

THE SPREAD OF MODERN TECHNOLOGY AND ITS INFLUENCE ON THE FISHING COMMUNITY IN KERALA

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ABSTRACT

Fishery sector holds an important position in the development of a nation. The modernisation and up gradation of existing fishing technologies helped to increase the efficiency of fishing and allied activities. At the same time it has made some sort of negative impact on those who are unable or reluctant to keep up with the changes that happened in the fishing technology. The motorized and non motorized fishing become a hot thought for the scholars since it is connected to the sustainability in fishing. The mechanised fishing obviously did well in the economics of fisher folk those who adopted technology, but did worse in the case of fisher folk those who didn't adopt technology. In this context the present paper examines the spread of modern technology and its influence on the fishing community in Kerala. The estimated model in this paper proves that there are significant mean differences in income among fisher men using technology in fishing and not using technology in fishing. The coefficient value fisher men using technology in fishing is having positive sign. As these regression results show, the mean income of fisher men using technology in fishing is higher compared to mean income of fisher men not using any technology in fishing. These results are validated by observed significance at given level of significance. Thus the hypothesis of significant mean difference in expenditure among users of modern and traditional methods is accepted and validated by the t test.

Keywords: Technology, modernisation, fishing sector, ANOVA, Mann-Whitney U Test

1. Introduction

Fishery sector holds an important position in the development of a nation. The modernisation and constant changes and up gradation of existing fishing technologies helped to increase the efficiency of fishing and allied activities. At the same time it has made some sort of negative impact on those who are unable or reluctant to keep up with the changes that happened in the fishing technology. The motorized and non motorized fishing become a hot thought for the scholars since it is connected to the sustainability in fishing. The mechanised fishing obviously did well in the economics of fisher folk those who adopted technology, but did worse in the case of fisher folk those who didn't adopt technology.

In this context the present paper deals with the spread of modern technology. Hence, the specific objective of this paper is to the spread of modern technology and its influence on the fishing community in Kerala. The study is based on a sample of 300 persons selected at random from these areas for the purpose of analysis various statistical tools will be used in course of the study. Data was collected from 4 villages in Thrissur district namely Valappad, Nattika, Vadanappally and Engandiur villages of Thrissur district in Kerala.

2. Review of Literature

There are several studies related to the impact of spread of modern technology on living conditions of the traditional fishing community in India. Sam Bennet P. and Arumugam G (1993) attempted to analyse the impact of motorisation on the traditional fishing in Tuticorin. The study could notice that motorisation in the field of fishing crafts brought out significant changes in the lives of traditional fishermen. He also brought to the light that there is a tendency of increasing and intensified fishing activity as a result of motorisation in the areas where traditional fishing going on. This ultimately contributed negatively as the traditional fishermen without motorised fishing could not withstand the motorisation and their fish catch and profitability significantly declined. Kurian J (1994) made an analysis of the causes and effects of motorisation in the areas of fishing. The author held the view that the modern sector is poised for a perpetual growth at the cost of the traditional sector in the fisheries industry. But the benefits of technological advancements are misappropriated by a few non-fishermen by marginalising and depriving the majority of the traditional fishermen.

Muktha Shet M (1995) organised a study on the socio-economic conditions of fishermen of Dhakshina Kannada. Study could identify that traditional fishermen and small boat owners have been facing serious challenge as the large mechanised boat owners were making serious influence of their fishery activity and profitability. In terms of fish catching, marketing and all the large units were overcoming the small owners. This has seriously affected their socio economic life and status of life.

A study was conducted by Antony George and Placid G (2000) to understand the status of fishermen community in Kerala as a result of mechanisation. The study could identify that the policy of the Government allowing mechanised fishing in the inshore waters of Kerala had contributed negatively to the traditional fishermen community. On the one hand their income level declined significantly due to mechanisation and on the other their economic life status have been very poor. The rapid mechanisation ensures that resourceful entrepreneurs take over the resources that had traditionally belonged to the artisanal fisher folk.

Another important study was conducted by Sathiadhas R, Venkateswaran K (2000) in the traditional fishery sector of Kerala. The economic implication of the mechanised fishing was very crucial as this practice affected the traditional fishery sector in Tamil Nadu. The study concluded that the introduction of mechanised crafts helped to increase the fish production but it adversely affected the livelihood of traditional fishermen. The catch per trip was maximum when the traditional crafts operated alone but the mechanised boats have created more employment opportunities. This may lead to a situation where in the traditional craft owners might leave their occupation and turn to work as labourers in mechanised sector.

3. Spread of Modern Technology in Kerala

Technology is an inevitable factor of development. Introduction of any kind of advanced technology in any fields of economic activity generates incomparable differences in the returns from the fields where it has implemented is an unveiled truth. Implementation of new technology is the only way to reap the unexploited coastal resource. The table 1 reveals that the fishing sector of Kerala is not reluctant to adopt any type of modern technology in order compete with the fishing people of abroad. Here 60 percent of people are using advanced technology for the results beyond their expectations, or the fishing sector is transforming technologically like anything and the result will be their economic and social development and finally the nation’s economic growth since the coastal resources have high international markets. But the reality that can’t be ignored is that 21.33% of the population is pessimistic as they are avoiding modernisation. Another fact that has same importance is the unawareness of people regarding the modern technologies available to them even we are far ahead in every fields compared to other states of India. About 18.67% of total population belongs to this category. That is the pessimistic and ignorant people together make 40% of the population.

Fishing gear refers to the equipments used by fishermen. This includes bag nets, scoop nets, traps, plunge baskets, seines, drift grill nets, Chinese dip nets, fishing crafts etc. The fishing gears may be traditional or modernised. About 70% of the population own modern fishing gears such as motorised boats, mechanised crafts and other equipments. Among this, 45 % prefer mechanised fishing methods and the remaining 25% use motorised fishing techniques. It will be noted that even in this age of technological explosion 30% are using or preferring the outdated fishing techniques which have been existing for several years or follows the methods of ancient times. In fact a major portion of the population is ignorant about modern facilities and technologies that are to be used in fishing; here these people may not alone be blamed. The inefficient governing bodies also have to bear the responsibility of this.

Table 1:
Application of technology in the fishing sector

Sl.No	Application of technology	Number of respondents	Percentage
1.	Use modern technology	180	60
2.	Do not use modern technology	64	21.33
3.	No idea about modern technology	56	18.67
	Total	300	100

Source: Primary Survey

4. Effectiveness of Technology

The modernisation and up gradation of any field become worthless, if the adopted changes are ineffective. As per our primary survey, 180 respondents were adopted modern technology in their fishing whereas 84 respondents are still using traditional methods. The effectiveness of technology is assessed by taking responses of uses in a five scale likert of effectiveness. Recorded responses are tested and validated by Mann-Whitney U Test. Total 264 fishermen are recorded their responses at five scale likert. 180

responses are marked from the users of modern technology, whereas 84 responses are marked from the users of traditional technology. The mean rank of responses marked against modern technology is 156.75 and it is 80.54 in traditional technology. The observed behaviour is statistically validated by the rejection of null hypothesis even at 1 percent level of significance

Table 2:
Effectiveness of Technology

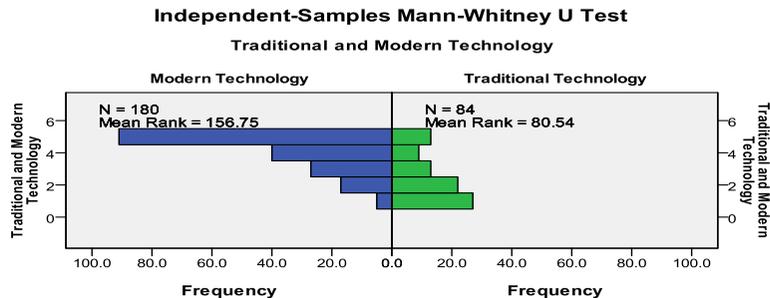
Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of effectiveness is the same across categories of Traditional and Modern Technology.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Note: 5 scale likert. 5= Highly Effective, 4= Effective, 3= Undecided, 2= Ineffective, 1= Totally Ineffective

The test statistics of 3195.5 at .001 significance corroborate that the the distribution of effectiveness is not same across categories of Traditional and Modern Technology. The direction of difference is found by mean ranks. Fisher men those who are using modern technology feel the technology are more effective than the older ones. Fisher men those who are using traditional methods feel the technology are not effective.

Diagram 1



Total N	264
Mann-Whitney U	3,195.500
Wilcoxon W	6,765.500
Test Statistic	3,195.500
Standard Error	555.449
Standardized Test Statistic	-7.858
Asymptotic Sig. (2-sided test)	.000

5. Modern technology and its Influence on the income and expenditure of the fishing community

The given ANOVA regression model shows the mean difference of income among fisher folk those who are using technology and traditional methods in fishing. The dependent variable is income which is measured at scale (rupees). Users of technology and users of traditional methods in fishing are taken as independent variable, which are represented as dummies (categorical or dichotomous) in the model. The estimated model proves that there are significant mean differences in income among fisher men using technology in fishing and not using technology in fishing. As predication equation represents the mean income of fisher men not using technology in fishing is rupees 10925.0 (it's the value of reference or excluded category). The coefficient value fisher men using technology in fishing is 6788.83 with positive

sign. As these regression results show, the mean income of fisher men using technology in fishing is rupees 17713.8, which is higher by about rupees 6788.83 in compared to mean income of fisher men not using any technology in fishing. These results are validated by observed significance at given level of significance (5%).

Table 3:

Technology Applied in Fishing and Its Impact on Income - ANOVA Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10925.0	507.298		21.536	.000
	Fisher men using technology in fishing	6788.83	587.083	.557	11.564	.000

- a. Dependent Variable: Income
- b. Excluded Category: Users of traditional fishing

$$Y = \beta_1 + \beta_2 D_2 + \mu$$

Where,

Y = Income

β_1 = Reference category or intercept value

β_2 = slope coefficient

D_2 = Dummy variable of fisher men using technology in fishing

μ = Stochastic error term

6. Technology and Expenditure

Technology in fishing sector mainly includes mechanised and motorised fishing gears, methods in gathering, marketing facilities, and new conservation and preservation methods to reduce post harvesting loss. Smart weighing machines, GPS facilities to identify the moving fish fleet, weather predicting technologies in boats etc are some other forms of modern technologies that can be implemented in the fishing sector. These implementation demands high monetary expenses from the side of the fishing folk. There are only 180 respondents have implemented modernised technologies and if their yearly expenditure for the purpose is considered, it would be noted that 25.56% people spend less than 5000 rupees and 34.44% have spending pattern between 5000 and 10000. These expenditure patterns are insufficient and inadequate for the modernisation of the fishing sector in any manner. Among those who have implemented modern technologies, 40% people have a spending pattern more than 10000 rupees in a year. The reason for the low expenses by the 60% people can be traced to the low income of the people.

Table 4

Yearly expenditure on implementation of technology

Sl. No	Maintenance of craft	Number of respondents	Percentage
1.	Below 5000	46	25.56
2.	5000-10000	62	34.44
3.	Above 10000	72	40
	Total	180	100

Source: Primary Survey

Table 5 shows that the fisher men those who are using technology need an average rupees 10513.83 monthly to maintain their given technology. Fishermen those who are using traditional methods have to spend merely rupees 3725.00 per year in an average.

Table 5

Expenditure for maintenance

Group Statistics						
		Use of Technology	N	Mean	Std. Deviation	Std. Error Mean
Expenditure for maintaining fishing equipments(yearly)	Modern Technology		224	10513.83	4917.39	328.55
	Traditional Methods		76	3725.00	2411.59	276.62

Source: Primary Survey

The differences which are shown in table 5 are statistically tested and its results are shown in the table 6. The results of parametric independent sample t test shows that mean difference of rupees 6788.83 is highly significant

Table 6
Independent Samples Test of Expenditure

Independent Samples Test									
Expenditure for maintaining fishing equipments	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	40.86	.000	11.56	298	.000	6788.83	587.08	5633.48	7944.19
Equal variances not assumed			15.80	261.10	.000	6788.83	429.50	5943.10	7634.57

Source: Primary Survey

Even at one percent level of significance. Thus the hypothesis of significant mean difference in expenditure among users of modern and traditional methods is accepted and validated by the t test.

7. Concluding remarks

The modernisation and constant changes and up gradation of existing fishing technologies helped to increase the efficiency of fishing and allied activities. At the same time it has made some sort of negative impact on those who are unable or reluctant to keep up with the changes that happened in the fishing technology. In this context the present paper deals with the spread of modern technology. Hence, the specific objective of this paper is to the spread of modern technology and its influence on the fishing community in Kerala. It can be seen that the modernisation and up gradation of any field become worthless, if the adopted changes are ineffective. The direction of difference is found by mean ranks. Fisher men those who are using modern technology feel the technology are more effective than the older ones. Fisher men those who are using traditional methods feel the technology are not effective. The estimated model in this paper proves that there are significant mean differences in income among fisher men using technology in fishing and not using technology in fishing. The coefficient value fisher men using technology in fishing is having positive sign. As these regression results show, the mean income of fisher men using technology in fishing is higher compared to mean income of fisher men not using any technology in fishing. These results are validated by observed significance at given level of significance. Thus the hypothesis of significant mean difference in expenditure among users of modern and traditional methods is accepted and validated by the t test.

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