Effectiveness of INCOIS – Potential Fishing Zone and Ocean State Forecast Services in Andhra Pradesh

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ABSTRACT

For the marine sector, Indian National Center for Ocean Information Services (INCOIS) providing services are Potential Fishing Zone (PFZ) and Ocean State forecast (OSF) advisory services. These are playing a pivotal role in the dissemination of information on identification of fishing grounds and ocean weather information to the fishers in India. Effective dissemination of both these advisory services to the fishers is made possible by the active involvement of facilitating institutions such as NGOs, Universities and Cooperative societies in Andhra Pradesh. It was inferred from the study that these ICT initiatives to sustain in the long run they should be need based, financially well supported. Awareness and usage of PFZ advisories are positively correlated with ICT ownership. Usage of mobile phones is positively correlated with the ICT ownership and type of service provider. Awareness of PFZ is negatively correlated with the type of service provider. ICT ownership and type of service provider are most important factors with respective to usage of INCOIS services. The study infer that an effective ICT intervention should be need based, regular in service, engaging with the local bodies with proper monitoring can give good result. Usage of mobile phones and VHF for communication in the sea will give the effective service delivery for INCOIS services.

***Key words**: INCOIS; MSSRF; ICT; Mobile phones; Services;*

According to *Maha Bahl (2008)*, "No country will reap the benefits of the network age by waiting for them to fall out of the sky. Today's technological transformations hinge on each country's ability to unleash the creativity of its people, enabling them to understand and master technology, to innovate and to adapt technology to their own needs and opportunities". India has a number of ICT (Information Communication Technologies) interventions in the various fields of agriculture and rural development indeed in fisheries and aquaculture. Among these initiatives, INCOIS – PFZ & OSF is the major ICT interventions to provide information about PFZ and OSF services to the fishers. In the capture-based marine fisheries sub-sector has characterized by common property regime, excessive fishing capacity, over-exploitation, there is no control on fishing boat fleet. Despite of all these, fishers were depend on the ITK's. They were having knowledge about fishing grounds by distance, direction, depth, colour of the water, water currents etc. These fishing practices are mainly on the luck factor and also not having any assurance for getting fish, In this connection INCOIS have initiated the services of PFZ and OSF for welfare of fishers by reducing the time and fuel for identification of fishing grounds for catching fish. But INCOIS performance is uncertain towards awareness and usefulness of PFZ and OSF. Since, it is not having any direct mechanism to provide services to the fishers. So it is depend on the various organizations like NGOs, Cooperative societies, Govt organizations and Universities etc. The extension personnel towards use of ICTs in agricultural extension system should be well taken care to promote efficient use of ICTs in agricultural extension system (*Raksha and Shaik N. Meera, 2015*). So this study has been taken to address the awareness and usefulness of PFZ and OSF services to the fishers in the coastal districts of Andhra Pradesh.

METHODOLOGY

Identification and documentation by three level multi-stage sampling technique was adopted for the selection of respondents. In the first stage, three districts were selected based on the total fish landings, fisher population, fishing crafts covering the entire stretch of Andhra Pradesh. In the second stage, the largest landing centre/fishing harbour in each district namely Visakapatnam, East Godavari and Machilipatnam and Nellore was selected. The third stage was characterized by the random sampling of 40 respondents from each selected fishing harbour and landing centers 20 (totalling 60) for each district, while ensuring equal distribution of mechanized (large scale, 120) and motorized (small scale, 120) fishers in the sample. Pretested structured interview schedule was used to collect the primary data. The requisite data from institutions (service providers) present in each district were collected through a semi-structured interview schedule. In addition to percentage analysis, the Kruskal Wallis test and Spearman's Rank Correlation were used to draw inferences and answer research questions.

RESULTS AND DISCUSSION

INCOIS advisory services -

Number of advisory services giving to the South and North Andhra Pradesh : According to information given by INCOIS officials, these services were started in Andhra Pradesh from 2008. The number of PFZ advisories reached the maximum during 2011 numbering 105 in a year. INCOIS generally provides PFZ advisories three days a week except cloudy days. The reasons for lower number advisories as quoted by INCOIS are seasonal problems like monsoons and cloudy weather as well as non-dissemination of advisories during the fishing ban period (April-May) as a measure of sustainability. INCOIS disseminates primarily through EDBs in Visakhapatnam and Nellore districts, while it is also faxed to service provides like MSSRF in East Godavari and Krishna districts in addition to EDBs. MSSRF is further customises as mobile based SMS services to fishers. Tuna forecasting has been initiated on a pilot scale in Andhra Pradesh for tuna long liners. The service frequency is very limited while it is also sent only to registered tuna long line fishers.

Table 2: Tuna advisory services given by the INCOIS

Sample sites	Number of Tuna advisories				
	2008	2009	2010	2011	2012 (till May)
South Andhra Pradesh	1	21	18	16	09
North Andhra Pradesh	1	17	16	13	03

Presence of Service Providers of PFZ and OSF of INCOIS services in Andhra Pradesh: INCOIS services of PFZ and OSF are provided to fishers mainly through the Electronic Display Boards (EDB). In Andhra Pradesh, a total of 16 EDBs were available along the coastal districts, all of which were installed in 2008. In Visakhapatnam district, they are established one each at Visakhapatnam harbour (common place) and *Pudimadaka* (Panchayat office). For East Godavari district, EDB places are Kakinada harbour (DoF office), *Bhairvapalam, Danavaipetta* and *Uppada* (Mahila mandals's office). For Krishna district, EDB places are *Sorlagondi, Nachigunta, Giripuram* and *Machilipatnam* harbour (DoF office) and for Nellore district - *Iskapallipatapupallem* (Co-op Society). In Visakhapatnam, EDB is managed by Andhra University (Institution category) while the NGO, MSSRF is managing them in Krishna and East Godavari districts. However, at two places namely Pudimadaka and Isakapallipatapallem, they are managed by local bodies / organisations namely Panchayat and Cooperative society respectively. Interestingly, though at many places EDBs were located in DoF offices, it was found to have no role its dissemination.

Awareness of INCOIS services among the fishers : Among the respondents from the both the sectors (mechanized and motorized) 47.9 per cent were found to be aware of the INCOIS services. The awareness

Table 1: PFZ and OSF Advisory Services given by the INCOIS

Sample site	Number of PFZ Advisories					Number of Ocean State Advisories				
	2008	2009	2010	2011	2012 (till May)	2008	2009	2010	2011	2012 (till May)
South Andhra Pradesh	59	44	61	105	53	365	365	365	365	135
North Andhra Pradesh	64	51	62	104	70	365	365	365	365	135

Table 3: PFZ and OSF advisory services providers to fishers in the study locales in Andhra Pradesh

Presence of services providers/ facilitators	Visakhapatnam	East Godavari	Krishna	Nellore
Source of INCOIS services	Andhra University (72.2%) Vizag harbour Panchyath (20%) at pudimadaka	MSSRF 40% in Kakinada harbour & 60% in Uppada	MSSRF 20% among Mechanized & 15% among Motorized	Co-operative society 100%
Access the frequency of services	Occasional (Panchayat never)	Occasional (37.5% never)	Occasional (12.5% never)	Never

levels were 44.2 per cent for mechanized boat owners while it was slightly higher (51.7%) for the motorized fishers. While in case of Nellore district 71.7 per cent fishers were aware about the INCOIS services despite of the NGO's intervention. It is mainly because of the cooperative society was more homogeneous fishers, isolated group, and having same fishing pattern in the Nellore. The t-test indicated that awareness about INCOIS services among the respondents did not differ significantly across the type of craft. But differ at across the district.

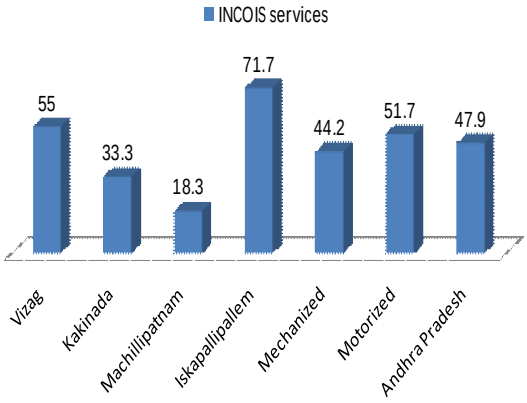

Fig 1. Awareness of INCOIS services among the fishers (%)

Occupational usage of mobile phones among the fishers in Andhra Pradesh : The study reveals that most of the fishers were using mobile phones for general purpose. But, for occupational usage 35.6 per cent for regularly and 38.6 per cent used it occasionally. All the fishers who owned VHF and GPS used it regularly for fishing activities. ICT ownership was found more among the mechanized boat owners of *Kakinada, Machilipatnam, and Iskapallipatapupallem*. Among the motorized boat owners occupational use of Mobile was found only among 21 per cent while usage of GPS was 100 per cent. The t-test indicated that occupational usage of mobile among fishers differed significantly across craft types and the districts.

Table 4: Comparison of occupational usage of mobile across districts (Kruskal-Wallis test)

Usage of Mobile	Districts	Sample Size	Mean Rank
Occupational usage of mobile across districts	Nellore	60	68.77
	Krishna	60	128.70
	East Godavari	60	137.18
	Visakhapatnam	60	147.36
Occupational usage of mobile across craft types	Motorized boat	120	101.12
	Royya	63	134.18
	Sorrha	55	144.07
	Sona	2	204.00
Asymptotic Significance (P) = .000			

Relation between awareness and usage of INCOIS advisory services and ICT tools : The correlation results indicate that awareness of INCOIS services was more among the ICT owners and type of services provider. This means that the fishers who are aware of INCOIS services, own the ICT tools to make the best use of available information and if the service provider is a cooperative institute then with homogeneous fishers then it has a positive impact on the awareness and usage of INCOIS services among these fishers. Though the NGO like MSSRF and the Andhra University are providing better service its area of coverage is limited due to this constraint its impact on level of awareness on all the fishers in the study is turning out to be negative.

The relationship among experience, type of craft, ICT ownership, type of service provider and education with awareness of INCOIS services and occupational usage of mobile phones, type of services provider depicted in the table, at 5 percent level of significance., Type of craft, ICT ownership and type of service provider were positively and significantly correlated with usage of INCOIS services, ownership of ICT occupational usage of mobile phones. The correlation values indicated that type of craft, ICT ownership and type of service provider had major role with respective usage of INCOIS services, occupational usage of mobile phones and ownership of ICT, where as awareness of

Table 5: Relationship among Experience, ICT ownership, Type of service provider and Education with Awareness and Usage of PFZ and OSF advisories

Variables	Experience	Type of craft	ICT ownership	Type of Service provider	Education
Awareness of INCOIS Services	NS	NS	0.437**	-0.301**	NS
Usage of INCOIS services	NS	0.228**	0.394**	0.640**	NS
Ownership of ICT	NS	0.755**	NS	0.346**	NS
Occupational usage of mobile	0.179**	0.305**	0.206**	0.180**	NS
Type of Service Provider	-	0.492**	0.470**	1	NS
Usage of mobile for accessing INCOIS services	NS	NS	0.346**	0.328**	NS

**Significance at 1% level of significance *Significance at 5% level of significance NS – Non-significant

INCOIS services remain in significant with type of craft and experience and more over negatively correlated with type of services providers.

The positive relation between type of craft and usage of INCOIS services use is due to the fact that the mechanized craft owners have sophisticated ICT tools on board which enables them to make effective use of INCOIS services. Ownership of mobile (ICT) positively affects the use INCOIS - PFZ and OSF services. Further, service provider like MSSRF encouraged the use of mobile for accessing INCOIS services through their unique SMS services on mobile.

CONCLUSION

The study has inferred that local bodies for delivering of INCOIS services to the fishers are panchayathi, cooperative societies and University (Vizag) are less effective towards awareness and usage of INCOIS services. Since, these local bodies are less funded and also having more homogeneous and isolated group. NGO's (MSSRF) were providing services in Andhra Pradesh having little impact on awareness and usage of services. These services also need to be strengthening for effective service delivery in terms of reaching fishers, because these services were limited. Most of the fishers were not having GPS for getting information on direction, distance and depth of the fish. Further INCOIS also need to categorize the information based on trawl fishing and motorized vessels - gillnets, hook lines and purse seine fishers etc. The use of ICT tools like mobile phones, VHF's will further strengthen the effective delivery of services.

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