

Analysis of Forest Based Mortar and Pestle Marketing in Oyo State, Nigeria

Abstract

The emerging high level technology is a threat to small scale retail livelihood business in Nigeria. Wood carving business particularly mortar and pestle production and marketing is an important component of local household economy and culture of many tribes especially in southwest Nigeria. This study analyzed marketing of mortar and pestle in Oyo state, Nigeria. Primary data were collected through administration of questionnaire using snowballing techniques to select 37 traders who involved in marketing of mortar and pestle in five major markets in Ibadan metropolis. Data were analysed using descriptive statistics to describe socio-demographic characteristic of the respondents. Marketing margin analysis was used to determine the profitability in mortar and pestle among the traders. The results revealed that majority of the respondents in mortar and pestle marketing were male (90.3) with more than three-quarter having primary education. The respondents are in their active and middle age with average age of 38 years. The estimated monthly return on the marketing of mortar and pestle was ₦19,000. that *Vitellaria paradoxa* was ranked first among the tree species used in mortar production while *Irvingia gabonensis* is was ranked last. The average price of *Vitellaria paradoxa* was the while highest while *Pterocarpus soyauxii* was the cheapest for all the types of mortar and pestle in terms of size. Majority (90.32%) of the respondents prefer to consider the species during marketing of mortar and pestle. The study therefore recommends effort should be made towards the establishment of tree plantation and sustainable forest management to ensure continuous availability of wood species for mortar and pestle business enterprise

Keywords: Motar, Pestle, Marketing, Snowballing

28

29 **Introduction**

30 Forest products are important for socio economic development of any nation and serve as a
31 major source of income in many developing countries. These are materials derived from forestry
32 for direct consumption or commercial use, such as lumber, paper, or forage for livestock. Wood
33 by far is the dominant product of forests which is used for many purposes, such as wood fuel
34 (e.g. in form of firewood or charcoal) or the finished structural materials used for the
35 construction of buildings, or as a raw material in the form of wood pulp that is used in the
36 production of paper (Belcher, 2005; Fuwape, 2000). Based on usage, forest products can be
37 divided into several categories: Timber, Non timber and minor minerals (Oriabure *et al.*, 2017).

38 Many household implements including furniture, tools, cooking equipment and utensils are
39 produced from forest materials. Mortar and pestle is one of such products.

40 Mortar is a cylindrical bowl shaped wood with a hollowed-outer interior, cut out of the stem
41 used for pounding and grinding of food substances such as yam, cocoyam, cassava, fresh herbs,
42 dried herbs, spices, etc. while a pestle is a club-shaped 2–3 meters long tree stem with 3–6
43 centimeters diameter used together with a mortar to crush, mash or grind materials.(Njoh *et al*,
44 2014), Mortar and pestle are made from tree stumps and logging waste after harvesting of timber
45 from natural forests, farms and the surrounding villages(Larinde and Aiyeloja 2015). They are
46 made in different shapes and sizes.Mortar and pestle making are part of wood carving that serve
47 as an important economic activity, that provides full and part time employment for both local and
48 urban dwellers in Nigeria (Aiyeloja, 2007; Kozak, 2007). And it also helps in locking-up of
49 carbon thereby mitigating climate change. Some of the variety of tree species use for making
50 wooden mortar and pestle are *Nauclea diderrichii*, *Melicia excelsa*, *Terminalia ivorensis*,

51 *Vitellaria paradoxa*, *Azelia Africana*, *Pterocarpus soyauxii* and *Irvingia spp* (Ndah 2013). In
52 most African countries mortar and pestle have been considered as a major wooden cookware
53 both in rural and urban communities; for instance in Cameroon, it is used in the pounding of
54 millets and maize, dried cassava to cassava flour, *Gnetum africanum*, *Colocosia sp* “Achu” and
55 pounding cassava “water fufu” (Njoh *et al*, 2014), in Ghana carbohydrate-rich foods such as
56 maize, cassava, yams, cocoyam and plantains are processed for considerable duration via
57 repeated kneading and/or pounding with Mortar and Pestle (Mensah *et al*, 2012) while in
58 Nigeria it is used to prepare rich cultural food such as pounded yam. Despite the invention of
59 modern machine meant to replace mortar and pestle a traditional kitchen utensil, most consumers
60 of pounded yam still prefer the one made from wooden mortar and pestle. This shows that wood
61 carving is a potential business to local artisans in Nigeria. Thus, efforts must be made to keep
62 these people in business for their socio economic sustenance and stability. This study therefore
63 evaluates marketing of mortar and pestle in the study area. Specifically, it described the socio
64 demographic of mortar and pestle marketers, identify the wood species used in mortar and pestle
65 production, estimate the cost and return in mortar and pestle marketing and determine the
66 marketers preference for mortar and pestle in terms of species, size and price.

67

68 **Methodology**

69 **Study Area**

70 The study was conducted in selected markets in Ibadan, Oyo State, Nigeria. It is located in
71 southwestern Nigeria and lies on longitude 7.3775° N and latitude 3.9470° E. There are eleven
72 (11) Local governments in Ibadan metropolitan area consisting of five urban local governments
73 in the city and six semi urban local governments in the less city. The urban local government

74 comprises of Ibadan North, Ibadan North East, Ibadan North West, Ibadan South West, Ibadan
75 South East. The Ibadan semi urban comprises of Akinyele, Egbeda, Ido , Lagelu , Ona Ara, and
76 Oluyole. The city's total area is 1,190 sq mi (3,080 km²).

77

78 **Data collection**

79 **Sampling and Data Collection Procedure**

80 Data used for this study were mainly primary and were obtained from mortar and pestle
81 marketers in the study area. Purposive sampling technique was used to select the respondents
82 from Five Local Government Areas (LGAs) in Ibadan metropolis based on the presence of
83 mortar and pestle marketers. Snow balling technique was used to select a total of thirty-one (31)
84 marketers across five major markets in the study area. These are Bodija, Shasha, Oja-Oba, Oje
85 and Orita-Merin markets

86 **Data Analysis**

87 **Analytical Techniques**

88 The following analytical methods were used

- 89 a. Descriptive statistics such as frequency count and percentages
- 90 b. Marketing margin analysis: This involves the calculation of costs and returns to determine
91 the profitability of mortar and pestle marketing. The formula is specified as follows.

$$92 \quad GI = TR - TVC$$

93 Where;

94 GI = Gross income

95 TR = Total Revenue

96 TVC = Total Variable Cost

97

98 **Results and Discussions**

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100 **Socioeconomic and Demographic Characteristics of the Respondents**

101 The results in Table 1 showed the demographic characteristics of the respondents. It was
102 revealed that most of the respondents (90.3%) were male while (9.7) were female. This shows
103 that males are more involved in the business, this may be due to the fact that it is energy-
104 demanding task requiring physical strength. This support the assertion that wood carving and its
105 sale requires much energy and it is associated with physical stress which most women cannot
106 cope with (Adedokun, 2018). The age of the respondents showed that (64.5%) were between the
107 ages of 31-40years while 3.2% were 50years and above this implies that most of the respondents
108 were in their active age. It is a good indication for enterprenurship development in wood carving
109 and marketing as majority of the people involved are youths. It was further noted that majority of
110 the respondents(87%) were married. The implication of marital status in small scale business is
111 associated with availability of family labour. Larinde and Aiyeloja (2015) in their study on
112 contribution of mortar and pestle production to rural livelihood reported that mortar and pestle
113 production and marketing provides livelihood benefits that can secure a living for households.
114 Majority of the respondents were literate as only 3.2% had no formal education. Educational
115 level is very important as small scale livelihood business because literates will be willing to
116 diversify the income sources to cope with socioeconomic need of household members.

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118 **Table 1: Socio Demographic Characteristics of the Respondents**

Variables	Frequency	Percentage
Gender		
Male	28	90.3
Female	3	9.7

Age		
21-30	2	6.5
31-40	20	64.5
41-50	8	25.8
>50	1	3.2
Marital status		
Single	2	6.5
Married	27	87.0
Divorced	2	6.5
Educational level		
No formal education	1	3.2
Primary education	27	87.1
Secondary education	3	9.7
Mode of business operations		
Mortar and pestle selling only	28	90.3
Mortar/pestle selling and farming	2	6.5
Mortal/pestle production and selling	1	3.2
Total	37	100

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120 **Species used in Production of Mortar and Pestle in the study area**

121 The results in Table 2 showed the tree species used in the production of mortar and pestle in the
122 study area. It was revealed that *Vitellaria paradoxa* was ranked first among the tree species used
123 in mortar production. This was followed by *Milicia excelsa* which was ranked second. While
124 *Terminalia ivorensis* and *Daniella ollivera* was ranked third and fourth among the species used
125 in mortar production. While *Irvingia gabonensis* is less important among the tree species used in
126 mortar production as it was ranked last. The use of shea tree is because it is a utility timber that is
127 hard, strong heavy, durable and resilient. It is also termite resistance. (Orwa et al. 2009). The
128 Wood used in the production of mortar are usually hard wood species that requires extremely
129 hard and durable capability of absorbing the applied force without developing cracks due to the
130 force of impact of the pestle. (Mensah et al. 2012). It also must have low sensitivity to moisture

131 be fungi and insect resistant. The value chains of mortar and pestle are characterized by a limited
 132 number of stages between production, trade, and end use. (Larinde and Aiyeloja, 2015).

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Table 2 Tree Species used in Production of Mortar and Pestle in the study area

S/N	Species	Family	Trade name	Frequency	Percentage	Rank
1	<i>Vitellaria paradoxa</i>	Sapotaceae	Shea butter	31	100.00	1
2	<i>Milicia excelsa</i>	Moraceae	Iroko	25	80.65	2
3	<i>Irvingia gabonensis</i>	Irvingiaceae	Bush mango	7	22.58	6
4	<i>Pterocarpus soyauxii</i>	Fabaceae	Camwood	10	32.26	5
5	<i>Terminalia ivorensis</i>	Combretaceae	Afara	21	67.74	3
6	<i>Daniella ollivera</i>	Caepinaceae	Iya	11	35.48	4

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Cost and returns in mortar and pestle marketing

139 The average gross income as shown in Table 3 revealed that monthly income from the sales of
 140 mortar and pestle is ₦19000 showing that that the business is profitable. The estimated profit
 141 obtained in this study is above the current minimum wage. Essentially, it is important to develop
 142 this local enterprise to enhance household economy. The implication of this also means that
 143 wood curving business is of one the potential livelihood option. (Babalola, 2009). The income
 144 from the marketing is of great importance and support for those engaged in the business. Many
 145 forest based businesses provide substantial employment opportunity and supplementary income.
 146 (FAO, 2009).

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Table 3: Cost and returns in mortar and pestle marketing

Items	Value (₦)
Gross Revenue	105,000
Average Variable Cost	86,000

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153 **Prices of mortar and pestle by the species and sizes**

154 As shown in Table 4, the average prices of Mortar and Pestle produced from *Vitellaria paradoxa*
 155 were ~~₦5000-₦6500~~, ₦2500-4500 and 1500-2500 for big, medium and small sizes respectively.

156 The price obtained for *Milicia excels* were ~~₦4000-5500~~, ₦2000-4000, ₦1500-2500 for big,
 157 medium and small sizes respectively. The price of big, medium and small of the mortar and

158 pestle produced from *Pterocarpus soyauxii* 3100-4500, 2200-3000, and 1500-2000 respectively.

159 This result implied that mortar and pestle made from *Vitellaria paradoxa* is the most expensive
 160 which could be due to durability, numerous socio economic and ecological values. (Ismaila and

161 Abibou, 2002). The mortar and pestle made from *Pterocarpus soyauxii* was the cheapest as
 162 stated by the traders.

163 **Table 4: Prices of Mortar and pestle based on species and sizes**

Species	Sizes	Prices(₦)
<i>Vitellaria paradoxa</i>	Big (>25cm)	5000- 6500
	Medium (18-25cm)	2500-4500
	Small (<18cm)	1500-2500
<i>Milicia excels</i>	Big	4000-5500
	Medium	2000-4000
	Small	1500-2500
<i>Irvingia gabonensis</i>	Big	3500-4000
	Medium	2100-3500
	Small	1200-2000
<i>Pterocarpus soyauxii</i>	Big	3000-3500
	Medium	2000-3000
	Small	1200-1800
<i>Terminalia ivorensis</i>	Big	4500-6000
	Medium	2500-4000
	Small	1800-2500

<i>Daniella oliveri</i>	Big	3100-4500
	Medium	2200-3000
	Small	1500-2000

164 **Note:** Big (>25cm); Medium (18-25cm); Small (<18cm)

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166 **Respondents' preference for mortar and pestle in terms of species size and price**

167 The results in Table 5 showed that the species of mortar and species is the major factor
 168 determining their preference as majority (90.32) stated that the first thing they consider is the
 169 species. About half (48.39) of the respondents consider size of the mortar. Those that prefer the
 170 species and size constitute 33.61% while those that prefer mortar and pestle based on species and
 171 price constitute 17.72%. The results implied that species is the major factor that determine the
 172 demand for mortar and pestle among the traders. Suppliers', manufacturers' and retailers'
 173 preferences for specific wood species for most wooden cookware differed from that of
 174 consumers (end-users) (Mensah *et al.*, 2012).

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176 **Table 5: Distribution of Respondents preference for mortar and pestle**

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Variable	Frequency	Percentage
Species	28	90.32
Size	15	48.39
Price	12	33.61
Species and size	17	17.72
Species and price	12	33.61
Size and price	15	48.39

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179 **Conclusion and Recommendation**

180 The study has revealed that men are actively involved in the selling and that the marketing of
 181 mortar and pestle is a profitable business that provides livelihood benefits that secure living. It
 182 was also revealed that the wood species used in the making of mortar and pestle are of great
 183 value even though they can be made from tree stumps and logging waste after harvesting of
 184 timber from natural forests, farms and the surrounding. Hence it is important not to

185 underestimate the role they play in easing poverty. It is therefore recommended that
186 establishment of tree plantation and sustainable forest management should be encouraged to
187 ensure continuous availability of wood species for mortar and pestle business enterprise.

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190 REFERENCES

- 191 Adedokun, M. O.(2018)Impact and Socio Economic Contribution of Wood Carving in
192 Abeokuta Metropolis, Ogun State, Nigeria. *International Journal of African and*
193 *Asian Studies* www.iiste.orgISSN 2409-6938 An International Peer-reviewed
194 JournalVol.42, 2018.
- 195
- 196 Aiyeloja, A.A. (2007): Potentials of Small Scale Forest-Based Enterprises in Poverty Reduction
197 in South-WestNigeria. Ph.D. Thesis submitted to the Department of Forest Resources
198 Management, University ofIbadan. Ibadan, Nigeria. Pp 216
- 199
- 200 Babalola F. D. (2009): Prospects and Challenges of Production and Marketing of Non-timber
201 Forest Products (NTFPs) by Rural Farmers in Southwest Nigeria. *Academic Journal of*
202 *Plant Sciences* 2 (4): 222-230, 2009 ISSN 1995-8986 © IDOSI Publications, 2009.
- 203
- 204 Belcher, B. M (2005). “Forest products markets, forest and poverty reduction”. *International*
205 *Forestry Review*. 7 (2): 82-89.
- 206
- 207
- 208 FAO, (2009): Special Programme for Food Security. <http://www.fao.org/spfs/en>
- 209
- 210 Fuwape, J.A (2000) . Wood utilization. From cradle to grave. Inaugural lecture delivered at
211 Federal University of Technology, Akure. 1-33pp.
- 212
- 213 Ismaïla, D. and Abibou, G. (2002): Strategies for the Conservation an Improvement of the
214 Shea-butter Tree (*Vitellaria paradoxa* syn.*Butyrospermum parkii*). Workshop by the Food
215 and Agriculture Organization of the United Nations. Held at Centre de Suivi Ecologique.
216 Dakar, Sénégal, 4 - 6 March 2002
- 217
- 218 Kozak, R. (2007). Small and Medium Forest Enterprise: US.A Instruments of Change in the
219 Developing World. Rights and Resources Institute, Washington D C,
- 220
- 221 Larinde, S. L. and Aiyeloja A. A (2015): Contribution of Mortar and Pestle Production to Rural
222 Livelihood in Southwest Nigeria*New York Science Journal* 2015;8(4) (ISSN: 1554-
223 0200).<http://www.sciencepub.net/newyork>.
- 224 Ndah R.N, Chia L.E, Egbe E.A, Bechem E, Yengo T (2013). Spatial distribution and abundance
225 of selected non-timber forest products in the Takamanda National Park, Cameroon,
226 *International Journal of Biodiversity Conservation*. 2013;5(6):378-388.
- 227

- 228 Njoh R N, Eugene L. C, L. C. Fonyikeh- Bomboh and T. Yengo (2014). Population Structure
229 and Regeneration Status of Trees Used in Making Wooden Mortar and Pestle in the
230 Takamanda Rainforest South West Region, Cameroon. *International Journal of Plant
231 & Soil Science* 3(11): 1374-1386, 2014; Article no. IJPSS. 2014.11.001
232
- 233 Mensah J. K, Adei. E, Adei. D and G. O, Ansah. (2012). Assessment of local wood species used
234 for the manufacture of cookware and the perception of chemical benefits and
235 chemical hazards associated with their use in Kumasi, Ghana. *Journal of
236 Ethnobiology and Ethnomedicine* 2012, 8:46
237
- 238 Oriabure, E. D., Andrew, I. M. and Terzungwue, T. E. (2017). Analysis of Wood- Based
239 Enterprise in Gboko Local Government Area of Benue State, Nigeria. *Asian Research
240 Journal of Agriculture* 4(1): 1-10
- 241 Orwa C. A., Mutua, Kindt R., Jamnadass R., S. Anthony. (2009). Agroforestry Database: A tree
242 referenceandselectionguideversion4.0.([http://www.worldagroforestry.org/sites/treesbs/tre
243 edatabases.asp](http://www.worldagroforestry.org/sites/treesbs/treedatabases.asp))
244