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FROM WAVES TO WIRES: THE SOCIO-ECONOMIC EFFECTS OF TECHNOLOGICAL ADVANCEMENTS ON KERALA'S FISHING SECTOR

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Keywords	***Abstract***
Technology, Fishing Sector, Marginalized, Productivity, Small Scale, Fishermen, Modernization.	One way to look at fishing technology is as an academic field that explains different methods. The development of more efficient fishing gear and vessels has allowed for the capture of larger fish stocks with less effort and energy. This article looks at the effects of recent technical developments on the fishing industry, particularly as they pertain to the fishermen of Kerala. The social interactions entrenched in fish feeding systems are an important but understudied part of these changes. Women and other marginalized groups are often left out in the cold when food system revolutions alter power dynamics and reshape gendered economic roles and divisions of labour.

1. INTRODUCTION

In the Global South, small-scale farmers' livelihoods and the food security of the impoverished are profoundly affected by how commercial development and technological developments are transforming fish food systems. The social interactions entrenched in fish feeding systems are an important but understudied part of these changes. Women and other marginalized groups are often left out in the cold when food system revolutions alter power dynamics and reshape gendered economic roles and divisions of labour.

According to research by Shyam et al. (2013), around 14.5 million people in India rely on fishing as

a daily livelihood. About 40% of the world's total fish production—4.5 million metric tons—comes from fishing. However, the productivity of capture fisheries has been flat worldwide since the 1980s (FAOFAOFAO, 2020). An assessment determined the maximum sustainable yield (MSY) of the fish populations in the Indian EEZ to be 3.93 million t (Annon., 2000). Despite claims of maximal exploitation, these equities' yields have not yet reached their MSY (CMFRI, 2018).

One way to look at fishing technology is as an academic field that explains different methods. The development of more efficient fishing gear and vessels has allowed for the capture of larger fish stocks with less effort and energy. This article looks at the effects of recent technical developments on the fishing industry, particularly as they pertain to the fishermen of Kerala. It keeps a careful eye on the spread of technology and its effects on the fishermen of Kerala and the state's fisheries. Since 1950, when five-year plans were introduced, the fishing industry has seen enormous transformation. Since the first five-year plan prioritised agricultural and related sectors, it is evident that this was a watershed moment for introducing technology into the fishing industry.

Prior to independence, Kerala began the process of modernising its fishing industry. The T.C.M. program, the FAOFAOFAO assistance, and the INPINPINP (Indo-Norwegian Project) support made it feasible for Kerala and other states. (The United Nations, the United States of America, and the Government of India entered the T.C.M. (Technical Co-operation Mission) in 1952.) Various fishing gear, synthetic twine, insulated vans, and containers for transporting and storing fish are only a few examples of the technological help our nation has received in the fisheries industry under the T.C.M. Programme. An early example of this kind of technology was the diesel engine, which was used to power tiny boats. Kerala's fisheries were blessed thanks to the FAOFAOFAO technical aid, which included training for fishermen, equipment supply, and infrastructure development. (As stated in the aforementioned source, (Master Plan for Fisheries Development) by G.O.K., pages 15). The INPINPINP was the starting point for the widespread mechanisation of the fishing industry in Kerala.

1.1. Indo-Norwegian Project and Kerala Fisheries Sector

In 1952, the governments of India, Norway, and the United States signed the Indo-Norwegian Project (INPINPINP), which allowed the state of Kerala to become the first in India to extensively use mechanisation. By this point in history, Kerala was no longer a separate language state but the former Travancore Cochin State. Therefore, the project was overseen by the Indian government but carried out by the Travancore administration. The project's primary goal was to introduce mechanisation to the sector, but it also had many secondary goals, such as raising people's living standards by increasing their earnings from fishing through more efficient distribution of fresh fish and increasing the volume of catching through the introduction of new combinations of craft gear. "Fisherwomen on the Kerala coast," by Leela Gulati, International Labour Organisation, Geneava, 1984, p. 6. The project shifted its focus to developing motorised boats suitable for Keralan harbours once it was determined that motorising indigenous watercraft had failed.

Kerala is well-known as a fishing Mecca situated on India's southwestern coast. Roughly thirteen percent of the nation's total marine fish output comes from its fisheries. The industry greatly impacts the development of the Gross State Value Added (GSVA), employing over 800,000 people in capture and related jobs (Government of Kerala 2022a). Among the Indian states that eat the most fish, Kerala ranks high (Government of India 2020). Fshing communities in Kerala remain among the state's most disadvantaged socioeconomic groups, even though the marine fishing business is economically significant. Due to technical advancements in fishing gear, techniques, and boats, the

marine fishing industry in Kerala has seen a significant transition (Government of Kerala 2022b).

1.2. Background of the Study.

Social and environmental issues put the maritime Fisherfolk of Kerala at risk of losing their way of life. Socioeconomic variables, such as the high degree of market exploitation and the unorganised character of the industry, among many others, impact livelihood vulnerability in addition to the aforementioned environmental vagaries and sustainability difficulties. During low-price and high-catch times, when intermediaries gain from price spread, Gopal et al. (2001) found a significant price spread in Cochin's retail marketplaces.

The value chain agents, including auctioneers, take a sizable cut of the price spread. The low proportion of primary producers (fishers) to the consumer rupee indicates inefficiency, another cause for worry. The percentage of the consumer rupee that goes to the fishermen is 59% for oil sardines and 70% for seerfish, as noted by Aswathy et al. (2014). The fishermen's low savings rate is a direct result of their poor profit margin; as a result, they must rely on informal lenders like auctioneers to fund their day-to-day operations, and the concealed exploitative repayment modules put them in the same position. The fishermen's fears are heightened because market prices might fluctuate. Auctioneers and dealers, rather than fishermen, usually determine how much a catch is worth. Due to its great perishability, fish is often sold at a discount during economic hardship (Salim et al., 2017). Because of this, the fishermen's income is quite unstable. Fishermen are forced to seek out other forms of work because of occupational rigidities. According to John and Sany (2019), fishers must disrupt the current quo and engage in marketing to prevent exploitation in the supply chain.

1.3. Significance of the Study

Examining how technical progress has affected the economic and social standing of Kerala's fishermen is the primary objective of this research. The study's most eye-catching aspect was the fishing industry's technical diversity, which might explain why there is a disparity in revenue among regions. The economic disparities among regions may be explained by a multitude of factors. To understand this income fluctuation, this research sets out to identify its causes. The distinct craft-gear combinations used by fishermen in each location are a good indicator of their technological diversity. In light of this theory, an examination of the common craft gear combinations in each area follows.

1.4. Objectives of the Study

- To analyse the different fishing practices among the Fisherfolk of Kerala.
- The purpose of this study is to evaluate the advancement of technology in the fishing sector and its influence on the socio-economic status of the Fisherfolk of the study region.
- To suggest policy measures in the light of findings for the betterment of the fishermen community.

2. MATERIALS AND METHOD

2.1. Profile of the study area: Short description of selected districts and fishing villages

2.1.1. Thiruvananthapuram District

In 1957, the Thiruvanathapuram district was established, with a total of 2192 sq. km. and boasting a coastline of 78 km. There are 33,07,284 people living there, with a maximum density of 1,509 people per square kilometre, according to the 2011 census. There are a total of 15,131 fishermen living in 42 different fishing communities within the region, according to 2018 figures. We picked three of these fishing communities at random from the list. Among these fishing villages, Vizhinjam

North ranks first with 12590 people, Poonthura with 12886 people, and Pulluvila with 9488 people.

2.1.2. Alappuzha District

The 17th of August 1957 saw the formation of Alappuzha district. North latitudes 90°05′–90°52′ and longitudes 76°17′–76°48′ make up its geographic location. Although it is the second-smallest district in terms of land, its population density of 1,501 per square kilometre makes it the most densely populated. The whole landmass is 1414 square kilometres. There are 212,1943 people living there as per the 2011 census. Out of the three districts that were considered, 54 of them are fishing communities, with a combined population of 156,192. The fishing communities of Chethy (population:6322), Vadackal (population:5023), and Ottamassery (population:6395) were chosen from among them.

2.1.3. Kozhikode District

Located on the southwest coast of India lies the Kozhikode district. Kannur district forms the district's northern boundary, Wayanad district's eastern boundary, Malappuram district's southern boundary, and the Arabian Sea's western boundary. A sandy coastal strip, rocky mountains produced by the mountainous sections of the Western Ghats, and a lateritic midland make up the district's topography. With a population of 1,31,787, this area is home to 34 fishing settlements along its 80 km coastline. The fishing villages of Chaliyam, Elathoor, and Puthiyakadavu were selected at random from this group. Their respective populations are 6,168, 5399, and 6095. (Cooperative for Coastal Development in the State of Kerala).

2.2. Methodology and Data Collection

In order to accomplish its aims, the study employs a hybrid technique that qualitatively follows the decision-making process at the policy level. The data analysis process made use of both quantitative and qualitative techniques. Factor analysis, paired t-tests, independent t-tests, chi-square, one-way ANOVA, and standard deviation were some of the statistical methods employed in the research.

2.2.1. Sample Design

The research achieves its goals using a hybrid method that qualitatively tracks the policy-level decision-making process. In order to analyse the data, researchers used quantitative and qualitative methods. The study used a variety of statistical tools, including chi-square, one-way analysis of variance, standard deviation, paired and independent t-tests, and factor analysis.

3. REVIEW OF LITERATURE

People typically assume small-scale fishermen have little access to information, but a 2020 research called "Benefits of Fisheries Technology on Small Scale Fishermen" dispels that myth. Society continues to marginalise them despite the fact that they have traditionally played a crucial role in rural development efforts. The research used an entirely exploratory strategy and data collection technique. Additionally, it has surveyed current literature on technical developments in the fishing industry. Among the many technologies used in the fishing industry, this research focused on fishing driven by information and communication technology (ICT). The term "information and communication technology" (ICT) refers to a collection of tools that may improve and speed up the exchange of information and the communication process, irrespective of physical location (Meng et al., 2013). S. Z. Omar, B. A. Samah, and C. C. Meng (2013).

Input marketing, insurance and credit supply, entrepreneurial development, technology and policy implementation, livelihood development, and other relevant areas are now being worked on by several entities under the State Department of Fisheries. Krishna and Veerakumaran (2020) state that

Matsyafed, an agency of the Department of Fisheries and the supreme authority of primary fishermen welfare development cooperative societies, offers financial aid to fishers in the form of subsidies for the motorisation of country crafts and appropriate fishing gear components, as well as working capital funding. In addition, primary cooperative organisations have set up microfinance groups to help people get institutional loans easily (Mathews & Nair, 2019).

Jeyanthi et al. (2018) found that fishermen's cooperatives performed very well regarding loan amounts, repayment rates, and revenue from fish marketing services. Additionally, they proposed enhancing the cooperative services by assisting stakeholders with technical matters related to cutting-edge fishing technology and efficient fisheries management. To improve the role of cooperatives in fish selling and to make Matsyafed more decentralised, John & Sany (2019) suggested.

Improvements in technology and literacy levels among rural communities, decreased digital divide, increased productivity and ability to combat poverty, and safety concerns among small-scale fishermen were the four main advantages of using ICT for fishing activities that the study emphasized.

4. TECHNOLOGY AND REGION

4.1. Use of Technology among Region

Table 4.1: Use of Technology among Region

Technology		Region			Total
		Alappuzha	Kozhikode	Thiruvananthapuram	
Mechanised	N	0	80	1	81
	% within region	0.0%	59.3%	0.6%	18.0%
Traditional	N	3	0	29	32
	% within region	1.9%	0.0%	18.7%	7.1%
Combination of both	N	157	55	125	337
	% within region	98.1%	40.7%	80.6%	74.9%
Total	N	160	135	155	450
	% within region	100.0%	100.0%	100.0%	100.0%
Chi-Square Test	Value: 260.744, df: 4, p: 0.000				

Seafarers in Kerala often use either traditional or mechanised methods, or a mix of the two. Table 4.1 shows that out of the three groups, about 75.9% of the population uses both traditional and mechanical methods while fishing. There are still some people who rely purely on traditional fishing methods; only 18.0% of the population relies on the mechanised industry. Based on the statistics broken down by area, the most common method of fishing in the Alappuzha region is a mix of traditional and mechanised techniques, followed by 80.6% in Thiruvananthapuram and 40.7% in Kozhikode. Since over 59.3% of the population relies only on the mechanised sector, it seems that there are fewer fishermen in the Kozhikode area than in the other two. According to the table, traditional fishing methods are still used by 18.7 percent of the population in the Thiruvananthapuram area, 1.9 percent in the Alappuzha region, and 0 percent in the Kozhikode region. By comparing the different fishing methods in Alappuzha, Kozhikode, and Thiruvananthapuram, we find that there are significant variations in these regions. The Pearson Chi

Square test statistic is 260.744 with 4 degrees of freedom, and the asymptotic significance (p) value is 0.000, which is lower than the level of significance of 0.05. What follows is more specific information that should help clarify it.

4.1.1. Type of Craft Gear Combination

Table 4.2: Type of Craft Gear Combination

Type of Craft Gear Combination	Responses		Percent of Cases
	N	Percent	
Traditional Fleet with IBM or OBM	412	48.4%	91.8%
Mechanised Fleet	148	17.4%	33.0%
Non-Motorised Traditional Fleet	293	34.3%	65.0%
Total	853	100%	189.8%

As new technologies emerged, a wide variety of craft gear combinations were available in Kerala. Mechanised fleets, non-motorized traditional fleets, and traditional fleets with inboard or outboard motors (IBMs) are some examples of these pairings. To learn more about how the fisherman used these combinations, we asked for their feedback many times. Eight hundred fifty-three unique replies were retrieved from the pool of 450 respondents. Among these respondents, 91.8% said they use a conventional fleet with an IBM or OBM, followed by 65% who said they use a non-motorized traditional fleet, and only 33% who said they use a mechanised fleet. Some fishermen still utilise traditional boat gear because to climatic variations and seasonal oscillations in catch, while others believe that relying only on mechanised fleet is not economically feasible.

4.1.2. Type of Craft Gear: Region Wise

Table 4.3: Type of Craft Gear: Region Wise

Technology		Region			Total (N)
		Alappuzha	Kozhikode	Thiruvananthapuram	
Traditional Fleet with IBM or OBM	N	150	131	131	412
	% within region	93.8%	97.0%	85.1%	
Mechanised Fleet	N	12	134	2	148
	% within region	7.5%	99.3%	1.3%	
Non – Motorised Traditional Fleet	N	125	13	155	293
	% within region	78.1%	9.6%	100.0%	
Total	N	160	135	155	

Note: multiple responses

Of the 160 fishermen surveyed in the Alappuzha region, 93.8% use traditional fleets equipped with IBM or OBM craft gear, 78.1% use non-motorized traditional fleets, and 7.5% use mechanised boats. The survey yielded multiple responses. Here in Kozhikode, data from the northern sections of Kerala shows that, out of a total of 135 samples, 99.3% use mechanised fleets, 97.6% use traditional fleets with IBM or OBM, and 9.6% use non-motorized traditional fleets. According to our data analysis conducted in Thiruvananthapuram, a city in southern Kerala, just 1.3% of the 155 respondents utilise a mechanised fleet, while 100% prefer a non-motorized conventional fleet and 85.1% have access to such a fleet equipped with IBM or OBM technology. The varied reactions of

the fisherman living around the coast of Kerala show that individuals were eager to embrace technology in their own unique ways. Fishermen in southern Kerala were less than thrilled to welcome the contemporary advancements into their ways, in contrast to those in northern Kerala who had embraced and integrated technology into their fishing practices to a considerable degree. For their fishing needs, the people of the central area rely on both traditional and contemporary mechanical fleets.

4.2. Technology and Income

Given the above, it should come as no surprise that the three study locations make quite different use of craft gear combinations. How do these regional differences in technology affect the incomes of the fisher folk in each area?

H0: There is no significant difference in income with respect to the use of technology.

4.2.1. Technology and Monthly Income from Fishing Activity

Table 4.2.1.: Technology and Monthly Income from Fishing Activity

Technology	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Combination of both	337	14600.297	1713.2623	93.3273	10000.0	18500.0
Mechanized	81	16955.556	905.1243	100.5694	13000.0	18900.0
Traditional	32	14175.000	1410.7879	249.3944	10500.0	17500.0
Total	450	14994.000	1827.0754	86.1292	10000.0	18900.0
ANOVA	F (2,47) = 77.350, p: 0.000					

The correlation between fishermen's monthly revenue and technology is seen in table 4.2.1. In order to draw conclusions, the research divided technologies into three groups: conventional, mechanised, and hybrid. Compared to the average income earned via conventional means (Rs.14175.7879) and the average income earned through a mix of the two (14600.297) the average income earned by the mechanised sector is at Rs.16955.556. The three technologies that the fishermen used were compared for their impact on revenue using a one-way ANOVA. With an F-value of = 77.350 and a "p" value of 0.000, a one-way analysis of variance showed that the mean incomes of at least two groups were significantly different from one another. A statistically significant difference in income is associated with technological proficiency, since the "p" value is lower than the significance level of 0.05.

4.2.2. Technology and Monthly Income from Fishing Activity: Region Wise

Table 4.2.2: Technology and Monthly Income from Fishing Activity: Region Wise

Technology	Alappuzha		Kozhikode		Thiruvananthapuram	
	N	Mean	N	Mean	N	Mean
Combination of both	157	14739.490	55	16694.545	125	13504.000
Mechanized	0	-	80	17005.000	1	13000.000
Traditional	3	14100.000	0	-	29	14182.759
Total	160	14727.500	135	16878.519	155	13627.742

ANOVA/ Independent t-test	t (158) = 0.940, p:0. 349	t (74.65)* = -1.400 p: 0.166	F (2,152) = 2.710, p: 0.070

Note: * Equal Variance not assumed

Monthly income and its relationship with technology in each region is exhibited in table 4.2.2. for the purpose of conducting statistical tests on technology as a distinct group within a certain area. Traditional, mechanised, and hybrid technologies are the three options shown in the table. If there are more than two groups, one-way analysis of variance is utilised; otherwise, an independent sample t-test is used. Since there is no preponderance of fishermen in the Alappuzha area who rely primarily on mechanised fleets, we may divide the region's fishermen into two groups and compare their revenue using an independent sample t-test. The average revenue generated by using both traditional and mechanised fleets is ₹14739, somewhat more than the average revenue generated by traditional vessels alone. As a result, there is no statistically significant relationship between wealth and the various technologies utilised in the Alappuzha area (t=0.940, p=0.349, both of which are larger than 0.05). Traditional fishing vessels are infrequently deployed in the northern region of Kerala, namely at Kozhikode. Thus, the t-test is used once again to assess the correlation between income and technology utilisation. In this case, the "t" value is -1.400 and the "p" value is 0.166, both of which are more than 0.05, suggesting that there is little to no difference in revenue generated by the two technologies used in this area. As seen in the table above, there is only a little difference of ₹.17005.000 for the mechanised fleet and ₹.16694.545 for the combination of mechanised and traditional fleet in terms of average monthly revenue. Despite the limited quantity, fisherman in the Thiruvananthapuram area use all three methods. In order to determine if the correlation between income and technology is statistically significant, one-way ANOVA is used. The total value of traditional, mechanised, and combined methods is ₹14182.759, ₹.13000.00, and ₹.13504.00, correspondingly. The F-value is 2.710 and the "p" value is 0.070, both of which are more than 0.050, indicating that the three sets of technologies do not vary significantly in terms of mean income. Every one of the three areas has discovered the same thing: there is zero difference in wealth and technology. So, it's safe to say that fisherman in different parts of the world use the methods that work best for them.

4.2.3. Use of Technology (Different Combinations) and Income

Table 4.2.3: Use of Technology (Different Combinations) and Income

Sl.No	Technology		N	Mean	Rank
1	Non-Motorized Traditional fleet	Catamaran	5	14000.000	12
2		Catamaran, dugout Canoe	17	13735.294	14
3		Catamaran, Plank Canoe	119	14173.109	11
4		Catamaran, Plank Canoe, dugout Canoe	94	13723.404	15
5		dugout Canoe			
6		Plank Canoe	5	14600.000	9
7		Plank Canoe, dugout Canoe	28	15200.000	7
8	Traditi onal Fleet with IBM or OBM	Craft with IBM	190	13860.000	13
9		Craft with IBM, Craft with OBM	200	16140.500	3
10		Craft with OBM	21	14714.286	8
11	Mechanized	Mechanized Gill netter cum liner	1	16000.000	4

12	Fleet with IBM or OBM	Mechanized Gill netter cum liner, Mechanized Purse Seiner	4	15875.000	5
13		Mechanized Purse Seiner	1	13000.000	16
14		Mechanized trawlers			
16		Mechanized trawlers, Mechanized Gill netter cum liner	8	16562.500	2
16		Mechanized trawlers, Mechanised Gill netter cum liner, Mechanised Pursue Seiner			
17		Total	450	14994.000	

Note: Ranking based on average income from fishing activity alone

There are three main types of technical combinations: conventional fleets without motors, traditional fleets with IBM or OBM, and mechanised fleets using those same technologies. There are sixteen more ways to classify these three depending on the craft gear combination. Mechanised trawlers with gillnet cum liner and purse seiner come out on top with an average monthly revenue of Rs.16844.80, while mechanised purse seiner alone bring in the least, with a mean income of Rs.13000.00. This ranking is based on the average monthly income, from 1 to 16. Depending on the time of year and the specific mix of vessel and gear used, fisherman in these three locations may earn varying amounts of money each month, as shown in Table 4.2.3.

4.3 Technology and Savings

4.3.1. Savings and Use of Technology

Table 4.3.1: Savings and Use of Technology

Technology		Savings (in Rs.)					Total
		Up to 50000	50001 - 100000	100001 - 150000	150001 - 200000	Above 200000	
Combination of both	N	277	48	7	2	3	337
	%	81.7%	50.5%	63.6%	100.0%	100.0%	74.9%
Mechanised	N	31	46	4	0	0	81
	%	9.1%	48.4%	36.4%	0.0%	0.0%	18.0%
Traditional	N	31	1	0	0	0	32
	%	9.1%	1.1%	0.0%	0.0%	0.0%	7.1%
Total	N	339	95	11	2	3	450
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0 %
Chi-Square		Value= 84.828, df =8, p =0.000					

As a whole, fishermen's saving habits are archaic. Table 4.3.1 shows the correlation between fishermen's use of technology and their savings. With a savings range of ₹50001 to 100000, 339 out of 450 fisherman have saved up to Rs.50000, while 95 have saved less than that. Just three of the fishermen had funds of more than two hundred thousand rupees. Combining mechanised and traditional fleets allows fisherman to save roughly 75.9% when looking at savings in terms of technology. From the traditional industry, only 7.1% of fishermen are saving. The chart above shows that the average monthly revenue from each technology varies, which means that savings also vary depending on the technology. A one-way analysis of variance (ANOVA) test with a statistical significance level of 0.000 (less than 0.050) and a "F" value of 84.828 (with 8 degrees of freedom) confirms this. Various combinations of technologies result in vastly different savings rates.

4.4. Technology and Borrowings

4.4.1. Loans and borrowings and Use of Technology

Table 4.4.1: Loans and borrowings and Use of Technology

Technology			Loan and Borrowings				Total
		Up to 25000	25001 - 50000	50001 - 75000	75001 - 100000	Above 100001	
Combination of both	N	5	114	131	27	60	337
	%	83.3%	69.5%	74.9%	75.0%	87.0%	74.9%
Mechanised	N	1	42	31	7	0	81
	%	16.7%	25.6%	17.7%	19.4%	0.0%	18.0%
Traditional	N	0	8	13	2	9	32
	%	0.0%	4.9%	7.4%	5.6%	13.0%	7.1%
Total	N	6	164	175	36	69	450
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chi-Square			Value= 24.923, df =8, p =0.002				

The quantity of loans taken out by fishermen who work in both the mechanised and traditional sectors is significant. Loan amounts exceeding Rs.100,000 are obtained by about 87% of these fishermen. A chi-square test with a "F" value of 24.923 at 8 degrees of freedom and a "p" of 0.002, which is less than 0.050, indicates that there is a significant relationship between technical changes and the inclination to avail loans.

4.5. Technology and Social status

Finding out how fishermen in Kerala are seen socially is the primary goal of this research. How changes in technology affect the fishermen's social standing is covered in the section that follows. By making assertions and rating their replies on a scale from one to five, we were able to gauge their social rank. On a scale from 1 (strongly disagree) to 5 (strongly agree), the average score for each statement is close to 1. Various technical combinations used by the fisherman are being considered in the assessment. Happiness is one metric by which the fishermen's social position may be evaluated. Economic autonomy, educational opportunity, healthcare accessibility, and all other social expenditures.

Table 4.5: Social Status and Use of Technology

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Being a fisherman, I am currently leading a happy life	Between Groups	1.640	2	.820	2.584	.077
	Within Groups	141.891	447	.317		
	Total	143.531	449			
I feel that I am economically self-reliant	Between Groups	2.294	2	1.147	4.055	.018
	Within Groups	126.463	447	.283		
	Total	128.758	449			
I feel that myself and my family's psychological and social well-being is very high	Between Groups	7.742	2	3.871	14.78	.000
	Within Groups	117.078	447	.262		
	Total	124.820	449			
The children in your family have access to education	Between Groups	24.178	2	12.089	19.09	.000
	Within Groups	283.146	447	.633		
	Total	307.324	449			
The educational qualification of your children is enough to get professional/	Between Groups	.716	2	.358	1.134	.323
	Within Groups	141.062	447	.316		
	Total	141.778	449			

govt./semi govt./private jobs						
Your family has insurance coverage other than govt. insurance schemes.	**Between Groups**	3.259	2	1.629	3.087	.047
	Within Groups	235.906	447	.528		
	Total	239.164	449			
The major share of your consumption expenditure comprises social expenses like marriage, festivals, celebrations, etc.	**Between Groups**	4.025	2	2.012	6.226	.002
	Within Groups	144.473	447	.323		
	Total	148.498	449			
Your spending on liquor and other intoxicants is relatively high	**Between Groups**	4.879	2	2.439	6.031	.003
	Within Groups	180.812	447	.405		
	Total	185.691	449			

To examine how three distinct technologies impacted the fishermen's social standing, a one-way ANOVA was used. When it came to happiness, a one-way ANOVA showed that various types of technology were associated with somewhat varying levels of satisfaction (F = 2.584, p = 0.077, which is slightly more than 0.050). In a similar vein, we statistically compared the three groups' levels of economic self-reliance and found that they differed from one another, with a "F" value of 4.055 and a "p" value of 0.018, just below the significance level of 0.050. However, statistical testing of the statement assessing their social and psychological health has shown that the three groups' means vary significantly (with a "F" of 14.78 and a "p" of 0.000, both of which are less than 0.050). When we looked at the education access of the kids in these families, we found that there was a noticeable difference in the mean value when we tested at 2 degrees of freedom. The significance level was 19.09, and the p-value was 0.000, which is less than 0.050. This means that the kids in these three groups had different opportunities to get a good education. On the other hand, the following statement clearly demonstrates that none of these three groups' children vary significantly in terms of the educational requirements needed to attain government or professional positions. According to the test results, which are larger than 0.050, the significance level is high (F=1.134, p=.323). Due to their families' economic instability, youngsters in certain areas nevertheless strive to get better occupations, despite the fact that they have less access to schooling overall. By surveying members of this community on their health care knowledge, we found that there is a moderate gap in the amount of health insurance that each group has. Examining the trend of spending on social expenditures, such as weddings, festivals, celebrations, etc., provides a clear picture of a community's social standing. Using a one-way ANOVA test on the obtained data, we find that, with 2 degrees of freedom, the "F" value is 6.226 and the "p" value is 0.002. The results demonstrate a statistically significant difference in the average social expenditures of these individuals, suggesting that regional variations in technology have a more outsized impact on these costs. There is a considerable difference in the frequency of intoxicant use between these categories.

5. CONCLUSION

Differences in the combinations of craft gear among fishermen in different regions of Kerala are clearly shown by the region-wise examination of technical advancements in the fisheries business. Approximately 74.9% of the fishermen in the research area use a mixed-fleet strategy, using both traditional and mechanized fishing techniques. However, there are still communities who rely solely on age-old fishing techniques. There is a colossal difference in the craft gear combinations found in these three locations when comparing them region by region. From the numbers in table 6.16, we may deduce that over 95% of fisherman in central Kerala utilise a mix of traditional and mechanized

fleets for fishing, whereas less than 50% of fishermen in the northern area do the same. Reason being: around 55% of the fisherman in that area rely entirely on the mechanical fleet. About 20% of the fishermen in the Thiruvananthapuram area still rely on traditional fishing methods, which is a more essential characteristic of this region than the pattern itself. This research confirms what many have suspected: the socioeconomic level of fisherman is affected more by regional differences in the mix of boat gear.

6. AUTHOR(S) CONTRIBUTION

The authors agreed to have no connections or engagements with any group or body that provides financial and non-financial assistance for the topics and resources covered in the article.

7. CONFLICTS OF INTEREST

The authors declared that no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

8. PLAGIARISM POLICY

The authors declare that any kind of violation of plagiarism, copyright, and ethical matters will be handled by all authors. Journalists and editors are not liable for the aforesaid matters.

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