



# A Survey on Social Economic Status, Fish Processing and Packaging Methods of Female Fish Processors in Ovia North East Local Government Area of Edo State, Nigeria

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## Authors' contributions

This work was carried out in collaboration between both authors. Author KO designed the study and wrote the draft manuscript. Author TE performed the laboratory experiments and statistical analysis under the supervision of author KO. Both authors read and approved the final manuscript.

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## ABSTRACT

The study was aimed at determining the social economic status, fish processing and packaging methods of female fish processors in Ovia North East Local Government Area of Edo State, Nigeria. One hundred and eighty well structured questionnaires were administered to the women fisher folks in three fish processing village (Ekehuan, Ikoro and Gelegele) reported to have fishing activities. The result showed that fish processors in the villages were dominated with married women (66.7%); 55.0% of these women have little formal education while those with no formal education were 26.7%. It was further revealed that 41.7% of the fish processors had been in the business for five to ten years. 90.2% of the women used cutting and staking as a method of processing while all the women agreed that they preserved their fish by re-smoking them. 88.3% had lack of storage facilities as their major problem. The study also revealed that their major source of capital was from their spouse (60.0%), the major fish spp smoked was *Clarias gariepinus* (80.0%), source of water were from river and bore hole while majority packaged their smoked fish in basket with paper (56.7%).

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## 1. INTRODUCTION

The importance of fish production on the tropics in particular and the world at large can never be over emphasized; it is a source of stable food, raw materials for our growing factories and job opportunity for the teeming population [1]. Fish is a low acid food therefore highly susceptible to pathogenic and enzymatic spoilage and it is one of the most perishable of all stable commodities especially in tropical climate regions of the world [2]. In Nigeria, over 80% of fish harvested is preserved by various methods of curing to prolong shelf life and these cured fishery products are highly acceptable by the local consumers [3]. The principal processing methods are smoking, drying, salting, fermentation, roasting, boiling and frying or any combination of these processes [4]. Smoking is a method of preserving fish which combines three effects; preservative value of smoke, drying and cooking [5] Operations involved in smoking of fish are simple and the method has the effect of imparting pleasant flavor to the product besides the preservative effect of the smoke [6]. Although the involvement of women in the fisheries sector has been recognised globally [7], more remains to be done to recognise and understand women's work in the sector [8].

Women play crucial roles in fisheries; their main activities are processing and marketing of fish products [9]. [10] Argues that the non-recognition of women labour for domestic chores is reinforced by the unequal allocation of resources. Thus, the lack of access and control over productive resources is the main factor limiting women participation in economic activities including fish processing thereby hampering the human development process [11].

In the developing world, women living in coastal areas participate in many different ways in the small scale fisheries sectors as fishers, traders, fish farmers and processors [8,12]

In the artisanal fisheries sector, women occupy the post-harvest sector by forming the link between fish capture and consumption, their involvement can be viewed as unloading of fish from fishing canoes when they land, marketing of the catch, processing (fish smoking and drying) and marketing [13]. Despite their involvement in the fishing sector women's operations are often small scale and their incomes are low as

compared to those of their male counterparts and they face various constraints including credit and finance problems, lack of training, inadequate markets and transport problems [14]. Paid and unpaid, their employment contributes to the individual, household and community at many different levels such as for food, income, and in cultural traditions [8]. However the lack of gender disaggregated data on fishers globally has hindered the recognition of the role and "invisible" work of women in the fisheries and fisheries production sector [15].

The aim of this study is to determine the social economic status, fish processing and packaging methods of female fish processors in Ovia North East Local Government Area of Edo State, Nigeria.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

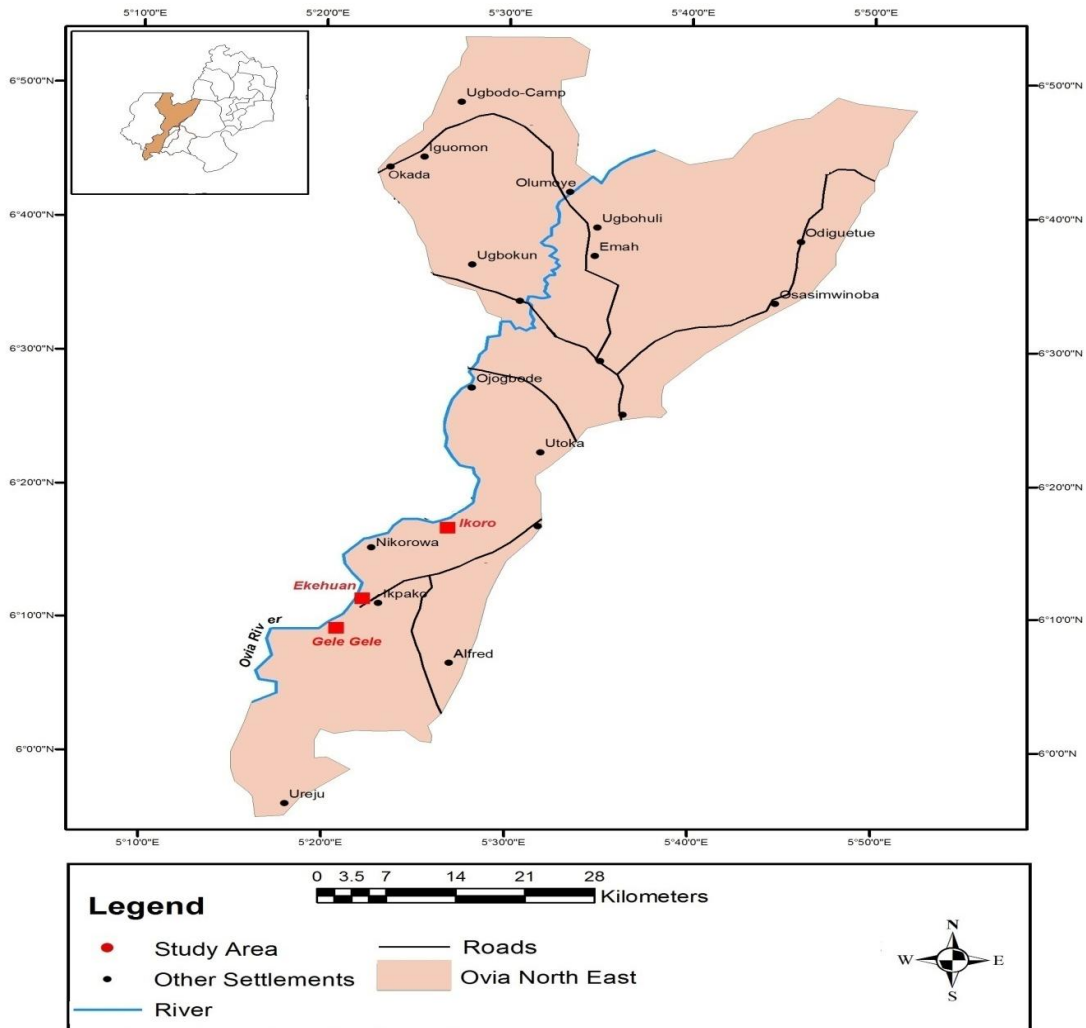
The study was carried out in Ovia North East Local Government Area of Edo State, Nigeria. Edo is an inland state in southern Nigeria. It is bounded in the North and East by Kogi State, in the South by Delta in the West by Ondo and was created August 1991 from the then Bendel State, it has a total Area of 17802 square kilometer.

### 2.2 Size of Sample

A total number of one hundred and eighty (180) questionnaires with 26 questions were administered to the female fish processors in three (3) villages which were Ikoro, Ekehuan and Gelegele communities of the local government area. These questionnaires were used equally among these three communities. A total of sixty (60) questionnaires were used for each of the community surveyed.

### 2.3 Method of Data Collection

A standard questionnaire was prepared containing 26 questions related to the personal data of the respondent, their participation in processing, storage and marketing of fish. About 180 questionnaires were administered to only female fisher folks in the area. The study covered 3 villages in Ovia North - East local government of Edo State. The sampling procedure involve a random selection of respondents from each



**Fig. 1. Map showing the study area**

Source: Ministry of Agriculture and Rural Development, Benin City, 2014

village visited and women were exclusively interviewed both at the landing spot, in their smoking house and also at market square. The samples were used as determinant of the socio – economic status and role of women in processing and marketing activities. Designated fisheries communities where fisheries activities are practiced were visited during d survey.

## 2.4 Data Representation and Analysis

The data was analyzed using statistical package for social science students (SPSS). The data were represented using descriptive statistical analysis. Tables, bar-chart and pie-chart were also used for data representation and analysis.

## 3. RESULTS AND DISCUSSION

The results of the analysis of the questionnaire administered are presented in this chapter.

### 3.1 Socio-economic Status of Respondents

#### 3.1.1 Age distribution of respondents

A total of 180 respondents were interviewed in the 3 villages visited, the age distribution of the respondents showed that majority (55%) 99 respondents falls between the age range of 30-40 years, followed by 30% (54 respondents) within the age range of 40-50 years, 18 respondents (10%) were 50 years and above

while the remaining 9 respondent were within the range of 20-30 years representing 5%. The result confirmed the survey carried out by [16] which revealed that majority of fish processors were 40 years and above. This implies that processing and marketing activities are managed by very active individuals who have both strength and reasonable level of maturity. This is also in line with the findings of [17] who stated that age was an important factor in fisheries activities.

**Table 1. Age distribution of processors**

Age distribution	Frequency	Percentage (%)
20 – 30 years	9	5.0
30 – 40 years	99	55.0
40 – 50 years	54	30.0
Above 50 years	18	10.0

Source: Field survey, 2016

### 3.2 Marital Status

66.7% (120) of the respondents interviewed were married; 27 respondents were widowed representing 15%, the divorced represented as 11.7% (21 respondents) while 12 of them were single representing 6.7%. This result is similar to findings of [18] which revealed that majority of the processors were married. High percentage of married women could be attributed to the fact that their husbands were fishermen and because of their status or responsibilities to shoulder, they had to render assistance to their husbands.

### 3.3 Educational Background

Majority of the respondents 55.0% (99 respondents) in Ovia North East Local

Government Area of Edo State are primary school certificate holders, this was followed by 48 respondents (26.7%) without education and those with secondary education were 33 respondents (18.3%). This result is in agreement with [19] who stated that majority of the processors had primary education. The reason being that most of them married early and do not have the opportunity to go beyond it. The young educated school leavers are more interested in white collar jobs. Also most of the educated ones do not leave in the fishing community. Similar Study carried out by [20] also revealed that majority of women involved in fish processing had primary school education. They stated that education is related to employment and income which influences access to household amenities and facilities including those related to fish hygiene and environmental health.

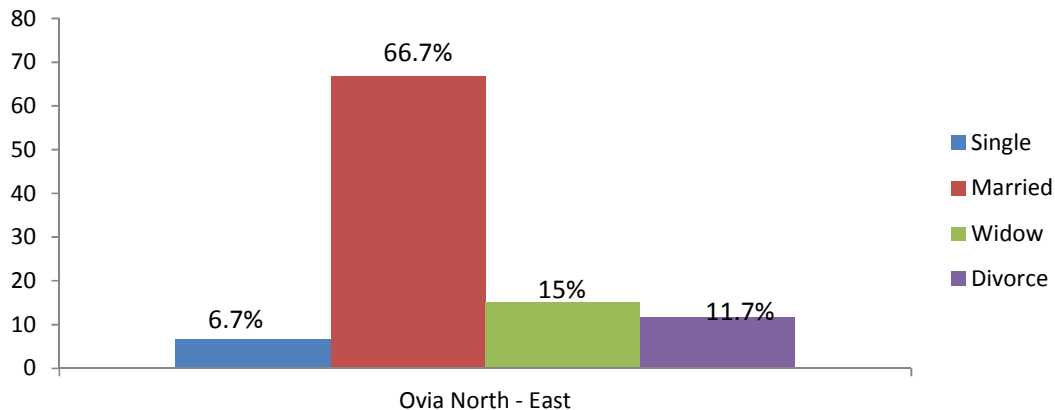
**Table 2. Educational background**

	Frequency	Percentage
None	48	26.7
Primary	99	55.0
Secondary	33	18.3

Source: Field survey, 2016

### 3.4 Occupation

43.3% (78 respondents) of the women were fish processors only; 78 respondents (43.3%) were petty trader while 24 respondents (13.3%) engaged in fish processing and other farming activities. Engagement in other occupations was necessary in order to augment their income especially during the period of low catch and unsteady market prices. It could also be attributed to the fact that fish processing could be conveniently done alongside with other domestic



**Fig. 2. Marital status of respondents**

activities. This result confirms the survey of other authors who categorized processing of fish as female business dominated by economically active ages [21].

### 3.5 Years of Experience in Fish Processing Activities

The results showed that 41.7% (75 respondents) had been in the business for to 5-10yrs, 23.3% (42 respondents) had been in the business for 1-5yrs, 21.7% (39respondent) for 10 to 15yrs and 13.3% (24 respondents) for 5yrs and above. This result is in agreement with findings of [18] which revealed that majority of the fish processors had been in the business for more than 10 years This also confirms the studies of [22] who observed that marketing experience is important in determining the profit level of marketers, the more the experience, the more the marketers understand the marketing system, condition, trends, prices etc.

### 3.6 Methods of Processing Adopted by the Respondents

From the result, 138 respondents (90%) indicated that they do cutting and sticking as a method of processing, while 9 respondents (5.0%) do scaling, gutting and sticking, 6 respondents (3.3 %) did scaling while 3 respondent (1.7%) indicates all of the above. Cutting and sticking is commonly used because it allows heat to penetrate easily and quick removal of water content from fish.

**Table 3. Methods of processing**

Methods of processing	Frequency	Percentage
Cutting and sticking	138	90
Scaling, gutting and sticking	9	5.0
Scaling	6	3.3
All of the above	3	1.7

Source: Field Survey, 2016

### 3.7 Methods of Fish Preservation

All of the respondents(100%) stated that preserve their fish by re- smoking which is similar to report of [23] who revealed that majority of fish processors preserved their smoked fish by re-smoking them. When the products are not sold

immediately they may be re-smoked to further remove moisture and prevent bacteria decomposition and mould growth. This also agreed with the findings of [24] who reported that various food preservation techniques including smoking have been utilized to improve the microbial safety and extend the shelf life of fish in general. Hence up to 70% of the total fish catch in developing countries is preserved by smoking [23].

### 3.8 Problems Faced by Respondents in the Course of Preservation

Majority of the respondents 88.3% (159 respondents) indicated lack of storage facilities; 10.0% (18 respondents) indicated high cost of transportation while 1.7 %( 3respondents) said lack of processing facilities were their major problems they faced respectively. This agrees with the findings of [25] indicating lack of storage facilities as their major problem of preservation.

### 3.9 Fuel for Smoking

All the respondents (100%) indicated that they use firewood as source of energy for smoking. This means that all the processors in the three villages used the same source of energy for smoking. This result is in agreement with [26] who revealed that majority of fish processors used fire wood as their source of energy for smoking. This could be attributed to the abundance of wood and high level of lumber jerking activities in the study area [27]

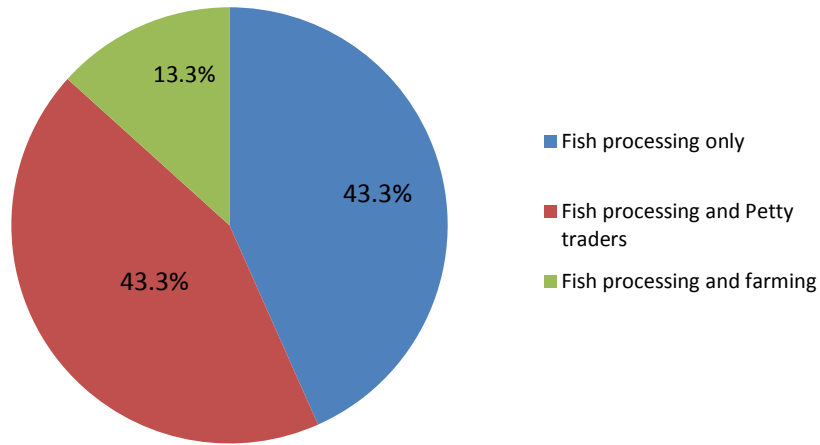
**Table 4. Source of capital**

	Frequency	Percentage (%)
Spouse	117	60
Co-operative society	39	21.7
Personal savings	24	13.3

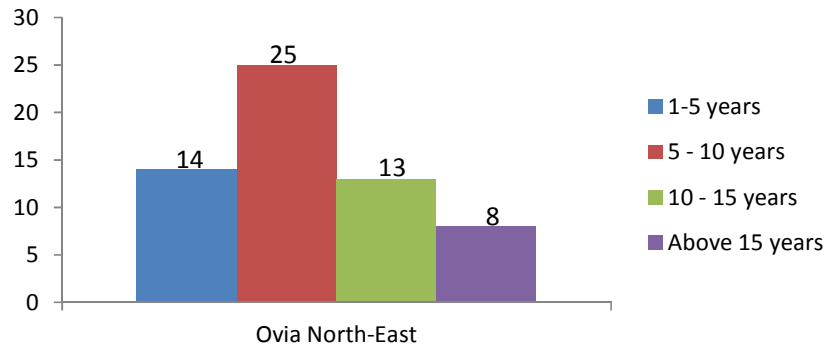
Source: Field Survey, 2016

### 3.10 Source of Capital

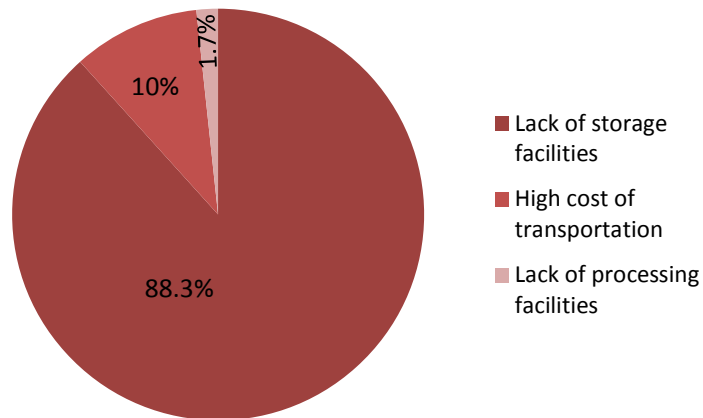
117 respondents (60%) indicated that their source of capital was from their spouse, 39 respondents (21.7%) indicated to belong to co-operative society while 24 respondents (13.3%) get their capital through personal savings.



**Fig. 3. Occupation of respondents**



**Fig. 4. Years of experience in fish processing activities**



**Fig. 5. Problems faced by respondents in the course of preservation**

### 3.11 Type of Smoking Kiln

Majority of the processors comprising of 120 respondents (66.7%) used full drum as smoker while, 57 respondents (33.3%) used

half drum. This is in line with the findings of [20] that had the majority of the processors (77.5%) using full drum as smoker which carries an average capacity of 71.42 kg of fish.

### 3.12 Species of Fish Commonly Processed by the Processors

From the result in Table 5, 144 respondents (80%) processed *Claris gariepinus*, 21 respondents (11.7%) process mackerel, 12 respondents (6.7%) process *Oreochromis niloticus* while 3 respondent (1.7%) process *Oreochromis niloticus* and *Clarias gariepinus*. This may be as a result of the abundance of *Clarias gariepinus* in the water body and considered as a high value species and of a great interest to farmers [28].

### 3.13 Source of Water for Processing

81 respondents (45.0%) indicated that their source of processing water was from the river, 81 respondents (45.0%) from borehole, 9

respondents used (5.0%) pipe borne water and 6 respondents (3.3%) get water for processing from the stream.

### 3.14 Packaging Methods

In the study area, 102 respondents (56.6%) used basket and paper for packaging; 75 respondents (41.7%) used basket only while basket and dry plantain leaves were used by 3 respondents (1.7%). This result is in agreement with [19] which revealed that majority of the fish processors used basket to package their fish for protection and preservation. This confirmed the findings of [2] who stated that packaging forms an important part of food processing because it facilitates handling during storage and distribution within the market chain.

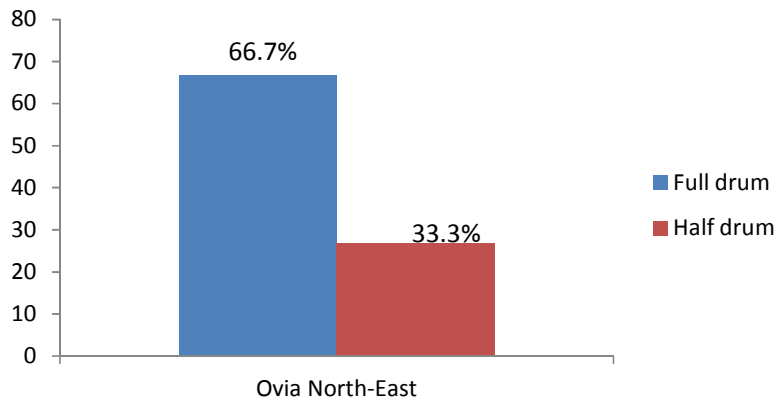


Fig. 6. Type of smoking kiln

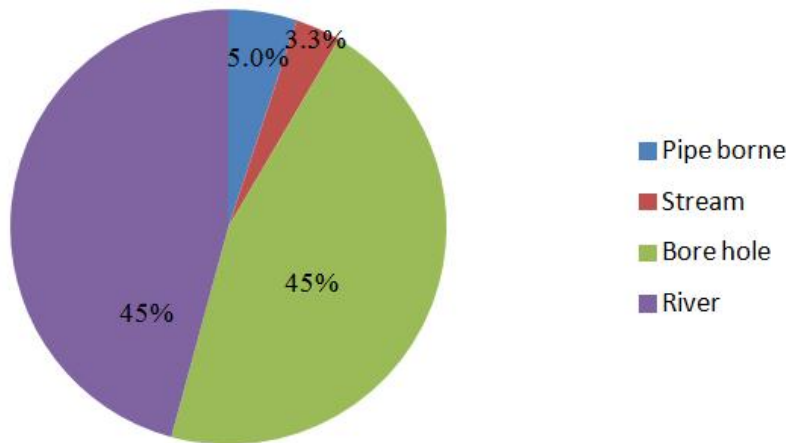


Fig. 7. Source of processing water

**Table 5. Species of fish commonly processed by processors**

	Frequency	Percentage (%)
<i>Clarias gariepinus</i>	144	80
Mackerel	21	11.7
<i>Oreochromis niloticus</i>	12	6.7
<i>Oreochromis niloticus</i> and <i>Clarias gariepinus</i>	3	1.7

Source: Field survey, 2016

**Table 6. Packaging materials used by processors**

	Frequency	Percentage (%)
Basket and paper	102	56.6
Basket only	75	41.7
Baskets and dry plantain leaves	3	1.7

Source: Field Survey, 2016

#### 4. CONCLUSION

The socio-economic status, fish processing and packaging activities of female processors in Ovia North East are significant in assuring food security, income generation, trades and improve living standard in the study area. The contribution of women in fisheries in the study area has impacted positively on the socio-economic status of women and it has helped to increase her family's meager income but they need to be encouraged and empowered by the relevant authorities as they are still involved with small scale production and faced with series of problems like lack of storage facilities, processing equipment and basic social amenities such as good roads, stable power supply and standard markets.

#### 5. RECOMMENDATIONS

Based on the findings from this study, I would hereby recommend the following:

1. Government and other relevant authorities should empower women to take active part in fishing activities regardless of their age and marital status because processing and marketing of fish is still done in a small scale in the study area.
2. Education and training should be organized by Government for women involved in fisheries activities since most of these women were illiterate.
3. Banks and other lending institutions should make special efforts to simplify the

procedures for obtaining loans and also create favorable conditions for better access to credit by low income women especially those in the rural areas.

4. Efforts towards organizing women involved in fisheries activities into cooperative societies should be intensified because it will enable the women to get assistance from government.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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