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Mass media usage among officials that can benefit aquaculture- Perceptual Mapping

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ABSTRACT

The different kinds of communication facilities utilized by the staff of Department of Fisheries (DoF) were studied by means of collecting data from a total of 165 Department of Fisheries staff that extended support to fish farmers in five districts in Kerala where a large number of inland fish farmers occupied. It was observed that the staff used communication media like newspaper, leaflet, farm magazine, bulletin, radio, TV, Kisan Call Centre, mobile phone and internet for getting aquaculture-related information on various subjects like, improved culture practices, stocking density, management practices and methods to tackle disease outbreak. A percentage analysis of the types of communication facilities utilized by the officials revealed that all of them used post office and telephone for communication but only 16.4% used radio. The next highest communication facility used was TV (72.7%) trailed by Internet (38.2%) and Kisan Call Centre (34.5%). A weighted score analysis was done after grouping different media for getting aquaculture related information under categories like never, occasionally, bimonthly, weekly and daily. Mass media exposure score through Newspaper (609) was the highest followed by Magazines (415), TV (324) and Radio (260). Multidimensional scaling visualized the level of similarity, with respect to dimensions like, relevance of mass media used by DoF staff, usage level of mass media by the staff and the ease with which the staff could access the farm-related relevant information. The level of similarity observed for the usage of Internet and Kisan Call Centre were dissimilar from that of radio, mobile phone, TV, leaflet, bulletin and farm magazine. Information channels like radio, newspaper and TV best fitted with each other for accessing information related to aquaculture. Internet and Kisan Call Centre adhered to Dimension 1 (relevance level), mobile phone, newspaper, leaflet, TV and radio stuck to Dimension 2 (usage) and print media like bulletin and farm magazine favoured Dimension 3 (ease of access). Finally, a series of suggestions were set for improving the usage of mass media that might benefit the aquaculture farmers.

Key words : Multidimensional scaling, Communication, Aquaculture, Perceptual mapping, Mass media exposure.

Introduction

Fisheries and aquaculture play a significant role in providing food and income, either singly or combined with agriculture and livestock rearing in many developing countries (World Fish Centre, 2011). India is blessed with diverse resources and more than 10 per cent of global biodiversity in terms of fish and shellfish species (NFDB, 2007).

Meenakumari (2012) quoted that the fisheries sector in India contributed 1.24% per cent to the GDP and 6.58 per cent of the agricultural GDP (Meenakshi, 2022) with an average annual growth rate of 9 per cent (DoF, 2022). Fisheries and aquaculture production in India in 1950 was 0.7 MT, which grew up to around 14.73 MMT in 2020-21 (IBEF, 2022). Of this, the capture contribution is around 3.05 million tonnes in 2021 which ascended from 0.7 MT in 1950

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(FRAD, CMFRI, 2022). Though capture was also on the rise, the rate of increase had almost reached a plateau. Aquaculture production in India is mounting at an increasing rate compared to that of capture with a production of 12.12 MMT in 2021 (Invest India, 2022), from a mere production of 0.2 MT in 1950 (FAO, 2014). Thus, in order to meet the needs of the increasing population, aquaculture production needs to be raised in the context of declining capture production over the years (Ajayakumar, 2011). Only 40 per cent of the 2.36 million hectares of ponds and tanks for freshwater aquaculture and 13 per cent of a total potential brackish water resource of 1.2 million hectares was utilised in India (FAO, 2010).

Kerala state in India, with a coastline of 590 km, had vast untapped resources for expansion with varying consumer preferences for Indian major carps. Kerala witnessed 149.1 MT of inland fish production with a growth rate of 6.47 per cent and 530.6 MT 6.01 lakh tonnes of marine fish production with a negative growth rate of 4.07 per cent during 2012-13 (DAHD, 2013). Annual fish production in Kerala (DiroF, 2022) during 2021-22 is 600802 million tonnes (marine) and 225428 million tonnes (inland). Presently aquaculture bears the distinction of being one of the fastest growing food production sectors in the state (Harikumar and Rajendran, 2007). An effective farmer extension agency could guide the farmers for the timely access to resources to gain quality inputs, equipments, advisory services, institutional credit, exclude middle men and command better prices for their products and mobilize them for better farm management practices (Kumaran *et al.*, 2012). States were ultimately responsible in providing such support as fisheries and aquaculture were a state subject. States played a prominent role in conducting field level extension programmes through the respective Department of fisheries. Effective rendering of extension services could boost aquaculture production thereby leading to economic upliftment of rural poor fish farmers (Omoyeni and Yisa, 2005; Udo *et al.*, 2005). In this background, a study was conducted among the staff of DoF to assess the extension support that was extended to farmers through mass media.

Materials and Methods

Data collection was completed in five districts in Kerala, which had the highest inland fish farmer population, namely Kollam, Alappuzha, Kottayam,

Ernakulam and Thrissur (DoF, 2010). A total of 33 staff of Department of Fisheries (DoF) was selected from each district, thus, making the total sample size to 165. Primary data was collected through administering schedule among the selected respondents.

Brief description and measurement of variables selected was presented in Table 1.

Statistical tools available in SPSS 16.0 and MS Excel were used.

Methodology

Multidimensional scaling

Multidimensional scaling (MDS) is a means of visualising the level of similarity of individual cases of a dataset. The DoF staff was asked a series of questions with respect to relevance of the media used, its usage level and the easiness in accessing fisheries related information, for nine variables like newspaper, leaflet, mobile phone, radio, TV, Kisan Call Centre and internet. The ranking for level of relevance of mass media used by DoF staff has been done in a five-point Likert scale, namely, 1- Not at all relevant, 2- Not relevant, 3- No opinion, 4- Relevant and 5- Highly relevant. The ranking for level of usage for the respective media used was done in a five-point Likert scale, viz, 1- Not at all used, 2- Not used, 3- No opinion, 4- Used and 5- Highly used. The ranking for the easiness in accessing fisheries related information from the corresponding mass media was done in a five-point Likert scale, viz, 1- Not at all easy, 2- Not easy, 3- No opinion, 4- Easy and 5- Highly easy. The DoF staff from each district expressed their perception on the nine selected variables and the mean of the perceptions for these nine variables were calculated in terms of relevance, usage and easiness. Finally, a lower triangular matrix was obtained using average perceptions of each variable pair. This matrix was run on SPSS 16.0, to obtain a three-dimensional perceptual mapping on the mass media used by the DoF.

Results and Discussion

Percentage analysis of different kinds of communication facilities utilized by the DoF staff are elaborated in Table 1.

All of the staff of DoF used post office and telephone for communication but the least used was radio (16.4%). The second highest communication

Table 1. Brief description and measurement of variables

Variables	Description	Measurement (scores/codes are indicated in parentheses)	Justification
Communication Facility Utility of DoF staff	Different communication channels utilised by DoF staff	Score: Post office (1): Telephone (1): Internet (1): Television (1): Radio (1): Kisan Call Centre (1)	The relative importance of each channel couldnot be differentiated and so an equal score of 1 was given
Mass media exposure of DoF staff	Sources of media used and their frequency of use for seeking fishery related information	Score: Each channel score (1): Fisheries information on newspaper (1): Fishery related magazines (1): Fishery related programmes on radio (1): Fishery related programmes on Television (1). Further, accessing regularity for each such channel was scored as: Daily (4): Weekly/ Fortnightly (3): Bimonthly/ Monthly (2): Occasionally (1): Never (0)	The relative importance of channels could not be differentiated and so an equal score of 1 was given for it. Those channels which were accessed more regularly was given a higher score

facility utilized was TV (72.7%) followed by Internet (38.2%) and Kisan Call Centre (34.5%).

Aquaculture farmers using different media for getting aquaculture related information, were grouped under frequency categories like never, occasionally, bimonthly, weekly and daily, and was assessed and ranked using weighted score analysis and is presented in Table 2.

Fishery related mass media exposure score through newspaper (609) was the highest because all of the staff read newspaper daily. A similar result was expressed by Vidya *et al.* (2009). The second highest score was for magazines (415), followed by TV (324) and Radio (260). Therefore, the staff of DoF

should go for subscribing fish farmer/culture relevant magazines (Bhanu, 2006 have suggested similarly in his study) which might increase a farmer exposure in aquaculture activities. The exposure to radio and TV might be less due to non-awareness of different aquaculture programmes scheduled in TV.

Perceptual mapping of mass media used by DoF staff in the study area is presented in Figure 1.

Visual representation showing association between Perception on relevance of mass media (Dimension 1), Usage of mass media (Dimension 2) and Ease in access of fishery related information through Mass media (Dimension 3) using various types of mass media among DoF staff was done using mul-

Table 1. Type of communication facility utilised by DoF staff (n=165)

Communication facility	Kollam (n ₁ =33)	Alappuzha (n ₂ =33)	Kottayam (n ₃ =33)	Ernakulam (n ₄ =33)	Thrissur (n ₅ =33)	Total (n=165)
Post office, Telephone	33 (100)	33 (100)	33 (100)	33 (100)	33 (100)	165 (100)
TV	20 (60.6)	31 (93.9)	23 (69.7)	25 (75.8)	21 (63.6)	120 (72.7)
Internet	6 (18.2)	15 (45.5)	12 (36.4)	14 (42.4)	16 (48.5)	63 (38.2)
Kisan Call Centre	14 (42.4)	9 (27.3)	15 (45.5)	9 (27.3)	10 (30.3)	57 (34.5)
Radio	5 (15.2)	5 (15.2)	3 (9.1)	6 (18.2)	8 (24.2)	27 (16.4)

Table 2. Fisheries related mass media exposure among DoF staff (n=165)

Media	Occasionally (n=165)	Bimonthly (n=165)	Weekly (n=165)	Daily (n=165)	Total score	Rank
Newspaper	15 (9.1)	0 (0)	6 (3.6)	144 (87.2)	609	1
Magazine	56 (33.9)	59 (35.8)	50 (30.3)	0 (0)	415	2
TV	24 (14.5)	57 (34.5)	59 (35.8)	25 (15.2)	324	3
Radio	91 (55.2)	53 (32.1)	21 (12.7)	0 (0)	260	4

tidimensional scaling. DoF staff perceived that Internet (int) and Kisan Call Centre (kc) were distinct from other media like radio (rad), mobile phone (mob), TV (tv), leaflet (lf), bulletin (bu) and farm magazine (fm) used. At the same time, for obtaining fishery related information, channels like radio, newspaper and TV best fitted with each other. Similarity in perception was observed for Kisan Call Centre and Internet as well as for farm magazine and bulletin. Internet and Kisan Call Centre favoured Dimension 1 (relevance level), mobile phone, newspaper, leaflet, TV and radio favoured Dimension 2 (usage) and print media like bulletin and farm magazine favoured Dimension 3 (ease of access). As the mass media showed inclinations to the three dimensions mentioned above, it is suggested to consider the following recommendations.

Suggestions

1. Internet should be promoted among staff for getting aquaculture related information so that they could use this information for solving farm related problems. Softwares for technology packages should be developed in such a way that farmers could ask queries and aquaculture experts could answer such queries directly. The officials might educate the fish farmers on benefits of using Kisan Call Centre so that they would use it effectively for solving their farm problems. Infact, they should use written, oral and electronic information sources more extensively as said by Shih and Evans (1991) and Rozum and Brewer (1997).
2. The officials could be assigned the task of knowing the schedule of programmes being broad-

casted in radio and TV, after which this schedule could be displayed in their office notice board, through which all staff would be intimated of these programmes, which might lead to an increase in mass media exposure and linkage with extension systems as found in a similar study by Kumar *et al.* in 2005.

3. As utilising farm related information might lead to an efficiency in fish production and improved productivity as stated by Ofuoku *et al.* (2008), the officials should publish success stories and farmer-oriented activities organised by them in farm magazines and bulletins. They should produce leaflets on aquaculture practices preferred by the fish farmers. The officials should communicate farmer-oriented activities in popular local newspapers, as exposure to newspaper is relatively high in the study area. For instance, they could publish a separate farm newspaper once a week with the assistance of an editor of a popular newspaper. They should take steps to popularize Kisan Call Centre among fish farmers by displaying pamphlets showing the benefits they could access through Kisan Call Centre, how to approach Kisan Call Centre and its toll-free number in notice boards as well as through giving a brief description of it during FAC and FIAC meetings as such kinds of activities could increase productivity as reported by FAO in 1997.
4. The staff should go for subscribing fish farmer/ aquaculture magazines as a subscription which could increase exposure to farm magazines as said by Bhanu, 2006.
5. As bulletins and farm magazines gave a comprehensive idea of farm-relevant information, print materials should be published more, which would be of great use for educated and literate farmers. As all farmers had a habit of reading newspaper daily, attempts should be made by the officials to publish their project details, farmer success stories, innovative aquaculture techniques and activities in popular newspapers. The support staff could use mobile phones to intimate farmers on support activities or to answer fish farmers' query.

Derived Stimulus Configuration
Euclidean distance model

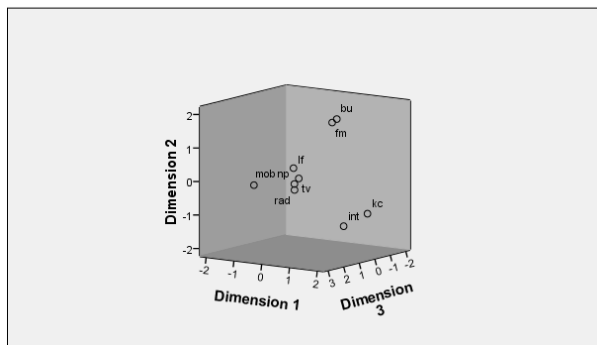


Fig. 1. Perceptual mapping of mass media used by DoF staff.

Conclusion

The communication facilities utilized by the staff of Department of Fisheries (DoF) were studied by

means of collecting data from a total of 165 Department of Fisheries staff in five districts in Kerala where a large number of inland fish farmers occupied. The study methodology included a percentage analysis of the types of communication facilities utilized; and a weighted score analysis by grouping different mass media used for getting aquaculture related information under categories like never, occasionally, bimonthly, weekly and daily; and a Multidimensional scaling analysis visualized the level of similarity, with respect to dimensions like, relevance of mass media used by officials, usage level of mass media by the officials and the ease with which the officials could access the farm-related relevant information. As all of the officials used post office and telephone, these could be used effectively for transfer of information. As most of the officials are reading newspaper, it should include more of aquaculture related information. Television can be used as an effective communication media to disseminate aquaculture related information. As information channels like Internet and Kisan Call Centre adhered to Dimension 1 (relevance level), mobile phone, newspaper, leaflet, TV and radio stuck to Dimension 2 (usage) and print media like bulletin and farm magazine favoured Dimension 3 (ease of access), such kinds of mass media shall be used according to the circumstances for effective information transfer.

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References

- Ajayakumar, C. 2011. *Socio economic aspects of the development of aquaculture in Kerala*. PhD unpublished thesis. Faculty of Social Sciences. Department of Economics and Research Centre. Thevara. Kerala.
- Bhanu, V. L. 2006. *Study on aspirations of rural youth and their attitude towards rural development activities in Dharwad district of Karnataka state*. Master's thesis in agriculture extension education, University of Agricultural Sciences, Dharwad, Karnataka.
- DAHD, 2013. Fisheries profile of the state: Kerala. [Online]. Available at http://dahd.nic.in/dahd/WriteReadData/Kerala_5-3-2014.pdf.
- DiroF (Directorate of Fisheries), 2022. Kerala Fisheries Statistics at a glance-2022. Prepared by Statistics Cell, Directorate of Fisheries, Vikas Bhavan, Thiruvananthapuram.
- DoF (Department of Fisheries), 2022. Annual Report 2021-22. Department of Fisheries, Animal Husbandry and Rearing, Govt. of India. Available at https://dof.gov.in/sites/default/files/2022-04/Annual_Report_2021_22_English.pdf.
- DoF- Department of Fisheries, 2010. Kerala inland fisheries statistics. Government of Kerala. Thiruvananthapuram. [Online]. Available at <http://www.fisheries.kerala.gov.in/images/publications/Inland%20%20Statistics%202010%20Final.docx.pdf>.
- FAO, 1997. Improving agriculture extension- A reference manual. [Online]. Available at <http://www.fao.org/docrep/W5830E/W5830E00.htm>.
- FAO, 2010. National aquaculture sector overview- India. pp 12. [Online]. Available at http://www.fao.org/fishery/countrysector/naso_india/en.
- FAO, 2014. FAO statistics, Fisheries and aquaculture information and statistics service. [Online]. Available at <http://www.fao.org/fishery/facp/IND/en>.
- FRAD, CMFRI, 2022. Marine Fish Landings in India 2021. Technical Report, CMFRI Booklet Series No. 26/2022. ICAR-Central Marine Fisheries Research Institute, Kochi.
- Harikumar, G. and Rajendran, G. 2007. An overview of Kerala fisheries with particular emphasis on aquaculture. *IFP Souvenir*. [Online]. Available at <http://ifpkochi.nic.in/IFPS2.pdf>.
- IBEF (India Brand Equity Foundation). 2022. The fisheries & aquaculture sector of India. Available at <https://www.ibef.org/blogs/the-fisheries-aquaculture-sector-of-india>.
- Invest India, 2022. Industry Scenario. Available at <https://www.investindia.gov.in/sector/fisheries-aquaculture#:~:text=India%20Specific%20Key%20Facts%3A,production%20in%20FY%2021%2D22>.
- Kumar, R., Arya, B. S. and Narwal, R. S. 2005. Extent and correlates of functional linkage as perceived by farmers. *Haryana Agric. Univ. J. Res.* 35: 71-76.
- Kumaran, M., Vimala, D. D., Chandrasekaran, V. S., Alagappan, M. and Raja, S. 2012. Extension approach for an effective fisheries and aquaculture extension service in India. *The Journal of Agricultural Education and Extension* 18(3): 247-267. DOI:10.1080/1389224X.2012.670442.
- Meenakumari, B. 2012. Prospects of fisheries and aquaculture in India. Posted in Bhuminirman. 1 June 2012. [Online]. Available at <http://www.bhuminirman.com/index.php/component/k2/item/12-prospects-of-fisheriesand-aquaculture-in-india>.
- NFDB, 2007. [Online]. Available at <http://nfdb.ap.nic.in/html/aboutus.htm>.
- Ofuoku, A. U., Olele, N. F. and Emah, G. N. 2008. Deter-

- minant of adoption of improved fish production technologies among fish farmers in Delta State, Nigeria. *Journal of Agricultural Education and Extension*. 14 (4): 297-306.
- Omoyeni, B. A. and Yisa, J. J. 2005. Enhancement of fish production in Borno state with extension services. In: Araoye, P.A. (ed.), *Proceedings of the annual conference of the fisheries society of Nigeria (FISON)*. Apapa, Lagos, Nigeria: Fisheries Society of Nigeria, pp. 658-662.
- Rozum, B. and Brewer, K. 1997. Identifying, developing, and marketing library services to cooperative extension personnel. *Reference & User Services Quarterly*. 37(2): 161-169.
- Shih, W. and Evans, J. F. 1991. Where field staff gets information: Approaching the electronic times. *Journal of Extension*. 29 : 16-19.
- Udo, M. T., Okon, A. O., Lebo, P. E. and Ikpe, G. B. 2005. Improving aquaculture through increased fisheries extension research. In: Araoye, P. A. (ed.), *Proceedings of the 19th Annual conference of the fisheries society of Nigeria*. Apapa, Lagos, Nigeria: Fisheries Society of Nigeria, pp. 54-57.
- Vidya, P., Manivannan, C. and Sudeepkumar, N. K. 2009. Situational and psychological profile t
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