



Economic Analysis of Forest-Based Small Scale Enterprises (FB-SSEs) in Herbal Soap Processing in South West, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author EOAO designed the study, wrote the protocol and wrote the first draft of the manuscript. Author EOAO managed the literature searches and analyses of the study performed the spectroscopy analysis. Author MFA managed the experimental process and authors EOAO, AMA, LJO, OFA and RAS identified the species of plant. All authors read and approved the final manuscript.

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ABSTRACT

This study investigated the economic effects of forest-based small-scale enterprises (FB-SSEs) for economic sustainability in southwest Nigeria. With focus on forest-based processing. Multistage sampling technique was adopted to purposively select 502 entrepreneurs from the six states of Southwest Nigeria. A pre-tested and open-ended questionnaire on socio-economic characteristics; Non-timber forest products identification; agricultural waste products and value-addition products (VAPs) were administered and data collected were analysed using descriptive and inferential

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statistics. The results revealed that 51.80% of the respondents were in the productive age group (31-50 years), majority (87.60%) were females, while 84.00% were illiterate the results revealed that twenty-seven tree species from 18 families and agricultural-wastes were used as fuel-wood and/or as ashes production for lye and soap making. Majority (51.80%) of the respondents were in the productive age group (31-50 years), 87.60% were females, and 84.00% of respondents were illiterate with indigenous knowledge of forest based products. All respondents sourced credit from informal sector. Costs and returns to investor were ₦58,571.90 and ₦516,147.00 respectively while rate of return on investment (rori) was 781.22%. Net present value (NPV) of ₦776,774.81 and benefit/cost (b/c) ratio (8.30) at discount factor of 10% confirmed that investment in the enterprise was profitable and economically viable. Economic inefficiency factors like educational level and membership of cooperative group were highly significant ($p < 0.01$). Conclusively, forest-based products have high economic and health potentials but with imperfect markets.

Keywords: Economic potentials; forest-based; agricultural waste; marketing and entrepreneurship.

1. INTRODUCTION

Small-Scale Enterprises (SSEs) may sound small but they actually play a very important role in the overall growth of an economy. The unique feature of labour intensiveness and income generated can characterize small Scale Enterprises. The importance of these industries increase considerably due to the immense income and employment generating potential to local communities while contributing to poverty reduction, national economies, and conservation of biodiversity. The countries that are characterized by acute unemployment problem especially put emphasis on the model of Small Scale Industries.

In spite of the type of forest-based enterprise, any enterprise that start out very small will need to grow in order to remain efficient and relevant as the conditions of operating the enterprise changes. Some of the characteristics that promote competitive operation of small-scale forest-based enterprise activities are as follows:

- Availability of raw materials
- High cost of transportation
- Small markets size
- Subcontracting is more efficient than integrated operations
- Mass production is not possible due to the nature of the forest products

FAO [1] Suggests that to be able to identify viable and competitive FB-SSEs, which have the potential for future growth, the following criteria must be used:

- Demand potential for a particular forest product must be good

- Technology must be available that allows for low production costs
- Labor productivity must be capable of increasing
- Management capabilities must be good
- Raw materials used must be available for the foreseeable future.

In addition to employment, FB-SSEs are important in providing above average income to rural entrepreneurs and their families, transferring skills through informal training; providing alternative sources of medical treatments to rural and urban dwellers, as well as, contributing to the local, national and international markets development [1,2,3].

The most important of the above criteria, and the only one external to the actual enterprise, is the "demand potential" for the particular forest product being gathered, processed or sold. The second most important criterion is the ability to achieve low production costs, which in turn depends on good management.

These advantages improve entrepreneurs' income and health security of the communities, and therefore lead to reduction of pressures on over-exploitation of the agricultural land-based enterprises [4,5,6,7].

1.2 Problem Statement

In spite of the worldwide growing awareness of economic and medicinal benefits of natural resources and herbal-based production, there has been limited study and insufficient knowledge on the economic potential of FB-SSEs in herbal soap production. Furthermore, with much work carried out on production of the

forest and agricultural productions, it is very necessary to pay attention to the marketing systems of products. It has been said that there is no production if there is no market for the produce. With a good marketing strategy and outlook, entrepreneur/farmers can remain in business as long as there is a market for their produces. If there is no coordination between production and marketing, more problems will be encountered.

The future of the sector is still faced with several uncertainties such as resource scarcity, credit unavailability, and lack of modern technology to ensure efficient use of scarce resources. This necessitated the study of economic importance of FB-SSEs to ensure efficient resource-use, marketing efficiency, returns on investment, and increase income distribution to ensure better livelihood status of the rural entrepreneurs. Hence, this study addressed the following research questions:

- (i) Are entrepreneurs not educated enough to market their products?
- (ii) Do FB-SSEs belong to cooperative group to seek for financial support?
- (iii) What are the socio-economic characteristics of the Forest Based- Small Scale Enterprises (FB-SSEs) that influence the production of herbal soap in the study area?
- (iv) What are the costs, returns and profitability level of herbal soap enterprises in study area?
- (v) What kind of tree species and families used for herbal soap processing and fuel wood in the study area?

1.3 Objectives of the Study

The broad objective is to study the socio-economic characteristics associated to Forest-based Small-Scale Enterprises (FB-SSE) in Southwest Nigeria

The specific objectives are to:

- (i) describe the socio-economic characteristics of herbal soap producer in the study area,
- (ii) investigate whether FB-SSEs belong to cooperative group to seek for financial support,
- (iii) analysed costs and returns and profitability of herbal soap enterprise in the study area,
- (iv) identify the different types of tree species and families used for herbal soap processing and fuel wood in the study area

1.4 Scope of Study

The study was carried out in South-western Geopolitical (SWGP) zone of Nigeria. The zone comprised six (6) states namely Ogun, Oyo, Osun, Ondo, Ekiti, and Lagos states. There are one hundred and thirty-seven (137) Local Government Areas (LGAs) in the geopolitical zone. In view of the cluster nature of Forest Based-Small-Scale Enterprises (FB-SSEs) in herbal soap making; size and marketing/logistics problems, sixteen (16) LGAs (representing more than 10%), where forest based products, such as Herbal Soap processing enterprises clusters existed were purposively selected for the study. These represented over 10% of the total number of LGAs in the zone.

2. LITERATURE REVIEW

There are countless natural additives (value-added products) that make forest based products good for natural hygiene, luxurious and adaptable to the human skin and hair. Consequent upon the noted effects of synthetic soap on the human skin and hair, great attention has been shifted globally to the use of natural products from herbal-based materials that are natural for maintenance of good personal hygiene (skin and cloth), healthier body and better for the conservation of the environment and through which farmers or processors can generate additional income. Unfortunately, benefits of PKO and CPHs have not been fully exploited in Nigeria whereas, CPH accounts for about seventy-five percent (75%) of the whole cocoa fruit [8].

2.1 The Concepts of Economic Importance of Forest-based Small-scale processing Enterprises (FB-SSEs)

FB-SSEs are important in providing above average incomes to entrepreneurs and their families, and wage income to employees (even if sometime below the minimum wage level) and avenue transferring entrepreneurship and vocational skills through informal training. SSEs in general contribute to the local and natural economy and sometime to exports. Also, the disadvantaged landless women in particular and other agriculturally disadvantaged groups are well represented among those getting income and employment from FB-SSIs/Es. Technologically simple operations and those that only demand limited skills and low capital.

FB-SSIs/Es are located predominantly in rural areas. Labour input is mainly family-based, that is, household dependence. Small size (Micro or Small-scale). Average employee size ranged from about 2 to 5 workers per enterprise. FB-SSIs/Es types include the following enterprises such as sawmilling/pit sawing; Carpentry/furniture; Wood carving/ bamboo cane processing; Baskets/mats/ hats weaving and Non-utility handcraft goods. However, fire wood and off cut wood (raw material being used in herbal soap making) were not recorded in FAO 1990 report because of the nature of the enterprise activities which includes large-scale sawmills, furniture plants, and so on. Although FB-SSIs/Es were defined in most of the field surveys to encompass all enterprises with up to 50 employees, average employment in practice ranged from about 2 to 4 worker per enterprises. Over fifty percent were one-person, household-based operations, and less than one percent employed 10 workers or more. FB-SSIs/Es have been found to be heavily clustered at the bottom of the scale range and could on average be best classified as “micro” unit with less than 5 workers.

Women traditionally rely on forest products to meet their basic household needs, from fuel wood, to food, to medicine. The gathering and processing of forest products for market is often done in conjunction with other activities. Much of the work can be done in or near their home, allowing them to perform other tasks at the same time, such as caring for children, fetching water, and other routine activities and household chores [9,10,11].

3. MATERIALS AND METHODS

3.1 The Study Area

The study area is South-west Geo-political (SWGP) zone of Nigeria which lies between Latitudes 7°1' and 8°14' and Longitude 2° 45' and 4° 15' and within the tropics along the Gulf of Guinea Atlantic Ocean on the Western coast of Africa. Kwara and Kogi States bound it on the north and Edo and Delta States on the east (Figs. 3.1–3.2). It covers a total land area of 79,795.1 km² with a population of over thirty million. The sampled locations in all the zones have mainly two vegetation, which are forest and derived savannah areas. All the States have samples in one vegetation type (forest) except Oyo State with samples that were in two vegetation namely forest and derived savannah. There are vast forest and games reserves that

are available to the entrepreneurs to source for raw materials for Forest-based production (FBP) in Southwest, Nigeria (Table 3.1).

3.2 Method of Study

3.2.1 Sampling techniques and sampling size

The multi-stage sampling technique was used in selecting the 502 entrepreneurs that participated in the cross-sectional survey adopted for the study. The first stage-involved stratification of Southwest Nigeria into six states based on political divisions- Ogun, Oyo, Osun, Ondo, Ekiti and Lagos States. Each State denotes a stratum. Stratification at the state level made it possible to get enumerators from Agricultural Development Agencies (ADPs). The enumerators understood the various languages and location of the Forest based producers in the study area. The second stage involved purposive sampling of sixteen (16) LGAs based on pre-test survey information. In the third stage, systematic random sampling procedure was employed to select entrepreneurs/respondents from the sampled LGAs. This was determined with Probability Proportionate to Size (PPS) based on the population distribution in the strata. There was random selection of the entrepreneurs from the first K sampling interval by taking the $(i + K)^{th}$, $(i + 2K)^{th}$, $(i + 3K)^{th}$... $(i + nK)^{th}$ respondent/entrepreneur [12]. A kind of purposive selection of entrepreneurs was done at this stage because some entrepreneurs selected by the systematic sampling were non forest based producers or non-herbal products entrepreneurs. These were deliberately replaced with the herbal products entrepreneurs.

Table 3.1. Demographics of states in southwest Nigeria

States	Land area	Population	LGAs/ state
Ekiti	6,353 km ²	2,737,186	16
Lagos	3,475.1 km ²	9,013,534	20
Ogun	16,762 km ²	4,054,272	20
Ondo	15,500 km ²	3,440,000	18
Osun	9,251 km ²	4,137,627	30
Oyo	28,454 km ²	6,617,720	33
Total	79,795.1 km ²	30,000,339	137

Source: Adapted from "C-GIDD (Canback Global Income Distribution Database)" (<http://www.cgidd.com>) Canback Dangel. Retrieved 2008-08-2

3.2.2 Source of data collection

The data for this study were collected from both primary and secondary sources. Multistage

sampling technique was adopted to purposively select 502 entrepreneurs from the six states of southwest Nigeria. A pre-tested and open-ended questionnaire on socio-economic characteristics; identification of non-timber forest products; agricultural waste products and value-addition products (vaps) were administered and data

collected were analysed using descriptive, inferential statistics and budgetary analysis. The questionnaire/interviews were conducted with the assistance of extension officers from Agricultural Development Agencies (ADPs) in the six states who were familiar with the study area and the subject matter.

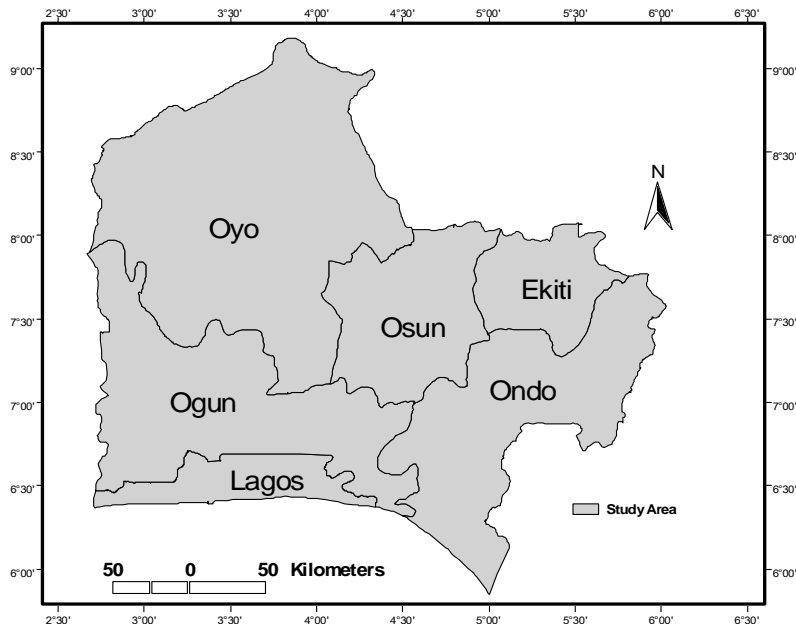


Fig. 3.1. Map of South-West Geo-political zone showing the various states

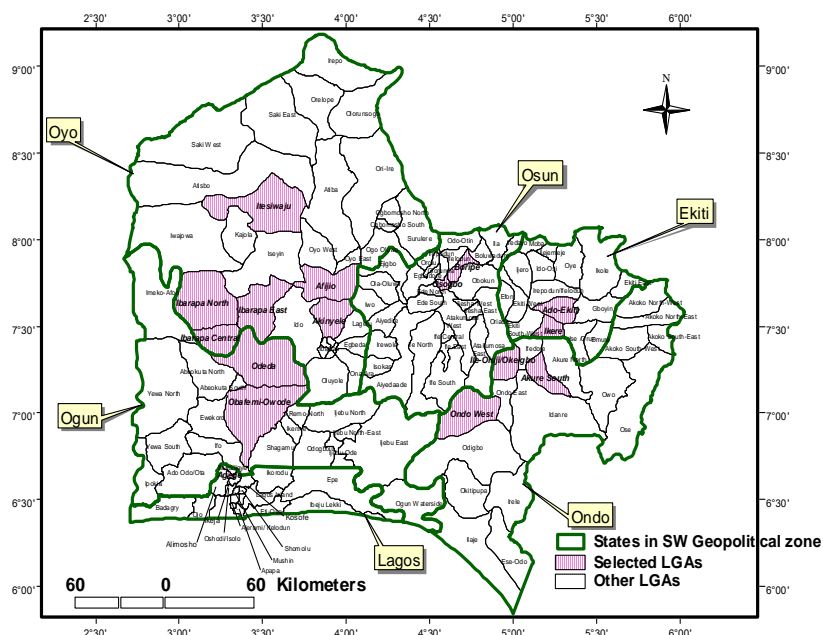


Fig. 3.2. Map of Southwest Geo-political zone showing selected locations within study area

3.3 Limitation of Data Collection

Some forest-based entrepreneurs were unwilling to divulge major information needed, some had no record of sales or past transactions. Much of the information needed was gotten through memory recall on the part of the respondents. The entrepreneurs were together in clusters according to the enterprise engaged in the processing and markets sites, thus making it easy to locate and group the entrepreneurs into enterprises combination. There is no reason to doubt the data collected, however, as the respondents, though, were deficient in record keeping seemed to have high technical and financial in-depth knowledge in their production and marketing information.

4. RESULTS OF THE STUDY

4.1 Descriptive Analysis of Socio-Economic and Demographic Characteristics of FB-SS Entrepreneurs

4.1.1 Distribution of the respondents by gender per state in the study area

Majority of FB Entrepreneurs (FBEs) in the study area are female. From gender analysis, it is clear that the FB-SSEs are female dominated. Out of the 502 respondents purposively selected as herbal soap producer in the six states in south west, Nigeria, 490 were females, representing 87.65% while, the few men (62) in Ekiti and Ondo States represented 12.35 % were involved in ash-burning and marketing enterprise. Women, therefore, can be said to be custodians of indigenous knowledge Forest-based processing and manufacturing (FBPM). The reason why few men are involved in the converting cocoa pod husks (agricultural-wastes) into ash for soap making in Ondo and Ekiti States may be due to lack of information about the economic and health potentials of the enterprise as against leaving the pods as wastes on the farms. This implies that, if awareness is created among the cocoa farmers, they will likely utilize the agro-wastes to generate more income in the cocoa-dominated States (Table 4.1).

4.1.2 Distribution of the respondents by age per state in the study area

Age is a very important parameter used in measuring the productivity of farmers. Young and active entrepreneurs are expected to be more productive than older entrepreneurs. Table 4.2

shows the age distribution of entrepreneurs in the study area. Two hundred and forty two (48.2 per cent) of the 502 respondents in the six States studied were in the 51- 60 years age group, followed by 37.1 per cent of the respondents were in the productive age of 31-40 years. The age group of 41-50 had 14.7% of the respondents. The average age was found to be 53.7year. The 41-50 years age group represents a gap between 31-40 and 51-60 years age groups. The 31-40 year age group is recruitment to the Forest-Based Industry (FBI). This means that the entrepreneurs in their productive age have the required physical strength for FBPM. Therefore, given adequate level of processing and marketing resources, the entrepreneurs are capable of achieving high level of processed forest-based output [13,8]. In all the States, with the exception of Lagos, respondents were more in the 31-40 and 51-60 years age groups than in the 41-50 years age group. This shows recruitment into the Forest-Based enterprise (FBE) as shown in Table 4.2. This should be interesting to policy makers as the FBI seems to attract younger people and that the cultures of Forest-Based production and marketing (FBPM) will go a long way into the decades ahead to create employment for the youth in the rural area.

4.1.3 Distribution of the respondents by marital status per state in the study area

The study revealed that, 338 respondents of the 502 respondents, that is, 67.3% were married. Married dominated the study area. The range was between 54.6% recorded in Oyo state and 100% in Ondo, Ekiti and Lagos states. It was 80.4% in Ogun state and 93.8% in Osun State. The mean for entire study area was 89.5% married status proportion of respondents. 32.7% of the respondents were widow but had families to cater for and therefore (FBPM) is important to the likelihood of the respondents and their families (Table 4.3).

4.1.4 Distribution of the respondents by occupation per state in the study area

As presented in Table 4.4, about 87.65 per-cents of the respondents described FBEs as their major occupation while only 12.35 percent had secondary occupation. This means that the FBI was their main occupation. However, in Ekiti and Ondo States; all the 62 respondents (12.35%) had farming as their major occupation. This result revealed that few entrepreneurs in the State have the knowledge of economic and

health potentials of FBEs and the opportunity to earn extra income by utilizing cocoa pod husks waste on the farm. Hence, there is the need to create awareness on value-added technique of generating wealth from agro-wastes generated along with NTFPs.

4.1.5 Distribution of respondents by annual income per state in the study area

The average annual Income generated from FBE ranged from below ₦100000 to over ₦300,000 with average total income of ₦150000.00 per entrepreneur. Table 4.5 revealed that Ogun State had the highest per cent (1.8%) of respondents in the income bracket below ₦10,000 per annum followed by Oyo and Osun States with 1.8 percent and 1.39 percent respectively. There are no respondents in this income level in Ondo, Ekiti and Lagos states. The highest percentage of respondents in the next income bracket of ₦100,000-199,999 were found in Ekiti State (100%), followed by Ondo and Osun States with 75 percent and 56.2 percent respectively. Lagos State had 51.5 percent and Ogun State with the least 35.7 percent. The highest income bracket of greater than ₦300,000 was only recorded in Ogun and Oyo States with 8.9 per-cent and 2.4 per-cent respectively. These income generations confirmed that FBE could be a very profitable business that can enhance livelihood status of entrepreneurs in rural areas if all the necessary infrastructures and entrepreneurship development trainings are provided and stakeholders intervening in economic development of rural people.

4.2 Distribution of the Respondents by Sources of Credit

The highest source of credit to the respondent was personal savings. Table 4.6 shows the different sources of credit available to the respondents. Informal source of credit are personal savings which form a bulk of major source of funds to all the respondents. 82.23% of the respondents enjoy loans from Family and friends, and cooperative groups form two other important groups of sources of funds. In Oyo State, only nine (9) respondents representing 1.8% respondents have access to formal credit (financial institutions). This groups benefitting from banks were mainly from Awe in Oyo State, and were helped by a Non-Government Organization (NGO) to obtain loans from banks. This figure is very insignificant compare to number of entrepreneurs who did not have access to credit from banks.

It can be deduced that access to adequate credit should become a policy issue to help small-scale producers or entrepreneurs to purchase the raw materials during excess (that is dry season). Also consumption loans and productive loans should be granted at the same time to improve their livelihood status of beneficiaries.

4.3 Distribution of Respondents by Uses of Credit

A prospective and existing entrepreneur usually utilise credit to start a new business or expand existing business. Table 4.7 revealed that 75.89% of the respondents used credit given to them to embark on an entirely new enterprise investment (FBPM) while 23.9% of them used it to finance current enterprise investment (ash burning). Thirdly 29.48% and 32.84% invested in processing equipment and packaging materials (cooking pot, steering sticks, containers) 84.06% of the respondents used part of their credit for purchase of raw materials. While 34.8% used credit for miscellaneous expenses which consist of paying of their children school fees, medical bills and family obligations.

However, all the respondents used part of their credit for family consumption. It is revealed that 71.7% of the respondents used part of their credit to settle debts while 68.32% of them used part of their own credit on social activities like naming ceremonies, burial ceremonies and marriage. The details of the amount used for each of the activities are not given as the entrepreneurs were not able to be so precise. This finding confirmed that credit policy to the entrepreneurs should be packaged to include consumption credit as well as productivity credits. This will go a long way to reduce poverty and enhance the economic status of the entrepreneurs

4.4 Distribution of Respondents by type of Vegetation in the Study Area

The dominant vegetation type in the study area was forest. The study area was classified into three areas, namely forest, derived savanna, and city centre. Table 4.8 revealed that Lagos State represented the city centre with 33 respondents representing 6.6%. The respondent in Ogun, Osun, Ondo, Ekiti and parts of Oyo State were forest-based, representing 81.48% of respondents while 11.95% were Derived Savannah-based.

Table 4.1. Distribution of the respondents by gender per state in the study area

Characteristics	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean	
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335					
	freq	%	Freq	%	freq	%	freq	%	freq	%	freq	%				
Male	30	100.0	0	0.0	0	0.0	32	100	0	0.0	0	0.0	62	12.4		
Female	0	0.0	33	100.0	56	100.0	0	0.0	16	100.0	335	100.0	440	87.6	Female	-
Total	30	100.0	33	100.0	56	100.0	32	100.0	16	100.0	335	100.0	502	100.0		

Source: field survey, 2015

Table 4.2. Distribution of the respondents by age per state in the study area

Characteristics	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean	
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335					
	freq	%	freq	%	freq	%	freq	%	freq	%	freq	%				
31 - 40	13	43.3	17	51.5	14	25.0	11	34.4	6	37.5	125	37.3	186	37.1		
41 - 50	2	6.7	12	36.4	10	17.9	2	6.2	2	12.5	46	13.7	74	14.7	51-60	53.7
51 - 60	15	50.0	4	12.1	32	57.1	19	59.4	8	50.0	164	49.0	242	48.2		
Total	30	100.0	33	100.0	56	100.0	32	100.0	16	100.0	335	100.0	502	100.0		

Source: field survey, 2015

Table 4.3. Distribution of respondents by marital status per state in the study area

Characteristics	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean	
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335					
	Freq	%	Freq	%	freq	%	freq	%	freq	%	freq	%				
Married	30	100.0	33	100.0	45	80.4	32	100.0	15	93.8	183	54.6	338	67.3	Married	89.5
Widowed	0	0.0	0	0.0	11	19.6	0	0.0	1	6.2	152	45.4	164	32.7		
Total	30	100.0	33	100.0	56	100.0	32	100.0	16	100.0	335	100.0	502	100.0		

Source field survey, 2015

Table 4.4. Distribution of respondents by occupation per state in the study area

Characteristics	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335				
Occupation	Freq	%	Freq	%	freq	%	freq	%	freq	%	freq	%	freq	%	
Primary	0	0.0	33	100.0	56	100.0	0	0.0	16	100.0	335	100.0	439	87.45	
Secondary	30	100.0	0	0.0	0	0.0	32	100.0	0	0.0	0	0.0	62	12.35	
Total	30	100.0	33	100.0	56	100.0	32	100.0	16	100.0	335	100.0	502	100.0	

Source field survey, 2015

Table 4.5. Distribution of respondents by annual income

Characteristics	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335				
Annual income (₦)	Freq	%	freq	%	freq	%	freq	%	freq	%	freq	%	freq	%	
<100,000	0	0.0	0	0.0	1	1.9	0	0.0	7	1.39	6	1.8	14	2.50	
100,000-199,999	30	100.0	17	51.5	20	35.7	24	75.0	9	56.2	140	42.8	240	47.90	
200,000-299,999	0	0.0	16	48.5	30	53.6	8	25.0	0	0.0	181	54.0	235	47.00	
≥300,000	0	0.0	0	0.0	5	8.9	0	0.0	0	0.0	8	2.4	13	2.60	
Total	30	100.0	33	100.0	56	100.0	32	100.0	16	100.0	335	100.0	502	100.0	

Source: field survey, 2015

Table 4.6. Distribution of respondents by sources of credit*

Sources of credit	Ekiti n = 30	Lagos n = 33	Ogun n = 56	Ondo n = 32	Osun n = 16	Oyo n = 335	Total n = 502	%	Mode	Mean
Personal savings (P.S.)	30	33	56	32	16	335	502	100	P.S.	
Loans from family and friends	12	20	46	20	10	305	413	82.23		
Association/cooperative groups	20	13	40	10	6	300	389	77.49		
Financial institution (Formal)	-	-	-	-	-	9	9	1.8		

Source: Field Survey, 2009

* Multiple responses

Table 4.7. Distribution of respondents by uses of credit *

Forest-based activities	Ekiti n = 30	Lagos n = 33	Ogun n = 56	Ondo n = 32	Osun n = 16	Oyo n = 335	Total n = 507		Mode	Mean
							freq	%		
New enterprise investment	30	33	30	32	6	250	381	75.89	R.M.	
Current enterprise investment	-	-	20	-	10	100	120	23.9		
Processing equipment	-	-	10	-	3	135	148	29.48		
Packaging materials	-	-	56	-	4	105	165	32.86		
Raw materials (R.M.)	-	-	56	-	16	350	422	84.06		
Debt settlement	-	-	30	-	10	320	360	71.70		
Social activities	-	-	40	-	3	300	343	68.32		
Family consumption	30	33	56	32	16	335	502	100		
Miscellaneous expenses	-	-	20	-	5	150	175	34.86		

Source: Field Survey, 2015 * Multiple responses

Table 4.8. Distribution of respondent by type of vegetation per state in Southwest Nigeria

Characteristics vegetation type	Respondents in six states in Southwest, Nigeria												Total N=502	Mode	Mean
	Ekiti n=30		Lagos n=33		Ogun n=56		Ondo n=32		Osun n=16		Oyo n=335				
	freq	%	Freq	%	freq	%	freq	%	freq	%	freq	%			
Forest area	30	6.00	33	6.60	56	11.20	32	6.38	16	3.12	275	77.9	409	81.48	
Derived savannah	-		-		-		-		-		60		60	11.95	
City centre	-		33		-		-		-		-		33	6.57	
Total	30	6.00	33	6.60	56	11.20	32	6.38	16	3.12	335	77.9	502	100	

Source: Field Survey, 2015

Table 4.9. Cost structure and profitability of FB-SSEs in herbal soap enterprises in study area (Derived Savannah)

Vegetation types	Variable cost (₦)					Fixed cost (₦)								Revenue and profitability (₦)			
	Ash	PKO	Fuel wood	Water	Others	TVC	Cooking pots	Stirring stick	Mud grad	Rolling slab	Filtering pot	Containers	TFC* 20%	TR	GP	NP	RORI %
Forest	15,22	24,85	13,240	987	5	54299	2195	78	291	41	1339	323	4247 (849)	516,147	461,848	460,999	781.22
Derived Savannah	10,500	18,775	8,416	670	4	38361	1570	50	199	20	1030	204	3073 (615)	143,240	104,879	104,675	271.42
City centre	-	-	-	-	35,000	35,000	-	-	-	-	-	3000	3000 (600)	278,500	243,500	242,900	682.30

Source: Field Survey, 2009. *Depreciation Value of TFC is in parenthesis
 Rate of Returns on Investment (RORI) = Total Revenue (TR) - Total Cost (TC) / Total Cost (TC)
 $RORI = \frac{TR - TC}{TC} = \frac{₦516,147.00 - ₦58,571.90}{₦58,571.90} = 781.22\%$
 $TC = ₦58,571.90$

Table 4.10. States of forest plant species used by forest-based small-scale enterprise industries (FB-SSEs)

Family	Species	Yoruba name	Source	Parts used	Uses	State where used
1. Bignoniaceae	<i>Blighia sapida</i>	Isin	Forest, Sawmills	Off cuts, stem, branches	Fuel wood during soap production; Wood ash for lye production	Ogun, Osun, Oyo
2. Bignoniaceae	<i>Cordia millenii</i>	Omo	Forest, Sawmills	Off cuts, stem, branches	Fuel wood during soap production; Wood ash for lye production	Ogun, Osun, Oyo
3. Combretaceae	<i>Anogeissus leiocarap</i> <i>Daniellia oliverii</i>	Ayin, Orin dudu	Savannah, Sawmills	Stem, branches, off cuts	Fuel wood during soap production; Wood ash for lye production	Ogun, Osun, Oyo
4. Combretaceae		Iya	Savannah, and forest re-growth, Sawmills	Off cuts, stem, branches	Fuel wood during soap production; Wood ash for lye production. The lye is traditional prized for the cure of skin diseases. The lye is drunk and bathed with by affected persons.	Ogun, Osun, Oyo
5. Combretaceae	<i>Terminalia avicennioides</i>	Idi	Free areas and savannah woodland, Sawmills	Stem, branches, off cuts.	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo
6. Combretaceae	<i>Terminalia ivorensis</i> <i>Terminalia superba</i>	Idigbo	Forest, Free areas, Sawmills	Branch, off cuts	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo
7. Combretaceae	<i>Lophira alata</i>	Afara	Forest, Free areas, Sawmills	Branch, off cuts	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo

Family	Species	Yoruba name	Source	Parts used	Uses	State where used
8. Ebenaceae	<i>Azelaia africana</i>	Ekki/Paran/Pahan	Forest, and free areas, Sawmills	Stem, branches, off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo
9. Leguminosae: Caesalpinioidea	<i>Brachystegia eurycoma</i>	Apa	Free areas, Derived savanna, Sawmills	Branch, off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo
10. Leguminosae: Caesalpinioidea	<i>Nesogordonia papaverifera</i>	Ekun	Forest, Sawmills	Branch, off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo
11. Leguminosae: Caesalpinioidea	<i>Piptadeniastrum africanum</i>	Oro	Forest, Sawmills	Branch, off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo
12. Leguminosae: Caesalpinioidea	<i>Albizia zygia</i>	Agboin	Forest, Sawmills Free areas, Forest,	Stem, branches Stem, Branches, Off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo Ogun, Osun, Oyo
13. Leguminosae: Caesalpinioidea	<i>Pterocarpus erinaceus</i>	Ayinre/ Ayunre	Sawmills Forest, Free areas, Sawmills	Stem, branches, off cuts	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo
14. Leguminosae: Papilionoidea	<i>Azadirachta indica</i>	Apepe	Free areas	Stem, branches	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo
15. Meliaceae	<i>Khaya ivorensis</i>	Dogonyaro	Free areas, Sawmills	Branches, Off cuts	Fuel wood during soap production; Wood ash for lye production.	Ogun, Osun, Oyo
16. Meliaceae	<i>Milicia excelsa</i>	Oganwo	Free areas, Forest Sawmills	Branches, Off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun
17. Meliaceae	<i>Vitellaria paradoxa</i>	Iroko	Free areas, drier types of forest, Sawmills	Stem, branches, off cuts	Fuel wood during soap production; Wood ash for lye production.	Osun, Oyo
18. Sapotaceae		Emi				

Source: Field survey, 2009 Classification

It can be deduced therefore, that each of the vegetation types was supportive of the FBPM. While herbal soap is not produced in Lagos State, Agege market in Lagos city is a major urban commercial point where herbal soap were marketed in large quantity whether locally produced soap or imported from Ghana or other nations.

4.5 Cost Structure and Profitability of FB-SSEs in herbal soap enterprises in Study Area (Derived Savannah)

Table 4.9 revealed the costs and returns to investor as ₦58,571.90 and ₦516,147.00 respectively while rate of return on investment (rori) was 781.22%. net present value (npv) of ₦776,774.81 and benefit/cost (b/c) ratio (8.30) at discount factor of 10% confirmed that investment in the enterprise was profitable and economically viable.

4.6 Plant Species Exploited and Utilised in Forest-Based Production and Marketing (FBPM)

There were many forest plant species used as fuel wood and ash production by forest-based small-scale FBE. Table 4.9 revealed the utilization of 27 plant species in 18 families in different states by the FB-SSE processing Herbal Soap enterprise in South-West Nigeria. The parts of the plants being used are the off cuts classified as Non-Timber Forest Products (NTFPs) as fuel- wood for cooking, baking in the bakery for lye production and soap making. Saw dusts ashes from saw mill are also utilised by the Forest-based processors in Osun state and part of Oyo state. The ashes collected were used to produce lye for making the herbal soap. The part of the tree used are usually classified as wastes, hence, the utilization of these wastes is desirable to generate more income, thereby improve their income generating activities leading to improvement in the livelihood status of the entrepreneurs involved in herbal soap production.

5. CONCLUSION AND RECOMMENDATION

It is concluded from this study that processing and marketing of herbal soap is highly profitable. The results revealed that 51.80% of the respondents were in the productive age group (31-50 years), majority (87.60%) were females,

while 84.00% were illiterate, the results further revealed that twenty-seven tree species from 18 families and agricultural-wastes were used as fuel-wood and/or as ashes production for lye and soap making. majority (51.80%) of the respondents were in the productive age group (31-50 years), 87.60% were females, and 84.00% of respondents were illiterate with indigenous knowledge of forest based products. all respondents sourced credit from informal sector. costs and returns to investor were ₦58,571.90 and ₦516,147.00 respectively while rate of return on investment (rori) was 781.22%. net present value (npv) of ₦776,774.81 and benefit/cost (b/c) ratio (8.30) at discount factor of 10% confirmed that investment in the enterprise was profitable and economically viable. economic inefficiency factors like educational level and membership of cooperative group were highly significant ($p < 0.01$). conclusively, forest-based products have high economic and health potentials but with imperfect markets. The findings of this study will enable the development of functional policies and strategies to actualize the economic and health potentials of Forest-based Small-scale Enterprises (FB-SSEs).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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