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Women in Processing and Marketing of Non-timber Forest Products: Case Study of Benin City, Nigeria

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Abstract: The study was carried out from 2002 to 2003 to assess the role of women in the processing and marketing of Non-timber Forest Products (NTFP^s) in Benin City. Thirty nine species comprising 32 familiar were identified. The results revealed that there were significant differences among the market channels of NTFP (p<0.05). The observation was multi-channel system of distribution through LSD analysis. The labour employment explained by the results indicated that 57.15 and 42.85% of women were involved in marketing and processing of edible NTFP^s, respectively. The indication results with 't' test analysis showed no significant difference among the consumers' preference of whether the edible products were processed or not. The result of ANOVA analysis revealed that there was significant difference among the time-interval of the shelf life of the processed edible NTFPs (p<0.05). It was observed that the results showed higher average profit for processing (52.59%) than marketing (47.41%) enterprise.

Key words: Non-timber forest products, edible species, multi-channel, consumer behavior

INTRODUCTION

In Africa rural communities women in particular have a rich traditional knowledge and properties of minor forest product (Haq, 2004). They have the necessary knowledge and skill to make good and quality products. Food processing as described by Bridier (1994) enables women to contribute to the family income, fulfill their obligations as daughters, wives and mothers, satisfy their own needs and maintain a degree of autonomy in the family group. This accounts for persistent dominance of women in the processing and marketing of Non-timber Forest Products (NTFPs) especially edible ones. The result is because women have beliefs in nutrition and commercial potential of these resources. Palatability influences the way decision is taken to process the products especially those use as condiments since processing of food items is an extension of women domestic activities.

The economic benefits of these products are considerable. Women and girls generally benefit from these activities. These are activities according to Oakey (2004) for household food security and economic stability. Most of these people as reported by Camera-Rojas *et al.* (2004) depend on selling NTFP^s such as farm produce, fuelwood, honey and vegetables, fruits and medicinal plants. One reason for this gender division may be that many women have limited formal education which restricts

them to small village-based cottage industries. As observed by ECART (1994) African culture also favours male dominance and therefore offers men advantage in terms of contact and access to credit facilities. These enterprises concerning NTFPs as revealed by Bridier (1994) provide income for many people who have no access to wage labour.

NTFPs provide access to food demand by the present lifestyle of the urban population in terms of quality and quantity as well as contribute significantly to the improvement of the standard of the urban markets. A housewife may also maintain control and increase her social status by performing the final steps of food processing herself. Processing is integrated into market operations due to conservative outlook, some of these products remain dominant in spite of the introduction of industrialized products. For instance, NTFPs of spice for pepper soup as condiments dominate Royco, Maggi, Ajino moto etc as this meets the very specific taste requirement and preference of the consumer. Simple precaution may be cost-effective implemented to prevent contamination of food products by water; air borne hazards, insects, animals and human beings.

The employment of women in processing may be seen as lifeline since the economic condition continues to decline. Considerable percentage of Nigerian and other African countries as documented by Maiga and Sandhu

(1994) depend largely on imports to meet food requirements because agricultural sector, in spite of its economic importance cannot provide enough. For this, NTFPs and other aspects of food should be processed and marketed in a large extent by the women so as to meet the needs of the people.

The study focuses on the prices of NTFPs, women employment in the enterprises, channel of marketing, out turn of the business as regard processing and marketing, average shelf life of processed items, consumers' preference levels and assessment of seasonal market variations also deserve some attentions.

MATERIALS AND METHODS

The study took place in Benin City Edo State. The area is located between (5°40"-5°E) and (5°-6°30" N) of total land area of about 1196.96 km² (FORMECU, 1999). There are 12 major markets within the metropolis as well as the outskirts. Among these, seven markets were randomly selected, namely: New Benin, Uwa, Osa, Uselu, Yanga, Agbado and Oliha.

Sampling methods: Forty five students in forest economic class were divided into 7 groups ranging from 4 to 7 students in a group to identify various edible Non-timber forest products. Each group made reconnaissance visit to the market that was within its jurisdiction. In all the locations, similar observation were made indicating that most of the processors and sellers of NTFPs were mostly women, especially those involved in medicinal plants and food materials in the first year of the study. In the subsequent year researchers undertook the administration of questionnaires to the areas previously studied by the students. Then the respondents (women) were randomly selected according to Babbie (1990). Subsequently, questionnaires were administered to the respondents; processors and/or marketers and consumers of the products. The total of 202 questionnaires for the seven markets were utilized in the study area. The number of questionnaires in each market varied according to the sampling intensities (Table 1). The data collection was through the supply of questionnaires. Some reliable information was also obtained by individual contact (personal observation) and group contacts with randomly selected consumers whose views were of great importance in validating the views of the other respondents.

Statistical analysis: The data on the number of people employed in processing and marketing of NTFPs and the consumer preferences were analysed with the use of 't

Table 1: Distribution of women involved in NTFPs enterprises

Markets	NWSN	NWSN	80% SIS	45%SIP
Uselu	15	6	13	5
New Benin	26	16	20	7
Yanga	10	3	8	3
Agbado	17	30	14	14
Oliya	20	41	16	17
Uwa	26	28	21	13
Ekiosa	35	13	28	6
Total	145	137	120	65

NWSN = No. of women selling NTFPs; NWPB = No. of women processing NTFPs; SIS = Sampling intensity of NTFPs Sellers; SIP = Sampling intensity of NTFPs processors

test, while ANOVA were used for data on market channels. Simple percentage was used for data on the profit on the enterprises; processing and marketing of NTFPs and data in average shelf-life of processed food of NTFPs origin.

RESULTS AND DISCUSSION

There are several forest tree species where NTFPs are obtained and subsequently processed and sold in most of the markets on regular basis especially the edible ones, of these 39 species comprising 32 families were identified (Appendix 1) Attention was focused on names of NTFP s, uses, form utilized (processed and/or not processed) and price per given standard measurement. These products contribute significantly both to the improvement of the standard of the rural population and financial strength of urban marketers through poverty alleviation. This corroborates the finding of Bridier (1994) that the enterprise based on NTFPs provide income for many people who have no access to wage labour.

Market channels of NTFPs in the study area: Table 2 indicates the results of ANOVA, which showed significant differences among the market channel of Non-timber forest products. The results were further subject to fisher's Least Significant Differences (LSD) analysis which revealed that there was variation among the means; Retailers, gatherers/farmers and whole sellers. In fact middlemen was not a feature in the marketing exercise because women involved in the enterprise did not depend on the latter. In addition, the consumers obtained the products from other channels outside the middlemen, which was insignificant. The multi-channel helped to expand the sales and market coverage of NTFPs. Thus created opportunities to distribute the products to the varied needs of different customers segments since NTFPs have different uses in various households at different occasions.

The products were readily available from various channels as indicated in the study under review. This

Appendix 1

Botanical name	Family	Common names	Uses	Processed	Not processed	Price standard measurement
<i>Piper guineensis</i>	<i>piperaceae</i>	West African Black pepper-apices Oziza (Bn) Igere (yor) Alligator pepper	Fruits and leaves; stem for coughs. Stomachache, pulverized seed: insecticides		x	N30/milk cup
<i>Afomomum melegueta</i>	<i>Zingiberaceae</i>	Ehinedo (Bn) Atare (Yor)	Decoction of leaves used for small-pox, spice and clearing of throat.	x	x	N5 per small pod.
<i>Monodora myristica</i>	<i>Ammonaceae</i>	(Ohuru (Ibo) African nutmeg Ikposa (Bn) Ariwo (yor)	Seeds are powdered and taken as stimulant for stomachache to relieve constipation. Fruits-edible	x	X	N10 for 4 seeds
<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	Wild mango, Dikanut Aghono (Ibo), Apon (yoz) Ogwu (Bn)	Fruit-edible, Soup ingredient/ leaves of bitter variety-used as worm expeller	x	X	N120 for milk cup
<i>Spondia mombin</i>	<i>Anacardiaceae</i>	Oghegbe (Bn) Iyeye (Yor)	Bark extracts: Treats Athlete's foot. Extracts form bark and leaves: treat cough, sore throats			N5 for 12 fruits
<i>Thaumatococcus danelli</i>	<i>Marantaceae</i>	Ewe (yor). Ibelebele (edo) wrapping leaves	Petioles used in mat making, packaging of food and fish.		X	N10 for 20 pieces of leaves
<i>Milicia excelsa</i>	<i>Moracaea</i>	Iroko	Bark to treat fungal infection		X	N10-20 for about 2x3 cm ²
<i>Xylopiya aethiopica</i>	<i>Ammonaceae</i>	African guinea pepper, Eru(Yor) Unien (Bn) uda (Ibo)	Fruits are ground to paste and used for treatment of boils and skin disease spice and stomach disorder,	X		N10 for bunch of 6 pieces (hands)
<i>Cymbopogon citratus</i>	<i>Poaceae</i>	Lemon grass Kotioba (Yor) Iti (Urhobo)	Decoction of leaves used for rheumatic arches and pains	X	X	N5 for bunch of 10 leaves
<i>Elaeis guineensis</i>	<i>Palmaceae</i>	Udi (Bn) Nkwu, (Ibo) Epo (Yor) Oil Palm/	Oil products of margarine, soap and cooking fats Convulsion, Traditional medicine	x		N10 for 15 nuts.N140 for beer bottle of oil.
<i>Parkia biglobosa</i>	<i>Ammonaceae</i> <i>mimosaceae</i>	African locust bean. Iru (yor) Ogiri (Ibo) Evbaure (Bn)	Young leaves and pods. Vegetables. Fermented seeds used for seasoning	X		N10-20 for 1cm ²
<i>Dimetia tripetala</i>	<i>Ammonaceae</i>	Pepper fruit Ako (Bn) Igberi (yor) Mimi (Ibo).	Used as ingredient for treatment, of fever Fruit- masticated as refreshment.	X	x	N50 for about 15 fruits
<i>Zingiber officinale</i>	<i>Zingiberaceae</i>	Atale (yor) Ginger, jinga (Ibo)	Chew for paralysis of the tongue. Powdered and used for tea-activates the system and reduces malaria fever	X	X	N10 per measure dry.N20 per handful of fresh wt
<i>Alstonia boonei</i>	<i>Apocynaceae</i>	Stool or pattern wood ukhu (Bn) akpi (Ibo)	Dried bark ground used for fever and pain. Ground wood used as tea to treats chronic diarrhea	X		N 10 for 2cm ²
<i>Colocasia esculentum</i>	<i>Aracae</i>	Cocoyam; Isu koko (yor) udu (yor).	Poultice from roots used for snakebite and rheumatism; roots-food.		X	N30-40/tuber
<i>Gangronema latifolium</i>	<i>Asclepiadaceae</i>	Utazi (Ibo) arunje (yor)	Stem twigs chewed for cleansing teeth and sore gums, bark stimulant for indigestion.		X	N20-50 per bunch. N10-50 per measure depending on whether processed or not
<i>Vernonia amygdalina</i>	<i>Compositae</i>	Bitter leaf. Oriwo (Bn) Ewuro (Yor) Onugbu (Ibo)	Extract-leaves in native gin and given to children for measles; juice helps reduce blood sugar, juice rich in iron	X	X	N10 per bunch of leaves.N20 for 10 3 fruits.
<i>Basella alba</i>	<i>Basellaceae</i>	Indian spinach. Amunu tautu (Yor)	Crushed leaves with water added serves as laxative for constipation; leaves-vegetables		X	
<i>Daecryodes edulis</i>	<i>Bumaraceae</i>	African pear Orunry (Bn)	Back soaked in water and ingested; worm expeller paste of bark: parasitic skin disease.	X		N20 /fruit
<i>Logemaria breviflora</i>	<i>Cucurbitaceae</i>	Ube (Ibe) E'tenu (Yor) giri (Yor)	Fruits are distributed round the house they short circuit spread of infections diseases e.g. meningitis, measles etc.	X		
<i>Momor dica-charantia</i>	<i>Cucurbitaceae</i>	Bitter gourd or African cucumber Ejrin (Yor) alo-ose (Ibo)	Use juice of pear or gourd and it clears headaches, caused by indigestion, fatigue and restlessness	x		N20 /6 inches
<i>Cnestis ferruginae</i>	<i>Counaraceae</i>	Oju ologbo (Yor) Ukpe ibieka (Bn), amunketa (Ibo)	Decoction of fruits and seeds in local gin; remedy for snake bit and scorpion. Decoction of seed extract: laxative.		X	N20 for 5seeds N10/bunch of 6-8 branches
<i>Garcinia kola</i>	<i>Gutiferae</i>	Bitter kola, orogbo (Yor) edu (Bn) adi (Ibo)	Seed extract: for hepatitis; crated seed+ honey for unpleasant cough.	X		N5/ branch N10 per measure

Appendix 1: Continue

<i>Occimum gratissimum</i>	Labiatae	Fever plant; efirin (Yor) ebaghogho (Bn)	Decoction of leaves: for stomach upset e.g. Dysentery, for fevers, aches, nail and bronchia catarrh, powdered leaf used as stuff to expel maggots from the nose	X		N 5 per bunch
<i>Phyllanthus amarus</i>	Euphorbiaceae	Coin leaf Iyinolobe (y) Ebe benizo (Bn)	Leaves are chewed raw to eliminate gas. Infuse leaves in water and drink for diabetes.	X	X	N 10 /bunch measure
<i>Tetrapleura tetrapthera</i>	Leguminosae	Aidan tree; Aridan (Yor) Ighirekhin (Ishan)	Wings of fruits removed, pounded in mortar and used for a jaundiced child Fruits extract given to pregnant women to prevent convulsion	X		N5 per fruit
<i>Azadirachta indica</i>	Meliaceae	Neem tree; Dogonyaro (hausa) ekeoyibo (yor)	Boiled leaves is a powerful drink for malaria the seeds used as laxative		X	N5 per fruit
<i>Gambeya albida</i>	Sapotaceae	African star apple, Cherry Agbulumo (yor) Otien (Bn) Udara (Ibo)	Powder from dried bark used in the treatment of bronchitis and chest pains: Fruit edible. Used as tea: good blood purifier, remedy for diabetes, stomach cramps.			N10-20 for 4 fruits depending on the sizes.
<i>Fluerya astance</i>	Urticaceae	Stinging nettle (Ovierieokpo (Urh))	Decoction of leaf, bark and roots: for cough stomach ache and diarrhea and for bad breath		X	N20 per cup of dried leaf.
<i>Vitex doniana</i>	Verbanaceae	Black plum; omta (Yor) oriri (Ishan)	Leaves: expectorant and prophylactic against fever. Leaves have antihistamine properties used to treat kidney and bladder diseases, general fatigue and diarrhea, Fruit, desert	X		N10 / bunch leaves.N10 /12 fruits
<i>Adansonia digitata</i>	Bombaceae	Baobab: Usi (Bn) Oshe (Yor) knka (Hause)	Fruits: treatment of diarrhea dysentery vomiting. Leaf: poultices used for pneumonia, as vegetable.		X	N30/fruit
<i>Anona reticulata</i>	Annonaceae	Sour sop,ako (yor) Ubum -ocha (Ibo)	Fruit edible; Seed production of alcoholic beverages; Wood used as fuel wood for blacksmith	X	X	N10 per bunch of fruits
<i>Dialium guineense</i>	Bombaceae	Velvet tamarind Amugen (Bn) Awin (Yor) Tsanrin (Hausa) Abacha eku (Ibo)	Edible fruits	X		N20-30 /processed seed
<i>Treculia africana</i>	Moraceae	African breadfruit, Ize (Bn) Ukwa (Ibo) Afon (Yor)	Seeds; eaten as main food; flour of seeds; snakes; bark for medicines- tonic	X	X	
<i>Ceiba pentandra</i>	Bombaceae	Silk cotton tree Kapok tree Ikpolulu (Bn) Eso (Yor) Efomru (Ibo)	Leaves/pods; vegetable; ground seeds: soup thickener; seed oil for lubricant, soap making.	X		N20 per bunch
<i>Pennari excelsa</i>	Chryobalen -aceae	Rough plum, Yiurin yiurin(Yor) Esagho (bn)	Macerated root taken for migraines and stomach Infusion of fruit used diarrhea and dysentery.		X	
<i>Pentacletra microphylla</i>	Sapotaceae	Oil bean tree Ukpaha (Edo) Ugba (Ibo) Apari (Yor)	Processed seeds soup thickener, leafy vegetables, bark medicinal preparation.		X	N10 per measure
<i>Terracarpidium conophorum</i>	Euphorbiaceae	African walnut, Asala (Yor) Okhue (Bn) Apumshon (Igarra)	Nuts eaten against snakes. Young shoots and fruits eaten with rice, provides conphor oil used for soup making oil.		X	
<i>Vitellaria paradoxa</i>	Sapotaceae	Sheabutter Osis (Ibo) Ori (Yor) Oriyo (Bn)	Used as oiltment for the body and for wound.			

Table 2: Market channels e NTFPs

Markets	Retailers	Gathers/farmers	Middlemen	Wholesaler
Uselu	4	9	0	2
New Benin	6	10	0	4
Yanga	0	7	0	1
Agbado	1	10	2	2
Oliya	3	9	2	2
Uwa	4	4	3	10
Ekiosa	9	0	0	14
Total	27	47	7	35
Mean	3.86 ^{ab}	7 ^a	1 ^b	5 ^a

Table 3: Labour employment in NTFPs enterprise %

Location/market	Processing	Marketing
Uselu	6.45	6.07
New Benin	4.64	8.93
Yanga	0.89	3.27
Agbado	8.57	4.82
Oliha	11.61	6.07
Uwa	5.00	13.93
Ekiosa	5.71	14.11
Total	42.85	57.15

observation is similar to what Kotler and Armstrong (1996) described that there are many customer segments and channel possibilities in which many producers have adopted multi-channel distribution system; often called hybrid marketing channels.

Labour employment in NTFPs enterprises: The employment of women in marketing and processing indicated the socio-economic roles of NTFPs (Table 3) The results also shows that 57.15 and 42.85% of women were employed for marketing and processing,

Table 4: Consumer preference of NTFPs

Location/market	Processing	Marketing
Uselu	2	11
New Benin	2	11
Yanga	2	12
Agbadu	11	3
Oliya	12	4
Uwa	22	5
Ekiosa	15	7
Total	66	63
Means	9.43	9

Table 5: Average shelf-life of processed NTFPs

Markets	5-8 wks	9-12 wks	13 wks
Uselu	5.74	9.97	8.13
N/Benin	8.13	17.46	12.92
Yanga	8.13	9.97	9.97
Agbadu	8.13	18.44	9.97
Oliya	9.97	19.37	9.97
Uwa	8.13	16.43	15.34
Ekiosa	8.13	21.97	17.46
Total	56.36	113.61	83.76
Mean	8.056 ^b	14.80 ^a	11.97 ^{ab}

NB: The values in Table 6 are the arcsine-transformed values according to Akindele (1990), $F_{cal} = 4.75 F (0.025) = 4.51$

Table 6: Average profit from NTFP's enterprises (%)

Markets	Processing	Marketing
Uselu	4.40	3.91
New Benin	11.00	7.33
Yanga	4.16	4.89
Agbadu	6.11	2.93
Oliya	8.56	2.69
Uwa	11.25	13.68
Ekiosa	7.09	11.96
Total	52.59	47.41

$F_{cal} = 3.57$ and $F (0.05) = 3.01a$

respectively. The variation might be due to the fact that the processing of NTFPs requires more expertise and training than marketing. Essentially, training in the marketing of NTFPs is simple and sometimes requires more orientation. Thus, there are more entrants to the aspect of the enterprise than the latter. The same is applicable to the cost of the factor inputs, which varies from one enterprise to another. Processing of NTFPs requires specific input cost while one can engage in marketing with any amount of money depending on the scale of operation.

Generally, women constitute 50-60% of labour force in agriculture, marketing and processing of food including edible NTFPs (Akinboade, 1992). This agrees with the predominance of women in the processing and marketing of edible NTFPs and in addition, this attests to the fact that forestry and agriculture play the role of custodian of a national fund, more especially, as they employ labour to the point that its marginal product equals to zero. Thus, with minimal rearrangement of resources, forestry and/or agriculture loses its labour force to other sectors; say industries and white-collar jobs. Essentially, a forest labour force policy is known to be passive, because it is

based on excessive supply of labour and seasonal underemployment, which compels large number of them to seek employment elsewhere at a slightest opportunity. This observation is in affirmative with the report by Bridier (1994) which explained that NTFPs enterprises provide income for many people who have no access to wage labour.

Consumers' preference of NTFPs types (processed and not processed forms): The result of 't' test analysis revealed that there was no significant difference between the consumers' preferences as regards processed or not processed NTFPs (Table 4). In other words, it is a sensitive test for consumers of NTFPs as regards their preference of the product types or forms. This is in contrast with the views of Browning (1992) that opined the consumers differ widely in their preference about goods and services. In fact, this is at variance with the view that the principle underlying preferences and taste play significant role in consumption decisions.

The reason could be the problems the economists consider why analysing some general propositions concerning consumer behaviour that are believed to be widely true. These propositions do not explain why people have the exact tastes associated with them. Thus they attempt to identify some common characteristics shared by the preferences of virtually everyone that are subjected. Hence, there is similarity between preferences of the two forms of NTFPs for consumers in the study under review.

Shelf life of processed edible NTFPs: Since edible NTFPs are locally processed, it is imperative that the time element to have a central role in and impact on the decisions of women involved in NTFPs enterprises, the intervals for shelf life is presented in Table 5. It was somewhat difficult to deduce a given time interval for the non-timber forest products considered in the study. In fact, the time element indicated the interval between the dates when the product was processed and the date when products was sold. Any time between these two dates the product might be judged still good for human consumption, that is free from biological and microbial agents that are injurious to the human system.

The results were further subjected to LSD that revealed a significant difference among the mean treatments. The variation in time intervals attests to the fact that shelf life of processed NTFPs ensures availability of the products all year round. Hopes of wider marketing have always been held back by limited shelf life of couple of days (Spore, 2004). This is because the supply of processed NTFPs displays characteristics of perfect

competition where harvesting and processing are done at one's volition without any form of restriction.

Profit from NTFPs enterprises: The basic reason for involvement in an enterprise is to make profit; the women engagement in NTFPs is primarily for profit making purpose (Table 6). It was difficult to evaluate specific profit on a particular Non-timber forest product, since there was variation in their costs and prices among the ranges of products under review. The average profits of the NTFPs deduced from processing and marketing were considered. The results of the study indicated that the average profit obtained from processing was higher (52.59%) than the one obtained from marketing (47.41%). Therefore, it is important for the women to engage in processing of edible NTFPs in order to reap more economic benefit from the enterprise.

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