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Adoption of longline fishing practices in Kanyakumari district of Tamil Nadu

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Abstract

The present study was carried out to find out the profile, adoption practices, knowledge level and constraints of longline fishermen. The village's viz. Eraviputhenthurai, Ezhudesam chinnathurai, Melamuttom and Thoothoor were selected based on majority of fishermen involved in longline fishing activities. One hundred twenty fishermen were selected proportionally from the selected fishing villages and the data were collected through interview schedule and analyzed with statistical tools. Of the 10 practices evaluated, the adoption scores were higher for four practices viz., Usage of Swivel (100.00 percent), Usage of modern fish finding equipments (100.00 percent), Onboard storage facility (100.00 percent), Usage of ice (100.00 percent). It was observed that low demand and low price rate for the catch during peak season, Lack of bank loan facilities, need training in advanced methods adopted for longline fishing, Lack of alternative income generation other than fishing, inadequate subsidies for inputs were the major problems faced by the longline fishermen. Fixing up the remunerative price for the problem of price fluctuations; Provide training on advanced method of fishing and to organize awareness programs on advanced method of fishing; Government should undertake steps to create alternate livelihood opportunities and the fishermen should be engaged in other employment activities for alternative income generation; Provide subsidy/ loans for inputs like boat, engine, fuel, gear, hooks were the suggestions for the constraints of longline fishermen.

Keywords: Adoption; longline fishermen; longline fishing practices

Introduction

Longline fishing is one of the most important commercial fishing methods in the mechanized fishing sector of Kerala, Tamil Nadu and Andhra Pradesh (Vipin *et al.*, 2014) [8]. Tamil Nadu has 1079 km long coastline with 0.19 million ha of EEZ (Exclusive Economic Zone) and 41,412 sq. km of continental shelf. About 6, 90,000 marine fishermen from 591 fishing villages along the coastline are fishing with 53,844 traditional and 12,325 mechanized crafts (Sakthivel, 2008) [7].

Tamil Nadu ranks first in long line fishing (39.00%) followed by Orissa (27.00%) and Andhra Pradesh (19.00%) (Anon, 2000) [1]. Due to lack of awareness, technology transfer and limitations of the long line fishing in Indian states resulted in change of scenario in terms of production. West Bengal ranks first in longline fishing (55.00%) followed by Tamil Nadu (33.00%), Odisha (10.00%) and Kerala (2.00%) (Anon, 2010) [2]. According to the 2010 census, 380 liners are used in the Kanyakumari district.

Out of 13 coastal districts of Tamil Nadu, longline fishing was predominantly practiced in Kanyakumari district. Kanyakumari is located in between the geo coordinates 8.08 N 77.57 E which has an average elevation of 300 meters. This district has the coastal length of 71.50 Kms. According to the 2010 census, the total population of the district was 18, 70,374 which includes the male population of 9, 26,345 and the female population of 9, 44,029. The district has a total of 47 fishing villages. The total fishermen and active fisher folk population of this district were estimated to be 1, 56,595 and 45,017 respectively. Based on the CMFRI Marine Fisheries census 2010 (Tamil Nadu) published as the report by Department of Animal Husbandry, Dairying and Fisheries, 380 liners were operated in Kanyakumari district of Tamil Nadu [3].

Longline gear consists of several basic components such as main line, branch line, hook and bait etc. However the hook and bait are the two factors which directly decide the catch efficiency and selectivity. Invariably all the parts of longline are adaptable to specific species

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By bringing out changes in material of construction and dimensions of different parts.

In this context, a study on an empirical study of Longline fishing in Kanyakumari district of Tamilnadu has been taken up with the following objectives.

Objectives

- To study the profile of longline fishermen
- To study the practices adopted by longline fishermen
- To identify the constraints faced by the fishermen and suggest suitable strategy to overcome

Methodology

The villages were selected based on the maximum of fishermen involved in longline fishing. Among the 47 fishing villages of this district, four fishing villages Toothier, Eraviputhenthurai, Ezhudesam chinnathurai, Melamuttom were selected for the study. The data were collected from a proportionate sample of 120 fishermen.

The selected practices viz., Line hauler, Usage of ecofriendly hook (relevant hook size), Size of the hooks (5 / 8 / 13), Use of Live bait, Use of artificial bait, Mode of Catch: Bottom / Pelagic, Adjustment of floats for maintaining the depth of operation, Usage of modern equipment's for determining depth of operation (Echo sounder), Usage of Sekiyama, Usage of Snood wire, Usage of Swivel, Usage of branch line clip, Usage of indicator floats, Type of engine (Branded / locally made / imported), Usage of modern fish finding equipment's GPS / SONAR / Others, Usage of communication

equipment's VHF / Mobile phone / Others, Usage of life saving appliances Life buoy / Life raft / EPIRB / Others, Adoption of advanced hook type (other than 'J' type hook), Adoption of monofilament, Correct float material (HDPE), Correct hook material (high carbon / stainless steel), Onboard storage facility (fish hold), Usage of ice, Deck cleanliness during and after fishing, Toilet facility for crew.

The adoption level of each respondent was calculated using the formula developed by Kumaran *et al.* (2003) [5].

Adoption = $n/N \times 100$

n = No. of respondents who had adopted the practice

N = Total number of respondents

Socio-economic characteristics viz., age, educational status, experience in fishing, family status, information seeking behavior, social participation status, annual income, material possession, contact with extension agency, mass media exposure, decision making behaviour, innovativeness, economic motivation, risk Orientation, scientific orientation, Communication tools used and knowledge level were also selected for the study. The data were proportionally collected from 120 respondents through personal interview with the help of pre-tested survey schedule and the data were analyzed using statistical methods like percentage analysis, mean, standard deviation, correlation coefficient *etc* [5].

Results and discussion

The study revealed that most of the important practices were adopted by the fishermen (Table 1).

Table 1: Distribution of the respondents according to their adoption level of different longline fishing practices

S. No	Practices	Adoption		Partial Adoption		Non Adoption		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
1	Line hauler	-	-	-	-	120	100	120	100
2	Usage of ecofriendly hook (relevant hook size)	80	66	30	25	10	9	120	100
3	Size of the hooks (5 / 8 / 13)	100	83	20	17	-	-	120	100
4	Use of Live bait	98	82	22	18	-	-	120	100
5	Use of artificial bait	20	17	46	38	54	45	120	100
6	Mode of Catch: Bottom / Pelagic	38	32	72	60	10	8	120	100
7	Adjustment of floats for maintaining the depth of operation	97	81	23	19	-	-	120	100
8	Usage of modern equipment's for determining depth of operation (Echo sounder)	93	78	20	17	7	5	120	100
9	Usage of Sekiyama	-	-	-	-	120	100	120	100
10	Usage of Snood wire	43	36	-	-	77	64	120	100
11	Usage of Swivel	120	100	-	-	-	-	120	100
12	Usage of branch line clip	-	-	-	-	120	100	120	100
13	Usage of indicator floats	85	71	35	29	-	-	120	100
14	Type of engine (Branded / locally made / imported)	100	83	20	17	-	-	120	100
15	Usage of modern fish finding equipment's GPS / SONAR / Others	120	100	-	-	-	-	120	100
16	Usage of communication equipment's VHF / Mobile phone / Others	92	77	28	23	-	-	120	100
17	Usage of life saving appliances Life buoy / Life raft / EPIRB / Others	45	37	75	63	-	-	120	100
18	Adoption of advanced hook type (other than 'J' type hook)	72	60	27	22	21	18	120	100
19	Adoption of monofilament	100	83	20	17	-	-	120	100
20	Correct float material (HDPE)	90	75	30	25	-	-	120	100
21	Correct hook material (high carbon / stainless steel)	72	60	48	40	-	-	120	100
22	Onboard storage facility (fish hold)	120	100	-	-	-	-	120	100
23	Usage of ice	120	100	-	-	-	-	120	100
24	Deck cleanliness during and after fishing	95	79	25	21	-	-	120	100
25	Toilet facility for crew	20	17	100	83	-	-	120	100

Majority of the fisherman were found to have fully adopted seventeen practices viz., Usage of ecofriendly hook (66.00 percent), Size of the hooks (83.00 percent), Usage of live bait (82.00 percent), Adjustments of floats for maintaining the depth of operation (78.00 percent), Usage of modern equipment's for determining depth of operation (Echo sounder) (78.00 percent), Usage of Swivel (100.00 percent), Usage of indicator floats (71.00 percent), Type of engine (83.00 percent), Usage of modern fish finding equipment's (100.00 percent), Usage of communication equipment's (77.00 percent), Adoption of advanced hook type (60.00 percent), Adoption of monofilament (83.00 percent), Correct float material (75.00 percent), Correct hook material (60.00 percent), Onboard storage facility (100.00 percent), Usage of ice(100.00 percent), Deck cleanliness during and after fishing(79.00 percent). Mainly the longline fishermen adopted sixteen fishing practices due to their high experience, nuclear family status, high number of material possession, information seeking behavior and risk taking behavior on innovative methods. This observation is in line with the findings of Nithya (2015) who also reported that the innovativeness level of fishermen was medium. Medium level

of fishermen was engaged in making of new fishing method like squid jigging. Majority of the fishermen willing to accept new fishing practices [6].

In the case of practices viz., Mode of Catch (60.00 percent), Usage of life saving appliances (63.00 percent), Toilet facility for crew (83.00 percent) majority of the fishermen reported as partial level of adoption. These practices were partially adopted by the fishermen due to inadequate knowledge and awareness.

Further, it has also been found that majority of the fisherman have not adopted some of the practices viz., Use of artificial bait (45.00 percent), Line hauler (100.00percent), Usage of Sekiyama (100.00 percent), Usage of Snood wire (64.00 percent), Usage of branch line clip (100.00 percent). These practices were non-adoption due to not awareness of new technologies and low level of education.

It could be concluded that the adoption of longline fishing practices by fishermen was very much influenced by experience in fishing, Information seeking behavior, social participation, annual income, material possession, decision making behaviour, innovativeness, economic motivation and risk orientation (Table 2).

Table 2: Correlation between the characteristics of the fishermen and extent of adoption

Variable code	Variable	Correlation co-efficient(r)
		Adoption
X ₁	Age	-.229*
X ₂	Educational Status	-.486**
X ₃	Experience in fishing	.318**
X ₄	Family status	-.380**
X ₅	Information seeking behavior	.256**
X ₆	Social Participation	.564**
X ₇	Annual income	.676**
X ₈	Material possession	.829**
X ₉	Contact with Extension Agency	.041NS
X ₁₀	Mass Media Exposure	-.555**
X ₁₁	Decision making behaviour	.387*
X ₁₂	Innovativeness	.673**
X ₁₃	Economic Motivation	.321**
X ₁₄	Risk Orientation	.760**
X ₁₅	Scientific Orientation	-.141NS
X ₁₆	Communication tools used	.102NS

Note: * - Significant at 5% level, ** - Significant at 1% level, NS – Non-significant

The Constraints of longline fishermen regarding longline fishing practices have been presented in Table 3. Low demand and low price rate for the catch during peak season (83.33%).

This finding is in line with the findings of Nithya (2015) [6] and Cyril *et al.* (2013) [4] were found that most of the respondent had medium level of scientific orientation.

Table 3: Constraints of longline fishermen (n=120)

S. No	Constraints	No. reported	Percentage
1	Low demand and low price rate for the catch during peak season	100	83.33
2	Lack of bank loan facilities	94	78.33
3	Need training in advanced methods adopted for longline fishing	89	74.16
4	Lack of alternative income generation other than fishing	87	72.50
5	Inadequate subsidies for inputs	85	70.83
6	International boundary related issues	82	68.3
7	Lack of education	80	66.66
8	Lack of knowledge on operation of communication tools	79	65.83
9	Lack of knowledge on the use of Android mobiles	74	61.66
10	Lack of repairing facilities	68	56.66
11	Non availability of crew members	54	45.00
12	Lack of landing center	53	44.17
13	Lack of marketing facility	51	42.50

Conclusion

Longline fishing has been practiced throughout the world since ancient times. This method has been evolved over time from small artisanal fishing craft to modern mechanized long lining all over the world. Change in their socio-economic characteristics is needed to bring about change in their adoption behavior. Some of the suggestions given below for their constraints,

1. Fixing up the remunerative price for the problem of price fluctuations.
2. Provide training on advanced method of fishing and to organize awareness programs on advanced method of fishing.
3. Government should undertake steps to create alternate livelihood opportunities and the fishermen should be engaged in other employment activities for alternative income generation.
4. Provide subsidy/ loans for inputs like boat, engine, fuel, gear, hooks.
5. Create awareness program on fishing within international boundary.
6. Training program on use of communication tools for all crew members to overcome the constraint about ICT tools.
7. Arrangement of government work shop near landing center for solve the problem of repairing the engine at low cost and any time.
8. Contract base working arrangement is the way to solve the non-availability of crew members problem.
9. Government should take action about construction of landing center for the main fishing villages (or) make necessary arrangements to land their fish nearby landing centres.
10. Provide marketing facilities.

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