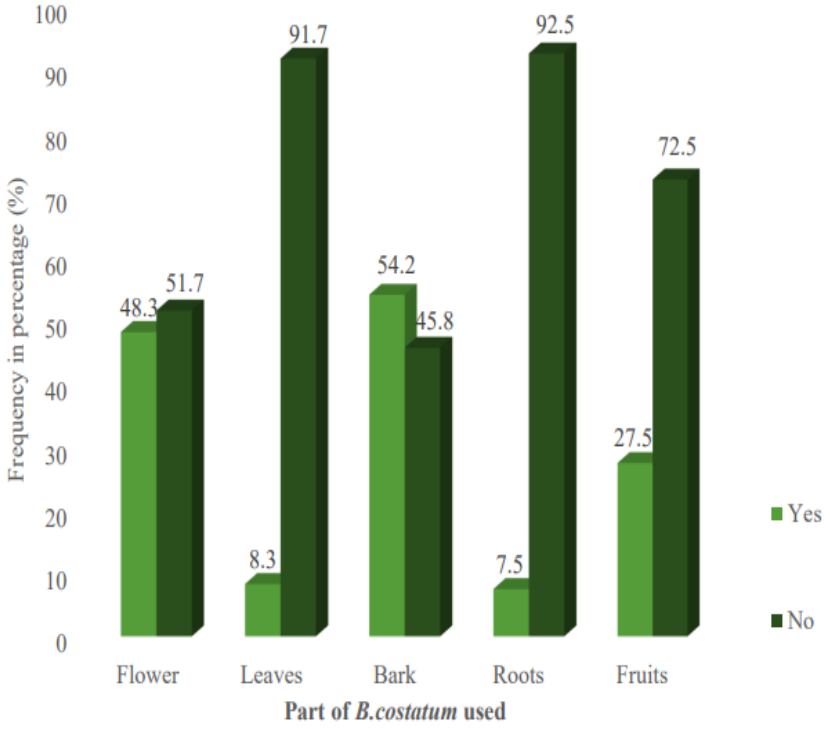


Figure 2: Beneficial Parts of *Bombax costatum* used in the Study Area

Constraints to the Sustainability of *Bombax costatum* in the Study Area

As indicated in Table 3, the constraints encountered in the sustainability of *B.costatum* by the respondents in the study area include deforestation for fuelwood and charcoal production which 63.3% of the respondents ranked as very severe, 35.8% severe while 8% indicate less severe. On insecurity which makes it difficult for farmers to propagate the tree species, 60% of the respondents ranked it as very severe while 40% indicated it severe. For lack of extension support services, 41.7% of the respondents ranked it as severe, 57.5% very severe while 8% indicate less severe. Overexploitation of the tree's useful parts, lack of adequate information on the tree's usefulness and cultural inclinations about the tree species are all other identified constraints identified and ranked by the respondents in the study area as factors militating against the sustainability of this very important tree species.

Table 3: Distribution of respondents according to constraints faced as regards to the tree's sustainability in the Study area.

S/N	Constraints	Very Severe (%)	Severe (%)	Less Severe (%)	Not Severe (%)	Rank
1	Deforestation for fuelwood and charcoal production	63.3	35.8	8	-	1st
2	Insecurity	60.0	40.0	-	-	2nd
3	Lack of extension support services	57.5	41.7	8	-	3rd
4	Over-exploitation	47.5	50.8	8	8	4th
5	Lack of adequate information on the usefulness of the tree	19.2	73.3	7.5	-	5th
6	Cultural inclination as regards the tree	-	8	40.0	59.2	6th

Source: Field Study, 2023

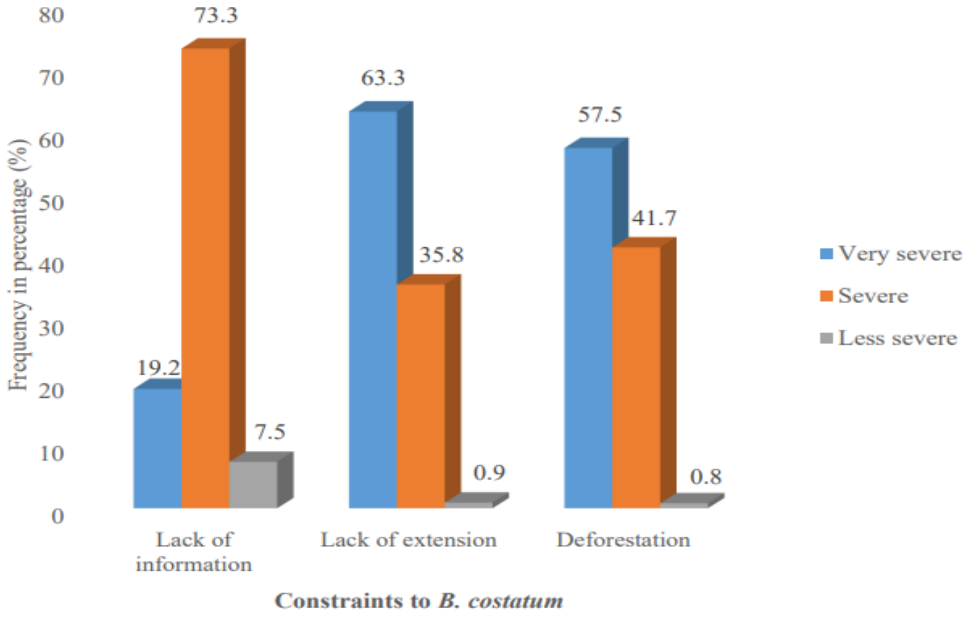


Figure 3: Constraints to the sustainability of *Bombax costatum* in the study area

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The study concluded that *Bombax costatum* is an indigenous tree species predominantly found in the wild within the study area. It also revealed that majority of the respondents are farmers and are aware of the multipurpose socio-economic uses of the tree for medicine, food, shelter, fuel wood and so on. Despite the current state of insecurity in some parts of the study area, the farmers showed willingness to learn more about the tree as well as in its conservation if only the State and Local Government authorities can assist through the provision of extension services, curtailing the species exploitation for fuel wood and charcoal production.

Recommendations

i. Provision of Extension support services: Government should prioritize the provision of extension support services to farmers to provide them with adequate knowledge and relevant information on *Bombax costatum*.

ii. Increased surveillance: Forest Guards should be encouraged to safeguard *Bombax costatum* to improve their sustainability in the study area.

iii. Provision of seedlings: Farmers in the study area should be provided with seedlings of *Bombax costatum* to encourage re-afforestation and sustainability of the species.

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