Investigation Of The Socio-Economic Conditions And Entrepreneurial Index Of Fisher-Folks In Atlantic Coast Of Eastern Obolo Local Government Area, Nigeria

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Abstract: Beach-seines have been used in small scale fisheries in many parts of the developing world for a very long time in recent years; the use of beach-seines has been banned in some countries because of perceived negative impacts on the environment and resources. The effects of the gears on the marine ecosystem as identified in the study were not limited to mortality of juveniles (environmental), trophic level destruction (biological) and fisher-folks food security (socio-economic) parameters. But also include reduction in urbanization and industrialization activities, destruction in downstream fishery and beaches/shores strewn with discards. Therefore, the aim of this research was to study the socio-economic conditions of the fisher-folks, examine the entrepreneurial Index and investigate the environmental impact of beach-seines operation in the coastline. The beach seine net deployed in the area were examine and measure using the design outline documented in the FAO catalogue of small scale fisher in Nigeria. Fish species caught near the coastline were compared. A relative paired T-test were used to test the hypothesis that there was no significant different between the total number of mature target and juvenile by catch species. These were because they both sizes occurred together and for every mature sorted were juveniles. The analysis showed an extremely significant results ($P < 0.05$, $n = 20$, $df = 19$), which leads to rejecting the H_0 and accepting H_1 meaning the hypothesis were statistically significant. The result of the socioeconomic research showed that 50% of the respondents were sampled from the main fishing settlement "Akasa". Also revealed were 23% respondents from Emeroke and Iko community. The age of the fisher-folks (26-36±28.73) being 60%, while the marital status and religion respondent were (married = 73.3%) and (Christian = 93.3%) respectively. In terms of family size (Nuclear = 80%) with the best fishing season being dry (100%). Monthly income classes were (₦26,000₦31,000) and (₦32,000 – ₦37,000) with 33.3% each. Fishing experience (x=7.33 ±3.72) and fishing operation per day (27±1.96) showed 46.67% and 90.0% respectively. While members of corporative 36.7% each, occupational diversity to trading and farming reveals 33.3% and 23.3% respectively. Notably women between 20-30 years also go to fishing, but also reveal were active male than female in the beach –seining with 73.3% and 26.7% respectively. The assessment of impact of gear suggested that discards is not the major environmental problem, but rather changes and depletion in fish population, out migration and reduction in other developmental activities. The entrepreneurial index calculated were capital expenses (₦318,960.00± 64082.86) and recurrent expenditure (₦1, 325.93±483.2).

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Introduction

FAO (2010) described bycatch as the total catch of that quantity taken by the fishing gear which reaches the deck of the fishing vessel. The ancient Phoenicians and Romans employed beach seining to catch fish in the Mediterranean. The reduction of food insecurity and rural poverty and the promotion of sustainable rural livelihoods and more equitable access to resources are major strategies which FAO's strategies framework from 2000 – 2015. Small-scale fisheries are critical for food security and poverty reduction as highlighted again by the FAOs committee on fisheries at its twenty-fifth session. A high proportion of small scale fishers are poor including those involved in beach-seining. The general design of the beach-seines used and their mode of operation are similar in some countries. Beach-seine is also used to capture the smallest fish and shrimp. Beach seines, also called haul seines, are typically small mesh nets in the range of 100m in length that are set in shallow water parallel to the beach or back reef and are then hauled onto the beach or reef (Kailola *et al.,* 1993). Fishery surveys can include demography, income, living costs, fishing gear, and marketing structure.

Socioeconomic information on status and usage of coastal marine resources is needed for management planning, especially when subsistence and small-scale fisheries are in question (Kronen*et al.,* 2007). The problem is much worse when there are no other opportunities outside of fisheries in which they could learn a basic living. Generally small scale (artisanal) fisher constitutes a group of very poor citizen (Moses, 2000). Mangi and Roberts (2006) and Mangi (2006) studied the environmental impact of artisanal fishing, gear on coral reef ecosystem in the multi gear fishery of southern Kenya. As an economic indicator that reflects how well an enterprise operate, in terms of gross revenue to produce a certain profit or net surplus. Therefore understanding the social characteristics and attitudes of fisheries are necessary for a complete fishery environmental assessment. This research is aimed at studying the design characteristics, bycatch mortality and socioeconomics of fisher-folks beach-seine operations in Atlantic coastline.

Materials And Methods

The research work was carried out in a fishing settlement of Eastern Obolo, of Nigeria. Situated in between Imo and Qua Iboe river estuaries with latitudes $4^0$28" and $4^0$53" North and longitudes $7^0$50" and $7^0$55" East respectively. It is bounded by the following areas of the state; Mkpat Enin Local Government, Onna, Ikot Abasi, Ibeno and by the Atlantic Ocean. (Fig. 1)

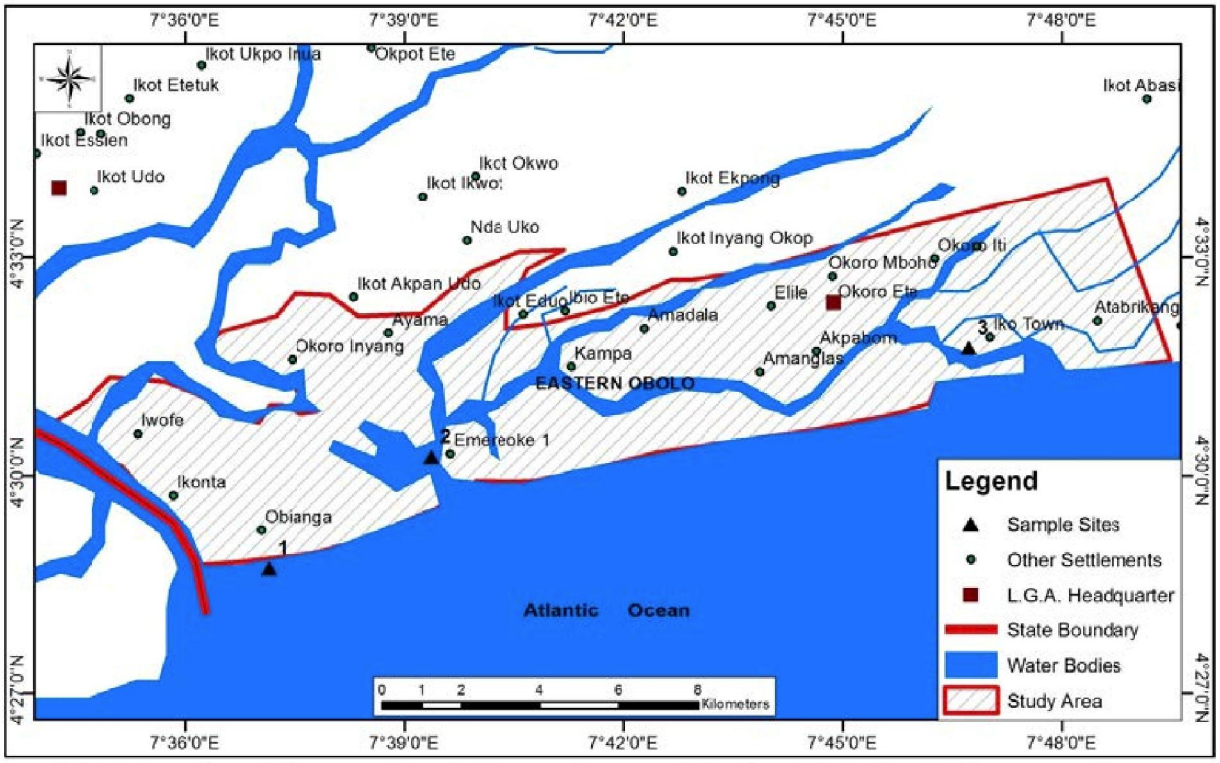


Fig. 1: Location of the sampling stations on the map of Eastern Obolo Local Government Area

Fishery Survey; was carried out in stages; reconnaissance and observer-based stage. The observer based survey incorporated both fishery dependent and independent survey. Dependently, oral interviews were conducted for the compositions of landed catch and estimation of the diversity of by catch (George *et al.,* 1982). Independent observation onboard the fishing vessel, net shooting, soaking, hauling, handling, fish sorting weighing and identifying of fish caught (Ambrose *et al.,* 2005).

Data collection; Organisms were sorted, into matured (target species) and juvenile fishes (bycatches). Juvenile category were identified, sorted according to species in 20 replicate landings. T- test analysis of catch data was used to pooled the landings from both 10 fishery dependent and 10 fishery

independent landings. CPUE was calculated according to the method of stamatopoulous (2002).

Socioeconomic Studies; Questionnaires were administered to fishermen (crew), leader and focus group interview to collect data. Discussion and photographed were employed. Personal interviews and fisher folks were selected at random. Total numbers of 30 questionnaires were administered, collected and recorded for analysis**.** The collected information were accumulated, grouped and interpreted. Numeric data were codified into narrative facts and graphically analyzed for statistical studies. Relative T-test statistic technique was used to compare the relationship between the two set of responses, since it came from a particular stock.

Results

Accomplished in two (2) stages, namely; setting and pulling the trapped fishes ashore. The bycatch compositions of species as revealed by the study were identified and named accordingly as shore in the below table. The statistical method in use was relative T-test, because they organisms were from one population. The table also revealed that for every matured target fishes caught by the beach seine gear, three juveniles bycatch species are vulnerably exploited. Except for the less valued shell fish that mortality of matured specie are more than the juveniles.

Socioeconomics of fisher-folks with beach-seine bycatch operations; revealed that marital status and religion of the respondent was 26.7% (single) and 6.7% (Islam) indicating that beach seining was dominantly carried out by married and Christian fisher folk with 73.3% and 93.3% respectively (Table5). Figure 11 showed that the level of illiteracy was significantly higher, with a mean value of 13.1 ±2.76, pointing to 50% secondary level. As revealed also in the result were active male (73.3%) in beach-seining than female (26.7%) that were involved in other aspects of beach seining fisheries and shore-based activities (Figure 8). In terms of family type 80% were nucleated family (figure 12) and the best fishing season was dry season (100%) respondent as indicated by the analysis (Figure 5). There was a high rate of jelly fishes which contributed to the increasing weight of the haul. There were two dominate average monthly income classes in the study, namely ₦26,000 – ₦31,000 and ₦32,000 – ₦37,000 with a frequency size of 33.3% each. The mean income of the entire study sample was ₦33,333 while only 3.3% of the fisher folk households earned as high as ₦98,000 – ₦103,000 as income (Figure 17). Also the least mean value of fishing experience X = 7.33 ± 3.72 meaning most fisher folk experienced at least close to 4 years (Figure 13). Figure 16 reveals that 36.7% each were members of cooperative and also those who were about to join, while the fishing operation per day 27 ± 1.96 was 90%, meaning that fisher folks mostly goes out for beach seine fishing twice a day (Figure 15). The study proved that occupational diversity of beach-seining fishers to trading and farming with 33.3% and 23.3% respectively (Figure 14). The study also reveled composition/size of fishers household with age 15 – 24 (male = 111) and (female = 96) being the highest and age 45 and above (male = 30) and (female = 32) as the least. Notably, women between 20 – 30 years also go to fishing mostly with hooks and lines.

Impact of beach seine on marine environments, aquatic resources and habitats; The assessment carried out suggested that discards are not a problem in beach-seining. Changes and depletion in fish population, out-migration of the fisher folks and reduction in other socioeconomic activities showed the highest in ranking while reduction of sustainable fishery, marine species extinction and ecosystem simplification were the lowest in its effects on the environment (Table 7). The study also reveals the adverse effect remarked to be of greater degree from 2.31 (max) and 2.29 (min) are of lesser degree on the marine environment impacted upon (Table 7).

Financial and economic performance of beach-seine bycatches; Economic indices of the beach seining operation were investigated in terms of recurrent expenditure (cost/trip), capital expenditure (fixed cost) and revenue (viability). The total recurrent and capital expenditure incurred was between (₦4000 – ₦34,000), and (₦500,000 – ₦1,250,000) respectively. Gross margin implies that the Return on investment (ROI) was about 53% showing the percentage of investment cost subtracted from total revenue (Table 8).

Table I: Names, length and weight of fish species caught by nearshore beach seine

S/N	Family/Names	Scientific Names	Common Names	Local Names	Min-Max Total Length (cm)	Min-max Total Weight
1.	Mugilidae	*Mugilcephalus*	Mullets	Okurukuru	1.4 – 88.0	0.5 – 10.0
2.	Mugilidae	*Mugil falcipinus*	Sickle fin	Aseke	1.3 – 19.5	0.19- 31.45
3.	Scieanidae	*Pseudotolithius typus*	Long neck croaker	Okpo	1.0 – 16.2	0.34- 9.82
4.	Scieanidae	*Pseudotolithius elongates*	Bobo croaker	Broke marry	1.7 – 44.2	0.34-2.2
5.	Scieanidae	*Pseudotolithius senegalensis*	Short neck croaker	Onna	3.2 – 10.0	0.11 – 4.80
6.	Polynemidae	*Pentanemus quinquarius*	Royal threadfin	Ora	1.7 – 18.2	0.28 – 1.80
7.	Polynemidae	*Galeoides decadactylus*	Shiny nose	Ora	1.3 – 17.5	1.50 – 31.34
8.	Polynemidae	*Polydactylu squadrilifilis*	African threadfin	Ora	1.9 – 31.4	2.05 – 3.50
9.	Clupeidae	*Illishaafricana*	African shad	Ebat	1.6 – 57.0	3.50 - 56.07
10.	Clupeidae	*Ethmalosa fimbriata*	Bonga shad	Ebat	1.0 – 172.5	3.55 – 30.50
11.	Ariidae	*Arius latisculatuls*	Catfish		1.5 – 46.1	0.21 – 43.11
12.	Carangidae	*Caranx carangus*	Color jack fish	Nnkukang	1.3 – 20.5	11.0 – 25.33
13.	Carrangidae	*Caranx hippos*	Crevalle jack fish	Nkikang	2.1 – 13.5	3.05 – 7.90
14.	Lutjanidae	*Lutjanus dentatus*	Red snapper		2.5 – 18.5	10.50 – 17.50
15.	Lutjanidae	*Lutjanus goreensis*	Gorean Snapper		2.0 – 8.8	5.20 – 8.16
16.	Pomadasyidae	*Pomadasys jubelini*	Grunters		1.9 – 13.9	2.0 – 5.50
17.	Pomadasyidae	*Pomadasys peroteti*	Pigsnout grunt		1.5 – 13.5	0.70 – 10.05
18.	Sphyraenidae	*Sphyraena sphyraena*	Barracuda		1.1 – 28.6	4.50 – 56.50
19.	Sphyraenidae	*Sphyraena guachancho*	Senects		2.0 – 25.8	0.35 – 15.8
20.	Tetraodontidae	*Lagocephalus laevigatus*	Smooth puffer		1.5 – 12.7	18 – 2.70
21.	Tetraodontidae	*Sphoeroides senegalensis*	Blunthead puffer		1– 10.52	1.5 – 15.5
22.	Serranidae	*Epinephelus aneus*	Grouper (white)		1.6 – 17.0	4.50 – 7.50
23.	Dasyatidae	*Dasyastis margarita*	Sting Ray	Cover pot	1.5 – 15.8	3.20 – 3.50
24.	Cynoglossidae	*Cynoglossus senegaslensis*	Tongue sole		1.5 – 15.8	1.50 – 7.20
25.	Portunidae	*Callinectus amnicola*	Blue crab	Isob	2cl – 10cl	1.20 – 1.70
26.	Penaeidae	*Parapenaeopsis atlantica*	Guinea shrimp	Obu	0.5mm – 125mm	0.5 – 100g

Source: ***Field Survey, 2017.***

Table II: Number of mature and juvenile (bycatch) species caught per landings that was used in T-test analysis (N=20; SS=Statistically Significant; NS=Not Statistically Significant; ES= Extremely Statistically)

S/N	Month	Monthly Species	Juvenile A	Matured B	Total A + B	Difference A - B	P-value	T-value	Degree of Freedom Df.	Error	Remark
1.	8/4/16	7	25	9	34	16	0.0428	2.5621	6	0.892	SS
2.	22/4/16	6	29	5	34	24	0.0288	3.0382	5	1.317	SS
3.	12/5/16	10	58	12	70	46	0.0025	4.1533	9	1.108	SS
4.	20/5/16	8	51	7	58	44	0.0004	6.2048	7	0.886	SS
5.	10/6/16	7	29	20	49	9	0.4354	0.8356	6	1.539	NS
6.	24/6/16	6	24	11	35	13	0.1946	1.4971	5	1.447	NS
7.	8/7/16	10	52	15	67	37	0.0726	2.0330	9	1.820	NS
8.	22/7/16	8	55	11	66	44	0.0089	3.5824	7	1.535	SS
9.	12/8/16	9	78	30	108	48	0.1114	1.7889	8	2.981	NS
10.	26/8/16	9	62	9	71	53	0.0074	3.5611	8	1.654	SS
11.	9/9/16	8	86	14	100	72	0.0048	4.0540	7	2.220	SS
12.	23/9/16	8	58	7	65	51	0.0355	4.6364	7	1.375	SS
13.	4/10/16	9	87	37	124	50	0.0279	2.5262	8	2.199	SS
14.	28/10/16	9	98	41	139	57	0.0281	2.6803	8	2.363	SS
15.	11/11/16	12	165	74	239	91	0.0153	2.5268	11	3.001	SS
16.	25/11/16	12	181	79	260	102	0.0001	2.8686	11	2.963	SS
17.	9/12/16	16	272	99	372	174	0.0001	5.3606	15	2.029	ES
18.	23/12/16	16	293	110	403	183	0.0001	5.7611	15	1.985	ES
19.	6/1/17	23	404	160	564	244	0.0001	6.7743	22	1.502	ES
20.	20/1/17	23	405	154	559	251	0.0001	7.6125	22	1.405	ES
Total		**216**	**2513**	**904**	**3417**	**1609**	**0.0001**	**15.1856**	**215**	**0.494**	**ES**

Source: ***Field Survey, 2017.***

Table III: Number of target (matured) catch and juvenile (bycatches) of twenty-six (26) species caught by nearshore beach seine that was used in percentage and ratio comparison. (Matured versus Juveniles) (N=20).

S/N	Species	Total No. of Juvenile (A)	Total No. of Mature (B)	Total No. of individual sp. (A + B) = C	Percentage %	Ratio (A:B)
1.	*Mugil cephalus*	144	40	184	5.38	3:1
2.	*Mugil falcipinus*	59	14	73	2.14	4:1
3.	*Pseudotolithiu stypus*	117	58	175	5.12	2:1
4.	*Pseudotolithius elongatus*	253	91	344	10.07	2:1
5.	*Pseudotolithius senegalensis*	36	18	54	1.58	2:1
6.	*Pentanemus quinquarius*	37	12	49	1.43	3:1
7.	*Galeoides decadactylus*	198	61	259	7.58	3:1
8.	*Polydactylus quadrilfilis*	65	16	81	2.37	4:1
9.	*Illisha africana*	99	25	124	3.63	3:1
10.	*Ethmalosa fimbriata*	268	56	324	9.48	4:1
11.	*Arius latiscutatus*	155	50	205	5.99	3:1
12.	*Caranx carangus*	247	53	300	8.78	4:1
13.	*Caranx hippos*	134	28	162	4.74	4:1
14.	*Lutjanus dentatus*	111	23	134	3.92	4:1
15.	*Lutjanus goreensis*	18	5	23	0.67	3:1
16.	*Pomadasys jubelini*	68	21	89	2.61	3:1
17.	*Pomadasys peroteti*	40	14	54	1.58	2:1
18.	*Sphyraena sphyraena*	100	25	125	3.66	4:1
19.	*Sphyraena guachancho*	55	12	67	1.96	3:1
20.	*Lagocephalu slaevigatus*	47	18	65	1.90	2:1
21.	*Sphoeroides senegalensis*	33	9	42	1.23	3:1
22.	*Epinephelu saneus*	105	25	130	3.80	4:1
23.	*Dasyatis margarita*	24	29	53	1.55	1:1
24.	*Cynoglossus senegalensis*	7	34	41	1.19	1:4
25.	*Callinectu samnicola*	63	162	225	6.58	1:2
26.	*Parapenaeopsi satlantica*	30	5	35	1.02	6:1
	Total	**2513**	**904**	**3417**	**100.00**	**-**
	Means	96.65	34.76	131.42	-	-

Source: ***Field Survey, 2017.***

Table IV: Different between target matured catch and juvenile bycatches of each species caught by nearshore beach seine that was used in T-test paired composition (N=20).

S/N	Species	Total of No. of Juvenile (A)	Total No. of Mature (B)	Difference A-B = D	$(A - B)^2$	Calculated T-test values	Level of significant (0.05)	Inference
1.	*Mugilcephalus*	144	40	104	10816	4.36	2.060	SS
2.	*Mugil falcipinus*	59	14	45	2025	4.19		SS
3.	*Pseudotolithiu stypus*	117	58	59	3481	4.35		SS
4.	*Pseudololithius elongatus*	253	91	162	26244	4.35		SS
5.	*Pseudotolithius senegalensis*	36	18	18	324	4.35		SS
6.	*Pentanemus quinquarius*	37	12	25	625	3.14		SS
7.	*Galeoides decadactylus*	198	61	137	18769	4.36		SS
8.	*Polydactylus quadrilifilis*	65	16	49	2401	4.36		SS
9.	*Illisha africana*	99	25	74	5476	4.36		SS
10.	*Ethmalosa fimbriata*	268	56	212	44944	4.36		SS
11.	*Arius latiscutatus*	155	50	105	11025	4.36		SS
12.	*Caranx carangus*	247	53	194	37636	4.36		SS
13.	*Caranx hippos*	134	28	106	11236	4.36		SS
14.	*Lutjanus dentatus*	111	23	88	7744	4.25		SS

15.	*Lutjanus goreensis*	18	5	13	169	4.36		SS
16.	*Pomodasys jubelini*	68	21	47	2209	4.36		SS
17.	*Pomadasys peroteti*	40	14	26	676	4.36		SS
18.	*Sphyraena sphyraena*	100	25	75	5625	4.36		SS
19.	*Sphyraena guachancho*	55	12	39	1521	4.36		SS
20.	*Lagocephalus laevigatus*	47	18	29	841	4.36		SS
21.	*Sphoeroides senegalensis*	33	9	24	576	4.36		SS
22.	*Epinephelus aneus*	105	25	80	6400	4.35		SS
23.	*Dasyatis margarita*	24	29	-5	25	-4.35		NS
24.	*Cynoglossus senegalensis*	7	34	-27	729	-4.36		NS
25.	*Callinectus amnicola*	63	162	-99	9801	-4.36		NS
26.	*Parapenaeopsis atlantica*	30	5	25	625	4.36		SS
Total		**2513**	**904**	**1609**	**2588881**	**5.0**	**2.060**	**ES**

Source: ***Field Survey, 2017.***

Table V: Distribution Of Fisher-Folk Respondents

	Age				
S/N	**Age Range (Year)**	**Frequency**	**Percentage (%)**	**Mean (X)**	**Sd**
1.	15-25	10	33		
2.	26-36	18	60		
3.	37-47	2	7		
	Total	30	100.0	28.73	
	Sex				
1.	Male	22	73.3		
2.	Female	8	26.7		
	Total	30	100.0		
	Marital Status				
1.	Single	8	26.7		
2.	Married	22	73.3		
	Total	30	100.0		
	Religion				
1.	Christian	28	93.3		
2.	Islam	2	6.7		
	Total	30	100.0		
	Level Of Education				
1.	Primary	2	6.7		
2.	Secondary	15	50.0		
3.	Ond/Nce	5	16.7		
4.	B.Sc/HND	6	20.0		
5.	Msc	2	6.7		
	Total	30	100.0	13.1	2.76
	Family Type				
1.	Nuclear	24	80.0		
2.	Extended	6	20.0		
	Total	30	100.0		
	Experience In Fishing				
1.	1-5	13	43.3		
2.	6-10	14	46.67		
3.	11-15	1	3.33		
4.	16-20	2	6.67		
	Total	30	100.0	7.33	3.72
	Secondary Occupation				

	Age				
S/N	**Age Range (Year)**	**Frequency**	**Percentage (%)**	**Mean (X)**	**Sd**
1.	Trading	10	33.3		
2.	Faming	7	23.3		
3.	Boat Building	2	6.7		
4.	Crafts	6	20.0		
5.	Others	5	16.7		
	Total	30	100.0		
	Best Fishing Season				
1.	Wet Season	0	0		
2.	Dry Season	30	100.0		
	Fishing Operation Per Day				
1.	1	2	6.7		
2.	2	27	90.0		
3.	3	1	3.3		
	Total	30	100.0	1.96	
	Membership Of Cooperative				
1.	Yes	11	36.7		
2.	No	8	26.7		
3.	About To Join	11	36.7		
	Total	30	100.0		
	Income Range (₦: K)				
1.	20,000-25,000	10	33.3		
2.	26,000-31,000	10	33.3		
3.	32,000-37,000	4	13.3		
4.	44,000-49,000	4	13.3		
5.	68,000-73,000	1	3.3		
6.	98,000-103,000	1	3.3		
	Total	30	100.0	33,333	15,799

Source: Field Survey, 2017

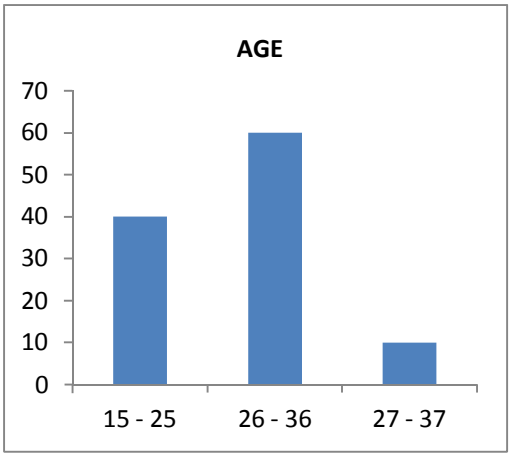
Table VII: Beach-Seine Operation Impact on Marine Environment, Aquatic Resources and Habitat

S/N	**Effects**	**Mean (X)**	**Rank**	**Remark**
1.	Changes and depletion in fish population (increase CPUE)	3.00	1	Maximum
2.	Distortion in ecosystem food chain (trophic level)	2.80	4	Maximum
3.	Out migration of the fisher folks	2.87	3	Maximum
4.	Disruption of other fisheries activities	2.47	6	Maximum
5.	Reduction of sustainable fishery (irresponsible fishery)	2.27	10	Minimum
6.	Migration of fish species to other location	2.60	5	Minimum
7.	Marine species extinction strip mining (overfishing)	2.20	11	Minimum
8.	Ecosystem simplification (evolutionary success/future recruit failure)	1.83	12	Minimum
9.	Biodiversity loss/mortality of vulnerable marine non-fish species	2.43	7	Minimum
10.	Description in downstream fishery activities (resource utilization, processing/marketing)	2.37	8	Minimum
11.	Reduction in other socio-economic activities (urbanization & industrialization)	2.87	3	Maximum
12	Beach/shores strewn with discards (Environmental Health Impact Assessment (HIA).	2.33	9	Minimum

Source: Field Survey, 2017.

Table VIII: Cost Structure Of Beach-Seine Bycatch Operations In Marine Environment

	Minimum	Maximum	Mean (X)	S. D	
	₦: K	₦: K	₦: K		
Fuel	2500	6000	3860:00	1407.5	
Feeding	1000	25000	2685:17	4240.9	
Miscellaneous	500	3000	1325:93	483.2	
Total	**4000**	**34,000**	**7871:10**	**5073.45**	
Boat (5 years)	250,000	450,000	310,000.00	50854.76	
Gear (2 years)	150,000	350,000	227,083.30	41479.46	
Engine (10 years)	100,000	450,000	318,960.00	64082.86	
Total	**500,000**	**1,250,000**	**856,043.30**	**109644.9**	
Fish	30	150	-	-	
Quantity	15	50	26.03	11.14012	
Price	5000	50,000	-	-	
Total	**5045**	**50,200**	**-**	**-**	



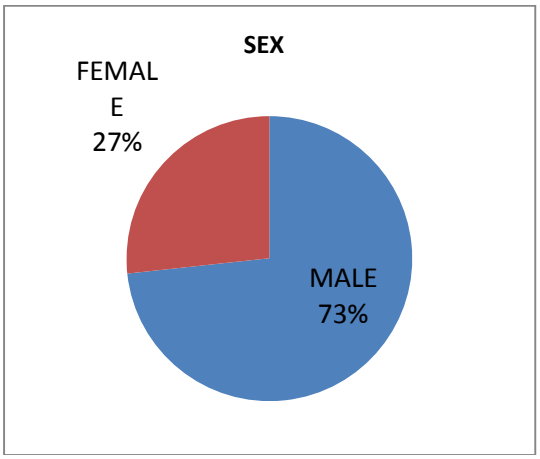
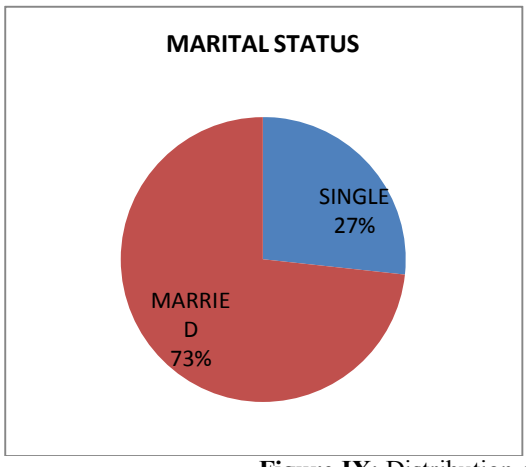


Figure VII: Distribution of fisher folks respondents by age
Figure VIII: Distribution of fisher folks respondents by sex



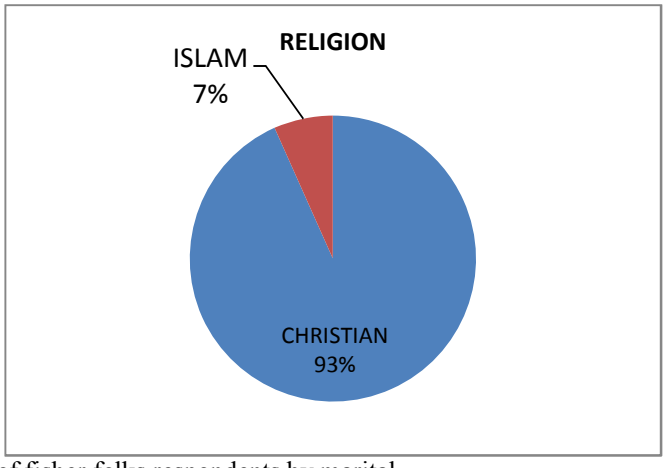
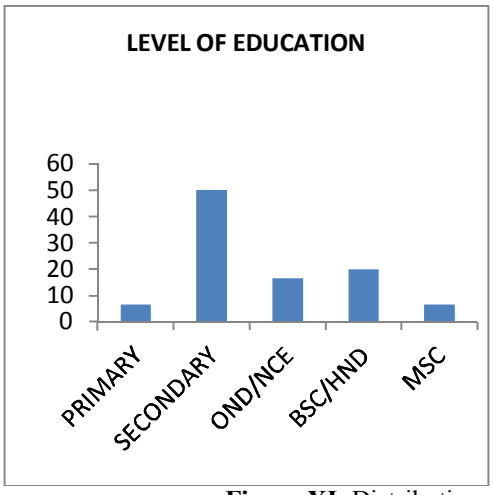


Figure IX: Distribution of fisher folks respondents by marital
Figure X: Distribution of fisher folks respondents by religion

Status



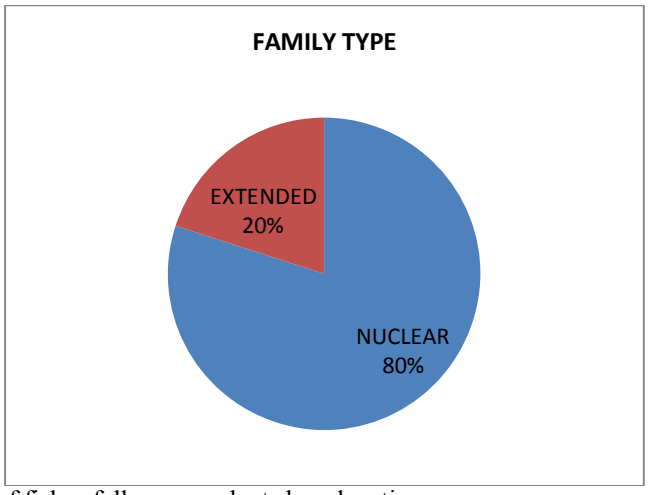
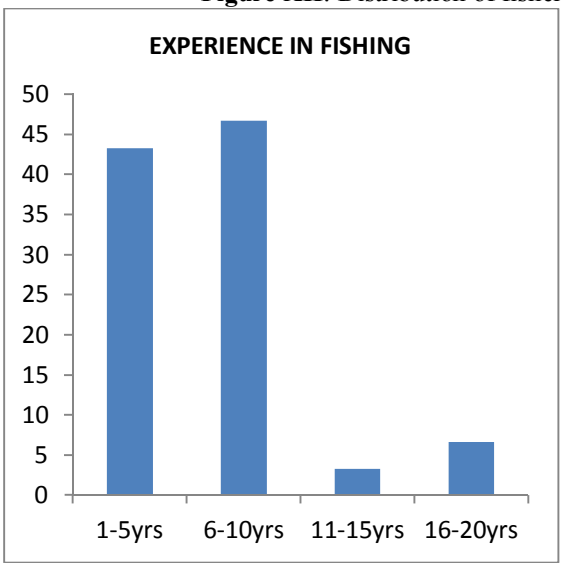


Figure XI: Distribution of fisher folks respondents by education
Figure XII: Distribution of fisher folks respondents by family type



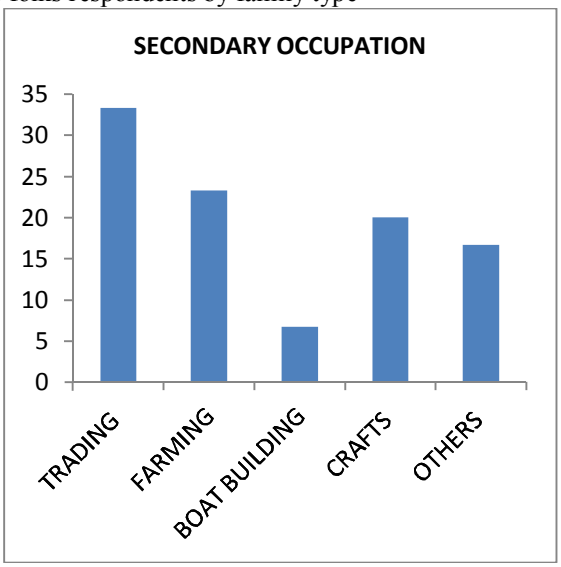
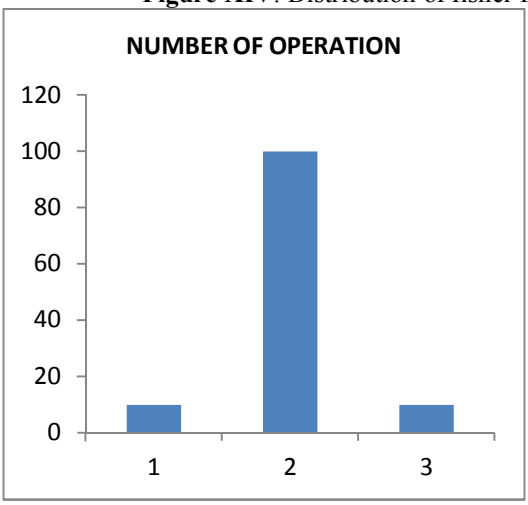


Figure XIII: Distribution of fisher folks respondents by experience in fishing
Figure XIV: Distribution of fisher folks respondents by secondary occupation



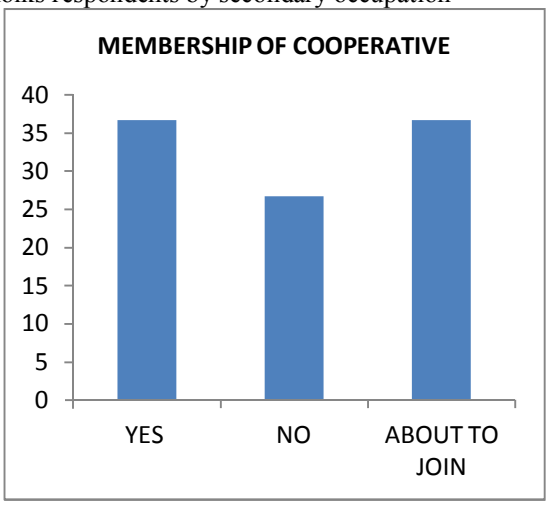


Figure XV: Distribution of fisher folks respondents by number of operation
Figure XVI: Distribution of fisher folks respondents by membership of cooperative

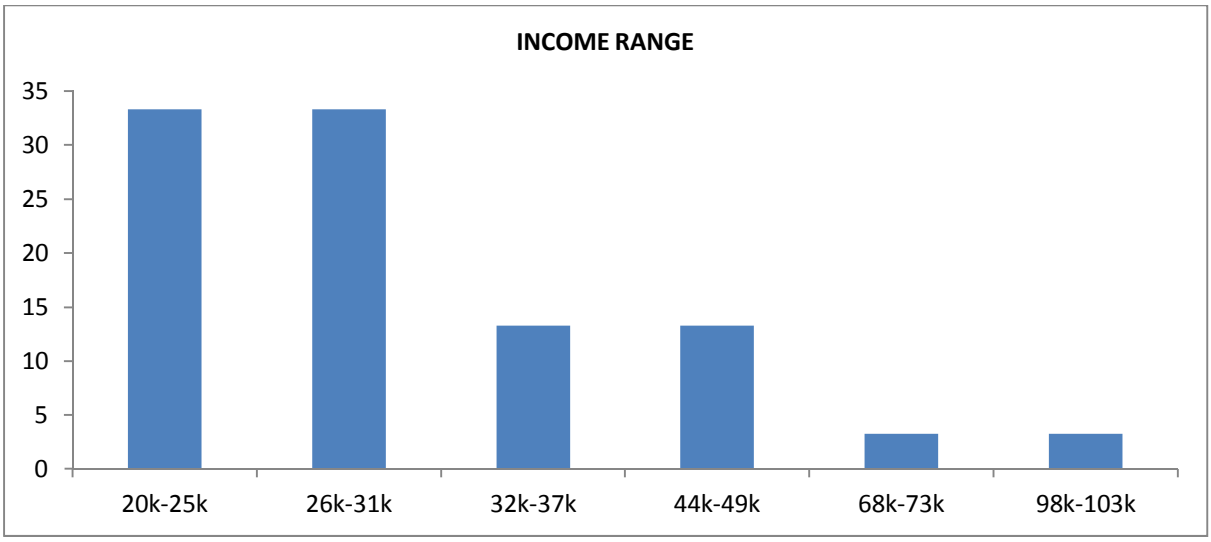


Figure XVII: Distribution of fisher folks respondents by income range

Discussion

The depth of the beach seine 1.3 to 1.5 fatton is used, because it does not reach the mud bottom. The aim is to keep the head line on the bottom and the float line at the same time remaining at the surface while the net is pulled to shore (FAO, 2014). Shahjahan (2000) studied on the economic condition of fishermen of the Jamune River in terms of religion, family size and composition, education status and income, which this study showed consistency of such parameters. As an economic indicator that reflects how well an enterprise operate, in terms of gross revenue to produce a certain profit or net surplus; the Return on investment (ROI) of fifty-three percent (53%) for beach-seining operation needed to be improved upon.

Conclusion/Recommendations

Understanding the social characteristics and attitudes of fishes are necessary for a complete fishery-environmental assessment. However, using this non-biological information together with biological warning can be effective instrument in preventing bycatch. Finally, Economic of financial data need to be collected on a regular basis over periods of time to cover the entire fishing seasons. This would assist policy-makers and operators to better understand the socio-economic impacts of fishing operation and particular, beach-seines.

Therefore, I recommend below:

✓ The use of fisher's ecological knowledge in resource management and opportunities for value addition and post-harvest improvements.

✓ Government and NGOs involvement in micro financing support and micro enterprising development.

✓ The use of socio-economic indicators for the monitoring of the impact of management measures on the livelihoods of the fishing community.

References

1. Ahamed N. (1999). A study on socio-economic aspects of coastal fishermen in Bangladesh. *Journal of Zoology* 24: pp.21-26.
2. Ambrose, E. E. (2005). Effects of fish eye codend on bycatch reduction in nearshor beam trawl shrimp fisheries in Nigeria. *Journal of Aquatic Science*20: pp.97 – 105.
3. Ambrose, E. E., Solarin, B. B., Isebor, C. E. and Williams, A. S. (2005). Assessment of Fish bycatch species from coastal artisanal shrimp beam trawl fisheries in Nigeria. *Fisheries Research* 7: pp 125, pp 132.
4. Canagavatnan, P. and Medcof, J. C. (1955). Ceylon beach seine fishery. Fisheries *Resource Station., Department of Fisheries Caylon,* 1: pp.11-23.
5. Chris F. (2003). Ecosystem-based management of fisheries: Is science limiting? *ICES Journal of Marine Science:* copentagen ICES. Williams. M. J., Stewart P. C., Reichelt R. E, McNee, and Grieve (1993). pp.241.
6. Davies, T. E., Beanjara, N. and Tregenza, T. (2009). A socio-economic perspective in gear-based management in an artisanal fishery in South-West Madagascar. *Fisheries management and ecology*. 6(2): pp.175 – 181.
7. De Silva, D. E. M. (2011) Value Chain of fish and fishery products: Origin functions and application in developed and developing country markets. FAO. pp. 77.
8. Etim, L. (2010), The tragedy of the commons – alleviating the tragedy by management. The commons in Nigerian waters. 27th Inaugural Lecture of the University of Uyo, pp. 39-60.
9. Everett, G. V. (1997) Actions to reduce wastage through fisheries management. In: technical consultation on reduction of wastage in fisheries.

FAO, Fisheries Report No. 547(suppl.) pp. 45-58. Tokyo Japan.
10. Fafchamps, M., and Moser, C. (2004). Crime, Isolation, and Law Enforcement, Research Paper, UNU-WIDER, United Nations University (UNU), No. 2004/05. Available at: http://hdl. handlenet/10419/84639.
11. Fridman, A. L. (1986), Calculations for fishing gear designs (FAO fishing manuals). Pp.120–135.
12. Gillman, E., (2011). Bycatch governance and best practice mitigation technology in Global tuna fisheries. Marine policy 35: pp.590 – 609.
13. Hahn P. K. J; Bailey, R. E; Ritchie, A. (2007). Beach seeing. Protocols pp.267-324.
14. Hall M. D, Alverson D. L. and Metuzals K. I, (2000). Bycatch: problems and solution marine *pollution bulletin* 41(1-6): pp.204 – 219.
15. Hall, S. (1996). The Effects of Fishing on Marine Ecosystems and Communities. Fishing News Books, Blackwell Science Ltd. Oxford pp.296.
16. Hannan M. (1994). Fisher-folk organization in Bangladesh. In: Socio-economic issues in coastal fisheries management, proceedings of the IPFC symposium, Banglok, Thailand, 23-26 November 1993; FAO Indo-pacific Fisheries Commission (IPFC), No. 8. pp. 46-222.
17. Hossain M. M. (2007). Utilization pattern of Mokashbeel for livelihood of the local Fishermen of Kaliakor Upazilla under Gazipur distinct M. S. Thesis, Department of Aquaculture. BAU Mymensingh. p.88.
18. Jones, J. B. (1992). Environmental impact of trawling on the seabed: a review. *New Zealand Journal of Marine and Freshwater Research* 26: pp.59 – 67.
19. Klust, G. (1982), Netting materials for fishing gear, 2nd editions. FAO, fishing News books Ltd. England. pp. 175.
20. Kronen, M., Stacey, N., Holland, P., Magron, F. and Power, M. (2007) Socioeconomic Fisheries Surveys in Pacific Islands; a manual for the collection of a minimum data set. 1. Fishing surveys – methodology 2. Fisheries-Economic aspects – oceania. 3. Fisheries – social aspects – oceania. I – Kronen, Mecki II. Title III Secretarial of the pacific community. 639.2095 AACR2. ISBN: 978-982-00-0190-9.
21. Lutchman, I. (2014). A review of best practice mitigation measures to address the problem of bycatch in commercial fisheries. *Marine stewardship council science*. Series 2: pp. 1 – 17.
22. Moses B. S. (1999). Socio-economic importance of biological conservation. *Transnational Nigerian Society for Biological Conservation* 8: pp.1-5.
23. Normura, M. and Yomazaki, T. (1985). Fishing Techniques, complication of SEAFDEC Lectures published by Japan International Cooperation Agency, p. 206.
24. Northridge, S. P. (1991b). Driftnet fisheries and their impact on non-target species: a world-wide review. FAO *Fisheries Technical Paper*. 320: p. 115.
25. Rabbani M. G. (2007). Study on the fisheries and socio-economic condition of fishermen of Karafoa river. M. S Thesis submitted to Department of Fisheries management, Bangledesh Agricultural University Mymensingh. p85.
26. Rahman K. A. (1994) country report on socio-economic issues in coastal Fisheries Management in Bangladesh. In: Socio-economic issues in coastal fisheries Management, proceeding or IPFC symposium, Bangkok, Thailand FAO Indo-pacific fishery commission 8: pp.170-175.
27. Rakotoson, L. R and Tanner, K. (2006). Community-based governance of coastal zone and marine resources in Madagascar. Ocean and coastal management 49: pp.855 - 862
28. Tietze, U. Lee, R., Siar, S., Moth-Paulsen, T. and Bage, H. E., (2011). Fishing with beach seines. FAO *Fisheries and Aquaculture Technical Paper* No. 562. Rome, FAO, 2011, p.149.
29. Tobor, J. G. and Ajayi, T. O. (1979), Notes on the identification of marine fisheries found in the Nigerian Coastal Waters. NIOMR occasional paper No. 25: p.70.
30. Tzanatos, E., Dimitrion, E. Papaharisis, L., Roussi, A., Somarakis, S. and Kotsiopoulos, C. (2006) Principal Socio-economic Characteristics of the Greek Small-scale coastal fishermen. Ocean & Coastal Management, Vol. 49, issues 7-8 pp.511-527.
31. Udolisa, R. E. L., Solarin, B. B., Lebo, P. E. and Ambrose, E. E. (1994). A catalogue of small scale fishing gear in Nigeria. RAFR Publication, RAFR/014/F1/92/02:142: p.142.
32. Watson, J. T., Essington, T. E. Lennert-cody, C. E and Hall, M. A (1999). Trade-offs in the design of fishery closures: Management of silky shark bycatch in the eastern Pacific Ocean tuna fishery. *Conservation Biology* 23: pp.626 635.
33. Witzig, J. F. (1997). Development of a plan for managing bycatch in U. S. fisheries In: Technical consultation on reduction of wastage in fisheries. FAO, fisheries Rpt. No. 547 (spply), pp.117-135. Tokyo, Japan.

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