



# MARINE FISHERIES INFORMATION SERVICE

## SEMINAR ON FISHERIES EXTENSION

Cochin, 8 - 10 December, 1980

PROCEEDINGS  
AND  
RECOMMENDATIONS

*Technical and Extension Series*

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

**THE MARINE FISHERIES INFORMATION SERVICE:** Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the Fishery Data Centre and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

Abbreviation - *Mar. Fish. Infor. Serv. T & E Ser., No. 27: 1981*

**Cover Photo:**

Delegates representing the States, Union Territories, Agricultural Universities, ICAR Fisheries Institutes, Department of Agriculture (Government of India) and Marine Products Export Development Authority participating in the Seminar

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## PREFACE

It has been well recognised that fisheries extension is one of the weakest links in the development programmes for fisheries in our country. In other fields of production such as agriculture, dairying and poultry, extension has played a major role in the application of technology for increasing production. In the fisheries sector, although a small beginning was made in the fifties by starting extension programmes the effort soon became dissipated. It never made much progress although, Plan after Plan, emphasis was laid on fisheries development. In the words of the National Commission on Agriculture "Absence of adequate work in fisheries extension has been one of the principal reasons for the slow pace of inland fisheries development." Extension service in the marine fisheries sector is much less enviable.

In spite of a half-hearted approach to fisheries extension, the country has made some progress in fish production. From a base level of 0.75 million tonnes in the beginning of the first Five-Year Plan, we have reached a production of over 2.2 million tonnes towards the end of the Fifth Plan. Although there has been use of new technology in certain fields which contributed to the increase in production, the fact remains that we have been operating in areas which were under-exploited. Increase in effort always resulted in higher production in the past. But the present experience shows that unless the fish production system is put on a much broader technological base and the required extension infrastructure is provided, any substantial increase in fish production would be difficult to achieve.

Fortunately the country has made the right approach in developing research, education and training infrastructure for aiding fisheries development in the form of various fisheries research, education and training institutes and agricultural universities. The research institutes in particular, during the last three decades, have built up a wealth of information on the fishery resources of the marine, brackishwater and inland water areas and have also developed technologies for production through capture and culture and for post-harvest treatment. However, it is a fact that the technologies remain very much underutilised. The absence of a motivated extension set-up in the country has been responsible for the underutilisation of the technologies.

The character of fisheries development has vastly changed today and we are in the threshold of a new era, armed with better knowledge of the fishery resources,

the opportunity of an Exclusive Economic Zone in our seas, improved and new technologies for increasing production through culture, a well-established processing industry, greater research support and above all a realisation of its potential as one of the Nation's major assets and we have the political will to assign priority to this sector. These tools and aids for increasing production will be meaningful only if the agency for transformation, namely the extension service, is strong and creative.

Realising the immediate need to bring into focus fisheries extension, the Central Marine Fisheries Research Institute desired to organise a forum for discussing the subject by bringing together the different fisheries interests in the country. This resulted in the *Seminar on Fisheries Extension* jointly organised by the four fisheries institutes of the Indian Council of Agricultural Research, namely the Central Marine Fisheries Research Institute, Central Inland Fisheries Research Institute, Central Institute of Fisheries Technology and Central Institute of Fisheries Education.

The objectives of the Seminar were:

1. To provide for the first time in the country a national forum to those engaged in fisheries extension to come together.
2. To discuss the state of art of fisheries extension in the country.
3. To identify the lacunae and needs of fisheries extension.
4. To develop a National Policy and to evolve an action plan for strengthening and streamlining fisheries extension in the country.

The Seminar was conducted at the Central Institute of Fisheries Technology, Cochin from 8-10 December 1980.

The plan of the Seminar included:

1. Invitation of status reports on fisheries extension from all the maritime and inland states and Union Territories which are responsible for fisheries development.
2. Invitation of background papers on fisheries extension from the Department of Agriculture, Government of India, ICAR Fisheries Institutes,

Fisheries Faculties of Agricultural Universities, and other fisheries organisations.

3. Presentation of the status reports and background papers at the different technical sessions and discussions.
4. Constitution of Task Forces on major identified areas to draft action plans for strengthening fisheries extension, which the participants themselves would be able to implement.
5. Holding of Plenary Session to discuss and finalise recommendations of the Seminar.
6. Organising an Exhibition on Fisheries Extension to highlight the latest developments in the field.

The scope of each invited paper was planned in advance and elaborate guidelines were prepared in order to obtain comprehensive information on fisheries extension from each of the organisations and to ensure uniformity in format. All the 35 status reports/background papers were cyclostyled and brought out in the book form for distribution to the delegates. This enabled cutting down the presentation time and providing more opportunities for discussion at the Technical Sessions.

It is realised that this first Seminar on the subject cannot fulfil all the tasks and find solutions to all the problems; nevertheless it would contribute to a better understanding of the magnitude of the problems and prospects at the National level and would form the basis for future discussions. We would acquire consciousness of this vital force and make extension an inalienable organic link of fisheries planning and development through a public policy.

The Seminar has made very important recommendations on various subjects relating to fisheries extension. Since these were made by the delegates themselves who represent the whole spectrum of fisheries interest in the country, it is anticipated that the recommendations will be implemented by the various organisations without much difficulty.

The Indian Council of Agricultural Research, recognising the importance of the topic of fisheries extension, approved the proposal for organising the Seminar on Fisheries Extension. I am grateful to Dr. O. P. Gautam, Director General, ICAR for his overall guidance in organising the Symposium.

Late Shri G. K. Kuriyan, former Director, CIFT, Cochin was a source of immense strength in planning

the Seminar. Dr. S. N. Dwivedi, Director, CIFT, Dr. A. V. Natarajan, Director, CIFRI and Dr. C. C. Panduranga Rao, Director, CIFT, as co-sponsors of the Seminar extended valuable support. Dr. S. N. Dwivedi, Shri M. M. Mohanty, (late) Shri A. G. Vasavan, Shri M. Swaminath and Prof. H.P.C. Shetty chaired the different technical sessions of the Seminar. Shri K. H. Alikunhi presided over the concluding Plenary Session and guided the discussions on recommendations. Dr. M. J. Sebastian, Dr. C. C. Panduranga Rao, Dr. Devesh Kishore, Shri M. M. Mohanty, Dr. S. N. Dwivedi and Dr. A. V. Natarajan took up the responsibility for convening the task forces and formulating the draft recommendations.

The success of the Seminar is entirely due to the interest shown by the Department of Fisheries of the States/Union Territories, Fisheries Faculties of the Agricultural Universities, the Fisheries Division and Extension Directorate of the Department of Agriculture, Government of India, Marine Products Export Development Authority, Fisheries Institutes of the Indian Council of Agricultural Research, National Academy of Agricultural Research Management and the V. M. National Institute of Co-operative Management. To all the above organisations and officers who contributed status and background papers I owe my thanks. I am thankful to all the delegates of the Seminar and the observers for their participation and useful discussions.

I am thankful to the Directorate of Extension of the Ministry of Agriculture, Central Fisheries Extension Training Centre of CIFE, Department of Fisheries, Government of Tamilnadu, Central Institute of Fisheries Technology and Central Marine Fisheries Research Institute for their active participation in the exhibition. My thanks are due to CMFRI and the Regional Shrimp Hatchery of Government of Kerala for organising the field visits for the delegates. The Central Institute of Fisheries Technology provided the facilities for holding the seminar and also for lunch and tea arrangements.

The committees constituted to look after the various arrangements for the conduct of the seminar did a fine job and I am thankful to the conveners and members of the committees for their help.

Dr. K. Alagarwami gave excellent support in planning, organising and conducting the Seminar and also in bringing out the publications.

E. G. SILAS  
Convener  
Seminar on Fisheries Extension

## SUMMARY OF PROCEEDINGS

Welcoming the delegates to the Seminar at the first Plenary Session held on 8th December 1980, Dr. E. G. Silas, Convener, stressed the importance of the seminar in the context of the present phase of fisheries development for increasing fish production through use of appropriate technologies. He traced the genesis of the seminar and pointed out that for the first time in the country a forum has been organised to discuss the vital link of fisheries extension between technology development and utilisation. He requested the delegates to give serious thoughts to identify the problems and evolve an action plan for strengthening fisheries extension.



Dr. E. G. Silas, Convener of the Seminar welcoming the delegates.

### Technical Sessions

The business of the seminar was held under five technical sessions on the 8th and 9th December 1980. The sessions were organised as follows:

- I. Status of fisheries extension in coastal states.
- II. Status of fisheries extension in non-coastal states.
- III. Fisheries extension in agricultural universities.
- IV. Background papers from Ministry of Agriculture and MPEDA.
- V. Fisheries extension in ICAR fisheries institutes.

The sessions were chaired respectively by Dr. S. N. Dwivedi, Shri M. M. Mohanty, Shri A.G. Vasavan, Shri M. Swaminath and Prof. H. P. C. Shetty.

Twelve status reports were presented at the first Session and the coastal States/Union Territories which presented the papers for discussion were Kerala, Maharashtra, Tamil Nadu, Gujarat, Karnataka, Andhra Pradesh, Orissa (4 papers), Pondicherry and Lakshadweep. At Session II Arunachal Pradesh, Haryana, Punjab, Sikkim, Tripura and Meghalaya presented status reports on fisheries extension. The presentation at Session III included background papers on fisheries extension in Agricultural Universities of Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, Konkan Krishi Vidya Peeth, Panjabrao Krishi Vidya Peeth, G.B. Pant University of Agriculture and Technology and Bidhan Chandra Viswa Vidyalaya. At Session IV two papers from the Fisheries Division of the Department of Agriculture, Government of India and one from the Marine Products Export Development Authority were presented. An interesting paper on the use of super-8 mm movie in fisheries extension was presented by the Directorate of Extension, Ministry of Agriculture. At Session V the ICAR fisheries institutes namely the CMFRI, CIFRI, CIFT and CIFE presented background papers dealing essentially with the technologies developed at the respective institutes and also the training and transfer of technology programmes under implementation. A paper on use of mass media was presented by the National Academy for Agricultural Research Management of ICAR. The status reports and background papers were discussed at the end of each session.

### Task Forces

One of the major objectives of the seminar was to evolve an action plan for strengthening fisheries extension. Six major areas were identified as requiring consideration of the seminar and task forces were constituted to follow the presentation and discussions at the seminar and to prepare draft action plans/recommendations on the subject areas. Each task force was led by a convener and 10 to 12 delegates were identified to be associated with each task force. An outline of the scope of the subject area was also prepared and supplied to each task force. The task forces constituted are as follows:

1. Organisational set-up and linkages.
2. Technological needs of fisheries extension.
3. Fisheries extension methods.
4. Input supply and output management.



Shri K. H. Alikunhi, Fisheries Advisor, Government of Kerala giving an overview of fisheries extension in the State of Kerala (Left to Right: Dr. C. C. Panduranga Rao, Director, CIFT, Dr. S. N. Dwivedi, Director, CIFE, Dr. E. G. Silas, Director, CMFRI, Dr. A. V. Natarajan, Director, CIFRI and Shri K. H. Alikunhi).

5. Extension education and training.
6. Public policies and planning for fisheries extension.

The task forces were convened respectively by Dr. M. J. Sebastian, Dr. C. C. Panduranga Rao, Dr. Devesh Kishore, Shri M. M. Mohanty, Dr. S. N. Dwivedi and Dr. A. V. Natarajan.

After the technical sessions concluded in the forenoon of 9-12-1980, the task forces met independently in the afternoon and drafted the recommendations. Late in the evening, the convener of each task force presented the draft recommendations at the Plenary Session II and a preliminary discussion was held on the drafts. Based on the discussion the recommendations were redrafted.

#### Final Plenary Session

At the final Plenary Session held in the forenoon of 10-12-1980 at the Prawn Culture Laboratory of Central Marine Fisheries Research Institute at Narakkal, the draft recommendations were presented and discussed at length. Shri K. H. Alikunhi chaired the Session. The amendments, suggestions and points of view expressed by the delegates were noted. The House constituted an Editorial Committee consisting of Shri K. H. Alikunhi, Dr. E. G. Silas, Dr. C. C. Panduranga Rao and Dr. K. Alagarwami to edit and finalise the recommendations of the seminar based on the draft documents and the discussions at the Plenary Session.

The Seminar concluded with a vote of thanks proposed by Dr. C. C. Panduranga Rao.

#### Special lecture

Realising the importance of fisheries co-operatives as one of the agencies of fisheries extension, a special lecture was arranged on "Fisheries co-operatives in India—Performance, problems and prospects" by Dr. G. S. Kamat, Professor at the V. M. National Institute of Co-operative Management, Pune. The lecture was delivered by him in the evening of 9-12-1980.

#### Exhibition

An exhibition on fisheries extension was organised at the CIFT premises to highlight the fisheries extension activities of different organisations and to focus attention on extension methods. The Directorate of Extension in the Department of Agriculture, Government of India took a leading part in the display of fisheries extension materials and particularly demonstrated the use of super-8 mm movie in extension. The Central Fisheries Extension Training Centre of CIFE at Hyderabad played a major role in the display of several audio-visual equipment and other extension materials. Other organisations which participated in the exhibition were the Department of Fisheries, Government of Tamil Nadu, the Central Institute of Fisheries Technology and the Central Marine Fisheries Research Institute.

#### Field visits

On 10-12-1980 the delegates were taken on a field visit to the Lab-to-Land Transfer of Technology centre



Shri M. M. Mohanty, Director of Fisheries, Orissa, addressing the Seminar.



Shri A. K. Kawatra, Director and Warden of Fisheries, Punjab, presenting the status paper.



Shri K. Raha, Joint Director of Fisheries, Tripura presenting the status paper on fisheries extension.

at Valappu near Cochin where the CMFRI is engaged in transferring prawn culture technology to a Harijan society consisting of 122 families as members. The delegates also visited the prawn culture laboratory of CMFRI at Narakkal. In the afternoon a visit was arranged to the Regional Shrimp Hatchery of the Department of Fisheries, Government of Kerala at Azhikode which marked the close of the Seminar's Programmes.

### Recommendations of the Seminar

The Editorial Committee constituted by the seminar subsequently met and finalised the recommendations. A total of 22 recommendations have been made under six headings and the organisations have been identified for taking action on them. The recommendations have been included under a separate section in this proceedings.



## LIST OF STATUS REPORTS/BACKGROUND PAPERS

### I. STATUS REPORTS ON FISHERIES EXTENSION

#### A. Coastal States

1. Department of Fisheries, Kerala, Trivandrum (A .G. Vasavan)
2. Department of Fisheries, Maharashtra, Bombay (S. S. Naik)
3. Department of Fisheries, Tamilnadu, Madras (C. Chellappan)
4. Department of Fisheries, Gujarat, Ahmedabad (U. L. Wadekar)
5. Department of Fisheries, Karnataka, Bangalore (K. Sripad Rao)
6. Department of Fisheries, Andhra Pradesh, Hyderabad (M. Venkateshwara Rao)
7. Department of Fisheries, Orissa, Cuttack (M. M. Mohanty)
8. Progress of Fisheries Extension Service in Orissa (J. C. Roy)
9. The Saga of Fisheries Extension in Western Orissa (M. K. Ahmed)
10. Role of FFDA, Balasore in extension of intensive pisciculture (R. K. Das)
11. Department of Fisheries, Pondicherry (E. Purushothaman)
12. Department of Fisheries, U. T. of Lakshadweep, Kavaratti (George Varghese)

#### B. Non-coastal States

13. Department of Fisheries, Arunachal Pradesh, New Itahnagar (A. K. Das)
14. Department of Fisheries, Haryana, Chandigarh (D. K. Kaushik)
15. Department of Fisheries, Punjab, Chandigarh (A. K. Kawatra)
16. Fish & Wildlife Department, Sikkim, Gangtok (Fisheries Development Officer)



Professor H. P. C. Shetty, Director of Instruction (Fisheries) University of Agricultural Sciences, Karnataka speaking on fisheries extension of the Fisheries College.



Shri V. D. Kapoor, Exhibition Officer, Ministry of Agriculture, presenting the paper at the seminar.

17. Department of Fisheries, Tripura, Agartala (K. Raha)
18. Department of Fisheries, Meghalaya, Shillong (Deputy Director of Fisheries)

## II. FISHERIES EXTENSION IN AGRICULTURAL UNIVERSITIES

19. Fisheries extension and related activities in the University of Agricultural Sciences, Karnataka—College of Fisheries, Mangalore (H. P. C. Shetty)
20. Fisheries extension activities at the Fisheries College, Tamil Nadu Agricultural University, Tuticorin (K. C. Joseph)
21. Fisheries extension programmes of the Faculty of Fisheries in Kerala Agricultural University, College of Fisheries, Mannuthy (M. J. Sebastian)
22. Fisheries research and extension programmes of the Faculty of Fisheries of Konkan Krishi Vidyapeeth (G. A. Shirgur)
23. Agricultural Universities—an aid to fisheries extension (L. M. Joshi, Punjabrao Krishi Vidyapeeth)
24. Fisheries extension programmes of Faculty of Fisheries of Andhra Pradesh Agricultural University (T. Rajyalakshmi)
25. Achievement and extension of fisheries research at G. B. Pant University of Agriculture and Technology (C. S. Singh)
26. Utilisation of information sources in the adoption of recommended species of fish in composite fish culture (G. L. Ray and M. A. Haque)

## III. BACKGROUND PAPERS FROM MINISTRY OF AGRICULTURE AND MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY

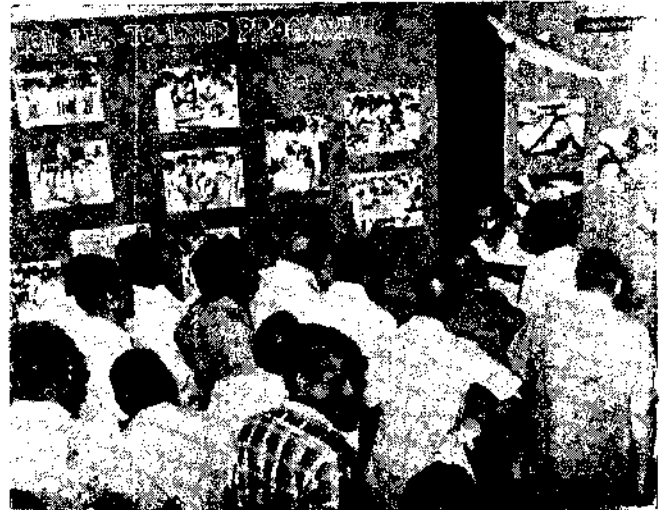
27. Approach to Fisheries Extension in India (T. A. Mammen, Fish. Div., Min. Agri.)
28. Introduction of fisheries extension service for development of inland fish farming (V. D. Singh and V. Sampath, Fish. Div., Min. Agri.)
29. Fishery extension in production for export (M. Sakthivel, P. U. Verghese and R. Ganapathy, MPEDA).
30. Improved techniques on fisheries production and processing come to life through super 8 mm movies (C. S. S. Rao, Directorate of Extension)



Dr. S. N. Dwivedi, Director, CIFE, speaking on fisheries extension activities of the Institute and its training centres.



The Plenary Session to discuss the recommendations was held at the CMFRI Prawn Culture Laboratory at Narakkal. (Left to Right: Dr. E. G. Silas, Dr. S. N. Dwivedi, Shri K. H. Alikunhi, Dr. M. J. Sebastian, Dr. A. V. Natarajan, Dr. Devesh Kishore, Shri M. M. Mohanty, Dr. C. C. P. Rao—Chairmen of the different sessions of the Seminar)



Dr. C. C. P. Rao, Director, CIFT explaining the Lab-to-Land programme and other extension activities at the exhibition.

#### IV. FISHERIES EXTENSION IN ICAR FISHERIES INSTITUTES

31. Technology generation and transfer for marine fisheries development—Central Marine Fisheries Research Institute, Cochin
32. Technology generation and transfer for fisheries development—Central Institute of Fisheries Technology, Cochin
33. Contributions of Central Inland Fisheries Research Institute in technology generation, verification, education and dissemination in inland fishery sector—CIFRI, Barrackpore

34. Fisheries education and extension training—Central Institute of Fisheries Education, Bombay (H. G. Hingorani, CFETC, Hyderabad)
35. Role of mass media in fisheries extension (Devesh Kishore, National Academy of Agricultural Research Management, Hyderabad)

#### V. SPECIAL LECTURE

36. Fisheries Co-operatives in India—performance, problems and prospects (G. S. Kamat, V. M. National Inst. Co-op. Management, Pune).



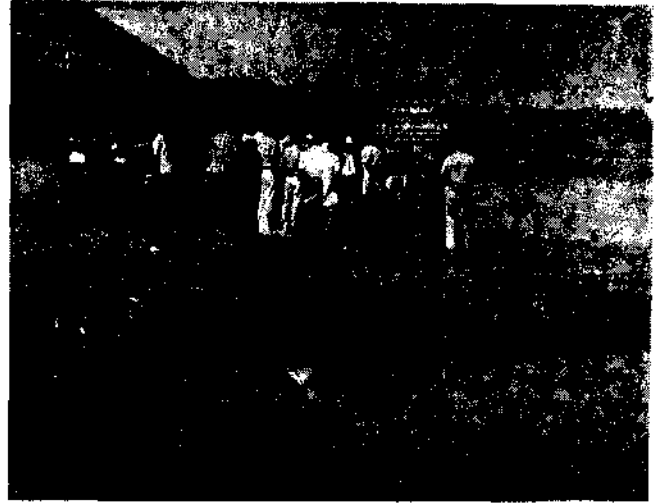
Shri H. G. Hingorani, Principal, CFETC, Hyderabad explaining the audiovisual aids at the fisheries extension exhibition.



Shri K. H. Alikunhi releasing the extension pamphlet on pearlspot brought out by the Krishi Vigyan Kendra on Mariculture of CMFRI at Narakkal (seen in the foreground are Dr. V. Balakrishnan, OIC, Krishi Vigyan Kendra, Shri K. H. Alikunhi and (late) Shri A. G. Vasavan, Director of Fisheries, Kerala.)



The delegates of the seminar visited the Prawn Culture Laboratory of CMFRI at Narakkal. Shri K. H. Mohamed, Scientist-in-charge of PCL explains the activities.



A visit to the Lab-to-Land centre of CMFRI at Valappu where the technology of prawn culture is under transfer to the member-families of a Harijan society.



The field programme for the delegates concluded with a visit to the Regional Shrimp Hatchery of the Department of Fisheries, Government of Kerala, at Azhikode.

## SEMINAR ON FISHERIES EXTENSION

### LIST OF RECOMMENDATIONS

#### 1. PUBLIC POLICIES AND PLANNING FOR FISHERIES EXTENSION

- 1.1. General policy and priorities
- 1.2. Streamlining fisheries extension
- 1.3. Status for fisheries extension
- 1.4. Leasing of water bodies
- 1.5. Fish inspection and quality control for internal marketing
- 1.6. Development of suitable systems of fisheries extension

#### 2. ORGANISATIONAL SET-UP AND LINKAGES

- 2.1. Strengthening of fisheries extension set-up
- 2.2. Linkages

#### 3. TECHNOLOGICAL NEEDS OF FISHERIES EXTENSION

- 3.1. Inventory of technologies
- 3.2. Forecasting and fisheries information

3.3. Conservation of ecosystem

3.4. Feed-back

#### 4. INPUT SUPPLY AND OUTPUT MANAGEMENT

- 4.1. Involvement of extension in input supply and output management
- 4.2. Fish seed production
- 4.3. Multipurpose fisheries co-operatives

#### 5. EXTENSION EDUCATION AND TRAINING

- 5.1. Fisheries extension education
- 5.2. Extension research
- 5.3. Fisheries extension training
- 5.4. Trainers Training Centres and Krishi Vigyan Kendras
- 5.5. Non-formal education

#### 6. FISHERIES EXTENSION METHODS

- 6.1. Training in extension methods
- 6.2. Provision of equipment at extension centres

## RECOMMENDATIONS

#### 1. PUBLIC POLICIES AND PLANNING FOR FISHERIES EXTENSION

##### 1.1. General policy and priorities

The Seminar,

*realising* that at present fisheries extension is one of the weakest links in our fisheries development programmes and that the existing extension service is totally inadequate and ill-equipped to meet the challenges and utilise the opportunities for enhancing fish production and improving rural economy, and

*taking into consideration* the views and recommendations of the Balwant Rai Mehta Commission (1957) and National Commission on Agriculture (1976) on fisheries extension,

*recommends* that the Government may give high priority to fisheries extension and integrate extension as a part of programme

planning for fisheries development in the country both at the National and State level and provide adequate administrative, financial and infrastructure support for efficient functioning of fisheries extension.

*Action:* Department of Agriculture, Government of India; Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

##### 1.2. Streamlining fisheries extension

The Seminar,

*recognising* that there are several organisations in the country engaged in fisheries research, development, education and training and all of them have some extension programmes or other, and

*realising* that it is necessary to broadly demarcate the responsibilities of different organisations as far as fisheries extension is concerned to avoid

duplication of efforts and to eliminate confusion in the minds of the beneficiaries,

*recommends* that the Department of Fisheries of the States/Union Territories may have the full responsibility for field extension programmes, the Agricultural Universities for extension education, the Central Institutes for national demonstrations and technical training, and the Department of Agriculture and Co-operation, Government of India for providing adequate financial support for fisheries extension programmes in the States/Union Territories and co-ordinating their functions.

*Action:* Department of Agriculture, Government of India; Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

### 1.3. Status for fisheries extension

The Seminar,

*pointing out* that one of the reasons for the absence of competent extension service in fisheries is the lack of qualified manpower, and

*stressing* that since the extension workers have a pivotal role to play in introducing improved technologies and promoting progress in fisheries development they should be professionally competent and must have an insight into and outlook for sociological problems and needs related to development,

*recommends* that an unified approach may be adopted by the States/Union Territories for giving a proper status to fisheries extension and extension workers; only persons who are qualified, competent and who have the required aptitude may be drafted to fisheries extension; and that at the block/village level the fisheries extension worker may be made responsible for fisheries extension programmes with minimum involvement in other development activities.

*Action:* Fisheries Departments of States/Union Territories.

### 1.4. Leasing of water bodies

The Seminar,

*considering* that proper development of aquaculture could be brought about through fisheries extension service only if the fish culturists have access to control over water bodies to be cultivated, and

*noting* that the public water bodies are generally under the control of the Government or public organisations such as panchayats,

*recommends* that the Government may evolve a clear policy to lease out the public water bodies to prospective aquaculturists and

*further recommends* that priority may be given to the backward segment of the society particularly to landless labour, tribals and scheduled castes/tribes, provided they are interested in taking up aquaculture, and to undergo training and develop skills as fish farmers.

*Action:* Department of Agriculture, Government of India; Fisheries Departments of States/Union Territories.

### 1.5. Fish inspection and quality control for internal marketing

The Seminar,

*noting* that there is no system to check and ensure the quality of fish offered for sale at landing sites and marketing centres and that an agency for inspection and quality control exists exclusively for the export trade, and

*stressing* that it is equally important to ensure that the consumer gets wholesome fish as per specified standards of quality,

*recommends* that quality control measures be developed for fish and shellfish sold in the internal market and that the States/Union Territories make a beginning to implement fish inspection system through local public health organisations.

*Action:* Department of Agriculture, Government of India; Indian Standards Institute; Indian Council of Agricultural Research; Council of Scientific and Industrial Research; Fisheries and Public Health Departments of States/Union Territories.

## 1.6. Development of suitable systems of fisheries extension

The Seminar,

*taking into account* the diversified nature of Indian fisheries in diverse agro and hydroclimatic conditions and different types of culture and capture fisheries requiring a wide range of technologies and skill of operation, and

*realising* the need for developing models and systems of fisheries extension appropriate for each of the above situations,

*recommends* that the Centre may take the responsibility for developing and testing selected systems of fisheries extension in particular States/Union Territories and, based on the results, recommend such system to other regions.

*Action:* Department of Agriculture, Government of India; Fisheries Departments of States/Union Territories.

## 2. ORGANISATIONAL SET-UP AND LINKAGES

### 2.1. Strengthening of fisheries extension set-up

The Seminar,

*observing* that the organisational set-up for fisheries extension in the Central as well as State sectors is very weak,

*noting* that even the nominal set-up existing at present differs from State to State depending on the priorities assigned to fisheries development and resources available, and

*stressing* that a strong fisheries extension set-up is an essential pre-requisite to a creative and effective extension system,

*recommends* that at the Central level the extension set-up and functions of the Fisheries Division of the Department of Agriculture & Co-operation, Ministry of Agriculture and the extension education and demonstration set-up and functions of the Indian Council of Agricultural Research be strengthened for providing necessary planning, system support and effective co-ordination of the various fisheries extension activities in the country, and

*further recommends* that fisheries extension set-up be strengthened in all the States and Union Territories with appropriate trained manpower at the senior level in the Directorate, middle level in the districts and operative level in the blocks and villages to manage, execute and operate the various programmes of fisheries extension.

*Action:* Department of Agriculture, Government of India; Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

### 2.2. Linkages

The Seminar,

*realising* that at present there is very little linkage between the extension organisations of the different States/Union Territories, and between Central and State Fisheries Departments, and

*stressing* the need for establishing close linkages and co-ordination among the various organisations on matters relating to fisheries extension,

*recommends* that explicit linkages among the extension systems of the Fisheries Organisations of the Centre, States/Union Territories and Agricultural Universities, and between extension and input supply agencies be established at different levels to ensure prompt transfer of technology and efficient extension service.

*Action:* Department of Agriculture, Government of India; Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

## 3. TECHNOLOGICAL NEEDS OF FISHERIES EXTENSION

### 3.1. Inventory of technologies

The Seminar,

*noting* with satisfaction that a wide range of pre-harvest, harvest and post-harvest technologies in marine, brackishwater and inland fisheries sectors are available at the ICAR Fisheries Research Institutes and Agricultural Universities, and

*pointing out* that while some of these technologies have been accepted and adopted by the fishermen

and fish farmers, there are several others which await practical use in production,

*recommends* that an inventory of tested and proven technologies with details be prepared by the ICAR Fisheries Research Institutes and Agricultural Universities, indicating different levels of operation and utilisation and be made available to the Fisheries Departments of the States/Union Territories and Extension Centres, and

*further recommends* that taking a cue from the package of technology being delivered to other production sectors, similar packages of technology to suit different categories of recipients, with particular emphasis on low-input technology to meet the needs of the weaker sections of the community, be developed and provided to the extension agencies.

*Action:* Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

### 3.2. Forecasting and fisheries information

The Seminar,

*drawing attention* to the need for providing information to the fishermen and fish farmers on the immediate prospects of production and also information on resources, technology, marketing and other areas which are immediately useful,

*recommends* that the Research Institutes should develop a credible system for effective forecasting to alert the fishermen or fish farmers on the short-term prospects of production and also on the long-term prospects and that the Research and Education Institutes, Agricultural Universities and Development Agencies, in co-ordination, should develop a viable system of fisheries information service for dissemination of all information, including meteorological information, relating to fisheries. The extension system in the States/Union Territories should be the agency for the communication and follow-up assistance to the fishermen, fish farmers and entrepreneurs.

*Action:* Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

### 3.3. Conservation of ecosystem

The Seminar,

*pointing out* that the fishermen and fish farmers do not realise the implications of indiscriminate exploitation of the resources and are not conscientious about the ill effects of over exploitation and abuse of valuable water resources,

*recommends* that the extension workers should create an awareness and understanding in the fishermen and fish farmers of aspects of conservation and management of the resources and also of protection of environment against its impairment through pollution and other factors.

*Action:* Fisheries Departments of States/Union Territories.

### 3.4. Feed-back

The Seminar,

*realising* the importance of getting feed-back information for evaluation and use by the technology production system,

*recommends* that the extension system should collect comprehensive feed-back information from the production sectors and pass it on to the Research Institutes and Agricultural Universities for evaluation and use in further improvement, refinement and innovations of technologies.

*Action:* Indian Council of Agricultural Research; Agricultural Universities; Fisheries Departments of States/Union Territories.

## 4. INPUT SUPPLY AND OUTPUT MANAGEMENT

### 4.1. Involvement of extension in input supply and output management

The Seminar,

*considering* that input supply and output management as aids and functions of fisheries extension would be the core of the problem in any attempt to substantially increase fish production in capture as well as culture fisheries in the inland, brackish-water and marine sectors, and

*realising* that while identification of inputs and outputs of fisheries extension is not so difficult a task, fruitful and precise operational solutions seem imposing,



*recommends* that the fisheries extension set-up should be geared to the needs of supply of inputs such as fertilisers, chemicals, implements, fuel oil and energy and also output management, particularly marketing, and provide timely assistance to the fishermen and fish farmers through co-operative and other institutional channels.

*Action:* Fisheries Departments of States/Union Territories.

## 4.2. Fish seed production

The Seminar,

*noting* that fish seed is usually subject to excessive mortality during storage and transportation, and

*realising* that a smooth and timely supply of fish seed is very important,

*recommends* that while encouraging increased fish seed production in the private sector, the existing departmental and corporation levels of fish seed production be stepped up and the supply network be refined and extended to panchayat level without seriously disturbing the supply network in the private sector.

*Action:* Fisheries Departments of States/Union Territories.

## 4.3. Multipurpose fisheries co-operatives

The Seminar,

*considering* that despite the mixed success of the fisheries co-operatives in India, the importance of co-operative effort cannot be underestimated in the present socio-economic context, and

*realising* the need for organising multipurpose fisheries co-operatives to provide various services connected with fisheries development,

*recommends* that formation of new multipurpose fisheries co-operatives be explored by the fisheries extension staff and such societies be given priority in fisheries development programmes.

*Action:* Fisheries Departments of States/Union Territories.

## 5. EXTENSION EDUCATION AND TRAINING

### 5.1. Fisheries extension education

The Seminar,

*noting* that extension education in fisheries is yet to take its roots in the country in spite of three decades of planned development of fisheries, and

*observing* that the present education and training facilities at the Research and Education Institutes and Agricultural Universities do not cater to the needs of fisheries extension,

*recommends* that the existing curriculum of fisheries education in the undergraduate programmes of the Agricultural Universities be suitably altered wherever necessary to include credits on "Extension Methodology" in order to provide the basic structure of extension education at this level, and

*further recommends* that facilities be provided for specialising in extension education at the post-graduate level in the Agricultural Universities in order to create a cadre of fisheries extension specialists.

*Action:* Indian Council of Agricultural Research; Agricultural Universities.

### 5.2. Extension research

The Seminar,

*realising* that there is need for improving the extension system on a scientific basis,

*recommends* that researches in extension education and extension methods be taken up at the Agricultural Universities in order to evolve appropriate extension systems and methods suitable for the different fisheries sectors.

*Action:* Agricultural Universities.

### 5.3. Fisheries extension training

The Seminar,

*considering* that training facilities in fisheries extension are available only at one centre in the country, namely the Central Fisheries Extension

Training Centre (CFETC), Hyderabad, and that no such facility is available for extension training in marine fisheries and post-harvest technology,

*recommends* that the training facilities at CFETC be expanded and strengthened and be fully availed of by the Fisheries Departments of the States and Union Territories, and

*further recommends* that specialised training facilities for extension in marine fisheries and post-harvest technology sectors be created.

*Action:* Indian Council of Agricultural Research; Fisheries Departments of States/Union Territories.

#### 5.4. Trainers Training Centres and Krishi Vigyan Kendras

The Seminar,

*observing* that the concept of introducing Trainers Training Centres (TTCs) and Krishi Vigyan Kendras (KVKs) in the fisheries sector by the Indian Council of Agricultural Research is a new venture and is already proving its usefulness towards providing vocational training,

*recommends* that such facilities of TTCs and KVKs be extended on selective basis in a phased manner based on actual needs.

*Action:* Indian Council of Agricultural Research.

#### 5.5. Non-formal education

The Seminar,

*noting* that the fishermen of the country are mostly illiterate and therefore extension programmes may not have desired impact unless the target groups are properly prepared and guided for the proposed changes,

*recommends* that non-formal education and self-employment programmes for the fishermen and fish farmers be introduced by the Agricultural Universities, Departments of Fisheries, Co-operative Institutions and Voluntary Organisations.

*Action:* Agricultural Universities; Fisheries Departments of States/Union Territories.

## 6. FISHERIES EXTENSION METHODS

### 6.1. Training in extension methods

The Seminar,

*considering* the fact that at present fisheries extension is carried out by staff inadequately trained in extension methods, and

*observing* that the present methods, including production of extension literature, often do not fully take into account the level and socio-economic status of the intended audience,

*recommends* that the Fisheries Departments of the States and Union Territories may plan accelerated training programmes for extension workers on the effective use of mass media such as radio, television, newspapers and exhibitions and other allied aspects of extension and communication systems.

*Action:* Fisheries Departments of States/Union Territories.

### 6.2. Provision of equipment at extension centres

The Seminar,

*noting* that extension is a multi-faceted field-oriented discipline and can succeed only if the required infrastructure is made available,

*recommends* that the Departments of Fisheries of the States and Union Territories may be suitably equipped with units for production of material for extension methods and that all district-level extension units be provided with equipments such as film and slide projectors, tape recorder, megaphone, camera, graphic aid material and exhibits and, if possible, also a mobile extension unit.

*Action:* Fisheries Departments of States/Union Territories.

## COMMITTEES OF SEMINAR

### Steering Committee

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Dr. S. N. Dwivedi, Director, Central Institute of Fisheries & Education, Bombay  
Dr. A. V. Natarajan, Director, Central Inland Fisheries Research Institute, Barrackpore  
Dr. C. C. Panduranga Rao, Director, Central Institute of Fisheries Technology, Cochin

### Reception Committee

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Shri R. C. Choudhury, Chairman, Marine Products Export Development Authority, Cochin  
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