

Teaching to Fish or Learning Not to Finish? -Reinventing a Responsible Marine Fisheries Extension System In India

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ABSTRACT

The marine fisheries sector in India is currently going through a phase of socio-economic cum ecological turbulence. The rate of growth in marine fisheries production, as evidenced by recent studies, is plateauing, if not, declining. The need for initiating management options that promote sustainable resource utilization and stable livelihood security to the coastal community through well-planned and massive efforts in making the fisher folk imbibe the message of the FAO Code of Conduct for Responsible Fisheries (FAO CCRF) through Extension initiatives is never felt so urgent as of now. Extension science is construed as the discipline that raises strategic questions and finds ways in bridging the research system and the client system. But unlike the farming sector, the extension system in the case of marine fisheries sector is confronted with a number of epistemological and methodological problems.

Based on the experiences and insights gathered during the implementation of a WB funded research project titled “Designing and Validation of Communication strategies for responsible fisheries – A Co-learning approach” at Central Marine Fisheries Research Institute(CMFRI) during 2001-04, this paper argues that the Transfer of Technology -based extension paradigm dominant in the country is insufficient to infuse an ethos of responsible fisheries among the stakeholders and therefore it is necessary to reinvent a new extension system, probably built on the logic of constructivism rather than positivism. The potential of the rich research database on the resource base, along with Fisheries Indigenous Knowledge system needs to be effectively utilized. A Responsible Fisheries Extension Module (RFEM), *first of its kind in the country*, consisting of a number of well-validated communication tools which includes the translation of the FAO CCRF into Malayalam, animation films etc., developed under the project through participatory co-learning methodology is a stepping stone in this direction. A theoretical model of a new extension approach is also proposed after diagnosing various parameters in the current extension system like information flow, strategic gaps in the research-extension interface *vis a vis* an ideal system and constraints (logical, epistemological and institutional).

(*Key words:* Extension science, FAO CCRF, Responsible Fisheries Extension, Constructivism)

INTRODUCTION

Give him a fish

He will live for a day..

Teach him how to fish

He will live for ever....

Though the figurative meaning of this famous Chinese proverb has been used extensively by development thinkers to emphasize the need for education / extension interventions to empower the marginalized, it doesn't hold good when juxtaposed with the current status of the marine resources of the world. The situation in India is no different. With a total capital investment of about \$ 1 billion, the marine fisheries sector in the country provides a \$2.1 billion worth domestic market; earns an annual foreign exchange to the tune of \$1.3 billions; and offers direct livelihood to about 3.5 million people. However, the estimated potential yield from the Indian inshore waters (0-50 m depth zone), which is incidentally the most productive one, has already reached a plateau [1]. Out of the total potential

annual yield of 3.93 million t from the Indian Exclusive Economic Zone (EEZ) the inshore contribution is to the tune of 2.21 million t and the rest 1.69 million t is from the region beyond 50 m depth. Though there is a potential of 2.2 million tons left the major concern is the lack of scope for expansion in the inshore waters. The growth has been phenomenal with the total harvest reaching 2.7 million tons from a mere 3.73 lakh tons in 1947. But the annual relative growth rate which was 3.73 in 1981 has declined to 2.71 in 2001.

The decline in growth rate *per se* may not be sufficient to pass a judgment that there is a crisis looming because health of a fishery cannot be assessed on the basis of catches, (or more correctly landings) alone. But fisheries scientists take other measures, which are considered as warning signals to get a clearer picture. According to a comprehensive study [2], many of those parameters (like i) a perceptible decline in Catch Per Unit Effort, ii) widely reported incidents of high fishing mortality due to wanton destruction of juveniles, discards and by-catches, and iii) deviations noticed in landing pattern i.e., changes in size composition and mean length at capture) prove ominous for Indian waters. A recently published review [3] on the Status of Exploited fishes of India indicates that out of the 47 commercially important species 55% have reached optimum level of exploitation and 30% are over exploited. The fact that the current harvesting capacity of fishing fleets far exceeds the estimated biological sustainability of most commercial stocks makes matters worse.

Responsible fisheries, Extension and search for a new logic...

From the resource point of view it is beyond doubt that the sustainability of our marine fisheries sector is under severe threat. It is imperative that we heed to the warning signals if we want to ensure livelihood security to the millions who depend on it. There now is a global consensus on the need for taking proactive measures in this regard. But the response in our country so far has focused on implementation of regulatory measures by government caveats. It is being increasingly realized that marine fisheries management by administrative measures alone will not yield viable solutions. It would be a Herculean task to bring such a huge sector, which is riddled with extreme degrees of socio-economic polarization under an effective mechanism of a “command and control regime”.

The marine fisheries scenario is dominated by the typical phenomenon of 80:20 divide. A minority has cornered the fruits of the sector leaving a large majority to get embroiled in the vicious cycle of penury and exploitation. To make matters worse the process of marginalisation faced by the small-scale sector, composed mainly by the artisanal fisherfolk, has been abetted by technological modernization and capital penetration. The inherent problems of entitlement and distributive justice are only to get aggravated by the irredeemable trends of resource depletion.

But do we have *alternatives*? It is here that the concept of Responsible Fisheries being advocated by Food and Agriculture Organization becomes relevant. It underscores that *‘the right to fish carries along with it obligations to do it responsibly’*. The point of departure it makes is in the conventional conceptualization of problems in marine fishing as mere resource issues. There cannot be fisheries management without the active participation of fishermen or rather the stakeholders of the system. *Humanizing the praxis of fisheries management* implies a very radical shift not only in the way we do fishing but also in the way we think about fishing.

The scope of this paper is placed at this juncture. *Will the strengthening of an extension system help us in mitigating the problems we now face in our marine fisheries sector? If so, in what way?* This paper, the culmination of a search for finding answers to these questions, is largely based on the insights and field experiences gathered during the implementation of the WB/NATP funded research project “Designing and validation of communication strategies for Responsible fisheries –A co-learning approach”. Thus the paper has two parts, one giving a brief review of the major processes and outcomes of the Project and the other deliberating on the need for reinventing a Responsible Marine Fisheries Extension System based on a constructivist reading of the insights derived from the project. The paper is organized under the following heads i) A Review of the Project-objectives, communication rationale and methodology ii) Meta analysis on the outcome, processes and learnings of the project and its implications iii) A constructivist perspective [4,5] on reinventing a responsible fisheries extension and iv) Post – project developments and Conclusions.

A REVIEW OF THE RESEARCH PROJECT “DESIGNING AND VALIDATION OF COMMUNICATION STRATEGIES FOR RESPONSIBLE FISHERIES –A CO-LEARNING APPROACH”.

This pioneering project with the major objective of *designing and validating communication tools and strategies meant for Responsible/Sustainable Fisheries* was conducted during 2001-2004 in five of the maritime states of India viz., Kerala, Andhra Pradesh, Tamil Nadu, Orissa, and Maharashtra. What made the project unique was the

methodological innovativeness it adopted in consonance with the demands of the communication rationale upon which the project was conceived.

Communication Rationale

The spirit behind the FAO Code of Conduct for Responsible Fisheries (CCRF) is voluntary action. This implies that extension intervention has to go beyond mere supply of information. The typical extension approach of creating awareness among fisher folk about the need of responsible fisheries using centrally designed communication messages would not be sufficient. The process of designing the communication tools itself is equally important as that of the act of communication. Thus the main communication strategy was to convert the very process of designing various communication tools into *conscientisation episodes*. When the intended audience themselves get a chance to actively participate in the process of message construction it becomes an experience of *meta-communication*. It also offers a shared learning experience to all the participants. The co-learning in turn provides a unique empowerment experience. The dynamics of this process is captured in fig.1 and communication strategies were attempted accordingly in the project.

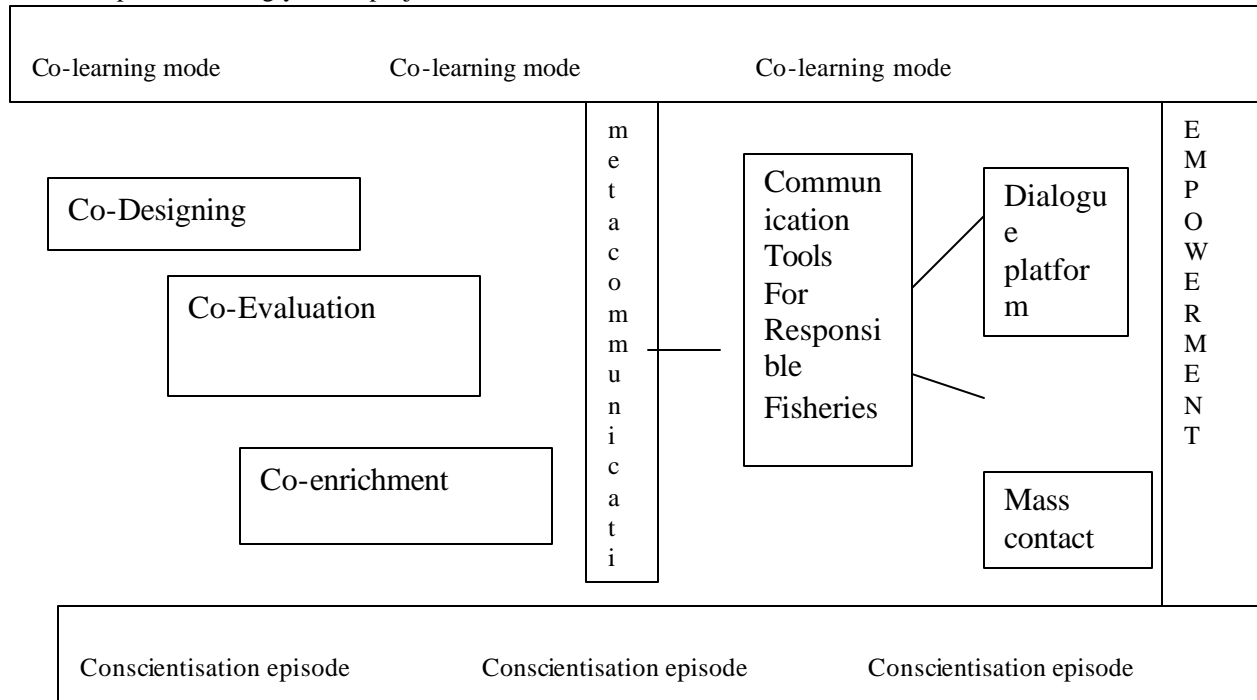


Fig 1. Communication rationale for Responsible fisheries interventions

The major strategies composed of a) Designing and validation of communication tools as conscientisation episodes b) Mass contact through telecast of animation films through television and outreach through radio talks on responsible fisheries followed by feed back studies, c) Popularization of the code of conduct through fisheries-related niche media, d) Individual and group contacts with the FAO CCRF as a dialogue platform and e) Co-learning workshops and Campaigns on responsible fisheries.

Co-Learning Methodology

The characteristic feature of the methodology was the emphasis given on setting the entire process in a decentralized, co-learning mode. The project progressed through eight phases or steps in the methodological ladder. A combination of different research strategies like survey, case study, PRA, media development & testing and impact assessment has been utilized in each of these phases. The major phases of the methodology are recaptured below:

Phase 1 Assessment of Responsible Fisheries Information Needs (ARFIN): The information needs regarding responsible fisheries were collected using a set of schedules developed for the study. A combination of research methods like survey, PRA tools, focused group interactions etc., was utilized. The data were collected from selected locations in the five maritime states of the country. The main objective was to assess various parameters like the extent of mass media contact, the media preference, and conservation orientation existing among the stakeholders. The criteria and reference points for responsible fisheries were based on the CCRF as well as the technical guidelines of FAO. The guidelines were suitably reinterpreted to suit the peculiarities existing in the Indian scenario.

Phase 2 Identification, Analysis and documentation of Cases : Cases of mismanagement /unsustainable fisheries as well as successful management initiatives were identified with the help of the regional research centers of CMFRI, located in five of the Indian maritime states viz., Kerala, Tamil Nadu, Karnataka, Maharashtra and Gujarat. The selected cases were studied in detail and documented. A number of cases for unsustainable fisheries as well as successful initiatives were documented. Detailed case studies were prepared on various initiatives/events like *Kadakkodies* (sea courts) -an indigenous *sui-generis* co- management institution of Malabar coast, initiatives of an NGO namely “Green Seas” located at Munambam, Kochi (in getting the fisher folk take a collective stand against night fishing and the detrimental effects of mini trawling- an innovation brought out by fishers themselves in Kerala) (For a detailed case study on *Kadakkody* as well as stakeholder –induced initiatives of Green seas see [6]).

Phase 3 Content Analysis : The phenomenological database thus obtained was subjected to content analysis by a selected group of stakeholders as well as extension experts from the State departments /Agricultural Universities /NGOs to decide the nature, content and treatment of the tools and message constructs which were to be designed under the subsequent phases.

Phases 4 -8 : This included i) Designing the Responsible Fisheries Extension Module (RFEM) in a co-learning mode, ii) Validation of the tools through media mix studies, iii) Demonstration of RFEM through campaigns, iv) Evaluation of behavioural responses, and v) Enrichment and Release of the Module for Scaling Up. The RFEM was officially released in two phases. The tools like Malayalam translation of the FAO CCRF and related tools were formally released by Hon. Minister of Fisheries and Tourism, Govt. of Kerala, 2nd December, 2002 at CMFRI, Kochi. And the rest of the tools were released by the Director General of ICAR on 2nd December 2004. These functions were given extensive mass- media coverage by national dailies as well as TV News channels [7].

Major findings of ARFIN

The response on different variables like awareness of the concept of responsible fisheries, conservation orientation, awareness about fisheries regulations, media preference etc., showed variation across locations in study states (Table 1). The preference for visual media as well as animation movies was markedly high. A very significant observation was the absence of the FAO CCRF in any of the maritime vernaculars but for Tamil. Similarly the extension agency contact was rated to be poor indicating the lack of attention being given to the issues related to responsible fisheries in an extension perspective. The mass media preference indicated that the use of TV was highly prevalent followed by news papers. Since the most preferred media identified were TV and print media they were given priority while designing the communication tools

Table 1 .Comparative response pattern across ARFIN study states

| S. no | Variable | Kerala | TN | AP | MR | Guja rath |
|-------|---|--------|------|------|--------|-----------|
| 1 | Awareness of the concept of responsible fisheries | poor | low | poor | low | poor |
| 2 | Conservation orientation | medium | low | low | low | poor |
| 3 | Preference for visual media | high | high | high | medium | low |
| 4 | Preference for animation /films | high | high | high | high | high |

| | | | | | | |
|---|---|--------|------|------|------|------|
| 5 | Preference for print medium | high | low | low | low | poor |
| 6 | Awareness about regulations | medium | low | low | low | low |
| 7 | Availability of translation of FAO CCRF | No | Yes | No | No | No |
| 8 | Extension agency contact | low | poor | poor | poor | poor |

(TN=Tamil Nadu; AP=Andhra Pradesh; MR=Maharashtra)

META ANALYSIS ON THE OUTCOMES, PROCESSES AND LEARNINGS OF THE PROJECT Responsible Fisheries Extension Module (RFEM)

The final outcome of the project was a well –validated extension module for Responsible Fisheries (Fig.2). The details of the different tools in the module are given in Table 2. The module consists of combinations of audiovisual tools like books (in Malayalam, English, and Hindi), brochures, animation films (in all the maritime vernaculars of India) and campaign materials. *One of the major achievements of the project* was the publication titled “*Utharavadithuvapara Matsyabandhana Perumattachattom*” which is the translation of the FAO Code of Conduct for Responsible Fisheries into Malayalam which was brought out in collaboration with FAO, Rome, based on the *Local Language Co-publishing Agreement (FAO ref: No IN 17/9 (Malayalam –India) LL/2002/3 dated 22/5/2002)* signed between FAO and CMFRI. The publication filled a long – felt need of having a translation of this landmark document of the global fisheries scenario in Malayalam language, thus making it the second Indian vernacular after Tamil to have this document. A fisher- friendly version of the Code explaining its spirit through illustrations was also brought out. The demand for copies of both these books was so stupendous that they were to be reprinted in 2004. In fact these publications acted as a fulcrum to the conservation extension activities conducted under the project by way of providing a topic to open the dialogue with the stakeholders. Copies were sent to NGOs, State Department of fisheries officials, other government agencies like *Matsyafed*, Aquaculture Development Agency of Kerala (ADAK), Marine Product Export Development Agency (MPEDA), 102 coastal *panchayats* (the grass root level local administrative body of Kerala), Fisheries –related educational institutions, scientists, extension workers, etc., located in different parts of Kerala State. In general, there was more demand for the illustrated booklet indicating its popularity. The details of the dissemination are indicated in Table 3. A contextualised version of it was made in the national language i.e., *Hindi* and distributed to meet the requirements of the Hindi speaking fisherfolk in the five maritime states of the country.

Table 2. Components of the Responsible Fisheries Extension Module (RFEM)

| No | tool | Title |
|----|-------------------------|--|
| 1 | Book in Malayalam | “ <i>Utharavadithuvapara Matsyabandhana Perumattachatto</i> ” FAO CCRF translated into Malayalam |
| 2 | Illustrated booklet | “ <i>Utharavadithuvapara Matsyabandhanam –enthinu? what ,why and howCCRF</i>) |
| 3 | Illustrated booklet | “ <i>Sagar sada bahar</i> ”(Ever green seas) (In Hindi) |
| 4 | Illustrated brochure | Need for responsible fisheries (in Malayalam) |
| 5 | Animation Film | “Little fish and Tiny Nets” in English and 9 Indian maritime vernaculars(Film short listed in World Environmental Film Festival, Tokyo 2003) |
| 6 | Animation film | The Greedy fish Farmer (theme- responsible aquaculture) |
| 7 | Video film | “Colorful voices for Responsible Fisheries” |
| 8 | Video film | <i>Kadakkody (Sea Courts)</i> of Malabar Coast |
| 9 | Participatory paintings | “We are for responsible fisheries” |
| 10 | Books in English | 1)“Teaching Not to Fi(ni)sh-A constructivist perspective on reinventing a responsible marine fisheries extension system” 2) “On designing communication tools for responsible fisheries” |
| 11 | Campaign materials | T Shirts, wall hangers, posters etc with messages |



Fig: 2 Responsible Fisheries Extension Module

Another unique tool developed under the project was animation films on Responsible fisheries. The first film titled *Kunjumeenum kothukuvalayum* (Little fish and Tiny Nets) which poignantly and with a touch of humour deals with the issue of juvenile fishing, was short-listed in the prestigious Global Environmental Film festival(Earth Vision) held in Tokyo in 2003. The Film was dubbed into all the nine maritime vernaculars (viz., Hindi, Gujarati, Marathi, Kannada, Malayalam, Tamil, Telugu, Oriya, and Bengali) of the country. The second film, “The Greedy Fish Farmer”, deals with the issue of excessive dependence on chemicals like antibiotics in aqua/mari culture activities, is devoid of dialogue and thus language is not a barrier. These films were made purely using a Participatory Media development methodology. The various steps in the development of the film like i) selection of theme (e.g.. the highly destructive practice of juvenile fishing which was estimated to cause a loss of about \$0.1 million every year in Kerala alone) ii) development of story board iii) development of prototypes iv) pre-testing of the prototypes and v)

finalisation of the version were conducted through Co-learning sessions in which various stakeholders like fisherfolk, extension workers, and scientists participated. The prototypes were subjected to a participatory feedback evaluation at two coastal villages, Chellanam and Vypin in Eranakulam district. A total of 45 active fishermen participated. The suggestions made by fishers like representative ness in picturisation (i.e. to include all major crafts, especially the trawlers, rather than a typical symbolic one. Interestingly this demand was emphatically made by the traditional fishers) were incorporated in the final version which was telecast through ‘*Doordarshan*’, the official TV channel of Govt. of India during June-July 2003. These months were selected for the telecast on the assumption that there would be more viewer ship due to the monsoon trawl ban imposed during these months. It was telecast at a frequency of weekly twice at 3 P.M. and 6.30 P.M. A feedback study was conducted at selected locations in all the coastal districts. The results indicated that the film effectively conveyed the message and it was a new experience for the fisherfolk [7]. The timing of the telecast had varying impact by way of viewer ship. There was more viewer ship for the late evening slot compared to the afternoon slot. This was mostly attributed to the fact that the evening slot preceded a serial, which had a theme related to the lives of fisherfolk. It is to be noted that the total estimated viewer ship of *Doordarshan* is about 2 million. The film and a few other tools in the RFEM have been made available through internet at www.aticcmfri.org under a special lead titled “Responsible fisheries extension- CMFRI Initiatives in India”.

Though these tools can be considered as important *products* of the project, it is equally important to consider the *co-learning process* that went behind them. It is the process part of the project that has given more valuable insights from the extension point of view. The process learnings originated in the various strategies followed in the design, validation and scaling up of these tools. A meta analysis on the outcomes ,process learnings and impact indicators of the project has been attempted in Table 3. Major implications of the meta analysis are discussed below:

Table 3 :A meta analysis on the process, outcomes and learnings of the Project

| Outcome (Tool/Strategy developed) | Targeted audience | Development process | Process insights | Dissemination/impact |
|--|--|---|--|---|
| 1.The FAO Code of Conduct for Responsible Fisheries (FAO CCRF) translated into Malayalam | Fisherfolk, Extension workers, Activists, NGOs, Policy makers, Political workers | Co-learning ; Translated version verified for readability and comprehension by fishers, scientists, extension officials of the Fisheries Department | Linguistic challenges like absence of exact words made verbatim translation difficult, It implies lack of corresponding concepts in the collective cognition of the fisherfolk and thus the need for awareness interventions using Neuro-Linguistic Programming; Need for fisher friendly version of the Code Was realised | 1000 copies distributed among various stakeholder groups in 2002;second edition of another 1000 copies in 2004;All the 102 Coastal panchayats in Kerala and offices of the line departments of fisheries now have a copy each; Full text was serialised in magazines and weeklies meant exclusively for fishers like <i>Coastal times</i> and <i>Alakal</i> during 2002-2004. |
| 2.Illustrated book in Malayalam (What, Why and How of the FAO CCRF) | -do- but fisherfolk in more focus | Co-learning; Illustrations, syntax were pre-tested by fisherfolk | The main message /spirit of the Code in a fisher-friendly, illustrated version has more extension utility than the full text of the code; But only very few articles of the code amenable for individual level application. | -Do- All copies exhausted High Demand from fishers; |
| 3. Illustrated brochure in Malayalam “Need for responsible fisheries” | -do- | -do- | The outreach is more as more copies could be printed; Easy to make copies by the extension agencies to meet local demand | 5000 copies distributed among fisherfolk in all the 102 coastal <i>panchayats</i> ; Locally made copies estimated to be 20,000. |
| 4. Illustrated book in Hindi (national language of the Country) | -do- Useful for Hindi speaking fishers esp.. in five maritime states | -do- | Modifying the metaphors, text and illustrations sensitive to suit the cultural ethos of Hindi speaking fishers improved message penetration. This was enabled through co-learning methodology | 10,000 copies distributed in selected villages of five maritime states of the country; Demand high, needs more copies |
| 5 Video film (English “Colourful Voices for Responsible Fisheries (Duration13 minutes) | Children and students of fisheries related courses | Documentary on the “All Kerala Painting competition on Responsible fisheries” , a first of its kind event in the state | Motivation tool for fisheries students, especially the students of Fisheries Technical Schools (which are exclusively for children of fisherfolk). | CDs supplied to all the fisheries- related institutions in the state(9 Fisheries technical schools, 10 Vocational Schools, 1 Fisheries college and 5 fisheries-related colleges |
| 6 Painting competitions | -do- | Participatory | Creating awareness among fisheries- students and children of fisherfolk | Paintings used during state-wide campaigns |
| | | | | |

| | | | | |
|--|--|--|---|--|
| <p>7. Animation films on Responsible Fisheries</p> <p>1.Theme: Juvenile fishing :titled “Little fish and Tiny Nets” in 10Indian languages</p> <p>2ResponsibleAquaculture ‘The Greedy Fish Farmer’ Theme- Injudicious use of antibiotics, (Duration3minutes), Version-DVD/CD and Betacam)</p> | <p>Fisherfolk and other stakeholders in all the 9 maritime states of the country</p> <p>Fisher folk and other stakeholders anywhere in the world</p> | <p>Co-learning, Participatory Media development process; Telecast through the National TV Channel (“doordarshan”) and regional networks across the country</p> | <p>Participation of fishers from the very beginning of the designing process improves acceptability of the treatment and content of the film;</p> <p>Potential of mass media like TV networks can be immensely tapped as duration is only three minutes</p> | <p>The estimated total viewer ship of “Doordrashan” channels across the country is 2 billion. More than 75% of fisherfolk was covered.</p> <p>But commercial channels reluctant to telecast; Institutional hurdles in adopting the message fully(see discussion) International utility of the medium (Film can be dubbed into any language as dialogue portion is hardly five seconds)</p> <p>Telecast ready versions made available to all Fisheries Departments of 9 maritime states of the country.</p> |
| <p>8Participatory painting (PP) on Responsible fisheries</p> | <p>Fishers and school children</p> | <p>Participatory Media development, Unique event where fishers and school children together made a painting on a big canvass</p> | <p>Tapping creativity in a collective way and potential for invoking active participation of various stakeholders with divergent views, Useful in activating Multi-stakeholder Processes</p> | <p>PPs created in coastal villages during the campaigns act as symbol of their willingness to form multi-stakeholder platforms for participation</p> |
| <p>9.Two day Co-learning Workshops and campaigns; campaign materials (T shirts, wall hangers etc)</p> | <p>Fishers and other stakeholders</p> | <p>Participatory</p> | <p>Freewheeling interactions supplemented with panel discussions of experts more useful, Presence of fishers who are ambassadors of responsible fisheries effective in motivation and improving legitimacy during the workshops</p> | <p>Four such sessions held in three regions ,one exclusively for women, All in collaboration with local NGOs, State agencies, other research institutions like CIFT; Total participants 636.</p> |
| <p>10 Books in English(2)</p> | <p>Policy makers, activists, scholars academicians extension workers</p> | <p>Non- Participatory</p> | <p>Participation in the International Training programme at IAC, the Netherlands proved useful for the investigator.</p> | <p>Appreciated by International experts like Dr .van Den Ban, copies sent to all the 13 fisheries colleges of the country, major libraries, FAO /WFC and other institutions all over the world</p> |
| <p>11Utilization of mass media and internet</p> | <p>-do-</p> | <p>Do-</p> | <p>The involvement of important public figures in the events ensure mass media attention. Internet has limited utility among fishers</p> | <p>Events like official release of the tools got extensive media coverage. Tools available at www.aticcmfri.org</p> |

Implications

1. The most important portent of the meta-analysis of the project is the affirmation of the potential utility of a communication model, which has been vindicated during the implementation of the project, in the context of Responsible Fisheries Extension. The model, as given in Fig1, is built on the proven possibility of making use of the very process of designing any communication tool as a conscientisation episode in a co-learning mode, which engenders a phase of meta communication in the cognitive domain of the communication actors. Since this augurs well for the active participation of the stakeholders in a decentralised mode of message construction the consequent tools go beyond the mere function of communication means (either as individual contact or mass contact points) but act as empowering platforms. This is one way to overcome some of the strategic communication gaps existing in the interface between marine fisheries research and fisherfolk like dichotomy between scientific validity and livelihood necessity, scale gap(For e.g., the concept of average stock, the fundamental unit of observation in fisheries science is a problem for scientists because it does not represent the stock mean and hence to be overcome by appropriate sampling design, where as for the fishers it is an opportunity for a profitable harvest [8] and opportunistic use of knowledge claims.

2. From the available indicators it is reasonable to conclude that the project interventions and the tools in RFEM made significant impact in creating awareness on the necessity to have an ethos of responsible fisheries among the fisheries stakeholders of Kerala state(which is considered as the harbinger in fisheries development initiatives in the country) in particular and the other eight maritime states (four states directly as study locations in the project and the rest through mass media interventions especially TV). Though the potential of mass media like Television channels is immense in this endeavour, rampant commercialization casting disincentives against mass media taking up social responsibilities, as indicated by the reluctance of commercial channels to telecast the film free of cost, must be overcome.

3. When the marine fisheries extension system as a whole is taken into scrutiny, as revealed by the ARFIN, it is seen that the logic and logistics of the existing structure is not conducive for scaled up interventions in responsible fisheries across the country. That only two of the maritime states in the country have translated the FAO CCRF into their vernaculars, even a decade after the release of the Code, betray the commitment of the State towards implementing the FAO CCRF. The impediments in the policy climate and institutionalisation need to be removed. In the next section a conceptual model, built on the logic of constructivism, is proposed towards remedying these lacunae.

REINVENTING A RESPONSIBLE MARINE FISHERIES EXTENSION SYSTEM-A CONSTRUCTIVIST PERSPECTIVE

The fisheries extension system in India, being under the administrative control of a Central Ministry of Agriculture, is unable to appreciate the peculiarities of the marine capture fisheries sector. More over, the production/yield oriented policy climate, that is more congenial to the agricultural research-extension system, fails to understand the necessity for sustainability- ensuring interventions, which the neo-liberal economic logic of the policy makers seldom may find finance worthy as the yield has reached a plateau. The pitfalls in the current extension scenario have been contrasted with an ideal scenario (in the context of responsible fisheries) in Table 4 as a prelude to the model proposed in fig.3.

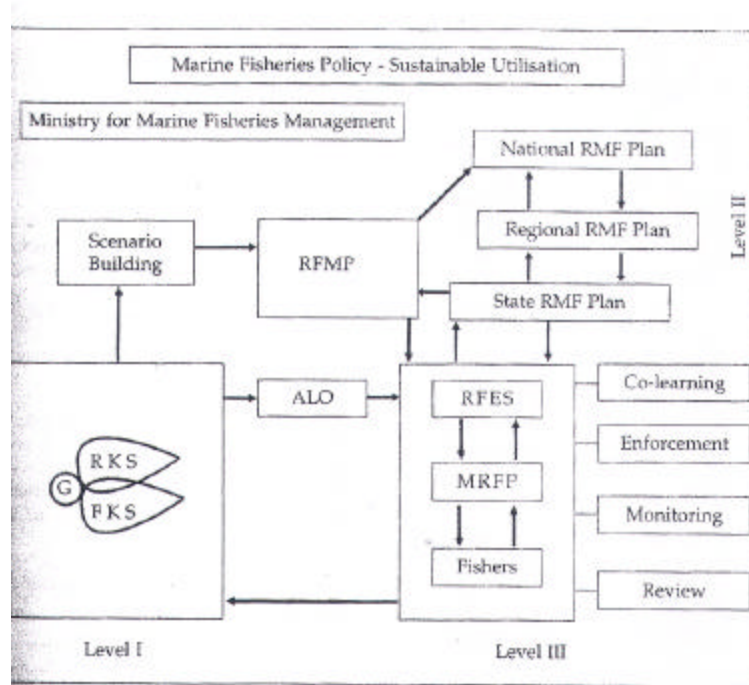
The conceptual model in fig.3 represents the epistemological and methodological means to realise the ideal extension scenario. The model tries to capture the dynamics of the processes involved through constructivist learning loops, at three levels viz., marine fisheries research, extension and policy making with each level conceived as temporally and spatially interconnected Learning cycles. The extension system is conceived as distinct but not independent machinery under the Department of Fisheries. The major functions of the extension system would be i) to *facilitate* the creation and maintenance of a multi-disciplinary Responsible Fisheries Research Platform at the research system level, 2)to *facilitate* the creation and maintenance of a multi-stakeholder Responsible Fisheries Platform at the client system level and 3)to *facilitate* the convergence of the two systems so as to enable building and evaluating responsible fisheries scenarios. The new knowledge is utilized to build a consensus on the most acceptable scenario, taking care of the concerns for sustainability through contested negotiations. What is aimed at here is an informed consensus which is arrived through a participatory decision making structure that makes Responsible Fisheries Management Plans by incorporating inputs from the four knowledge /technology base(biological, statistical ,socio-economic and technological) after demonstrating the relative attributes of various

management choices. The basic challenge here is to translate the negotiated positions into management actions like effort reduction and mesh size regulations. It is extremely difficult to reach complete agreement among competing interests. But, a participatory evaluation of the alternative scenarios, if done more on an analytical basis keeping previously –agreed management objectives in focus, than on the basis of political concerns, would help to reduce divergence among the stakeholders. The advantages of occupational pluralism existing among the fisher folk, availability of alternative livelihood options etc., can be effectively utilized here.

The country is yet to come out with a cogent policy statement for marine fisheries. At present the fisheries policy climate is dominated by the logic of higher production so as to justify the investment being made by the government. Export promotion is clearly the priority and the State has not fully recognized the importance of taking proactive measures for ensuring the sustainability of the resource. The most important job for members of the bodies empowered to provide legitimacy for the plans would be to take part in the level I and level II Learning loops. An important prerequisite envisaged in the model is the creation of a separate ministry for marine fisheries that consider sustainable utilization as the policy focus, at the center. The unfortunate situation of the research system and the fisheries management system running parallel needs to be avoided by bringing these two systems under one institutional structure armed with enough administrative control over the regulatory regime it dispenses with. The grave difficulties being faced by the policy makers cannot be ignored in this context. Though there are marine fisheries regulation acts in all the maritime states serious interventions are required to get them reoriented towards the goal of sustainability. The FAO CCRF needs to be contextualised to suit the peculiarities of each state.

Table 4 Marine Fisheries Extension System(MFES) Current vs Ideal scenarios

| MFES Factor | Current scenario | Ideal scenario |
|------------------------------|---|---|
| Focus | Welfare and Regulatory measures | Welfare and Regulations as one wing supplemented by another wing for Responsible Fisheries Extension; |
| Logic | TOT ,ministerial approach based more on positivism | HRD+Co-management+ positivism combined with constructivism |
| Linkages | Very poor with research and clientele system | Client, extension, and research systems holistically embedded |
| Policy climate | Production/yield orientation (more suitable to agriculture) | Sustainability orientation |
| Central Ministry | Agriculture | Fisheries/NRM |
| State ministry | Fisheries | Marine Fisheries/NRM |
| Epistemological base | Fisheries Biology, Taxonomy, Stock assessment, Harvest /post harvest technology on disciplinary and institutional grounds | Convergence of the formal knowledge system with Fishers' knowledge system as interdisciplinary , inter-institutional and participatory learning loops |
| Integration of NGOs | Poor | Strong; encourage multi-stakeholder processes |
| Research system focus | Techno-biological | Socio-economical +techno-biological |
| Communication rationale | Awareness through centralized message production | Empowerment through Decentralized message construction |
| Regulatory focus | Government regulations imposed (e.g. .seasonal bans) | +traditional systems (e.g., <i>sea courts</i>) arrived through consensus and reconciliation |
| Resource management system | MSY focused ; research system and management system running parallel | Ecosystem based Precautionary approaches Scientifically informed interventions by a unified research-management system having control over management regime |
| Extension personnel | No professional background in extension | Professionally trained cadre, special focus on conservation |
| Fisheries Educational system | No PG level specialization in Fisheries extension (nor Fisheries social sciences | PG level specialization in Fisheries extension/social sciences |



(RFMP-Responsible fisheries management plan; RFES-Responsible fisheries extension system; MRFP-Multi-stakeholder responsible platform; ALO-Alternative livelihood options; RKS-Research generated knowledge system; FKS-Fisher's knowledge system; G-Governance system)

Fig.3 Reinvented Responsible Marine Fisheries Extension System

POST-PROJECT DEVELOPMENTS

Though the project officially ended in 2004 some of the post project activities and consequent developments are worth mentioning. In 2005 the state fisheries department of Kerala came forward to include a special training package on FAO CCRF in their regular training programmes meant for fisheries functionaries. The programme is regularly being conducted and so far 210 of their field level officials were given training. Similar requests have been made by Fisheries departments of four other states. Regional campaigns on responsible fisheries were held in three maritime states during 2005 under the auspices of the CMFRI research centers located in the respective states and the RFEM was widely used. The outcomes of the project were nominated for the prestigious Indira Gandhi award for popularization of science. The communication tools like films are regularly utilized during International Fisheries Training programmes conducted by IAC (recently changed as Wageningen International(WI)), the Netherlands. A total of about 2100 stakeholders who visited CMFRI were exposed to the animation films during 2004-2005. All the State Fisheries Departments of the country have procured these tools and are being utilised during their training programmes and other interventions.

CONCLUSIONS

The project, which can be considered as first of its kind ever undertaken in the country, has clearly established not only the necessity but also the possibility of undertaking extension interventions by way of designing communication tools and strategies in a participatory mode and putting them into massive use for creating an awareness on the concept of responsible fisheries among the stakeholders of marine fisheries sector in the country.

The marked preference for, as well as the effectiveness (as indicated by the results of the feedback studies) of animation films indicate that these tools, especially when designed in a co-learning, participatory mode have very big potential in bridging the communication gap existing between research/ extension institutions and fisher stakeholders.

Each communication tool or product is accompanied by a process consisting of various dimensions like the genesis of an idea, its creative expansion, selection or choice of the treatment/medium, designing, evaluation and enrichment. The overall aim of the project was to make the process as participatory and decentralized as possible. A centralized approach may not be the right one for efforts aimed at development communication. In this approach the various parameters that define the Stimulus – Response praxis would be taken for granted. The antidote to this malady is to make the process democratic and decentralized. Since no *a priori* assumptions are conceived for the Stimulus – Response praxis, contextual learning in a phenomenological sense gets the upper hand. This augurs well for the creation of an enabling space for dialogue and collective learning. The animation film, which has been made in all the maritime vernaculars, signifies a very important step in the process of responsible fisheries extension in our country. The periodic telecast of this film through the regional Television channels can play a big role in making the fishers refrain from harmful practices like juvenile fishing.

It is to be noted that the FAO Code of conduct for responsible fisheries till date is available, even after its original release in 1995, only in two of the Indian maritime vernaculars. The very process of translating the code can be undertaken in a participatory mode, and it is more effective as has been shown through this project. Along with assuring active participation by the stakeholders, the location specific niche media, if any, being utilized by the fisher folk should be effectively made use as a communication partner.

The need of the hour is to undertake similar exercises all along the length and breadth of the maritime states of the country so that the credo of responsible fisheries, as being promulgated by FAO, can be realized as a lasting moral obligation among the stakeholders. Institutional reinvention and professional reorientation as outlined in the suggested model assumes much significance in this regard. It is hoped that the insights and experiences of the project could be translated anywhere in the world, especially the developing countries of the tropics, in the efforts to ensure a sustainable future for the global marine fisheries scenario.

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