



Research Paper

Perception of Fish farmers regarding different ICTs and contents

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Abstract

Fisheries offer a key point to reach millions of people in order to assist in increasing their income improving nutrition and health of families as well as make as active agents of economic development & social change. Despite wide acceptance of fish farming as an income generating activity, its contribution to total domestic fish production in the country is not encouraging. This may be due to domestic fish production in the country is not encouraging, which might be the resultant effect of lack of appropriate technical know-how available to the fish farmers as well as perspective entrepreneurs. Even there may be sufficient information available but fish farmers perceived 'not appropriate'. In today's context ICTs have a great role to play in terms to making appropriate fish farming technologies to the fish farmers available anytime, anywhere. The presents study entitled "Perception of Fish farmers regarding different ICTs and contents" has been conducted in Odisha to ascertain the perception of fish regarding different ICTs that disseminate fisheries technologies as well as the perception regarding the content that being disseminated.

Information collected on the scale point of very much, much, not so much and not at all were analysed with the score value of 3,2,1 and 0 respectively. The results obtained from the analysis of collected data from the respondents are discussed in this section.

Keywords: Aquaculture, Perception, Production and Technical.

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I. Introduction

The use of aquaculture technologies to strengthen production has proven potentials in revising the trend of fish production. Applying feasible and proven technologies had significant impact on productivity and income of the fish farmers. One of the effective strategies calls for adequate use and application of the Information and Communication Technologies (ICTs) especially mobile, computer and internet that are considered as the principal drivers of economic growth and development. Chauhan *et al.* (2004) observed that maximum of 56.00% of the respondents fully and 30.00% partly stated about the possibility for development of Indian farmers through Internet. The study further revealed that internet was best means to learn all new things for young generation. Around 82.00% of the farmers desired their children to make use of internet and 81.00% of them stated for the use of internet by them. Adejoet *et al.* (2009) emphasized the use of ICTs in boosting agricultural production among farmers. It had promoted access to and sharing of information in agriculture and allied fields. Nkwocha *et al.* (2009) indicated that ICT played an essential role in poverty alleviation by providing powerful tool to rural farmers and other citizens to grow their business as well as create new opportunities and delivery of services to rural areas.

Unless the fish farmers have favourable attitude towards benefits of ICTs, transmission of technologies may be very slow that can restrict production, productivity and income generation in fish farming.

The researcher therefore set another objective in the study to assess the perception of the fish farmers regarding different Information and Communication Technologies (ICTs) media along with contents. Accessibility, availability, benefits, timing, seasonality, understanding, usefulness of mobile, television, computer, radio as well as newspaper were selected as the variables to study perceptions. **Balaji et al. (2007)** stated that content need to be aggregated from different sources but it needs to be sorted in granular format for rapid adaptation at field level. Localization and customizability of content are not being practiced in a significant scale. If sufficient scientific information is not available, content need to be generated, tested, refined and used for further advisory services through ICTs. Most of the web portals are being lacked on relevant content in local language.

II. Material and Methods

The present study has been conducted among the fishing community of twodistricts, namely, Khurda and Puri of Odisha. 120 farmers each from boththe study districts have been selected for the purpose (240 in total). Selectioncriteria was to select respondents those who are engaged in fishery and possessmobile. Structured interview schedule was used for capturing data from theprimary source. Standard scales have been used for measurement of variable andcorresponding statistical analyses as described below.

To ascertain the perception regarding different ICTs and contents respondents wereasked to record their perception regarding different ICTs in a four-point scale [0-3] containing very much with corresponding score (3), much with correspondingscore (2), not so much with corresponding score (1) and not at all with corresponding score (0) against nine aspects [Table-1] identified for the purpose. Mean knowledge scores were calculated for each aspect and rankings were done on the basis of the pooled mean scores forboth the study districts.

Further, to ascertain distribution of respondents in different

Level of perception categories, Perception Index (PI) was calculated by following formula:

$$PI = \{ \text{Score obtained} / \text{Maximum Possible Score} \} \times 100.$$

KI was calculated foreach respondent against all four aspects of perception like accessibility, availability, benefits and timeliness.

III. Results and Discussion

Results obtained in the present research work is presented below separately for each aspect of perception.

1: Accessibility

The ICTs media need to be available with easy access of the fishermen enabling them to use the media adequately for getting need based information. Unless the medias are not easily accessible, they may not develop interest to gather technological information by using the media. Information collected from the respondents regarding their perception towards accessibility to ICTs media have been analysed and reflected in Table-1A.

Table-1A: Perception towards accessibility to different ICT medias

Sl.No.	Accessibility	Mean Score		Different percentage	Pooled Mean score(N=240)	Rank
		Khordha district (N=120)	Puri district (N=120)			
1.	Access to mobile	2.48	2.23	10.08	2.35	III
2.	Access to Computer	1.58	1.75	9.71	1.66	IV
3.	Access to Television	2.48	2.58	3.88	2.53	II
4.	Access to newspaper	2.70	2.77	2.53	2.75	I

(Maximum obtainable score-3)

From [Table-1 A] it can be observed that the respondents of both Khordha and Puri district had perceived better access to newspaper and television. The respondents of Khordha district had better access to mobile in comparison to the respondents of Puri district. But, the respondents of both Khordha and Puri had poor perception towards accessibility to computer. **Agwuet al. (2008)** delineated that 65% of the researchers, 56% of the extension workers and 33% of the fish farmers claimed that they had access to ICT facilities. Moreover, it was revealed that a large percentage of farmers (67%) had no access to ICT facilities indicating the existence of deprived condition of ICT facilities in rural areas of Enugu and Abia states. **Ferris et al. (2008)** also found that 86 per cent of the farmers had access to mobile phone which therefore contributing towards development of farmer's linkage with other people including extension experts for getting information on their farm activities. Any person can read news paper and watch television from their friends and neighbours, if they are unable to subscribe for the newspaper on purchasing television set. This might be the reasons for which they opined for

their better access to newspaper and television. **Jain et al. (2012)** suggested that television being the most popular means of communication among farm women could be used for dissemination of essential agricultural knowledge to them on a day-to-day basis, for their betterment.

Mobile is now very common and the fish farmers mostly have the mobile set and use for their activities. Computer requires adequate skills to use. Besides it is comparatively more costly and may be beyond capacity of the fish farmers. Moreover, computer facilities on hire basis may not be available sufficiently in rural areas for which the respondents had perceived their poor accessibility. The findings therefore conclude that the respondents had better perception towards their access to news-paper, television and mobile.

2: Availability

Adoption of technological innovations depends on its availability in easy access of the fish farmers. The fish farmers must have easy access to the medias disseminating technological innovations. The study also attempted for ascertaining the availability of different ICT medias along with the contents. The data collected from the respondents have been analysed and obtained results presented in Table-2 A.

Table-2 A: Perception about availability of ICT media and contents

Sl.No.	Availability	Mean Score		Different percentage	Pooled Mean score(N=240)	Rank
		Khordha district (N=120)	Puri district (N=120)			
1.	Service provided through radio become cheaper	2.23	2.42	7.85	2.33	II
2.	Service provided through television become cheaper	2.03	2.13	4.70	2.08	IV
3.	Availability of computer	1.33	1.59	1.31	1.46	VI
4.	Internet connected to the computer	1.18	1.27	1.17	1.22	VII
5.	Availability of newspaper	2.38	1.93	18.91	2.15	III
6.	Cost effectiveness of the news paper	2.37	2.49	4.82	2.43	I
7.	Availability of the services through mobile and its cost effectiveness	2.28	1.85	18.86	2.05	V

(Maximum obtainable score-3)

As observed from the table 2A, the respondents of both Khordha and Puri district are of similar opinions on service provided through radio and television, availability of computer along with internet connectivity as well as getting information through newspaper becomes cheaper. Contradictory opinions were observed regarding availability of the newspaper as well as availability of the services through mobile and its cost effectiveness where the respondents of Puri district did not perceive much on these aspects. Similarly, the respondents of Khordha district had not perceived much on the services provided through television becomes cheaper in comparison to the respondents of Puri district. The pooled mean score value revealed that the respondents had better perception about cost effectiveness of the news-paper, services provided through radio becomes cheaper and to some extent availability of the newspaper.

Doordarshan telecasted fishery programme regularly on free of cost. Poor perception of the respondents on services provided through television becomes cheaper indicated that the respondents might have not access to television. Computer with internet facilities enabled the fish farmers to collect need-based information around the world. Poor perception of the respondents on these services indicates that computer with internet facilities were not available to them. Similarly, respondents had poor perception towards availability of the services through mobile at cheaper rate.

These are the powerful ICT medias where latest technical information provided to all the fish farmers. It is therefore suggested that the State fishery department and research institute have to analyse the constraints of the respondents on their media and take necessary steps to provide services through their ICT media enabling to receive the technological information regularly so that the respondents use in their fishery activities timely.

3: Benefits

Fish farmers have the interest for the benefits of the technological information disseminated through various ICT media. Unless they found the benefits of the technology in their farming situation, they may not like to use the concerned ICT medias. The data collected from the respondents about the benefits for the use of ICT medias have been presented in Table- 3A after analysis.

Table-3 A: Perception towards benefits of the ICT medias and contents.

Sl.No.	Benefits	Mean Score		Different percentage	Pooled Mean score(N=240)	Rank
		Khordha district (N=120)	Puri district (N=120)			
1.	Television programme available anytime and any where	2.33	2.23	4.29	2.28	IV
2.	Programme on TV beneficial	2.52	2.29	9.13	2.41	II
3.	Information timely available on mobile	2.38	2.28	4.20	2.33	III
4.	Information timely available in other ICT media	2.46	2.40	2.44	2.43	I

(Maximum obtainable score-3)

The respondents of both the Khordha and Puri district were of similar opinions about their perceived benefits of ICT medias as significant difference not being observed from the table. However, the respondents of Khordha district had perceived better benefits than the respondents of Puri district. Though the respondents perceived benefits from ICTs media as mentioned in the table, they had better perceived benefits of timely available of information from other ICT medias, programme on television beneficial and timely availability of information through mobile in comparison to programme on television available anytime and anywhere.

The findings therefore suggested that the State fishery department and research institutes functioning in the State need to strengthen the functioning of the ICT medias enabling the respondents to collect the need based technological information and use in their fishery activities.

4: Timeliness

Pisciculture has a series of activities that are to be implemented in various stages of fish growth. They need different technological information at different stages. Therefore, timely availability of information for each activity is very much essential to get desired production. The study therefore made attempt to assess the opinions of the respondents towards timely availability of information from various ICT medias. The data collected in this regard have been analysed and results reflected in Table- 4 A.

Table-4 A: Timely availability of information in ICT medias

Sl.No.	Availability	Mean Score		Different percentage	Pooled Mean score(N=240)	Rank
		Khordha district (N=120)	Puri district (N=120)			
1.	Timely availability of information on Television	1.77	1.67	5.65	1.72	III
2.	Timely availability of information through Computer	1.62	1.38	14.82	1.50	IV
3.	Timely availability of information in Radio	2.10	1.88	10.48	1.99	II
4.	Timely availability of information in Newspaper	2.74	2.43	11.31	2.59	I

(Maximum obtainable score-3)

Significant differential opinions were observed among the respondents of Khordha and Puri district except timely availability of information on television. The respondents of both the districts did not agree for the timely availability of information through computer, television and radio. However, the respondents of both the districts agreed for the timely availability of information through newspaper.

Fish farmers essentially need timely technological information for proper management of fishes as risk factors are comparatively more. Similarly, the respondents use various ICT medias in different times. It is therefore suggested that the State fishery department and research institutes have to consider the constraints of the fish farmers and take steps to provide timely information enabling them for proper management of their fishery activities.

5: Understanding

Technological information transmitted through ICT media must be within the understanding level of the fish farmers so that they can assess the benefits and adopt in their fishery activities. The data collected from the respondents in this regard has been analysed and presented in Table-5 A

Table-5 A: Perception regarding understanding of the information disseminated in ICT media.

Sl.No.	Information	Mean Score		Different percentage	Pooled Mean score(N=240)	Rank
		Khordha district (N=120)	Puri district (N=120)			
1.	Information transmitted at appropriate time of application in mobile	2.73	2.56	6.23	2.64	IV
2.	Information transmitted at appropriate time of application in Television	2.84	2.53	10.92	2.69	III
3.	Information transmitted at appropriate time of application in radio	2.88	2.68	6.94	2.78	II
4.	Information transmitted at appropriate time of application in computer	2.66	2.58	3.01	2.62	V
5.	Information transmitted at appropriate time of application in Newspaper	2.86	2.78	2.80	2.82	I
6.	Language of information transmitted at in ICTs easily understandable	2.38	2.28	4.20	2.33	VI

(Maximum obtainable score-3)

As observed from the table, the perception of the respondents of both Khordha and Puri district were almost similar as significant difference in their perception not observed. However, the respondents of Khordha district had perceived better understanding than the respondents of Puri district. The pooled mean score value indicated that the respondents had better perception on information transmitted at appropriate time of application in news paper followed by radio, television, mobile and computer. The respondents had also better perception about language of information transmitted in various ICT media were easily understandable.

The findings therefore conclude that the information transmitted by various ICT media were at appropriate time of application and easily understandable.

Attempt was made for comparative analysis of the perception of the respondents towards various ICT media covered under the study. The mean score value of each statement was pooled together and mean score value of that particular variable was calculated for the comparison. The results obtained from the analysis were presented in Table-6 A

Table-6 A: Comparative analysis of the perception towards ICTs media

Sl.No.	Perception	Mean Score		Difference percentage	Pooled Mean score(N=240)	Gap percentage
		Khordha district (N=120)	Puri district (N=120)			
1.	Accessibility	2.31	2.33	0.86	2.27	24.33
2.	Availability	1.97	1.95	5.34	1.96	34.67
3.	Benefits	2.42	2.30	2.24	2.36	21.33
4.	Timeliness	2.06	1.84	10.68	1.95	35.00
5.	Understanding	2.73	2.57	5.86	2.65	13.33

(Maximum obtainable score-3)

The respondents of both Khordha and Puri district were of similar opinion as no. significant differences observed from the table. The respondents perceived favourably for the understanding of the information disseminated in ICT medias followed by benefits and their accessibility to ICTs. Poor perception was observed timeliness and availability of the information which needs to be strengthened by the organisations transmitting information in various ICT medias. Special attention has to be given for easy availability and timely sending the information. The State fishery department and research institute have to analyse the perceived opinions of the respondents and take necessary steps to make sure for the easy availability and appropriate time enabling the respondents to use the information in their fishery activities.

Attempt was also made to assess the influence of socio-economic attributes of the respondents in accelerating their perception. The results obtained from the correlation co-efficient analysis has been presented in Table-6B

Table-6 B: Influence of socio-economic attributes on perception.

Sl.No.	Attribute	Correlation(r) value	't' value
X1.	Age	-0.107	0.167
X2	Education	0.100	0.142
X3	Family type	0.134*	0.191

X4	Family size	0.052	0.074
X5	Social participation	-0.007	0.010
X6	Cosmopolitaness	0.130*	0.185
X7	Occupation	-0.018	0.025
X8	Material possession	-0.130*	0.185
X9	Annual income	0.070	0.099
X10	Communication materials used	-0.042	0.059
X11	Holding size	0.096	0.136

*Significant at 0.05 level

Out of eleven socio-economic attributes of the respondents analysed with their perception, only family type as well as cosmopolitaness positively and material possession negatively influence their perception on use of ICTs with contents. It is therefore concluded that socio-economic attributes of the respondents had not much influence in improving the perception level of the respondents towards various ICTs with contents.

Further attempt was therefore made for multiple regression analysis to assess the contribution of the socio-economic attributes enhancing the perception level of the respondents. The results obtained from the analysis are indicated in Table-6 C.

Table-6 C: Regression analysis of socio-economic attributes on perception

Sl. No.	Attribute	Unstandardised Coefficients		Standardised Coefficients	‘t’ value	Probability
		Beta	Std. Error	Beta		
X1.	Age	-0.401	0.639	-0.050	-0.628	0.531
X2	Education	0.256	0.251	0.077	1.023	0.307
X3	Family type	2.154	0.978	0.175	2.202	0.029
X4	Family size	0.408	0.715	0.047	0.570	0.569
X5	Social participation	-0.434	0.500	-0.070	-0.868	0.386
X6	Cosmopolitaness	0.427	0.554	0.063	0.770	0.442
X7	Occupation	-1.207	0.863	-0.121	-1.399	0.163
X8	Material possession	-1.459	0.617	-0.196	-2.366	0.019
X9	Annual income	0.497	0.434	0.088	1.146	0.253
X10	Communication material used	-0.039	0.355	-0.008	-0.110	0.913
X11	Holding size	0.876	0.547	0.104	1.602	0.111

R²-0.109 Adj.R²-0.041

The results in the table revealed that family type and possession of materials had significant association with perception of the respondents towards different ICTs and its contents. But the best fitted regression equation could explain only 10.9% of the total variance in exhibiting perception level of the respondents indicating that socio-economic attributes had not much influence in accelerating the perception level of the respondents.

Fish farming is not the traditional occupation of the respondents. They have diverted on taking additional occupation due to more income generation for which they had no past experience. It might be the reason for which socio-economic attributes had no significant influence in exhibiting perception level of the respondents. However, family type, material possession and cosmopolite behaviour of the respondents may be taken into account to enhance the perception level of the respondents towards different ICTs and its content.

IV. Results and Discussion

Results of the present research work is presented below in different sections, like Accessibility, Availability, Benefits, Timeliness, Understanding, Comparative analysis of the perception towards ICTs media, Influence of socio-economic attributes on perception and Regression analysis of socio-economic attributes on perception.

Conclusion

- I. The respondents of both the districts had better access to newspaper, television and mobile in comparison to computers.
- II. Cost-effectiveness of the newspaper, cheaper in service provided through newspaper, availability of newspaper and television were the perceptions of the respondents towards the availability in content.
- III. The respondents had perceived timely information available on mobile and other ICT media as well as the beneficial programme on television including its availability anytime and anywhere were the major benefits in using ICT media.

- IV. The respondents had stated timely availability of information only in a newspaper than other ICT media studied.
- V. The respondents of both the districts had opined for their good understanding of the messages transmitted through all the ICT media covered under the study.
- VI. Significant gap percentages were observed on comparatively analysis perception of the respondents towards ICT media. However, better perceptions were observed on the understanding of the message transmitted and to some extent on benefits and accessibility to the ICT media studied.
- VII. Socio-economic attributes of the respondents had less influence in exhibiting their perception level towards ICTs and contents. However, family type, material possession, and cosmopolite behaviour may be taken into account to enhance the perception level.
- VIII. The respondents of both Khordha and Puri districts had positively opined for the technology-oriented, effective, appropriate and useful services provided through mobile phones. Similarly, the respondents of both the districts had also stated in similar manner with the services provided through television, radio and newspaper. Poor opinions were observed with the computer.

IV. Review of Literature

Perception regarding different ICTs and contents

Heeks (2005) indicated that the development projects must be designed around the information chain. They must either provide or draw together an entire “information chain package” of all resources necessary to turn data into effective action. Until this happens, ICTs will not deliver on their developmental potential.

Chauhan (2010) revealed that the major purposes to community Internet Centre (CIC) stated by the respondents were to collect agricultural information, collect information on government’s programmes, exchange information and to know more about market prices. Majority of the respondents expressed their desire to use Internet daily or twice in a week by their own. All the respondents expressed positive response to have proper training about the use of Internet facility through government agency and or at CIC for sustainable agricultural development. The variables like education, land holding, experience of internet use and mass media exposure of the respondents were significantly and positively influenced in use of the internet.

Michailidis *et al.* (2010) stated the benefits in using mobile technology in reducing the distance between individuals and institutions. It helps to accelerate in sharing information easily and effectively, making availability of local content and making rural services more efficient in terms of logistics coordination and cost-effective.

Mittal (2010) revealed that ICT tools were used effectively video conferencing, voice activated call centre facility, internet enabled PC based networking, voice and text messaging via mobile phones, internet-based crop specific digital video, and interactive community radio.

Sideridis *et al.* (2010) observed that most of the ICT initiatives disseminated generic information on crop cultivation practices of major crops along with weather and market information. Multimedia portals and one stop centres for various operations in agriculture were known as academic exercises.

Saravana (2011) stated that most farmers had access to a variety traditional information source such as television, radio, newspapers, farmer friends, government agricultural extension services, traders, input dealers, seed companies and relatives, which they regularly accessed for agricultural information.

Sulaiman *et al.* (2012) reported that there was a limited scope for interaction. Projects such as Farmers Call Centre, Village Resource Centre, e-Arik, e-Sagu, Digital Green, Lifelines India and IKSL provide opportunities for interaction among farmers and experts.

Agwuet *et al.* (2013) conducted a study on “Access and Use of Information Communication Technologies by Women staff of Public Extension Service in the North Central Zone of Nigeria”. The findings revealed that majority of the Women in Agriculture (WIA) staff had access to telephone, television and radio, respectively and very few of them had access to digital ICT facilities such as computer, internet and printer etc. Radio, video machine, television and telephone were used by the respondents to a large extent in the process. Lack of training opportunities, insufficient availability of ICT facilities and lack of technical know-how were the pertinent constraints being identified in the use of ICTs effectively.

Jayadeet *et al.* (2014) reported that ICT played very important role in the development of education, health, rural development as well as in agricultural activities. This technology brought a significant change in agriculture development in Maharashtra and India in particular where farmers were directly connected with research centres, universities, government, market, buyers, customers and meteorological department to get information regarding inputs, practices, weather forecast and market prices.

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