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## Aquaculture information exchange facilitating farmers

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### Abstract

The present study was completed in five districts of Kerala. Primary data was collected from 225 farmers who availed support from the Agricultural Technology Management Agency (ATMA) and from 165 Department of Fisheries (DoF) staff officials who provided such support. The presently existing aquaculture information exchange, facilitating fish farmers was illustrated to finally conclude with an extension strategy using mobile phone and internet among farmers.

**Keywords:** ATMA, Information exchange, Mobile extension, Extension strategy

### 1. Introduction

Most of the extension initiatives since India's independence programmes failed to meet the needs as well as to utilise opportunities required for majority of people (MANAGE, 2007). In order to tackle the different constraints as well as to meet the emerging challenges in our extension system, the Innovations in Technology Dissemination component of National Agricultural Technology Project (NATP) implemented Agricultural Technology Management Agency (ATMA) as a pilot project in seven states in India. Based on the ATMA experiences undergone in the NATP pilot project, extension reforms were planned to initiate under the scheme 'Support for State Extension Programmes for Extension Reforms' in the form of ATMA, on 29 March, 2005 by Department of Agriculture and Cooperation, Government of India, in 252 districts/ UTs all over India during the X five year plan (Planning Commission, 2007). Through ATMA, the officials in agriculture and allied departments in association with the Department of Fisheries (DoF) staff started encouraging aquaculture, with new projects and schemes, supporting the fish farmers by means of activities like training, demonstration, exposure visit, rewards and incentives and other innovative activities. There were no perfect linkages within the system because of inadequacies in departmental staff, fund allocation *etc.* The present service delivery system was difficult to manage as there were huge areas to supervise with minimal human resources. Thus, practically, the present service delivery system was benefitted by the individual line departments only. The support from DoF was not extended appropriately to the needy aquaculture farmers in the selected area due to inadequacies in staff support. Moreover, the services were not rendered in appropriate time. ATMA had opened up opportunities to integrate extension approaches and strategies emerging in aquaculture.

### 2. Materials and methods

A list of fish farmers who availed ATMA support were collected from Department of Fisheries (DoF) for the year 2010 to 2012 in five districts, which had the highest inland fish farmer population (DoF, 2010). As there was not much variation among the fish farmer beneficiaries a uniform sample size from all the districts was decided. Primary data was collected through administering schedule among the farmers and DoF staff.

**Table 1:** Sampling for the study

| Respondent category | South Kerala |           |          | Central Kerala |          |
|---------------------|--------------|-----------|----------|----------------|----------|
|                     | Kollam       | Alappuzha | Kottayam | Ernakulam      | Thrissur |
| DoF staff           | 33           | 33        | 33       | 33             | 33       |
| Fish farmers        | 45           | 45        | 45       | 45             | 45       |
| Total               | 78           | 78        | 78       | 78             | 78       |
| Grand total         | 390          |           |          |                |          |

**Table 2:** Brief description and measurement of selected variables

| Variables   | Description   | Measurement (scores/ codes are indicated in parentheses)   | Justification  |
|---|---|--|--|
| Communication Facility Utility (CFU) of farmer and staff              | Different communication channels utilised by the farmer and staff   | Score: Post office (1): Telephone (1): Internet (1): Television (1): Radio (1): Kisan Call Centre (1)  | The relative importance of channels could not be differentiated and so an equal score of 1 was given   |
| Mass Media Exposure (MME) of farmers in fisheries                     | Sources of media used and their frequency of use for seeking fishery related information  | Score: 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 each. Those channels which were accessed more regularly for getting information in fisheries was given a higher score   |
| Fishery related Information Exchange                                  | Information needs sought through different channels like newspaper, magazines, radio and television   | Score: Information on Improved culture practices (1): Tackling disease problems: (1) Management practices: (1) Stocking density (1): All (2)   | The relative importance of information needs could not be differentiated and so an equal score of 1 was given for it   |
| Farm information dissemination (FID) activity efficiency of DoF staff | Regularity in information dissemination through different sources and satisfaction arising from conducting such activities  | Score. Each information dissemination method score (1), i.e., District level exhibitions (1): Aqua shows (1): Printed leaflets (1): Local advertisements (1): Internet (1). Further level of regularity of each method was scored as, Regularly (3): Rarely (2): Occasionally (1): Don't Know (0). Level of satisfaction for each method was scored as, Highly Satisfactory (4): Satisfactory (3): Unsatisfactory (2): Highly Unsatisfactory (1)                     | The relative importance of each information dissemination method could not be differentiated and so an equal score of 1 was given. Those information dissemination methods which were more regular and which resulted in higher satisfaction level were given higher score |
| Contact with resource persons   | Contact a fish farmer had with development or extension agents for advice. Resource Person Contact Index (RPCI) calculated from this.                                     | Score: Each extension personnel contacted was scored as 1, i.e., VEWs (1): BDOs (1): Specialists from research stations (1): Input suppliers (1): Marketing agents (1): Bankers (1): KVK professionals (1): NGOs (1): SHGs (1): Cooperatives (1): Panchayath members (1): Further, accessing regularity for each such extension personnel contacted was scored as: Never (0): Half yearly (1): Monthly (2): Weekly (4): More than once per week (5): As per need (6) | The relative importance of extension personnel could not be differentiated and so an equal score of 1 was given for it. Those resource persons who were accessed more regularly was given a higher score   |
| Sources of awareness  | Sources through which farmers became aware of ATMA beneficiary programs   | Score: Extension agents (1): Neighbours (1): Friends (1): Social workers (1): Coordinators (1): Other farmers (1)  | The relative importance of each source could not be differentiated and so an equal score of 1 was given  |
| Linkage perception of DoF staff                                       | Perception of DoF staff on different linkages like interdepartmental linkages, research extension linkages, linkage with farmer organizations and public private linkages | Score: Each linkage score (1): interdepartmental linkages (1): research extension linkages (1): linkage with farmer organisations (1) and public private linkages (1): GO NGO linkages (1). Further the level of satisfaction for each linkage was scored as - Highly Satisfactory (4): Satisfactory (3): Not Satisfactory (2): Not at all Satisfactory (1)  | The relative importance of each information linkage type could not be differentiated and so an equal score of 1 was given for it. Those linkages which resulted in higher satisfaction level were given higher score   |
| Changes gained from ATMA  | Perceived changes gained by a farmer through ATMA   | Score: Strongly Agree (4): Agree (3): Disagree (2): Strongly Disagree (1)  | Higher score was given to higher level of agreement  |

### 3. Results and Discussion

Farmers retrieved information from farmer related information sources (like extension agents, coordinators, other farmers, neighbours, friends and social workers) and officials (like DoF staff, ATMA GB members and ATMA MC members). The prevailing aquaculture information exchange, facilitating fish farmers are presented in Figure 2.

Abbreviations used: KBMP- Knowledge on BMPs, SD- Skill development, KIMPF- Knowledge on improved farming practices, SBF- Support based on farming needs, IINC- Increased income, IFS- Increased financial support, MS- Marketing support, SAMETI- State level Agricultural Management and Extension Training Institute, ICP- Improved Culture Practices, SDn- Stocking Density, MP- pond management practices, TDO- Tackling Disease outbreak, KCC- Kisan Call Centre, DoF- Department of Fisheries, Np- Newspaper, FRT- Fishery related programmes on TV, FRR- Fishery related programmes on Radio, FRM- Fishery related articles in magazines, VEW- Village Extension Worker, BDO- Block Development Officer, MA- Marketing Agent, KVK- Krishi Vigyan Kendra, NGO- Non Governmental Organisation, GO- Government Organisation, FO- Farmer Organisation (A score was assigned to each, within the range 1-10, with scores being not less than 1 and not greater than 10)

State Agricultural Management and Extension Training Institute (SAMETI) existing at the state level offered training to ATMA officials and middle level extension functionaries like DoF staff on the different farmer beneficiary activities and ATMA cafeteria. The ATMA officials and DoF staff in turn delivered information to farmers through awareness training, demonstration, exposure visit, reward and incentive and farmer scientist interaction. It was observed that DoF staff recorded aquaculture information like improved culture practices, stocking density, pond management practices and tackling disease outbreak, so as to utilise it in suitable situations for fish farmers' benefit. Different farmer supporting factors like communication facility utility, mass media exposure, resource person contact and farm information dissemination activities also acted as pools of information. Farmers utilised different modes for communication like post office, mobile phone, radio, TV, internet and KCC. They used different mass media for retrieving aquaculture information, viz, newspaper, aquacultural programmes on TV and radio and aquacultural related articles on magazines. They tried to be in contact with resource persons who would help them in aquaculture related activities and queries like VEW, input supplier, specialists from research stations, SHG, marketing agents, bankers, Panchayat members, BDO, KVK, cooperative and NGO.

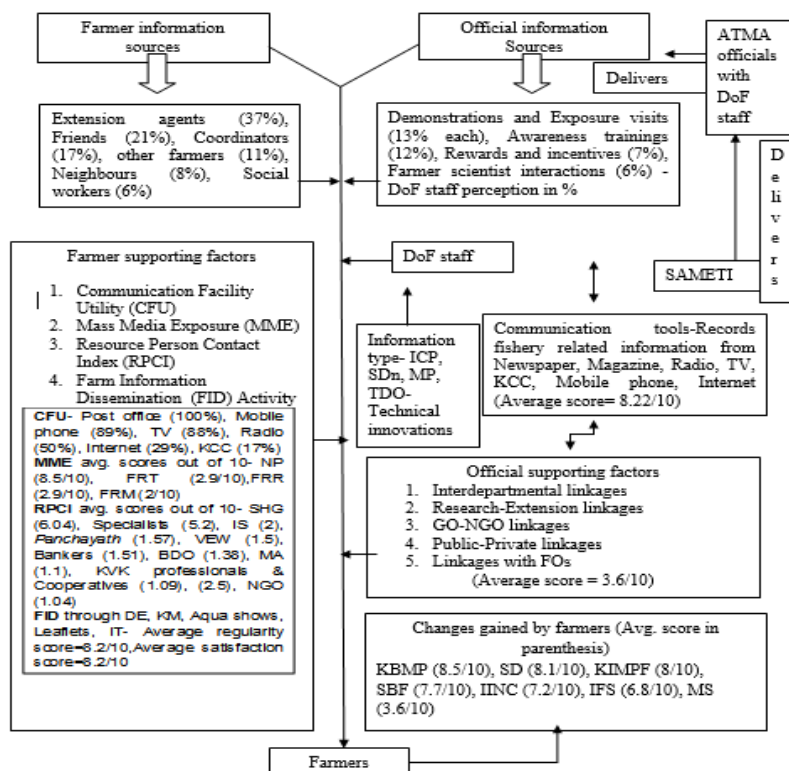


Fig 2: Aquaculture information exchange, facilitating farmers

In order to get acquainted with latest culture technologies and related information, they participated in farm information dissemination activities organised for them by DoF staff and ATMA officials. Thus, they participated in exhibitions held at district level, aqua shows and utilised IT packages displaying latest culture technologies. They also tried to advertise their farm related information through signboards kept adjacent to their farm/home as well as through publicising their culture strategies in gatherings and festivals. Official support factors like interdepartmental linkages, research-extension linkages,

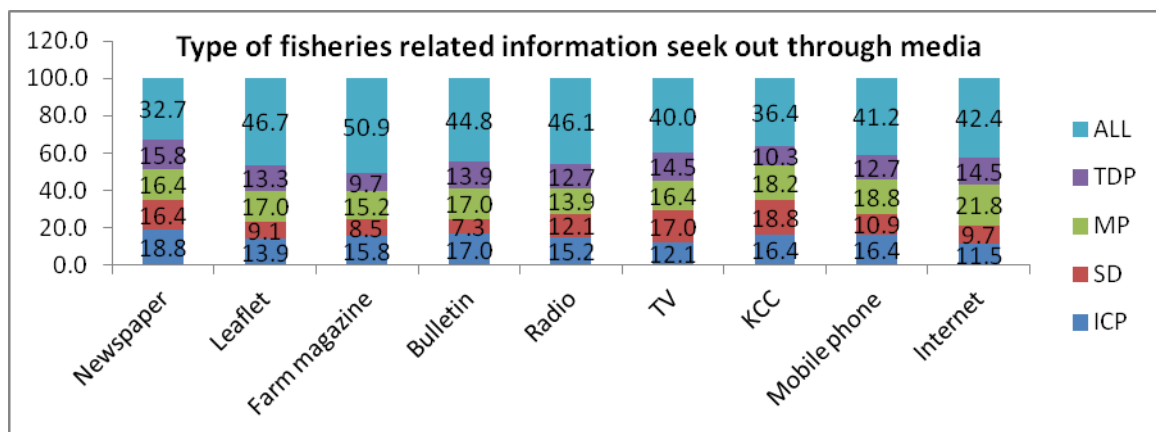
GO-NGO linkages, public-private linkages and linkages with FOs also accelerated the information dissemination activities intended for fish farmers. The farmer and official support factors and information sources existed in close coordination with each other for the effective farm information dissemination in the study area. After studying different communication facility utilised by farmers, it was understood that majority (89%) of them used mobile phones and 29 per cent used internet.

**Table 3:** Communication facility utilised by farmer

|                   | Kollam    | Alappuzha | Kottayam  | Ernakulam | Thrissur  | Total      |
|-------------------|-----------|-----------|-----------|-----------|-----------|------------|
| Post office- Yes  | 45 (20)   | 45 (20)   | 45 (20)   | 45 (20)   | 45 (20)   | 225 (100)  |
| Post office- No   | 0 (0)     | 0 (0)     | 0 (0)     | 0 (0)     | 0 (0)     | 0 (0)      |
| Mobile phone- Yes | 41 (18.2) | 38 (16.9) | 42 (18.7) | 42 (18.7) | 38(16.9)  | 201(89.3)  |
| Mobile phone- No  | 4 (8.9)   | 7 (15.6)  | 3 (6.7)   | 3 (6.7)   | 7 (15.6)  | 24 (10.7)  |
| Internet- Yes     | 14 (6.2)  | 11 (4.9)  | 16 (7.1)  | 17 (7.6)  | 7 (3.1)   | 65 (28.9)  |
| Internet- No      | 31 (68.9) | 34 (75.6) | 29 (64.4) | 28 (62.2) | 38 (84.4) | 160 (71.1) |
| Television- Yes   | 44 (19.6) | 42 (18.7) | 40 (17.8) | 37 (16.4) | 35(15.6)  | 198 (88)   |
| Television- No    | 1 (2.2)   | 3 (6.7)   | 5 (11.1)  | 8 (17.8)  | 10 (22.2) | 27 (12)    |
| Radio- Yes        | 22 (9.8)  | 19 (8.4)  | 20 (8.9)  | 20 (8.9)  | 32(14.2)  | 113(50.2)  |
| Radio- No         | 23 (51.1) | 26 (57.8) | 25 (55.6) | 25 (55.6) | 13 (28.9) | 112 (49.8) |
| KCC- Yes          | 7 (3.1)   | 5 (2.2)   | 10 (4.4)  | 5 (2.2)   | 12 (5.3)  | 39 (17.3)  |
| KCC- No           | 38 (84.4) | 40 (88.9) | 35 (77.8) | 40 (88.9) | 33 (73.3) | 186 (82.7) |

All the farmers in the study area used post office for communication because it stood closest to farmer as opined by Chaminuka *et al.* (2008) in Africa. A total of 89.3 per cent used mobile phones, as cheap handsets are available and 88 per cent viewed television through which they saw visuals in local language as reported by Chhachher *et al.* in Pakistan (2012). Only 29 and 17 per cent used internet and Kisan Call Centre respectively, due to low awareness. Number of

extension agents reaching fish farmers were fewer compared to allied sectors, as staff support in DoF, was less. A total of 73 per cent of DoF staff recorded information like management practices (19%), improved culture practices (16%), tackling disease outbreak (13%), stocking density (11%) and all (41%) of the above mentioned information types through mobile phones. Information searched by DoF staff in different media was displayed in Figure 3.



**Fig 3:** Fisheries related information exchange among DoF staff.

ICP- Improved Culture Practices, SD- Stocking Density, MP- Management Practices, TDP- Tackling Disease problems, ALL- All of these Staff read newspaper, leaflet, farm magazine, bulletin, radio, TV, Kisan Call Centre, mobile phone and internet respectively, for getting different information on improved culture practices, stocking density, management practices and methods to tackle disease problems. Farm magazines (51%) gave maximum culture related information, while the least information was obtained through

newspaper (33%). Utilising such information could lead to efficiency in fish production and improved productivity as stated by Ofuoku *et al.* (2008). Considering the usage of mobile phones among farmers and officials, a suggestion for a framework of mobile extensions supported by internet in farming was proposed. A framework elaborating extension strategy using mobile phone and internet among farmers in the study area was shown in Figure 4.

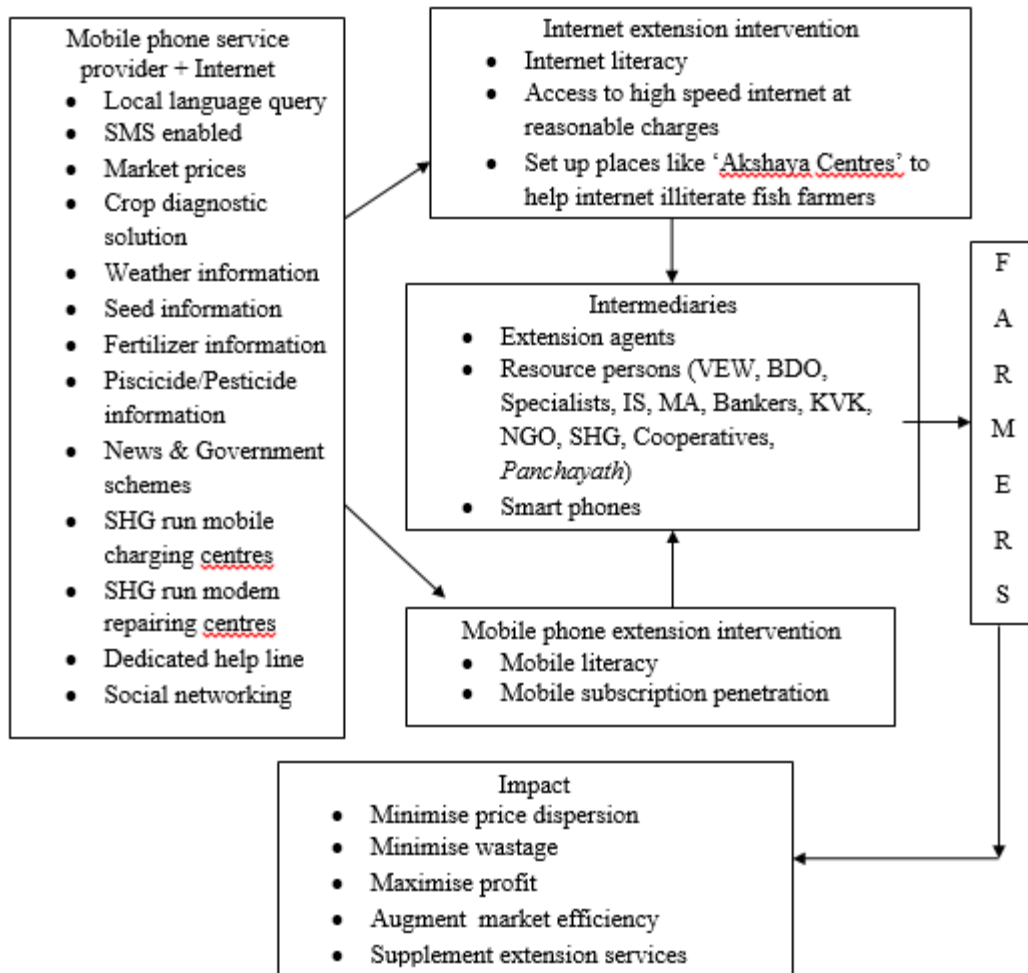


Fig 4: Framework of mobile based extension among fish farmers

#### 4. Conclusion

A total of 45 farmers who received ATMA support from the Department of Fisheries (DoF) and 33 staff of DoF, was selected from each district. Primary data was collected through administering schedule among the selected respondents. Statistical tools used were percentage analysis, weighted scoring method and resource person contact index. The majority of farmers (36.9%) depended on extension agents for knowing about ATMA support activities. Aquaculture information exchange in the area which aided the fish farmers was illustrated. Around 89 per cent of farmers used mobile phones, while only 29 per cent and 17 per cent used the internet and Kisan Call Centre respectively. DoF staff read newspaper, leaflet, farm magazine, bulletin, radio, TV, Kisan Call Centre, mobile phone and internet respectively for getting different culture related information. Around 73 per cent of DoF staff recorded information like management practices (19%), improved culture practices (16%), tackling disease outbreak (13%) and stocking density (11%) through mobile phones. Considering the usage of mobile phones among farmers and staff, mobile extension supported by internet in farming was proposed.

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