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Impact of institutional dissemination of technologies and extension services on marine fisheries and mariculture to stakeholders

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Abstract

The Agricultural Technology Information Centre (ATIC) is a single window delivery system for technology transfer from research institutes to potential clients. An attempt was made to assess the impact of ATIC in terms of dissemination of technology, products and services on the outcomes of marine fisheries and mariculture research by Central Marine Fisheries Research Institute from beneficiaries' point of view. A well-structured and pre-tested interview schedule was used to collect primary data from a sample of 30 beneficiaries for each product / service of ATIC. Results indicated that among the technological inputs and products, the highest level of satisfaction was for the sale of algal inoculums and aquarium fish feed followed by dry fish products supplied by women's Self Help Groups. Water sample analysis, feed composition analysis and shrimp seed screening using PCR test are the major items of satisfaction among the diagnostic services. With regard to priced publications, the most preferred published pamphlet was 'Aquarium fish keeping' followed by 'Mussel farming', 'Marine ornamental fishes' and 'Marine fisheries management'. Among farm advisory services, general ATIC services followed by 'Shrimp feed' and advisory services concerned with bivalve culture and marine ornamentals ranked top.

Keywords: Impact assessment, ATIC, technology products and services

Introduction

The Agricultural Technology Information Centre (ATIC) of Central Marine Fisheries Research Institute (CMFRI) was established in 1999 to provide a single window delivery system for the technological support on marine fisheries and mariculture available from the institute to fisherfolk and other interest groups under the funding of National Agricultural Technology Project (NATP). It provided access to the farmers and fisherfolk to avail the facilities from the institute at a nominal cost. The CMFRI is one of the premier research institutes carrying out multi-disciplinary research in capture and culture fisheries in India. ATIC of CMFRI acts as a bridge between scientists and fisherfolk thereby enhances the linkage between the research and clientele system.

The ATIC of CMFRI is built with facilities like museum, sound proof audio-visual room, auditorium, library and sales room with the latest laminated flex posters of fishery-based technologies and articulation works with chronological display of specimens so as to serve as a fully functional single window delivery system. The technological inputs such as algal inoculums, zooplankton and technological products such as shrimp feed, fresh shrimp meat, edible oyster meat, mussel meat, marine cultured pearls, seaweed products such as *agar agar*, jelly, pickles, value added fish products and dry fish products supplied by the self help groups of Institute-Village Linkage Programme (Sathiadhas *et al.*, 2003, 2004) are the major items being sold through ATIC. The major diagnostic services undertaken by ATIC include environmental monitoring, microbiological analysis, fish disease diagnosis, soil analysis, water quality analysis, feed composition analysis, electron microscopy works, fish and shell identifications. Information services on technologies developed by CMFRI were printed as pamphlets and distributed to the visitors in addition to the queries answered

through letters, personal enquiries, phone calls and web site. An attempt was made in this study to assess the impact of these sales of technological products, diagnostic services and facilities of ATIC by evaluating the level of satisfaction of beneficiaries.

Material and methods

De and Singh (2007) measured the level of satisfaction of the beneficiaries with the service provided under Fish Farmers' Development Agency (FFDA), *i.e.*, training, credit support, technical guidance and marketing assistance. Level of satisfaction with training was measured with the help of a five point continuum against five parameters *viz.*, course content and instructional method, scope of deliberation, hands-on practice and farm literature. Mean score was computed based on the score (strongly agree-5; agree-4; undecided-3; disagree-2 and strongly disagree-1). A sample of 300 beneficiaries consisting of 30 each from the services of ATIC was drawn using quota sampling procedure. Data were collected using a well-structured and pre-tested interview schedule focusing the questions seeking the evaluation of ATIC technology products and services. The respondents were asked to indicate the level of satisfaction in a three point continuum as highly satisfied, moderately satisfied and least satisfied which were scored 3, 2 and 1 respectively. The percentage level of satisfaction was computed for each programme / facility of ATIC as extent of satisfaction / potential of satisfaction X 100 (Haque, 1981). Successful cases were also recorded to substantiate the findings. Trained enumerators and technical staff of ATIC undertook data collection. Data analysis was confined to content analysis, frequency, percentage, ranking and tabulation.

Results and Discussion

Revenue generation: It was estimated that from 2000 to 2006, revenue of about Rs. 15 lakhs was generated by ATIC through sales and services which benefited about 33,735 farmers**,** fisherfolk and entrepreneurs. The farmers were benefited through sales and services including advisory services, awareness programmes, movie shows and unpriced publications. The total revenue generated and beneficiaries through various items are shown in Table 1. An amount of Rs 10,58,894 was generated

Table 1. Revenue generated and beneficiaries of ATIC from 2000 to 2006

Item of Sale / Service	No. of beneficiaries	Amount (Rs)
Sale of technological inputs/ products	3,104	10,58,894
Diagnostic services	6,81	92,380
Priced publications	5,487	2,96,052
Farm advisory services	9,121	
Awareness programmes organized	2,034	
Movie shows projected	10,302	
Unpriced publications	3,0 06	
Total	33,735	14,47,326

Table 2. Level of satisfaction of beneficiaries from sale of technological inputs and products

Technological input / product	No. of respondents Highly satisfied	No. of respondents Moderately. satisfied	No. of respondents Least satisfied	Level of Satisfaction (%) (Multiple responses)
Algal inoculums	21	7	2	87.78
Aquarium fish feed	21	7	2	87.78
Dry fish products	19	10	1	86.67
Zooplankton	20	7	3	85.55
Fresh shrimp	17	10	3	82.22
Oyster meat	18	10	2	84.44
Oysters	17	11	2	83.33
Pearl oysters	19	8	3	84.44
Pearl	18	7	5	81.11

from the sale of technological inputs and products through ATIC and the most important item was the sale of algal inoculums.

Sale of technological inputs and technology products: Table 2 shows that the most important item of highest level of satisfaction was attained for algal inoculums (87.78%), aquarium fish feed (87.78%) and dry fish products (86.67 %). Two success cases were elucidated from the private hatcheries 'Kaliparambil' at Chellanum (Ernakulam District, Kerala) and 'Water Fry' at Kodungallur (Thrissur District) who used algal inoculums of CMFRI. Similarly success cases were drawn from Self Help Groups mobilised by CMFRI who supplied dry fish products to ATIC for sale. Livelihood analysis is inevitable for the appropriate micro-enterprise selection for the location for empowerment (Kurien, 2003). The livelihood analysis encompasses all the strategies and assets that individuals and households use to earn a living (Aujimangkul *et al.*, 2000; DFID, 2001; Graham and Tanyang, 2001; Arciaga *et a*l., 2002; Ashby, 2003; CBCRM Resource Center, 2003).

Diagnostic services: An amount of Rs 91,380 was generated from diagnostic services which benefited 651 stakeholders and the most important item was water sample analysis. For assessing the level of satisfaction of beneficiaries of diagnostic

Table 3. Level of satisfaction of beneficiaries of diagnostic services

Diagnostic services	No. of respondents highly satisfied	No. of respondents moderately satisfied	No. of respondents Least satisfied	Level of Satisfaction (%) (Multiple responses)
Water sample analysis	19	10	1	86.67
Feed composition analysis	18	10	2	84.44
PCR test charges	17	11	2	83.33
Mud sample	16	12	2	82.22
Disease diagnosis	16	12	2	82.22
Shell identification	16	11	3	81.11
Electron microscopic work	16	11	3	81.11
Inorganic Phosphate analysis	14	12	4	77.78
Silicate analysis	13	13	4	76.67
Ammonia analysis	13	13	4	76.67
Nitrate analysis	13	12	5	75.56
Nitrite analysis	13	12	5	75.56

Table 4. Level of satisfaction of beneficiaries of priced publications

Priced publications	No. of respondents highly satisfied	No. of respondents moderately satisfied	No. of respondents least satisfied	Level of satisfaction (%) (multiple response)
Aquarium fish keeping	18	10	2	84.44
Mussel Farming	17	11	2	83.33
Marine Ornamental fishes	17	11	2	83.33
Marine fisheries management	17	11	2	83.33
Marine Pollution	16	12	2	82.22
Prawn farming	16	12	2	82.22
Shrimp hatchery	16	12	2	82.22
Crab farming	16	12	2	82.22
Seaweed recipes	16	12	2	82.22
Fish diseases	16	11	3	81.11
Pearl farming	16	11	3	81.11
Oyster farming	14	12	4	77.78
Mahima feed	13	13	4	76.67
Artificial reef	13	13	4	76.67
Clam culture	13	12	5	75.56

Table 5. Visit of beneficiaries to ATIC during April 2000-June 2006

Year	Purpose of visit	Fisherfolk/ entrepreneurs		Students / Educational team	VIP Visitors	Total
		Male	Female			
2000	TechnologicalInformation	410	75	651	28	1164
2001	,,	512	30	1,358	34	1934
2002	,,	552	120	1,297	32	2001
2003	,,	673	287	1,342	40	2342
2004	,,	741	345	1,427	64	2577
2005	,,	719	211	1,215	38	2183
2006	,,	928	830	1,516	29	3303
	Grand Total	4,535	1,898	8,806	265	15,504

services, 30 beneficiaries who availed each of the services were interviewed and the results are presented in Table 3. The highest level of satisfaction was for water sample analysis (86.67 %) followed by feed composition analysis (84.44 %) and PCR test for detecting virus infection in shrimps (83.33%).

Priced publications: The priced publications for sale in ATIC include pamphlets, bulletins, books and CDs. An amount of Rs 2,96,052 was generated from the sale of priced publications with 5,457 beneficiaries through ATIC and the most important sale item was the sale of pamphlets like aquarium fish keeping, mussel farming, marine fisheries management etc. For assessing the level of satisfaction of beneficiaries of priced publications, 30 beneficiaries of each publication were interviewed and the results are presented in Table 4. The most preferred pamphlet with the highest level of satisfaction was Aquarium fish keeping (84.44 %), followed by Mussel farming, Marine ornamental fishes and Marine fisheries management (83.33 %).

Farm advisory services: A total of 15,504 beneficiaries visited CMFRI and ATIC during April 2000- June 2006 (Table 5). Student visitors were 57% of the total. The results of assessment on level of satisfaction are given in Table 6. The highest level of satisfaction was for the general ATIC services with the score of 81.11% followed by 'Shrimp feed'. Advisory services concerned with bivalve culture

Table 6. Level of satisfaction of beneficiaries of farm advisory services

Farm advisory services	No. of respondents Highly satisfied	No. of respondents Moderately satisfied	No. of respondents Least satisfied	Level of Satisfaction (%) (Multiple response)
CMFRI/ ATIC services	16	11	3	81.11
Shrimp feed	14	12	4	77.78
Bivalve culture	13	13	4	76.67
Marine ornamental fishes	13	13	4	76.67
Training	13	12	5	75.56
Fish disease management	12	10	8	71.11
Prawn farming	11	10	9	68.89
Shrimp hatchery	9	11	10	65.56
Crab farming	9	11	10	65.56

Table 7. Level of satisfaction of ATIC facilities

Other Services	No. of respondents Highly satisfied	No. of respondents Moderately satisfied	No. of respondents Least satisfied	Level of Satisfaction (%) (Multiple response)
ATIC Museum	21	7	2	88
ATIC Library & Sales Room	16	11	3	81
ATIC Audio Visual Hall	16	11	3	81
ATIC Conference Hall	14	12	4	78
ATIC Laboratory	1	6	23	42

and marine ornamentals ranked third with the score of 76.67 % each (Table 6).

Other facilities of ATIC: The other facilities being offered for the public in ATIC are the museum, laboratory and library. Museum satisfied the visitors the most (88%) followed by Audio Visual Hall and Conference Hall (81%) (Table 7). ATIC Laboratory got the least satisfaction score of 42% which shows the need for improving the facilities by equipping with essential items to develop it as a fully functional laboratory.

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References

Arciaga, Olrando, Fernando Gervacio, Robert Charles Capistraco and Cathrine Demesa. 2002. *Envisioning Life : Community – created Sustainable Livelihood Analysis and Development*. Philippines : Hribon Foundation & International Development Research Centre, 62 pp.

Ashby Jacqui. 2003. Introduction: Uniting Science and Participation in the process of Innovation- Research for Development. *In*: Barry Pound, Sieglinde Snapp, Cynthia McDougall and Ann Braun (Eds.), *Managing Natural Resources for Sustainable Livelihoods- Uniting Science and Participation*, IDRC, Ottawa, 252 pp.

Aujimangkul, S., A. Namasonthi, A. Jindanon and P. Wongsanga. 2000. Participation of fishermen in the seasonal closure: Measures for marine fishery resources conservation: A case study in the western part of the Gulf of Thailand. *Kasetsart University Fishery Research Bulletin*, 23: 1-20.

CBCRM Resource Centre. 2003. "Sustainable Livelihoods Issues in CBCRM". *Community Based Coastal Resource Management* Vol. 2, San Antonio, Zambales, Philippines. p. 32-34.

De, H. K. and B. Singh. 2007. Evaluation of FFDA initiative on freshwater aquaculture in Orissa. *Indian J. Ext. Edu.*, 43(1 & 2): 26-30.

DFID. 2001. *Sustainable Livelihoods Guidance Sheets*. DFID, London. p.2.

Graham, Jennifer and Gaynor Tanyang. 2001. *The Sustenance of Life: A Pilot Research Exploring SL in CBCRM*, Tambuyog Development Centre and Coastal Resources Research Network, Dalhousie University. p. 23

Haque, M. A. 1981. Study of Some Factors Related to the Adoption of Recommended Species of Fish in Composite Fish Culture. *Ph.D. Thesis (unpublished)*, Dept. of Agrl. Extension, Bidhan Chandra Krishi Viswavidyalaya, West Bengal. p. 74-83

Kurien, J. 2003. The Blessing of the commons: Small – scale fisheries, community property rights and coastal natural assets. CDS Trivandrum, *Working paper* 349 : p.56

Sathiadhas, R., Sheela Immanuel, L. Laxminarayana, L. Krishanan, D. Noble, K. N. Jayan and Sindhu Sadanandan. 2003. *Institution Village Linkage Programme Coastal Agro-Ecosystem and Interventions*. *CMFRI Spl. Publ.*, 75: 79 pp.

Sathiadhas, R., Krishanan, D. Noble, L. Laxminarayana, Sheela Immanuel, K. N. Jayan and Sindhu Sadanandan. 2004. *Reaching the Unreached : Highlights of Institution Village Linkage Programme of CMFRI*. *CMFRI Spl. Publ.*, 82: 40 pp.

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