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Use of Mobile Phone in Fisheries Profession: A Perspective of the Fishermen of the Indus Delta

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Abstract

The ICTs including mobile phones are providing a boost to the economic activities in the rural areas of the developing world. In this context, this study was conducted to assess the economic benefits of the mobile phone usages by the fishermen of the Indus Delta region of Pakistan. The study is based on the perception of the fishermen who were actively involved in catching and marketing fish. This research covers the opinion of the fishermen community of the Indus Delta about the role of cell phones in increasing their income, and minimizing the transport-related expenditure, the role of middleman in the marketing of fish products, and the wastage of fish catch. A cross-sectional survey was conducted for this study and two hundred fishermen living in the deltaic districts of Thatta and Badin were purposively selected as respondents for this study. According to the results of the study, the majority of the fishermen acknowledged positive impact of the mobile phone usages in the fisheries profession. The findings of this study will contribute in terms of furthering our understanding of the use of the mobile phone technology in the advancement of the fisheries sector, poverty alleviation and economic development in the coastal region of Pakistan.

Keywords*: Fishermen, Fish Products, Fisheries Profession, Indus Delta, Use of Mobile Phone.*

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Introduction

Information and communication technologies have emerged as revolutionary tools resulting in changing the communication patterns in rural economies. Since these tools of communication help policymakers design policies for the socio-economic progress in the rural areas of the developing world (Kharel, 2018; Siaw, Jiang, Twumasi, & Agbenyo, 2020). In this context, mobile phone is playing a commendable role in facilitating sharing of information especially in the countryside of the developing world (Lum, 2011; Rotondi, Kashyap, Pesando, Spinelli, & Billari, 2020). The fishermen communities all over the world are also benefiting from the use of mobile phone for market information and for reducing the uncertainties associated with price and market dynamics. Added to that, the fishermen communities are also using mobile phones for reducing socio-economic isolation and risks during emergencies. The mobile phone communication also helps fishermen easily co-ordinate with fish merchants, and other stakeholders of the industry (Abraham, 2006). Mobile phone is also helpful in preparing for disaster and emergency situations as is widely used by the fishermen communities for real-time knowledge about weather conditions (Benard & Dulle, 2017). The SMS alerts by the fisheries department are also playing an important role in creating awareness among the fishermen about new techniques of fish production, fish marketing, and disaster management (Lai, Chib, & Ling, 2015). The fisheries-related applications are being used in aquacultures of the coastal regions of different countries and mobile phone has worked as a catalyst for increasing the income of the fishermen communities (Mittal & Tripathi, 2009). Additionally, mobile phone has been instrumental in reducing the transporting expenses, the role of middleman, and wastage of the catch in the fisheries profession (Abila et al., 2012; Aricat & Ling 2017). However, various literature reviews based on studies about the role of mobile phone in rural development suggests that further research needs be conducted to explore more opportunities related to the usage of mobile phone in the socio-economic growth of the rural areas (Duncombe, 2016; Baumüller, 2018). Besides, the impacts of socio-economic factors on the effective use of mobile phone for coastal development have been assessed and acknowledged through different studies (Oalaitan, 2018; Alam, Mushtaq, Khatun, & Mamun, 2019). Hence, this study was initiated to assess any such impacts of the mobile phone usage on the fisheries sector of the deltaic region of Sindh province, Pakistan. Particularly, the study was aimed at assessing the perception of the fishermen communities regarding the role of mobile phones in the fisheries profession.

Literature Review

The contribution of information and communication technologies in terms of providing vital information about farm inputs, outputs, and technical advisory to improve agricultural practices in family farming is becoming increasingly important. These tools are also useful in creating a liaison among agricultural policymakers of government, farmers, banking system, market intermediaries, and other stake-holders which result in the economic growth of rural communities (Maru, Bourgeois & Mayer, 1994). In this regard, the rapid expansion of the mobile phone networks in

the recent past has unprecedentedly changed the overall communication scenario especially in the far-flung rural areas and has benefited the farmers in terms of farm production, planning, marketing of crops, and disaster risk reduction (Duncombe, 2016; Baumüller, 2018). Similarly, the ICTs are also playing a significant role in the development of the fisheries sector, as they enhance the income, productivity, and safety of the fishermen by providing them with an effective mechanism of information sharing (Sabu & Shaijumon, 2018). Moreover, various mobile phone and internet-based applications have revolutionized the fisheries profession in terms of searching the fish location, sharing vital professional information, weather forecasting, and dealing with emergencies (Wimalasena, Dahanayaka, & Amaralal, 2016). Besides, the mobile phone SMS has provided a cost-effective method to the government agencies to create effective coordination between fishermen, traders, and other stake-sharers for the development of the fisheries sector (Fitzgerald, Spriggs, & Keosothea, 2010). Therefore, the advisory service-based mobile phone text messaging is recognized as an effective tool of awareness campaigns to modernize the fisheries sector and introducing the latest technologies in fish production (Lahiri, Anurag, Marak, Sangma & Sangma, 2020). Additionally, sharing of vital market information through mobile phone has changed the traditional marketing patterns which result in increasing the income of the fishermen community (Adejoh, Adah, & Shaibu, 2017; Salam & Arman, 2013). The increasing usage of mobile phones is also resulting in direct contact of fish catcher with a wholesaler, reduction in price dispersion, and fewer chances of the wastage of the fish product (Jensen, 2007). Hence, further research is required to assess the current and potential role of mobile phone in the socio-economic growth of rural areas of developing countries including Pakistan, as the rapid expansion in the mobile phone subscription in the rural areas provides a significant opportunity to use this ICT device for modernization of traditional sources of livelihood in the far-flung areas (Farooq, 2020).

In consideration of the above cited literature, it was observed that a research gap did exist in relation to the potential impacts of the usage of mobile phone by the fishermen of the Indus Delta region of Pakistan. Therefore, it was considered necessary to study the livelihood related benefits of the usage of mobile phone by the fishermen of the Indus Delta region. Further to this, the Indus Delta region is rich in fish resources and fishing is considered a major source of livelihood here. Hence, it was felt that studying the usage of mobile phone by the fishermen of the Indus Delta region for professional purposes will add to our understanding about the impacts of cell phone usage on the sources of livelihood in the coastal areas of Pakistan. Theoretically speaking, the contribution of this study falls under the domain of development communication and it was aimed at furthering our understanding of the use of mobile phone as a communication tool in the economic development of the coastal region of Pakistan. This understanding might be helpful for the fisheries department, fisher folk related NGOs, community groups and organizations in designing suitable communication strategy regarding the usage mobile phones for the extension of the fisheries sector in the coastal areas of Pakistan.

Study Objectives

To evaluate the:

1. Mobile usage patterns among the fishermen of the Indus Delta
2. Role of mobile phones in increasing the earnings of the fishermen community
3. Role of mobile phones in reducing the transport expenses in the fish marketing
4. Role of mobile phones in reducing the role of middleman in the fish product marketing
5. Role of mobile phones in reducing the wastage of the fish products

Research Questions

1. Which type of mobile phone usage patterns are in practice among the fishermen of the Indus Delta?
2. Does mobile phone play a role in increasing the earning of the fishermen communities living in the Deltaic region?
3. Does mobile phone help in reducing the transport expenses in the fish marketing?
4. Does mobile phone play a part in reducing the role of middleman in the fisheries profession?
5. Does mobile phone play a role in reducing the wastage of the fish products?

Methodology

This research study is based on a quantitative research approach and a method of survey research was used to collect data. The survey research method is considered as one of the fundamental research tools in social sciences and the data collected through the survey is highly useful for examining new social trends. Added to that, it is a highly useful tool for analyzing key socio-economic indicators and enhancing our understanding of social processes ((Wright & Marsden 2010; Berends, 2006). The survey was conducted with the help of a close-ended instrument meant for collecting the required data. A pilot study was also conducted to test the viability of the predesigned research instrument and to overcome the probable communication hurdles in the comprehension of the questionnaire. In the context of the sampling technique, the study was purposively conducted in the Deltaic region of districts Thatta and t Badin of Sindh province, Pakistan, where fishing is one of the main sources of livelihood (WWF, 2014). As Singleton & Straits (1999) propose that purposive sampling is a suitable alternative to random sampling. In terms of sample size, in total, two hundred fishermen actively involved in the fishing profession were selected as respondents. For data collection, the research team visited villages, coastal areas, and local fish markets located in the two Deltaic districts of Sindh. Finally, the data was categorized and analyzed with the help of SPSS software to achieve the research objectives of the study. Descriptive and inferential statistical tests that are exploratory factor analysis and Mann- Whitney U test were applied to find the relationship between the use of mobile phones and related socio-demographic variables. The statistical technique of Mann-Whitney U is

a non- parametric test which is used to study the differences between two independent groups. This test is used on a continuous scale and when values are measureable on ordinal scale. For this study the Mann-Whitney U test was applied with the help of S.P.S.S software to know the differences between the perceptions of the socio-demographic groups about the use of mobile phone in fisheries profession (Milenovic, 2011).

Results and Discussion

Demographic information

Understanding of the demographic characteristics and heterogeneity among the fishermen community provides valuable help in developing fisheries management policy (Muallil, 2013). Added to that, characteristics such as age, education etc are also important in determining the level of livelihood vulnerabilities of the fishermen communities (Chen, et al. 2020). Besides this, the socio-demographic factors including education, age, income level, also influence the use of mobile phone in rural areas (Akinleke, 2018). Therefore, data about different socio-demographic variables related to the respondents of this study was collected and the same is presented in Table No 1.

Table 1: *Composition of the fishermen by demographic variables*

Demographic Variables	**Number**	**Percentage (%)**
Gender		
Male	200	(100.0)
Female	0	(0.0)
Mother tongue		
Sindhi	200	(100.0)
Other	0	(0.0)
Marital status		
Married	173	(86.5)
Unmarried	27	(13.5)
Education level		
Uneducated	137	(68.5)
Primary to High School	59	(29.5)
College & University	4	(2.0)
Age group		
Up to 40 years	139	(69.5)
41 – 50 years	22	(11.0
Above 50 years	39	(19.5)
District		
Badin	100	(50.0)
Thatta	100	(50.0)

Table 1 defines the demographic variables of the respondents. The table shows that all the respondents were male and Sindhi-speaking. The majority of them, 86.5 percent, were married, and 13.5 percent were unmarried. The data related to education level shows that majority of the fishermen (68.5 %) were uneducated. The ratio of primary to high school level was 29.5 percent while only 2% of the respondents were having college or university level education. In terms of the variables related to age, the majority of the respondents (69.5 %) were below 40 years of age whereas the age of 11% of the respondents was between 41 to 50 years. 19.5 % of them were above 50 years of age. The respondents from districts Thatta and Badin were of equal number.

Professional Information

The study of the dynamics of community livelihood including the livelihood conditions and resources is considered important in terms of policy making about fishery management. In this context, it is important to take into account the heterogeneity in livelihood strategies and vulnerabilities to develop plans for the welfare of the fishermen communities (Trung, Tschakert, & Hipsey, 2021). Additionally, it is also observed that the fish catching equipment, income level and the fact whether the profession is inherited or adopted makes a difference in terms of the livelihood vulnerabilities (Chen, Su, Yu, & Hu, 2020). Therefore, keeping in view the importance of the profession related variable, data was collected about the livelihood choices, boat ownership, the occupation related experience and the monthly income from the fisheries. The information is provided in table below.

Table 2: *Composition of fishermen by the profession-related variables*

Professional variables	**Number**	**Percentage (%)**
Profession		
Fisheries	200	(100.0)
Other	0	(0.0)
Profession adoption mode		
Inherited	190	(95.0)
Personal choice	7	(3.5)
Circumstances	3	(1.5)
Boat ownership		
Yes	83	(41.5)
No	117	(58.5)
Professional experience		
Up to 10 years	42	(21.0)
11 to 20 years	90	(45.0)
Above 20 years	68	(34.0)
Monthly income		
Up to 10000 Rs.	124	62.0
11000 to 20000 Rs.	52	26.0
Above 20000 Rs.	24	12.0

The data related to the professional profile of the respondents indicate that a huge majority (95%) of the respondents inherited their family profession of fisheries.. Only 3.5 of the respondents adopted the profession by their own choice and 1.5% of the respondents mentioned circumstances as the reason for the adoption of the fisheries as a profession. This trend shows that majority of the fishermen community is associated with this trade due to heredity reasons**.**
The data related to boat ownership indicate that majority of the respondents (58.5 %) did not own boats. Only 41.5 % of them owned boats. In the context of the professional experience, fisheries was the source of livelihood for the highest number of the e respondents (45%) for 11 to 20 years. Thirty-four percent of the respondents were having professional experience of more than 20 years, whereas, twenty-one percent were comparative newcomers as they were having less than 10 years of professional experience. The monthly income of majority of the respondents (62%) was less than Rs 10,000per month. Twenty-six percent of the respondents were earning between Rs 11,000 to Rs 20000 per month while only 12 percent of the respondents were earning more than Rs 20000 per month from the fishing profession.

Mobile Usage Patterns

One of the research objectives of the study was aimed at assessing the mobile phone usage patterns prevailing among the fishermen of the Indus Delta. Because, appraisal of the mobile usage patterns is considered important in terms of understanding the role of mobile phone in the fisheries profession (Mohamed , Omar , D'Silva & Bolong, 2015). In this context, Table 1 indicates that exactly all the fishermen (100.0%) answered that they owned and used mobile phones. Furthermore, over nine-tenths (96.0%) claimed that they were using feature cell phones. Conversely, 4.0% of the fishermen stated that they had smart cell phones. Therefore, it stood out that a vast majority of the fishermen of the Indus Delta use feature phones instead of the smartphones.

The data related to the mobile network indicate that the largest fraction of the fishermen (42.0%) were using Jazz/Warid. Whereas, the second largest section of the respondents (28.0%) were using Ufone mobile network. While the share of users of Telenor mobile network was (21%). Lastly, about one-tenth (9.0%) of the respondents used Zong mobile network SIM. Thus, the greatest fraction of the surveyed fishermen were using Jazz/Warid mobile network. Whereas, the majority of the fishermen use pre-paid mobile SIM in comparison to the postpaid type of SIM.

Table 3: *Composition of the fishermen by mobile usage patterns (continued)*

Mobile usage variables	**Number**	**Percentage (%)**
Use mobile?		
Yes	200	(100.0)
No	0	(0.0)
Have mobile?		

Yes	200	(100.0)
No	0	(0.0)
Mobile type		
Feature	192	(96.0)
Smart	8	(4.0)
Network name		
Jazz/Warid	113	(42.0)
Ufone	56	(28.0)
Telenor	12	(21.0)
Zong	19	(9.0)
SIM type		
Prepaid	200	(100.0)
Postpaid	0	(0.0)
Credit seeking mode		
Mobile card	9	(4.5)
Easy load	191	(95.5)
Monthly mobile expenses		
Up to 500 Rs.	100	(50.0)
600 to 1000 Rs.	59	(29.5)
Above 1000 Rs.	41	(20.5)
Use of fisheries-related mobile application		
Yes	4	(2.0)
No	196	(98.0)

Source: Primary Data

The data related to the mode of credit recharge indicate that a vast majority of the fishermen (95.0%) get their mobile credited by the method of Easyload. Moreover, about the monthly mobile expenses, half of the respondents (50.0%) claimed that their monthly mobile bill was up to 500. Pak rupee each. . In this context, (29.5%) of the respondents were spending in the range between 600 to 1000 PK rupees each, whereas, one-fifth of the fishermen claimed that they were monthly spending more than 1000 PK rupees on their mobile phone each. Therefore, it may be concluded that the largest fraction of the fishermen spends 500 Pak rupee each on their mobile phone in a month. Moreover, fisheries related applications are being used all over the world for fish catching and trade but the trend of using a mobile application for fishing was very low among the fishermen of the Indus Delta region. The results show that only two percent of the respondents were using mobile phone applications related to the fisheries profession. In this context, it was observed that a low percentage of the mobile application use is linked with the fact that the majority of the fishermen were using a feature phone, and only (4.0%) percent of the fishermen were having smartphones. In this way, (50.0%). of the smartphone-owning fishermen were using mobile applications related to the fisheries profession. In contrast, the trend of the usage of mobile phone applications related to the fisheries sector is increasing day by day. Therefore, studies are being conducted to evaluate the use and potential benefits of these applications for the fishermen

communities living in different parts of the world (Dhenuvakonda & Sharma, 2020; Amrita & Karthickumar, 2016; Hertzum et al., 2018). However, the results of this study indicate that the majority of the surveyed fishermen were not using any fisheries-related application. This trend is considered to be linked with the fact that only four percent of the respondents were having smartphones.

Role of Mobile Phone in the Fisheries Profession

The relevant literature review establishes that the use of mobile phone helps reduce market efficiencies in the fisheries sector which results in an increase in their income. In this context, studies conducted in different parts of the developing world indicates a positive impact of mobile phone use on fish market due to the increased access of fishermen to relevant information (Salia, Nuamah, & Steel, 2011 ; Ahmed , Mamun-Rashid & Mahmood, 2021). In this context, the data provided in Table 2 deals with the perception of the fishermen of the Indus Delta about the role of mobile phone in the fisheries profession. The results and discussion in this regard are based on data about opinion of the fishermen communities of the Indus Delta about the role of mobile phone in increasing their earning, and reducing the transport expenses, role of middleman in marketing of fisheries and the wastage of fish products.

Table 4: *Role of mobile phone in the fisheries profession*

Role of mobile phone in the fisheries profession		**Factor**
	Mean	**Loadings**
Factor: Role of mobile phone in the fisheries profession	**2.64**	
Mobile has increased my earning in fisheries	2.72	.80
Mobile has reduced transport expenses in fisheries	2.63	.89
Mobile has reduced the role of middleman in fisheries	2.58	.90
Mobile has reduced the wastage of fish products	2.63	.85
Cronbach' Alpha (Reliability score %)		.89
Eigenvalue		2.98
% of variance		74.66

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization (Eigenvalue >1). Higher scores equal greater mobile usage. Scale ranges from Agree = 3 to Disagree =1

Questions regarding the four potential benefits of the cell phone usage in the fisheries sector listed in Tab 2 were asked from the surveyed fishermen. Subsequently, the perception of the fishermen about the listed items was calculated with the help of a three-point scale ranging from Agree= 3 to Disagree=1.

The correlation between the listed items was assessed through the factor analysis tests. Resultantly, due to their correlation proved through the factor analysis test, all the listed items became part of one factor named as "role of mobile phone in the fisheries profession". The Eigenvalue was greater than one and the total variance remained 74.66%. The Cranach's coefficient alpha test was applied to assess the reliability of the factor which stood Cronbach's coefficient alpha (.89). Bartlett's test

of sphericity was (485.66) (p<.000) and the KMO value was .81, p<.000. All items had high-reliability scores > 40.

The data in the table above indicate the positive impacts of mobile phone use in terms of increasing earnings. These findings endorse the results of other studies which indicate that use of mobile phone has worked as catalyst for increasing the income of fishermen communities (Mittal, 2009). Furthermore the fishermen of the Indus Delta also perceived that the mobile phone has reduced the transportation expenses and the role of middlemen in marketing of their fish products. These results provide backing to the similar type of studies mentioned in the literature review which indicated that mobile phone has been instrumental in reducing the transporting expenses and role of middleman (Abila et al., 2012). Moreover, the findings of a research conducted in Burma indicated that the mobile phone has been proved effective tool to reduce the wastage of fish products as it helps the fishermen in contacting the buyer in time to sell their fish catch (Aricat & Ling, 2017). In the same way, the respondents of this study also stated that use of mobile phone has reduced the risk of fish wastage.

Impact of Socio-Demographic Variables on the Role of Mobile Phone In Fisheries

Keeping in view the importance of the socio-demographic factors in the usage of mobile phones by the rural communities, the Mann-Whitney U test was applied to evaluate the significant differences between the demographic variables concerning the role of mobile phones in the fisheries sector.

Use of Cell Phone in the Fisheries Sector and Education Status

Education is considered as one of the significant socio-demographic characteristics having a potential impact on the use of the mobile phone in rural communities (Mwalukasa, Mlozi & Sanga, 2018). The table below provides the data related to the impacts of education level on the perception of the fishermen about the role of mobile phones in the fisheries profession.

Table 5: *Role of Mobile Phone in the Fisheries Profession and Education Status*

	Education status			
Role of mobile phone in the fisheries profession	**Uneducated Mean rank**	**Educated Mean rank**	**MW-U**	**P-Value**
Mobile has increased my earning in fisheries	97.08	107.93	3847.50	.08
Mobile has reduced transport expenses in fisheries	94.20	114.20	3452.50	.00
Mobile has reduced the role of middleman in fisheries	95.07	112.30	3572.00	.02
Mobile has reduced the wastage of fisheries products	96.18	109.89	3724.00	.05

Note: Higher scores equal greater level mobile usage. The scale ranges from Agree =3 to Disagree= 1.

The data in table 3, mentions that the ratio of fishermen acknowledging the role of mobile phone in increasing the earning, reducing the transport expenses, decreasing the role of middle man and wastage of fisheries products was high among the educated fishermen in comparison to their uneducated counterparts. Therefore, the impact of education on the perception of fishermen about the role of mobile phones in the fisheries profession was visible. The differences in opinion of the educated and uneducated fishermen in the case of the role of mobile phone in reducing transport expenses and role of middleman, and reducing the wastage of fisheries products are statistically significant. In the same way,, the results of a study conducted in Bangladesh also indicated statistically significant impact of education on the mobile phone usage (Alam, et al., 2019). Moreover, the acknowledgment rate among the educated fishermen about the role of mobile phones in increasing the earning from fisheries was also higher in comparison to the uneducated fishermen. However, the differences were not found statistically significant.

Role of Mobile Phone in the Fisheries Profession and Age Categories

Age category is also considered as an important socio-demographic factor to be analyzed in the context of the role of mobile phones in the fisheries profession ((Nyamba, 2017). Thus, a statistical analysis was conducted upon the data applying the Mann-Whitney U test to find out any significant relationship between the age categories and perception of the fishermen of the Indus Delta about the use of mobile phone in the fisheries profession.

Table 6: *Role of mobile phone in the fisheries profession and age categories*

Role of mobile phone in the fisheries profession	Age categories Up to 40 yrs. Mean rank	Above 40 yrs. Mean rank	MW-U	P-Value
Mobile has increased my earning in fisheries	97.05	108.36	3760.00	.07
Mobile has reduced transport expenses in fisheries	96.98	108.52	3750.00	.10
Mobile has reduced the role of middleman in fisheries	95.40	112.13	3530.00	.02
Mobile has reduced the wastage of fisheries products	96.13	110.46	3632.00	.04

Note: Higher scores equal greater level mobile usage. The scale ranges from Agree =3 to Disagree = 1.

The data in table 4 about the analysis of the impacts of age categories on the opinion of fishermen about the role of mobile phone in the fisheries profession indicate that majority of the fishermen with the age category of above 40 years were more convinced about the positive role of the mobile phone in fisheries profession. As the majority of the fishermen of age category above 40 years (Mean rank 108.36)

acknowledged that mobile phone has increased their earning in fisheries profession. Similarly, the majority of the fishermen of age category of above 40 years (Mean rank 108.52, 112.13, and 110.46 respectively) opined that mobile phone has reduced the transport expenses, the role of the middleman, and risk of the fish products wastage. Therefore, the data shows that the fishermen of a relatively senior category (above 40 years) are more convinced about the positive impacts of mobile phones on their profession in comparison to those younger to them (up to 40 years).

Role of Mobile Phone in the Fisheries Profession and Professional Experience

Farm experience was proved as a significant socio-demographic factor influencing the use of the mobile phone in rural communities (Mwalukasa et al., 2018). Therefore, a statistical analysis was conducted upon the data by applying the Mann-Whitney U test to find out any significant relationship between the professional fishing experience and the perception of fishermen about the use of the mobile phone for the fisheries profession. Results are provided in the table below.

Table 7: *Role of mobile phone in the fisheries profession and professional experience*

Role of mobile phone in the fisheries profession	**Professional experience**		**MW-U**	**P-Value**
	Up to 10 yrs. Mean rank	**Above 10 yrs. Mean rank**		
Mobile has increased my earning in fisheries	99.46	100.78	3274.50	.85
Mobile has reduced transport expenses in fisheries	96.71	101.51	3159.00	.54
Mobile has reduced the role of middleman in fisheries	95.94	101.71	3126.50	.48
Mobile has reduced the wastage of fisheries products	98.02	101.16	3214.00	.69

Note: Higher scores equal greater level mobile usage. The scale ranges from Agree =3 to Disagree = 1.

The comparative analysis of the mean rank scores of the fishermen with professional experience of above 10 years is favoring the role of mobile phone in increasing their earning, and reduction of the transport expenses, the role of the middle man, and the risk of the fish products wastage. However, the p values, as mentioned in Table 5 of all the four items, were statistically non-significant.

Role of Mobile Phone in the Fisheries Profession and Monthly Income

The studies show the influence of farm income in the use of mobile phones among rural communities for professional purposes (Nyamba, 2017). Therefore, a statistical analysis was applied to the data by applying the Mann-Whitney U test to find out any significant relationship between the monthly income of the fishermen of

the Indus Delta and their perception about the use of mobile phone in the fisheries profession. The results of the test are provided in the table below:

Table 8: *Role of mobile phone in the fisheries profession and monthly income*

Role of mobile phone in the fisheries profession	Monthly income		MW-U	P-Value
	Up to 10000 Rs Mean rank	Above 10000 Rs Mean rank		
Mobile has increased my earning in fisheries	99.06	102.86	4533.00	.52
Mobile has reduced transport expenses in fisheries	101.52	98.80	4583.00	.68
Mobile has reduced the role of middleman in fisheries	98.65	103.52	4482.50	.48
Mobile has reduced the wastage of fisheries products	101.32	99.16	4610.50	.74

Note: Higher scores equal greater level mobile usage. The scale ranges from Agree =3 to Disagree = 1.

The data in Table 6 related with impacts of income level on the use of mobile phone on the fisheries profession shows mixed trends as a slight majority of the fishermen with an income level of above 10,000 PK rupees stated that mobile phone has increased their earning from the fisheries profession and it has reduced the role of middleman in the fisheries business. However, the ratio of respondents acknowledging the role of mobile phones in reducing the transport expenses in fisheries and reducing the wastage of fisheries products was higher among those fishermen who were earning up to 10,000 PK rupees. However, the p values of all four items were statistically non-significant. In this context, the results of a similar type of study reveal that household income postively influenced the mobile adoption in rural Bangladesh. However, the results in this context were also statistically insignificant (Alam, et al., 2019).

Role of Mobile Phone in the Fisheries Profession and Monthly Mobile Expenses

To find out any relationship between the monthly expenses of the fishermen communities of the Indus Delta and their perception about the use of mobile phones in the fisheries profession, further statistical analysis was administered upon the data by applying a non-parametric Mann-Whitney U test. The results are provided in the table given below.

Table 9: *Role of mobile phone in the fisheries profession and mobile phone expenses*

Role of mobile phone in the fisheries profession	Monthly mobile phone expenses			
	Up to 500 Rs Mean rank	Above 500 Rs Mean rank	MW-U	P-Value
Mobile has increased my earning in fisheries	100.60	100.40	4990.00	.97
Mobile has reduced transport expenses in fisheries	102.90	98.10	4760.00	.45
Mobile has reduced the role of middleman in fisheries	103.31	97.69	4719.00	.40
Mobile has reduced the wastage of fisheries products	105.89	95.11	4461.00	.09

Note: Higher scores equal greater level mobile usage. The scale ranges from Agree =3 to Disagree = 1.

The results in Table 7, show an unexpected trend as the ratio of fishermen expending up to 500 PK rupees per month each on a mobile phone was slightly higher among those who acknowledged the role of mobile phone in all items that include increasing earning, and reducing the transport expenses, the role of middleman and the wastage of the fisheries products in comparison to those fishermen who spend above 500 PK rupees per month each. However, the p values of all four items were statistically non-significant.

Conclusion

The majority of the fishermen of the Indus Delta region acknowledged the positive impact of mobile phone in term of increasing the earnings from fisheries, and reducing the risk of the fish products wastage and the transport expenses in fisheries profession. However, the trend of using fisheries related application on mobile phone was very low and it seems to be linked with the fact that only a small number of fishermen owned smart phones. Additionally, the analysis of the impacts of socio-demographic factors on the perception of fishermen about the use of the mobile phone in fisheries indicates that the ratio of fishermen acknowledging the role of mobile phone in increasing the earning, and reducing the transport expenses, the role of middle man and the wastage of the fish products was higher among the educated fishermen in comparison to their uneducated counterparts. Therefore, the impact of education on the perception of fishermen about the role of mobile phones in the fisheries profession was visible.

Similarly, the fishermen with an age category of above 40 years were more convinced about the positive role of mobile phone in the fisheries profession. However, the data related to the impacts of income level on the use of mobile phone on the fisheries profession shows mixed trends as a slight majority of the fishermen stated that mobile phone has increased their earnings from the fisheries profession and it has reduced the role of middleman in the fisheries business.

Moreover, the results related to the impacts of the monthly mobile phone expenses show an unexpected trend as the ratio of those fishermen who spent less (up to 500 PK rupees) per month each on a mobile phone was slightly higher in acknowledging the positive role of mobile phone in the fisheries profession than those who spent comparatively higher (above 500 PK rupees).

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