1 **VALUE CHAIN ANALYSIS OF ARTISANAL FISHING IN ILAJE**

2 **LOCAL GOVERNMENT AREA OF ONDO STATE, NIGERIA**

3 **Abstract**

4 *To bridge the demand supply gap in the Nigerian fishing industry, the value chain analyses in artisanal*

5 *fishing in the coastal area of Ondo States were investigated.*

6 *Primary data was used in the study. Purposive sampling technique was used to select four*

7 *fishing communities in Ilaje local government, where 35 (fishermen, processors and marketers)*

8 *were each selected randomly from the communities. Data were analyzed using Descriptive*

9 *Statistics and Gross Margin Analysis.*

10 *The socioeconomic characteristic indicated that 68.6% of the fishermen, 77.2% processors and*

11 *65.7% marketers were less than 50 years of age. Result revealed that all the fishermen were*

12 *male, 91.2 % processors and 97.10% marketers were female. 62.9% of the fishermen have*

13 *household greater than 4, the processors has 54.3% household size above 4 and 60% of the*

14 *marketers have household size above 4. 94.3% of the fishermen have one form of education or*

15 *the other, 77.1% of the processors have one form of education or the other and 65.7% of the*

16 *marketers were also educated. All the marketers are into one association or the other. Budgeting*

17 *analysis indicated positive margin by the two categories of marketers was ₦300.54 and*

18 *₦1,866.00 per basket respectively, a net return of 1.04 and 1.30 respectively. Processors had a*

19 *positive gross margin of ₦43.871.54 and a net return of 1.12. Most influential actor is the*

20 *marketer*

21 **Keywords: Value Chain, Artisanal, Gross Margin, Analysis, Fishing.**

22 **Introduction**

23 Fishery production is significant to Nigerian economy in view of its importance in providing

24 cheap source of food security, income, employment and serves as source of foreign exchange,

25 particularly to those of the riverine communities [1]. The Fisheries sub-sector maintains a steady

26 contribution of about 3.5 to 4% of total GDP between 2008 and 2012, translating to about 10%

27 of total agricultural GDP, which itself contributed between 35 and 40 percent within the same

28 period [2]. Nigeria fish supply is from four major sources; the artisanal fisheries, industrial

29 trawlers, aquaculture and imported frozen fish [3]. Also the sector is made up of capture

30 fisheries and aquaculture. Capture fisheries encompasses both marine and inland fisheries.

The artisanal fisheries in Nigeria provided more than 82% of the domestic fish supply giving livelihoods to one million fishermen and up to 5.8 million fisher folks in the secondary sector [4]..

The Niger Delta region contributes more than 50% of the entire domestic Nigerian fish supply. Due to abundance of both fresh, brackish and marine water bodies that are inhabited by a wide array of both fin fish and non-fish fauna that supports artisanal fisheries. It equally provide essential source of sustenance, employment and financial well-being for coastal populations of developing countries [5].

Fish is highly susceptible to deterioration without any preservative or processing measure. [6]. immediately fish dies, numbers of physiological and microbial deterioration sets in, this invariably degrades the quality of fish [7].

Value chain refers to all activities necessary to bring a product or service from conception, through the different stages of production, distribution to final consumption and final disposal after use [8] and [9]. Therefore, analysis of value chain involve identifying chain actors and discerning their functions; identifying value added in the chain and assigning costs to those activities [10].

[11]) posited that value chain analysis is essential for understanding markets, their relationship, the participation of different actors, and the critical constraints that limit the growth of livestock (fish) production and consequently the competitiveness of small holders' farmers. These farmers currently receive only a small fraction of the ultimate value of their output, even if, in theory, risk and reward should be shared down the chain. In agriculture they can be thought of as a farm to folk' set of processes and flows. Artisanal fish value chain analysis looks at every step, a fisheries business goes through, from captured fishes to the eventual end user. The goal is to deliver maximum value for the least possible total cost.

Value chains in artisanal and aquaculture fisheries differs and composed of several nodes the products pass through before meeting the consumers. However, Fish value chains in Nigeria are not yet developed to meet international market requirements as limited value addition is done in the industry, with the result that market for fish and fish products are limited to domestic markets [12], and the eagerness to raise immediate income from fish harvest. Actors in the chain comprises of the fishermen, (fish collector) marketer and processors.

61 The ability to make fish relevant in the market is to ensure the flow of fish and fish product from

62 the artisanal fisherman to the consumers in the form, time and place that will be convenient. This

63 involves the participation of some actors along the fish distribution channel especially the

64 middlemen [13]

65 This study is imperative because, most research work in the study area focus mainly on artisanal

66 fishing and marketing, while the areas of value chain / value addition were uncovered. It is in the

67 light of this that the research has been conceptualized to analyze value chain in artisanal fishing

68 in the coastal area of Ondo State.

69 **Objective of the Study**

70 The main objective of the study is to analyze value chain in artisanal fishing production in the

71 coastal area of Ondo States of Nigeria,

72 The specific objectives are to:

73   i.   ascertain or determine the socio-economic characteristics of the actors in the fish value

74   chain;

75   ii.   identify the major players (actors) in artisanal fish value and;

76   iii.   estimate the profit margin along the identified fish value chain;

77   iv.   Identify the major constraints to fish value chain actors in the study area.

78 **Methodology**

79 **The Study Area.**

80 The study was carried out in Ilaje Local Government Area of Ondo State, Nigeria. The state lies

81 between latitudes 5^0 4S and $7^0 52$N and longitude 4^0 20^0N and 6^0 05E. Its land area is about

82 15,500 square kilometers. Ondo State is bounded in the East by Edo and Delta State in the south

83 by Bight of Benin and Atlantic Ocean. Ilaje was purposively selected due to its predominant

84 coastal wetland suitable for fish farming. It is situated within the mangrove rain forest and has an

85 annual rainfall ranging between 2000-3000mm per annum.

86 **Data Collection and Sampling Technique**

87 Data were collected through primary source with the aid of well-structured questionnaire.

88 Purposive sampling techniques were used in the selection of four fishing communities namely;
89 Awoye, Odofado, Zion Pepe and Araromi sea side. The selection was based on their fishing
90 intensity. From the selected communities, 35 fishermen, 35 processors and 35 marketers were
91 randomly selected at the central market arena to give a total of 105 respondents.

92 **Data Analysis and Analytical Procedure**

93 Data were analyzed using descriptive statistics and gross margin model

94 **Descriptive Statistical Tools**

95 Frequency tables, and percentage were used to describe the socio-economic characteristics of the
96 respondents. The characteristics include the age, marital status, educational attainment, primary
97 or major occupation, experience of the fishermen, marketers and the processors.

98 **Gross Margin Analysis**

99 The budgeting techniques was used to determine the gross margin and income at each stage of
100 the chain.

101 The model for the estimation of the gross margin is as; $GMI = \sum TR - \sum TVC$

102 Where; $TR = Py. Yi$, $TVC = P \times X$, $TC = TVC + TFC$, $NROL = NFI/TR$, $NFI = GM - TFC$

103 $NPM = NFI / TC$, $BCR = TR / TC$

104 GM = Gross Margin (₦)

105 TR= Total Revenue (₦)

106 TVC = Total Variable Cost (₦)

107 TC = Total Cost (₦)

108 NROL = Net Return on Investment (₦)

109 Py = Unit Price of Output (₦)

110 Y = Price of Output (₦)

111 PXi = Unit Price of Variable Input Used

112 (₦)

113 Xi = Variable Input (₦)

114 NFI = Net Farm Income (₦)

115 NPM = Net Profit Margin (₦)

116 BCR = Benefit Cost Ratio (%)

117 **Depreciation**

118 Depreciation on fixed assets used were calculated, using a straight line method (SLM) which

119 assumed salvage value of zero naira. The formula is specified as; DS =

120 Where: DS = Annual depreciation, AC = Asset Cost, SV= Salvage Value, L = Useful Life Year.

Results and Discussion

122 The actors in the artisanal fish value chain in the study were identified as; the fishermen, fish

123 processors and fish marketers.

Socio-Economic Characteristics of the Fishermen in the Study Area

Gender of the Respondents

126 The result as shown in table 1 indicated that all fishermen in the study area were male (100%).

127 This could be attributed to strenuous and tasking nature of their operations which the male

128 gender could possibly handle better than the weaker female counterpart. These findings is in line

129 with the finding of [14][15][16][17]Majority of the processors (91.2%) and marketers (97.10%)

130 were female, indicating the dominance of women in processing and marketing of fish in the

131 study area. This result is in line with the findings of [18] who opined that the role of women in

132 fishing cannot be over emphasized.

Age of Respondents

134 The study revealed that majority of the actors in the value chain was below 50 years of age. This

135 implied that majority of people involved in fishing operations are in their active age. This finding

136 agreed with [19] and [20] that age had a positive correlation with agricultural productivity.

Household Size

138 The relatively large and medium household sizes of majority of the actors in the study area may

139 reduce expenses incurred on hired labour for the operations.

Educational status/ Membership of Association

141 The study also revealed that majority of the actors (94.3% of fishermen, 54.3% of processors and

142 51.4% of marketers) had one form of education or the other. Therefore the number of years spent

143 in formal education enhances the knowledge ability to adopt modern technology in improving

144 their fishing activities.

The study further indicated that all (100%) of the marketers were in one form of union/ association or the other, while the fishermen and the processors were not into any form of association.

Table 1; **Socio-Economic Characteristics of the Respondents**

Variables	Fishermen		Processors		Marketers	
	Freq.	percent	Freq.	percent	Freq.	percent
Gender						
Male	35	100.0	2	8.8	1	2.90
Female	0	000	33	91.2	34	97.10
Total	**35**	**100.0**	**35**	**100.0**	**35**	**100.0**
Age						
Less than 30	5	14.3	5	14.3	4	11.4
31- 50	19	54.3	22	62.9	19	54.3
51- 60	7	20.0	3	8.5	12	34.3
61-65	4	11.4	5	14.3	0.00	0.00
Total	**35**	**100.0**	**35**	**100.0**	**35**	**100**
Marital status						
Single	4	11.4	1	2.83	2	5.7
Married	21	60.0	28	80.0	27	77.1
Divorced	5	14.3	6	17.14	4	11.4
Widow/widower	5	14.3	0	0.00	2	5.7
Total	**35**	**100.0**	**35**	**100.0**	**35**	**100.0**
Household size						
1-3	13	37.1	16	45.7	14	40.0

4-7	17	48.6	19	54.3	18	51.4
Greater than 7	5	14.3	0	0.0	3	8.6
Total	**35**	**100.0**	**35**	**94.6**	**35**	**100.0**
Educational status						
No formal	2	5.7	8	22.9	12	34.3
Pry	10	28.6	15	42.8	9	25.7
Sec	7	20.0	5	14.3	9	25.7
Tertiary	16	45.7	7	20.0	5	14.3
Total	**35**	**100.0**	**35**	**100.0**	**35**	**100.0**
Association						
Yes	**-**	**-**	-	-	**35**	**100**
No	**-**	**-**	-	-	-	-

149 **Source; field survey, 2019**

Table 2: Descriptive Statistics on Cost and Returns of Marketers

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Price/ basket fish	35	3,000.00	15,000.00	216,781.75	6,193.7500	2,544.68928
Price after purchase	35	3,500	17,000	244,800	6,994.29	2,981.901
Price outside the environment	35	4,000	20,000	282,100	8,060.00	3,245.830

150 **Source; field survey, 2019**

151 From table 2 above, the average cost of purchase of a standardized basket of fresh fish from the

152 fishermen in the study area was ₦6, 193.75.00, immediately after purchase, and without any

153 value addition, the same quantity of fish were sold at an average of ₦6, 994, 29 and ₦8, 060.00

154 outside the environment. The implication of this is that non- member of fish marketers

155 association have no direct contact with the fishermen, hence must pass through them for the

156 purchase of fish, while a profit margin of about ₦801.29 is realized from immediate purchase

157 within the same environment and an average of ₦1866.25 from the sale of same basket outside

158 the environment.

159 **Profit Margin of Marketers**

160 Average purchasing price of fish from fishermen = ₦6193.75

161 Average selling price immediately in the same location = ₦6494, 29

162 Average selling price outside the location = ₦8060.00

163   **i.   Profit margin of marketers on same location**

164 Average revenue from sales in same location = ₦6494, 29 - ₦6193.75 = ₦300.54

165 Net return on investment (benefit/ cost) = 6494, 29/ 6193.75 = 1.04

166 That is on every ₦1 invested in fish marketing in the same location and sell within the location

167 4kobo is realized.

168   **ii.   Profit margin of marketers outside the location**

169 Average revenue from sales outside the location =₦ 8060.00 - ₦ 6193.75 = ₦1866.25

170 Net return on investment = benefit/ cost = 8060.00 / 6193.75 = 1.30

171 The implication of this finding is that on every ₦1 invested, 30kobo is realized

Gross Margin Analysis For Fish Processor

172 **Average variable cost**

173 Average cost of fish purchased = ₦260, 508. 10,   Average Cost of firewood = ₦27,437.14

174 Average transportation cost = ₦1,018.57,   other variable cost = ₦2,146.57

175 Average labour cost = ₦10,925.71,   Average variable cost = ₦302,036.09

176 **Fixed cost**

177   Cost of drum = ₦14,271.42   Cost of basket = ₦25,485.71

178   Cost of wire = ₦9,868. 57   Average fixed cost = ₦49625.70

179   Average total cost (ATC) = AVC+ AFC = 303,036.09 + 49, 625.70 = ₦352,661.79 =
180   ₦352,661.79 Average revenue = PX*Q = AR = ₦396, 533.33

181   Profit = AR - ATC = 396, 533. 33 – 352,661.7 =   ₦43, 871, 54

182   Fish processing is a profitable venture worth investing because it has a positive margin of
183   ₦43,871.54.

184   Net return on investment for fish processing = 1.12   The return on investment is 1.12,
185   meaning that on every ₦1 invested in fish processing, 12kobo is realized.

186

187   **Depreciation on fixed equipment**

188   OC = 41,903.78,   SV = 0

189   It is assumed that equipment has a shelf life of 3years

190   41,903.78/ 3 = 13,967/ annum

191   Monthly depreciation = 13,967/ 12 = 1,163. 99

192   = ₦1,163. 99 must be set aside as depreciation value.

193   The main actor in the value chain are the marketers because of the strong association that
194   prevent others from buying directly from the fishermen, even the processors sometimes do not
195   have direct access to the fishermen except through the marketers

196   **Table 3: Gross Margin and Net Return of Actors.**

Variable	Gross Margin	Net Return
Sales/Marketing at immediate environment	300.54	1.04
Sales/Marketing outside the environment	1866.25	1.30
Processor	43871.54	1.12

197

198   The table 3, shows the categories of the gross margin of the actors in the value chain

199   All the actors have a positive gross margin therefore each of the enterprise is profitable. Also all

200   the net return on investment are greater than one therefore the sales of fish immediately at the

201   environment was 1.04 indicating at every ₦1 invested, 4 kobo is realized, marketers outside the

202   environment has a net return of ₦1.30kobo. Meaning that at every ₦1 invested 30kobo is

203   realized while for processing net return of ₦1.12kobo is achieved meaning at every ₦1 invested

204   12kobo is gained. The implication is that the marketers particularly sales after the environment

205   has higher gross margin of ₦1866.25 kobo and a net return of ₦1.30 kobo.

206

207

208   **Conclusion**

209   Artisanal fish farming is a profitable venture with all the actors in the value chain enjoying

210   different degree of profit. The two categories of marketers made a profit of ₦300.54 and

211   ₦1,866/basket and a net return of 1.04 and 1.30 respectively. The processors equally had a

212   positive gross margin of ₦43.871.54 and a net return of 1.12.

213   However, among the three actors in artisanal fish value chain in the area, the marketers are the

214   main and most influential group. This is due to the strong associations of the group which

215   prevent others (even processors) from buying directly from the fishermen. The over bearing

216   influence of this marketers group reduces the gross margin and net returns of other actors in the

217   chain.

218   **Recommendation**

219   Based on the findings of this study, it is recommended that;

220   • Fishermen and processor in artisanal fish value chain should form a strong association in
221   other to reduce the effect and influence of the marketers on their profit.

222   • Fishermen should join cooperative societies in other to get needed inputs rather than
223   getting financial assistance from middlemen/marketers who always use that to determine
224   their faith in the business.

225 • Government and other relevant organizations should be involved in training and
226 retraining of the different categories of the artisanal fish value chain players.

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228
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