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2nd Zonal Workshop on Fisheries and Aquaculture Policy: Ecosystem and Livelihood Perspectives in East Coast States

Andhra Pradesh, Andaman & Nikobar Islands, Orissa,
Pondichery, Tamilnadu and West Bengal

Hyderabad
22-24 March, 2007

Proceedings



2



Central Institute of Fisheries Education

(Deemed University-ICAR)

Fisheries University Road, Versova, Mumbai - 400 061

<http://cife.edu.in>

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PREPARATION OF THE DOCUMENT

This document is an outcome of a stakeholder consultation process conducted across the country as part of the research cum advocacy project on 'Developing a Policy Framework for Fisheries and Aquaculture Development'. This is the proceeding of the 2nd Zonal Workshop on 'Fisheries and Aquaculture Policy: Ecosystem and Livelihood perspectives in East Coast States' consisting of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, A&N Islands and Pondicherry held in Hyderabad during 22-24 March 2007. After the five workshops, a series of participatory review cum expert consultation including a synthesising workshop was conducted at CIFE to extract specific policy inputs and prepare a draft policy framework for different sub sectors of fisheries and aquaculture. In the process the quality of each of these proceedings document got considerably improved. It is our hope that the document would be of use to all the stakeholders particularly the policy makers and development planners. Suggestions on the content of the document or on issues related to fisheries policy are welcome. The same may be addressed to Director, CIFE or emailed to director@cife.edu.in

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Acronyms and Abbreviations

AAI	Aquaculture Authority of India	ICES	International Council for Exploration of Sea
AMS	Aggregate Measure of Support	ICT	Information and Communication Technology
ATIC	Agricultural Technology Information Center	IFP	Integrated Fisheries Project
BFDA	Brackishwater Fish farmer Development Agency	IMC	Indian Major Carp
BMP	Best Management Practices	IUCN	International Union for Conservation of Nature and Natural Resources or World Conservation Union
CCRF	Code of Conduct for Responsible Fisheries	LME	Large Marine Ecosystem
CIBA	Central Institute of Brackish water Aquaculture	MOA	Ministry of Agriculture
CICEF	Central Institute for Coastal Engineering for Fisheries	MOC	Ministry of Commerce
CIFE	Central Institute of Fisheries Education	MOEF	Ministry of Environment and Forestry
CIFNET	Central Institute of Fisheries Nautical and Engineering Training	MREGS	Minimum Rural Employment Guarantee Scheme
CIFT	Central Institute of Fisheries Technology	MST	Ministry of Science and Technology
CMFRI	Central Marine Fisheries Research Institute	NCDC	National Cooperative Development Corporation
CO	Community Organization	NDDB	National Dairy Development Board
CRZ	Coastal Zone Regulation	NFDB	National Fisheries Development Board
CSIR	Council for Scientific and Industrial Research	NGO	Non-governmental Organization
DARE	Department of Agricultural research and Education	NIO	National Institute of Oceanography
DBT	Department of Biotechnology	NRSI	Natural Resource Service Incorporation
DLC	District Level Committee	NTB	Non Tariff Barriers to Trade
DOD	Department of Ocean Development	PMRY	Prime Minister's Rojgar Yojna (Prime Minister's Employment Scheme)
DoF	Department of Fisheries	PPP	Public Private Partnership
DST	Department of Science and Technology	PRI	Panchayat Raj Institution
EEZ	Exclusive Economic Zone	RIDF	Rural infrastructure Dev. Fund
EU	European Union	SAARC	South Asian Association for Regional cooperation
FAD	Fish Aggregating Device	SAU	State Agricultural University
FAO	Food and Agricultural Organization	SHG	Self Help Group
FCR	Feed Conversion Ratio	SLC	State Level Committee
FFDA	Fish farmer Development Agency	SPF	Specific Pathogen Free
FISHCO-FED	National Federation of Fishermen Cooperative Societies	SPR	Specific Pathogen Resistant
FSI	Fisheries Survey of India	TDS	Trickle Down System of Aquaculture Extension
GIS	Geographical Information System	TED	Turtle Excluding Devices
GOI	Government of India	UGC	University Grant Commission
HACCP	Hazard Analysis & Critical Control Points	UNEP	United Nations Environment Program
HRD	Human Resource Development	UT	Union Territory
ICAR	Indian Council of Agricultural Research	WTO	World Trade Organization

Executive Summary

Indian fisheries and aquaculture sector has been growing at a faster rate than crop and livestock sectors. The sector contributes to the livelihood of a large section of economically under-privileged population, and has assumed greater significance in changing scenario of rising income, growing urbanization and unfolding globalization. However, there are still vast underutilised and untapped resources having potential for development, which is being limited greatly by the absence of comprehensive and an enabling policy framework at the Central and State levels. Policy support and institutional innovations would be prerequisite for sustainable and equitable growth.

In this context, CIFE, Mumbai has taken a lead role in facilitating the process of developing an overarching Fisheries and Aquaculture Policy Framework by organising five consultative workshops at different levels involving all the stakeholders since December 2006. The first workshop was conducted in Guwahati for North Eastern States and this is the report of 2th Zonal Workshop on 'Fisheries and Aquaculture Policy: Ecosystem and Livelihood Perspectives in East Coast States consisting of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, A&N Islands and Pondicherry held in

Hyderabad during 22-24 March 2007. It was organized jointly organized by CIFE, Mumbai & PREPARE, Chennai in partnership with Department of Fisheries of Andhra Pradesh, wherein 87 participants attended.

In the workshop there were five technical sessions starting from Status of Fisheries and Policy Overview of each participating states, Policy Issues in Capture Fisheries, Policy Issues in Aquaculture, Gap analysis and Presentation of working groups based on the discussions held in each of the sessions. Under Gap Analysis eight work groups were formed to identify policy gaps existing in the different sub-sectors of fisheries and aquaculture. Based on the work group interaction and outcome a joint session was held wherein the summary of each work group discussion presented and specific recommendations/action points was evolved collectively. The following policy issues were brought out by the workshop:

1. Considering the special requirements of artisanal fishers, the policy shall define and elaborate on allocation of user rights and access control, allocation of fishery resources (e.g. between artisanal, motorized and mechanized categories), ban on certain nets like the ring-seine, and adopting new participatory and co-management approaches for the

management of resources including mangroves.

2. **Provide alternative livelihoods to the fishers especially during the ban period:** provisions are to be made under the schemes like Minimum Rural Employment Guarantees Scheme (MREGS) and schemes under Panchayat Raj institutions (PRI). It is therefore recommended that the Government of India, Ministry of Agriculture in consultation with the concerned state governments initiate a formal dialogue with affected parties and revise the rules etc. Work related to the development of landing centers can be introduced during this period to employ fishers. Aquatourism can also be encouraged to provide the fishers with alternate livelihood options.

3. The occurrence of clashes between fishers of artisanal and mechanized vessels and between those of small and large mechanized vessels resulting occasionally in death has become reported. Besides, there are instances of open sea pirates and robberies warranting a concerted effort to prevent recurrence of such incidences and protect the lives and property of those engaged in fishing. It is recommended that the government may consider suitable

security and legislative measures to protect the personnel engaged in fishing.

4. Current annual marine fish production by capture is of the order of 3 million tons. This is close to the maximum sustainable yield in the currently fished grounds. About 65% of marine fish landings in the country are taken by the mechanized vessels particularly trawlers and therefore addition of new vessels to the existing fleet is not desirable. It is hence recommended that the concerned state governments do not permit additional vessels in the presently fished grounds. Presently only the mechanized fishing vessels are registered. There is requirement of registering all the existing and new fishing vessels.

5. Government of India need to appoint a taskforce to organize the required activities related to ornamental fisheries and come up with a policy for sustainable harvest and export of marine ornamental fishes. The country is blessed with vast resources of marine ornamental fishes along Tamil Nadu and Andaman & Nicobar Islands on the East Coast. Moreover, due to the association of these fishes with the coral reefs, concerns/fears are expressed in different forums on matters relating to environment,

intellectual property rights, degradation of habitat, marine biodiversity and overexploitation of these resources all of which are acting as factors against developing a sustainable ornamental fisheries.

6. Considering the importance of tunas in the export market and potential of additional employment in this sector, it is recommended that the government of India intensify tuna fishing in the country's EEZ by the Ministry of Agriculture and NFDB. A business proposal on this may be prepared by an expert committee. Later this proposal may be discussed with different agencies, private companies and community organization for its refinement and implementation.

7. **Marine Fisheries Research and Development Authority (MFRDA)** consisting of representatives of ICAR (Fy), MOA, MOC, MST (DOD, DBT), MOEF and all maritime state governments including the UTs, should be set up to oversee all the activities related to marine fisheries to overcome the interdepartmental coordination problems. Management plans by one country on the basis of the data available for that country will not be successful unless exploitation of the species in their entire range of

distribution and exploitation is taken into account. It is hence recommended that the Government of India accords due attention to this issue starting with the SAARC countries.

8. M. S. Swaminathan Committee recommendations on Coastal Zone Management replacing CRZ with CMZ have raised serious concerns among sections of fishers with respect to the its more favourable orientation towards developmental activities within the coastal zone as against the stringent regulations in the existing CRZ guidelines. There is fear among the coastal fishing communities that if this recommendation is implemented, the fishing communities would be displaced and their fishing based livelihood permanently disrupted. Hence the proposed policy shall seriously reexamine the recommendations in consultation with the affected fishers and come out with appropriate guidelines for protecting the interest of fisheries and fishers.

9. **Central Government has to play a major role in managing the rivers:** It was strongly felt that our large river systems flowing through different states need holistic action plan for their conservation and development. The past experience of conservation plan of such river systems has met

with little success mainly because water being state subject. It is recommended that our national river systems should be brought under the central control for effective conservation and management.

Licensing / contracting out the riverine/ stream stretches / lacustrine areas wherever possible and desirable for the purpose of increased livelihood development, revenue generation, conservation, angling and eco-tourism should be encouraged. Central govt. shall give a broad set of model guidelines for the states to adopt.

10. **Formation of nodal agency** for coordination with involvement of all related Ministries viz., Agriculture, Water resources and Ministry of Environment and Forest including related departments to manage the inland fisheries resources. The multiple ownership of open water resources and their conflicting interests make the inland ecosystems quite complex to manage. Property regimes based on different degree of contractual obligations and other shared property regimes shall also be considered. The inland water resources are subjected to multiple uses and therefore have multiple stake holders. Governance of such resources is difficult as it is

undefined. The policy shall take this complexity and diversity into account and formulate overarching guidelines and establish a coordinating agency involving all relevant Departments.

11. The water bodies are under different departments. They are also used for fishing and aquaculture. When they are not under the DoF the developmental intervention in the fisheries and aquaculture are restricted. Therefore the fishing rights of all types of water bodies should be given to State DoFs.

12. **Aquaculture should be treated at par with agriculture** for all purposes like tariffs and taxes, bank finance, crop insurance, electricity, water tariff, etc. Accordingly, the Kisan credit card facility should be extended to them and the benefits of the Prime Ministers Rojgar Yojna (PMRY), concessional electrical tariffs, etc. should be extended to the fish farmers.

13. **Land leasing policy for aquaculture should be revised** in all maritime states and UTs to ensure sustainable production and livelihood security based on evidences from success stories. Leasing period for a minimum of 5 years should be made. The preference to be given to fisheries

cooperative/ SHGs/ unemployed trained fisheries professional groups. Sustainability of production and equitable distribution of the income are the major concerns of inclusive development. When the leasing period is short neither the lessee nor the credit agencies are interested in bringing structural renovations. As a result productivity of the water bodies are not sustainable. Leasing policy for culture of shell fish, finfish and sea weeds should also be made for the use of coastal waters. **Seed / hatchery certification** be made mandatory for the production of quality seed and appropriate regulatory mechanism be put in place for ensuring availability of quality seeds. Certification of aquaculture inputs like feed, chemicals, drugs, probiotic etc should be made mandatory.

14. Promote watershed management approach in areas where aquaculture is concentrated. It should consider conservation, protection, restoration, recharging and other environmental factors. As far as possible, other farm activities shall be integrated for effective use of water and land resources. Water being a limiting factor, it is necessary to make sustainable use and conserve it. Guidelines on watershed should be prepared by an expert committee appointed by MoA.

15. Minimum hygiene standards should be fixed for processing and marketing: International standards shall be implemented for hygiene onboard fishing vessels, landing centers, and at the local processing units. Minimum infrastructure facilities for icing and cold chain should be developed at all landing centers to facilitate maintenance of hygiene and for getting good returns from the produces. Despite availability of standards very little is done to improve on ground the hygienic and sanitation conditions in most of the existing fishing harbours and landing centers. Also, there is no effective mechanism and a marketing network to utilize the bio-wastes from landing centers, peeling sheds, processing units and fish markets. Hence bio-waste management should be given priority. The policy shall provide for requisite investment for infrastructure development, result oriented implementation mechanism and capacity building and training of all stakeholders.

16. Safeguard workers in processing sector: This is very much needed so as to have better quality of life for labours and better output for the industry. The working place in most of the processing units is not hygienic and ergonomically comfortable. There

is also a need to train the labour on different safety measures. Prawn peeling is a painful exercise. The workers do not have sufficient place to work and they have to work in standing posture. All these may lead to health problems of the workers. Appropriate policy and regulations need to be introduced.

17. **Subsidies should be linked with sustainability:** Sustainable fisheries, if is being practiced by many a fisher folk around the world, produce not only tangibles and tradables, but also many intangibles like correction and preservation of environment or ecological factors. Therefore, subsidies *per se* are not bad, as long as they are net value adding in nature and may therefore be retained for net wealth creation by certain communities across the globe. Subsidies to navigation and communication devices lower down the costs and risks in fishing. However, subsidy to trawling is not likely promote sustainability. So, according to the need of the sector the subsidies should be decided.

18. **Strengthen domestic market for shrimps** with the required cold chain and market promotion activities. The potential markets in the cities need to be identified and these markets are to

be linked with the producers through a market chain. **Domestic fish marketing and market information network needs to be strengthened** to reduce exploitation of farmers and fishermen. **Market analysis and training on value addition for processors and vendors** is necessary to increase the realization of value from their produce.

19. In international fish trade, often importing developed countries resort to regulations in the guise of using environmental standards to protect their domestic markets. This has become a trade restrictive and discriminatory tool affecting export from developing countries. Experiences of TED, eco-labeling standards, tuna-dolphin debate illustrate this. WTO has also favored linking the environment issues to the trade. In this scenario, fisheries policy while in sync with international agreements shall strive to delink these two different issues and provide institutional mechanism to develop strategies for international trade negotiations.

20. **Fisheries Council of India**, similar to the Indian Veterinary Council, All India Council for Technical Education or the Indian Medical Council needs to be established to develop and maintain

norms, standards and curriculum for fisheries education in the country. It is recommended that the ICAR initiates consultations with the UGC and Government of India towards fulfilling this.

21. Considering the challenges facing fisheries sector, the DoFs need to revamp and reform their recruitment policy and processes wherein fisheries professionals shall be preferred for recruitment. Regular refresher training and need based capacity building shall be made mandatory for career advancement. The DoFs have to upgrade their know-how in the emerging fields of fisheries science. There is also a need to augment social skills of DoF personnel to impart co-management and participatory extension.

22. The service delivery system is mostly top down. Often the felt needs of the target communities are not taken into account and addressed. As a result the services are not reaching to the needy persons. Service delivery system should have bottom up approach based on realistic needs.

23. Encourage women in seed production, homestead aquaculture, marketing, etc. There should be greater economic and

gender equity for more inclusive growth. The economic participation of women in aquaculture activity is minimal at present though there is scope for their greater involvement. Gender - mainstreaming has to be an integral component, including more gender sensitive programs in marketing.

24. **Strengthening database** in fisheries is essential. Fishers and fish farmers should be provided incentives to supply data on catch and other related aspects of fisheries management. DoFs should develop a mechanism for such collection and analysis of the data. Departments of Fisheries can develop a **marketing information cell** to update the market rates of different species in different districts. There is also a need to promote fishers'/farmers' associations to generate market information.

1. Introduction

Fisheries and aquaculture are vibrant economic activities, and have been the fastest growing food production systems during the last three decades. Their significance and contribution towards agricultural (4.6 per cent GDP) and national economies (1.3 per cent GDP), livelihood and nutritional security, employment generation (11 million people) and foreign exchange earnings (Rs.7, 245 crores) have been enormous though understated so far.

The overriding challenges have been and still are producing adequate and cheap food fish for all and improve the quality of life of fishers and farmers. This could be achieved only by addressing the issues of underutilisation and low productivity in inland water bodies (rivers, canals, lakes, flood plains, reservoirs and ponds), sustainable development of aquaculture, huge post harvest losses, poor quality and low value addition, unregulated domestic markets and protective global markets, and the low level of domestic fish consumption.

Realising that the extent and quality of development is to a large extent conditioned by the given policy, regulatory mechanism and enabling institutional environment, and the lack thereof in the Indian context, CIFE, Mumbai, has taken a

lead role in facilitating the process of developing an overarching Fisheries and Aquaculture Policy Framework at the Centre and a Comprehensive Fisheries Policy in the States. People's participation in evolving the policy guidelines has become very important, particularly in the context of effective implementation and to overcome potential conflict of interests. Also, it is imperative to accommodate the essential elements of FAO's Code of Conduct of Responsible Fisheries, India is signatory to it, in the National and State level policies by adapting to the local and regional requirements. CIFE has decided to facilitate this process by organizing consultative and participatory meeting at different levels involving all the stakeholders i.e. organising five zonal workshops across the country and a concluding national workshop.

The first Zonal Workshop was conducted in Guwahati during 7-8 December, 2006 involving all the North Eastern States. The present workshop, 'Fisheries and Aquaculture Policy: Ecosystem and Livelihood perspectives in East Coast States', was second in the series which was organised at MANAGE, Hyderabad during 22-24 March, 2007 involving all the East Coast States of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Puduchery and Andaman & Nicobar Islands.

The Workshop was organized jointly by Central Institute of Fisheries Education

(CIFE), Mumbai and PREPARE, a Chennai based NGO working in the coastal fishing villages of Tamil Nadu, Andhra Pradesh and Orissa, and in partnership with Department of Fisheries, Andhra Pradesh with the following specific objectives:

- To review the policy related issues and recommend inputs for developing policy to support sustainable fisheries and aquaculture development
- To critically examine the services delivery systems in terms of its adequacy, accessibility and quality, and evolve an effective model with approaches and strategies
- To assess the present Human Resource status as well as the future requirements for fisheries and aquaculture development, and prepare strategies for HRD.

There were 87 participants representing stakeholders from Directorate / Department of Fisheries (Secretary/ Commissioner/ Director / Deputy Director), Representative Fishers / Farmers, Representatives of Co-op Societies and NGOs, Entrepreneurs / Commercial Farmer/Fisher, Industry Representatives, Academicians (ICAR/ SAU), Planners and Policy makers in the government, PREPARE personnel and CIFE faculty. The workshop consisted of

inaugural session, policy status overview session, parallel working group discussions, plenary session and a concluding session. About 180 participants consisting of Secretaries, Directors and other Staff of Fisheries Departments, Scientists, NGOs, Fishers, Farmers, Bankers, Entrepreneurs actively participated in the workshop with open mind which was conducted in a truly consultative and business like mode.

The workshop had inaugural session, where the dignitaries from the participating states and Union Territories (UT), the Fisheries Ministers of West Bengal and Andhra Pradesh among others, expressed their views on the need for a policy in the sector and its emerging policy issues. The workshop was divided into different technical sessions like Status of Fisheries and Policy Overview of each participating States, Policy Issues in Capture Fisheries, Policy Issues in Aquaculture, Policy Issues in Processing, Markets and Trade, Policy Issues in HRD and Service Delivery System wherein invited presentations were made to throw pen the policy issues in different sub sectors by different stakeholders.

In addition, four sub-sector based work groups were formed on each day which discussed the issues in detail and identified policy gaps existing in the different production systems of fisheries

and aquaculture in parallel sessions while the summary was presented in the plenary session. The groups were formed on the basis of expertise and work experience and with adequate representation from different stakeholders. Each group had a facilitator who facilitated and moderated the session, a team leader who summarised and made the presentation before the joint house and a rapporteur who document the proceedings of the group. Based on the work group interaction and outcome a joint session was held wherein the summary of each work group discussion presented and specific recommendations/ action points was evolved collectively.

The expected outcomes of the workshop were:

- Sectoral and cross sectoral issues that deserve policy consideration
- Factors confronting quality service delivery system in the fisheries sector
- Institutional weaknesses and prioritised HRD requirements at various levels
- Recommendations for improving service delivery system including strategies and approaches, institutional strengthening and HRD support.

2. Inaugural Session

The inauguration of the workshop was addressed by the many dignitaries. Shri Kironmayee Nanda, Hon'ble Minister of Fisheries, Government of West Bengal was the Chief Guest of the function and Shri Mohd. Fariduddin, Hon'ble Minister of Fisheries, Government of Andhra Pradesh was the President. Dr. P. V. Dehadrai, Ex-Deputy Director General (Fisheries), ICAR was the Guest of Honour.

Dr. Dilip Kumar, Director, CIFE in his welcome address explained the need for developing a frame work for National fisheries policy depending on the needs. He emphasized the fact that common property resources provide livelihood for millions of poor people and therefore a national policy is need of the hour. He also brought to the notice of the audience that the compliance level is extremely low throughout the country which needs to be tackled. He further mentioned that there is no dearth of aquaculture technologies but effective service delivery systems are lacking. There is no doubt that time has come for the government to involve resource users and also make use of their indigenous knowledge. He informed that fisheries policy is one of the niche areas of CIFE and the findings of all the five zonal workshops will be collated to prepare the framework.

The keynote address was delivered by **Ms. Norma Alwares**, one of the renowned Advocate of Goa High Court and Social Activist. She informed the audience that despite the regulations, destructive fishing methods are being carried out in different areas of the State. In addition she said that the industrial fishing pollutes the environment and this again had adverse impact on fish production. She expressed her dismay that despite plethora of Acts for regulation, none seek to enhance or promote resource base. She also stressed on the need to give priority to sustainability over increased production and the rationale of closed season should be based on scientific data. She brought to the notice of the gathering the fact that the existing CRZ I Notification dose not account for seaward side of high tide. For the welfare of fishers, she suggested to consider several post harvest activities. She however emphasized that the national law must be in conformity with the international laws. She expressed her dismay at the constitution of committee empowered to look into the Maritime Zones Act, 2005 which does not include the stakeholders. Ms. Norma expressed her appreciation for CIFE in organizing this workshop and also for ensuring the participation of stakeholders.

The Guest of Honour, **Dr. Dehadrai** stressed on people's participation in evolving the policy guidelines. He

appreciated the efforts of Minister of Fisheries, West Bengal for bringing about low cost fish production and making aquaculture sustainable. He mentioned the example of East Godavari district where the farmers face the problem of high input costs and need for suitable policy interventions. He touched upon the functioning of the joint venture vessels during 1981-86. There were 186 deep-sea fishing vessels that were not supposed to fish within 50 m depth. However, he said due to weak political will power, the scheme did not take off as anticipated. He mentioned there is definitely need to have deep sea fishing vessels with equity participation of fishers. He also opined that more purse seiners should be operated for exploitation of quality fish like tuna that are at present mainly exploited by long lining.

Dr. Dehaderai emphasized on enhancement of reservoir fisheries in W.B. and development of wet-land water bodies in A.P. He opined that Code of Conduct of Responsible Fisheries to which India is signatory needs to be modified as per the local and regional requirements. He made specific mention of ornamental fish rearing activity for which Self Help Groups could be formed. Finally he emphasized that the interests of artisanal fishers should be the utmost priority in designing any policy framework.

Shri. Mohd Fariduddin, Hon'ble Minister of Fisheries, Andhra Pradesh in his presidential address emphasised the need for a National Fisheries Policy to enhance/improve Indian's position among the fish producing countries in the world. This, he said, would be possible only through strategic planning and joint efforts by both scientists and planners. He also stressed on the need to evolve consensus among the stakeholders while formulating guidelines. The Minister advocated an ecosystem approach.

He recommended that the new policy should define the responsibilities of stakeholders, provide welfare measures, regulations based on ecosystem and management of natural resources. He hoped that the workshop will be able to bring out implementable recommendations and he wished the workshop all the success.

Shri Kiranmayee Nanda, Hon'ble Minister of Fisheries, West Bengal in his Chief Guest address appreciated the efforts of CIFE in formulating the guidelines at the right time when the eleventh plan is just round the corner. He said that the East Coast States are highly resourceful and contribute substantially to the export earnings to the country.

Dr. Jacob D. Raj, Executive Secretary, PREPARE proposed vote of thanks to the dignitaries and all the participants.

3. Technical Session I: Status of Fisheries and Policy Overview

The first Technical Session 'Status of Fisheries and Policy Overview' consisted of detailed presentation from Department of Fisheries of the participating States covering the status of fisheries resources, level of exploitation and production in their states, and flagging of the policy related issues requiring intervention. The session was chaired by Dr. P.V. Dehadrai, Former DDG (Fy), ICAR. Ms. Aarthi Sridhar, ATREE was the rapporteur.

Andhra Pradesh

Dr. V. Raghothama Swamy, Joint Director, DoF, Andhra Pradesh presented an overview of the fisheries sector the prevailing Fisheries and Aquaculture Policy in Andhra Pradesh and highlighted that fisheries sector is contributing 2.36% to the G.D.P (2005-06). The quantity of fish / prawn produced was 8.91 lakh tones with a value of Rs. 6929 crores (2005-06) which provided employment to 14 lakhs fishers directly or indirectly. The State is contributing about Rs.2500 crores by way of marine exports, which is nearly 40% of the marine exports from India. State Fisheries Department is dedicated to the Integrated Fisheries Development and Welfare of Fishermen. The State, he said, is first in brackish water shrimp production and freshwater prawn production in the country and second in freshwater fish

production, fifth in Marine fish production, and second in total value of fish/prawn produced. Existing Fishery policies and the related Act and Rules governing the fisheries department activities in AP, he said, include Indian Fisheries Act 1897 amended in 1961, AP Co-op Societies Act, 7 of 1964, Policy related to Management and regulation of Reservoirs / Rivers, A.P Marine Fishing (Regulation) Act 1994 and Rules 1995, A.P Aquaculture Seed (Quality Control) Act, 2006 and Disposal of Fishery Wealth in tanks and Reservoirs (G.O. Ms. No 776 AH, DD, dated 31-12-1990).

Later, he brought out the basic concerns of the sector that includes: Low rate fish production, Lack of comprehensive Inland fishery policy, Silting up of tanks, Inadequate supply of inputs, Less varieties (Catla, Rohu etc) are cultured, Infestation of tanks by weeds, Additional levy taxes like, High power tariff, Inadequate conservancy measures, Old and conventional fishing methods, Lack of communication from shore to vessel, Inadequate fishing harbours, Unhygienic landing centres, Lack of concern for environmental protection, Inadequate credit facilities, Lack of coverage of aquaculture by insurance companies and Inadequate facilities for training.

The other concerns, he explained, include: Over fishing / Over capacity of fishing fleets, Enforcement of Marine Fishing

Regulation Act, Post harvest losses and wasteful fishing, Supply of ice and salt, Establishment of Cold storage and ice plants, Linking of remote fishing villages to markets and Creation of fish passages, fish ladders across reservoirs, dams. Identified research needs are Evolving site-specific good management practices, Production of disease-free, disease-resistant shrimp brooders in captive conditions, Diversified fishing method, Breeding of Murrell in captive conditions and Low cost preservation techniques and Promotion of organic farming. Policy, he said, should be for: maximizing the utilization of resources available in the state, achieving increased productivity and ecologically sustainable aquaculture, enhancing inland fish production and resource utilization through reclamation of beels / bundhs / reservoirs, introduction of appropriate technologies, and implementation of ornamental fishery and mud crab culture for socio-economic upliftment of poor womenfolk in rural villages.

In order to increase the productivity in aquaculture, following recommendations were offered: De-silting, de-weeding and widening of tanks in order to maintain water at right places to help maintaining sill level water storage, Connecting small tanks to channels and other tanks, Explore new approaches in stocking seed, Stocking of fresh water prawn in selected tanks to

increase production value, Auction of selected reservoir and adopt regular stocking with stock size fish seed, Establish disease diagnostic labs, Construction of rearing ponds to rear fish spawn to fingerlings/stock size seed at the same tank to avoid seed transportation from distant places, Drilling of bore wells near the tank periphery to pump water to the rearing ponds and to restore sill level to maintain crop period in seasonal tanks, Adopting culture practices with feed in selected water bodies without polluting the water for increasing production, Capacity building for fishermen societies and Credit facilities to fishermen for crop rearing and marketing

The other important policy issues for consideration include: Introduction pen and cage culture in canals / rivers / reservoirs / coastal areas, Exploitation of untapped marine resources in a sustainable manner and more emphasis on reduction of by-catch through participatory management program, Improvement in post harvest technology and food processing for value addition and creation of transportation infrastructure, More emphasis on development of infrastructure facilities in both marine and inland sector, Strengthening of domestic marketing system, Creation of domestic market infrastructure and augmentation of export earnings. To ensure utilization of funds through FFDA/BFDA and

technological know-how, Training for dissemination of technology, strengthening of research and development with special emphasis to the need of the area/field, Disease diagnostics and control facilities through setting up laboratories with latest state of art gadgets, Re-orientation of fishermen cooperatives with an aim to bring the resources for better management and enhancement of yield, Application of GIS and RS technology in fisheries sector for resource survey, and Enforcement of fisheries acts and rules for maintaining ecological balance between aquatic ecosystem and fishing activities are needed.

Recommended policy objectives of the state, he stated, could be: to achieve Sustainable growth of fisheries, to protect Aquatic Environment, to promote employment / exports, to provide affordable protein diet to the people and to achieve all round development of fishing community.

Tamil Nadu

Mr. Rangaraju, Joint Director (Inland Fisheries), Dept. of Fisheries, Tamil Nadu made a detailed presentation on Tamil Nadu fisheries with focus required policy interventions. One of the major issues is to overcome the conflict among the resource users, for which policy needs to be formulated to get inter-departmental support and for multiple-use management

of aquatic resources for fisheries, agriculture, domestic use, fisheries, wild life and environment conservation. In order to reduce fishing pressure in the inshore waters, it is felt that government shall encourage off-shore deep sea and high sea fishing by introducing intermediary vessels and by equipping the existing vessels for offshore fishing through soft credit and incentive support to fishers. Introduction of multi day fishing vessel and carrier / collector vessels may also be considered.

In addition, the following issues were highlighted for **policy intervention in marine sector**: promotion of joint venture for fishing in EEZ and international waters; introducing resource specific fishing vessels for tuna and squid fishing; providing information to the state fisheries department on fish stock and optimal exploitation level, fish availability on regular basis with the help of central institutions like CMFRI, FSI; implementing sea ranching program at least for selected commercially targeted fishes like shrimps; establishing FAD and artificial reefs along the coast in selected places; Strengthening the communication facilities through establishing well equipped fishers service centers / village knowledge centers; strengthening marketing network by providing cold chains facilities from the point of fish catch to retail outlets / export; educating fishers on hygienic

handling of fish harvested to realize more money for their catches; undertaking ecosystem based fishery management (eg. Fishing holidays during breeding season, Declare sanctuaries, Marine national park etc); banning destructive fishing practices such as dynamite / cyanide poisoning; pairing trawling purse seine operation; banning illegal poaching of species; permitting fishing in restricted area; regulating pollution which affects the natural ecosystem; promoting participatory management in fisheries, sharing the responsibilities with fishers and Non-Governmental organizations to promote Sea ranching, Setting up of Artificial reef / fish aggregating device for resource enhancement; including integrated coastal zone management plan, both in capture and culture fisheries as a vital program.

For the development of inland fisheries, one of the major interventions shall be strengthening of conservation programs like watershed development and introduction of percolation tanks which in the long term may help aquatic resources in riverine system as well as farm ponds. Other issues highlighted were: micro level planning should be introduced to classify the water bodies to develop resource specific fish culture technology; open water bodies are to be classified into different categories taking stock of the water availability, period and depth, and

suitable package of practices are to be evolved for different categories of water bodies; candidate species are to be identified and culture technology standardized / perfected so as to use the short seasonal tanks having water tentatively for 3 to 6 months; fishing rights of the water bodies irrespective of ownership should be vested with fisheries department so as to plan well in advance and lease the water bodies in right time; lease period shall be changed to *fasli* year (July to June) instead of financial year (April to March); adequate credit facilities and financial assistance shall be provided to the Fishermen Cooperative Societies to take up fish culture.

Issues with regard to **development of reservoir fisheries** may include development of different management models after taking stock of the availability of water period, depth, quality, quantity of water for fish production and productivity to utilize the small / medium / large reservoir resources effectively; ensuring availability of stock size fingerlings for stocking by creating necessary infrastructure and also promoting seed rearing in cages; replacing the present system of stock-harvest method with culture based system to enhance the unit fish production; promotion of cage culture and pen culture wherever possible and feasible; dead storage level / fish passes to be provided

in all the newly constructed reservoirs; the existing management system of leasing, share fishing and licensing to be reoriented with participatory approach to enhance their livelihood option and increase fish productions; Self Help Group, inland fishermen society may be involved in reservoir fisheries by providing necessary technical skill and financial support; Public-private partnership (PPP) in reservoir fisheries management may be tried on experimental basis by providing due importance to the conservation of fishery wealth.

It was strongly felt that aquaculture shall be treated on par with agriculture for its full fledged development. Also aquaculture can be well integrated with agriculture since the fish culture involves no water consumptive value. The other commercial aquaculture activities such as Hatcheries, Coastal aquaculture, Ornamental fish culture shall be treated on par with Cottage / Tiny Industry for electricity power tariff. The research shall be geared up to identify suitable candidate species for the utilization of short seasonal tanks and also be diversify the carp based culture in inland sector and shrimps in coastal aquaculture. Registration of fish seed farm and fish seed certification to be brought under regulation so as to ensure good quality of seeds. Modern technologies like cage culture, pen culture are to be promoted

involving Self Help Group / Fishermen Cooperative Society to enhance unit fish production. The Government shall curb over exploitation of native ornamental fishes from the natural ecosystem. The research institutions should develop technology for breeding and rearing of native ornamental fishes. The Government shall simplify the procedures for the import of ornamental / shrimp brood stock. Quarantine infrastructure / procedures to be developed and implemented with necessary legal support. The coastal areas, those are not suitable for agriculture or any other purposes, shall be delineated as aquaculture zone. The unproductive government lands in the coastal areas shall be leased for coastal aquaculture development. Coastal shrimp farms shall be regulated as per the Coastal Aquaculture Authority Act 2005.

ORISSA

It was revealed that Department of Fisheries, Orissa, target: To double the present level of inland fish production of 1.90 lakh MT in coming three-five years and enhance state fishery product export from the current level of around Rs.350 Crores to Rs.1000 Crores in coming three to five years.

Marine Fisheries envisaged: Launching of state supported stock assessment survey; Promoting intermediary craft of 15-17 mts.; Regulation & rational distribution of

shrimp brood stock; Ban on shore seine fishing/prawn seed collection in coastal areas/river mouths; Introduction of sea ranching; Dredging of river/fishing harbour mouths of eastern coast; Revival of Marine Cooperatives & Federations under assistance from NCDC/FISHCOFED; Encouraging people's participation in conservation and policy making; Studying impact of gill-netters in turtle mortality; and Developing alternative livelihood programme for the affected fishermen during turtle season/in sanctuary areas.

Inland Fisheries was discussed and issues that were highlighted were: The issues highlighted under this were: Resource inventory for correct & reliable data base are to be made; Community friendly comprehensive lease policy for long term lease of GP/Revenue tanks to be developed; private sector on seed production to be encouraged; Proper seed certification mechanism to be developed; Data base to identify various aqua-climatic zone to be developed and package of practices for each zone are needed to be Standardized. The other issues were; Entrepreneurship development of aqua-farmers; Diversification of culture technology; Improvement of genetic and bio-diversity and giving Thrust for freshwater prawn culture.

Riverine Sector had the issues like Need for strict conservation regulation;

Introduction of river ranching; Conducting resource inventory survey by research institute taking the help of satellite imagery data; Fixation of river water quality optimal standard for pisciculture; Maintaining minimum river water flow throughout the year for sustenance of indigenous stock.

Reservoir had issues like Enforcement of conservation regulation; Policy for settlement of reservoirs; Fresh resource inventory for mean water spread area; Appropriate management strategy for individual reservoir; and Registration of fishermen, boat & nets.

Brackishwater Fisheries had issues like Not levying of water tax & land conversion charge on shrimp farming; Electricity tariff for aquaculture should be at par with agriculture; Incorporating farmers-representative in DLCs & SLCs under AAI; Liberalization of sales taxes on seed & feed; Providing wider coverage of institutional finance & insurance; Eliminating/controlling White Spot Disease; Certification of seed should be made mandatory; Banning the use of antibiotics and harmful chemical; Ensuring proper FCR for shrimp feed; Diversification of culture technology for shrimp farming; Production and distribution of quality brood stock; Quality up-gradation of infrastructure and providing assistance to export houses to maintain EU norms.

Puducherry

The main objectives of the Department are to augment marine and inland fish production and to improve the socio-economic status of the fishing community, thereby, generating rural employment opportunity in the UT and meeting out the food requirements of the nation. To accomplish the above goals various development and welfare oriented schemes are formulated and implemented in an effective manner from time to time placing greater emphasis on production-cum- employment oriented activities. Presently, special attention has been given on conservation and management of marine, brackishwater and fresh water resources on sustainable basis besides bestowing focus on provision of social security to old aged fishermen and on safeguarding all sectors of fishers either directly or indirectly involved in fisheries sector with special preference to artisanal fishermen.

Marine fishing regulation bill has been formulated and approval of the Govt. of India was recently obtained by the UT. The said bill has to be placed before the forthcoming assembly session for its enactment. Meanwhile as executive order of Lt. Governor imposing total ban on fishing is enforce since 2001. The costal zone regulation as envisaged by Govt. of India has been strictly adhered to and it was being monitored by the Department of

Science Technology and Environment. As total ban on fishing has been enforced in the UT of Puducherry since 2001, relief measure to a tune of 100 Kgs rice and Rs.500/- as cash extended to the all the fishermen families in order to make food loss of profession. The measure adopted by this UT has been appreciated by the National Board. The failure to manage fishery recourses monitor and control over illegal fishing practices has to be attributed to the lack of separate full pledged staff pattern with sophisticated fishing equipments inclusive of patrol boats as prevails in other countries like USA. The monitoring wing has to be de linked with Departmental activities and the violators should be punished. There should be co-ordination with other Departments like forestry Science Technology and Environment on the aspects of conservation and preventive measures against pollution.

Coastal and Brackishwater Aquaculture has emphasized on macro level survey conducted to identity the potential of Brackishwater resources in the UT of Puducherry. This revealed that about 1209ha are reported to be suitable for taking up Brackishwater aquaculture. Harvest of the shrimp yield in a Ha ranges from 750 to 1000Kgs per yield of 4 months and the harvest is being disposed in the farm premise itself. The socio-economic conditions of the nearby inhabitants are

enhanced by providing drinking water facilities, interconnecting road facilities, employment opportunities etc., and through the adoption of shrimp farming. No adverse impact has been reported as per report on Environment Impact Assessment conducted by CMFRI-Kochi. Besides, as per survey conducted by CIBA, 45 KM coastal and 1209 ha of brackishwater area offers ample scope for undertaking coastal aquaculture, such as seaweed culture, sea bass culture, mud crab/lobster fattening, mud crab cage culture etc. As a pilot project, the administration has taken up seaweed culture by imparting training to fisherwomen self help groups. In general, composite fish culture is predominantly undertaken in these water bodies. Culture of giant freshwater prawn (Scampi) is also carried out in same packets of this UT. The average inland fish yield from these resources is estimated as 200to2200 Kgs/ha/annum.

Andaman & Nicobar Islands

Marine Fisheries Regulation Act 2003, as learnt, states that the period commencing from 15th April to 31st May every year is a closed season for fishing and 1st May to 30th September every year shall be closed season for shell fishing. Catching or collection of all marine ornamental fishes, including Butterfly fish, Scorpion fish, Damsel fish, Parrot fish, Angel fish, Doctor fish, Puffer fish, Cat fish, Surgeon fish, Sea

Anemone, Clown fish, Turbo worm, Sponges and any other fishes as may be specified by Notification in the Official Gazette from time to time are prohibited during the period.

Freshwater Capture Fisheries in the islands is not there in the island. The subsistence fishery is very marginal, mostly comprising air-breathing fishes like cat fishes (singhi, magur), *Anabas*, Tilapia etc. IMC grown in the ponds are harvested around 50 tonnes annually. Lack of adequate infrastructure for fish landing, preservation, storage, processing, transportation and marketing are the major problems.

Brackishwater Fisheries is limited to collection of crabs, shrimps and a few varieties of fishes like mullet and sea bass. Issues of concern in this area are: Lack of technical man power; inadequate information on the resources-availability and distribution; lack of focused policies for fisheries development; lack of adequate technical know-how for hatchery production of marine cultivable fishes for culture purpose.

Policy gaps observed were: No policy with respect to cage culture and deep sea fishing; No policy for identifying Tuna Fishing Zones of Andaman; No infrastructure for fishing harbor in the vicinity of such tuna fishing areas; No

policy with respect to brackish water aquaculture-particularly shrimp culture in the post tsunami scenario; No policy for oceanic fishing; No appropriate Coastal Regulation Zone (CRZ) to suit the Island condition keeping in view of development of fisheries; No conservation policy of Marine resources such as coral reef, coral fishes, conservation of nursery ground in mangrove areas, conservation of important marine resources such as Dugong, Dolphin, Whale, Sharks, endemic mollusks etc.; No single window clearance with respect to various projects related to fisheries; No policy with respect to export of hatchery produced naupli and post larvae from mother prawn of Andaman; No quarantine policy with respect to import of aquatic organism associated disease; No guidelines on exploitation possibilities of surplus marine resources, such as, sea cucumber, sea urchin etc; No specified area marked for the entrepreneur having the capability of doing deep sea fishing; No area marked for the traditional fishermen; and No guidelines to develop Eco- tourism, particularly with respect to, coral reef fishes and even mangrove related tourism can also be developed.

Infrastructure gap analysis revealed that some of the issues are of urgent nature and they are; Easy transportation facility by sea and air needs to be developed for sea food product; Introduction of tuna fishing vessels such as long liners, mother

vessels with facilities for sashimi grade tuna etc are needed;

Technology gap analysis depicted that the prospects of cage culture of groupers and snappers are not explored. Import of hatchery technology of groupers and snappers etc are required. Import of technology for sea worthy cages is also required.

4. Technical Session II: Policy Issues in Capture Fisheries

The policy overview session was followed by Technical Session II: Policy Issues in Capture Fisheries, and Technical Session III: Policy Issues in Aquaculture wherein invited presentations by experts gave a brief overview of the sector and threw open various pertinent issues requiring policy interventions and gave leads for more detailed discussion in the work groups.

Dr. V. Sriramachandra Murty made an elaborate presentation on the policy issues in marine capture fisheries. He critically evaluated the constituent elements of the present Marine Fisheries Policy of 2004, basing his argument on the premise that it is only marine *fishing* policy rather than a fisheries policy as the nomenclature misleadingly suggests, underscoring it as one of its major weakness. The policy advocated protection, consideration and encouragement of subsistence level fishermen, technology transfer to small scale sector and infrastructure support to industrial sector. The policy deals with the following areas *viz.*, harvesting of marine fish resources, post-harvest operations, resource management fishermen welfare, environmental aspects, infrastructure development for marine fisheries, legislative support and the development of

fisheries in the Union Territories of Lakshadweep and Andaman & Nicobar Islands. He opined that the Policy however, concentrated mainly on mechanized and deep-sea fishing and the associated infrastructure etc. "Areas such as use of information technology, strengthening of database in marine fisheries, Human Resource Development, eco-labeling of marine products, would also be paid needed attention". He opined that the areas which requires policy support includes small-scale (artisanal) fisheries, ecosystem management - marine biodiversity, marine ornamental fishes, elasmobranches, HRD, research, governance and co-operative research. He also advocated for the need for international cooperation in the region

Mr. Sebastian Mathew in his presentation discussed the limits of the present dominant fisheries regulatory/management regime and highlighted the possibilities of alternative and more useful regimes in view of the fast declining capture fisheries production and vulnerable fishers' livelihood. He opined that during the last 25 years, marine fish production and total number of marine fishers doubled with a significant increase in the fleet size of mechanized and motorized fishing vessels and decline in the size of non-motorized fleet (five-fold increase in trawl fleet; four-fold increase in purse seine fleet; six-fold increase in

gillnet fleet, etc). However he questioned whether the expansion of fishing capacity commensurate with available fisheries resources and cautioned that the marine ecosystems negatively impacted by fisheries.

He suggested that fisheries management is required to rebuild, restore, or maintain any fishery resource and the marine environment. He explained about the Current Fisheries Management Regimes in India for Domestic Fishing Vessels and indicated that the problems with current fisheries management regimes include existence of a top-down approach, lack of legitimacy, poor institutional arrangements (paucity of technical skills and financial resources), lack of enforcement capacity even in harbors and fish landing centres, *de facto* open access in territorial waters, economic over-fishing, and biological over-fishing.

He suggested that participatory Fisheries Management Regimes would be better in ensuring community / coop / association / trade union participation in planning and implementation of fisheries management, by capacity building, decentralization (Panchayat institutions), co-management or shared management responsibility between the government and the community or other parties (considering the issue of power, hierarchy, scientific knowledge vs. traditional knowledge,

costs, etc). He advocated that there needs to be rights-based fisheries which is a formalized system of allocating individual fishing rights to fishers, fishing vessels, enterprises, cooperatives or fishing communities. There is a need to meet development goals and to address poverty and food insecurity within the framework of conservation and management of fisheries resources. Protection of marine and coastal ecosystems was emphasized.

Dr. Latha Shenoy during her presentation on sea safety and security highlighted the need for safety measures and informed that fishermen are just one percent of the world's workforce, but accounting seven percent of the occupational deaths in the world with 26,500 fatalities annually and positioning number one in the occupational deaths. She also pointed out that there is no international or national law to enforce the construction of small vessels and safety equipment required training and certification of fishermen in small-scale fisheries. Half of the world's fish catch is coming from small-scale fisheries. She enlisted the different factors endangering Sea Safety as lack of appropriate safety equipments, lack of access to weather predictions, lack of training on sea safety practices, no regulations for design and construction of small fishing boats. Basic data related to types and causes of accidents lacking.

She further said that there is no code of safety for artisanal and small fishing craft less than 24 m and there is inadequate availability of search and rescue operation services. She also informed about the organizations and voluntary guidelines concerned with the code of safety for fishermen and fishing vessels, and the initiatives in sea safety measures across the world. She cautioned that except India's Merchant Shipping Act, which contains provisions stipulating that all fishing vessels should carry safety equipment (shipping with mechanical propulsion), there is no direct regulation or convention on small-scale fishing vessels safety. All the maritime states along the east and west coast have enacted Marine Fisheries Regulation Act. But the enforcement machinery is inadequate and compliance level very low.

She recommended that integration of safety issues into Marine Fisheries Policy, regulation and enforcement of design and construction standards and materials. Better-designed boats provide better working and living conditions besides facilitating efficient fishing operations and achieving fuel economy and education and training need to be imparted in effective warning and communication system, search and rescue operations, simple navigation, causes and types of accidents, behavior in marine accidents and survival at sea are the major programmes which

are required for enhancing sea safety measures

Inland capture fisheries: Dr. K.K.Vass in his lead presentation explained that the river ecosystems are not merely the channels to transport water, but complex ecological systems which support large biological diversity, human and their activities. He stressed upon the dynamic three-dimensional systems, dependent upon longitudinal, lateral and vertical transfer of water, material, energy and biota and the five elements viz., Riparian zone, Physical structure, Water quantity, Water quality and Organisms, determine its structure and function.

He detailed about the elements of River Conservation Policy which should encompass Remedial, Preventive, Institutional, Capacity Building, Social, Economic and Legal parameters. The remedial policy attributes includes by way of ensuring Environmental flows, Habitat restoration, Land-use planning, Wastewater treatment and Planting Riparian Buffers. He detailed about the Socio-economic aspects of human use on river systems which include settlements, housing, family and social system, caste system, education, health care, economic system, water availability, development activities, grazing, tourism, environmental degradation, resource use pattern, sand mining, river bank and bed cultivation, and

profitability of agriculture/ aquaculture as an alternative livelihood

He outlined the major issues of river fisheries which included water abstraction, damming of rivers resulting in flood, construction of engineering structures; deteriorating water quality and environmental flows. He also highlighted about the fish species affected by dams in the major river systems like Ganga, Indus, Mahanadi, Cauveri and Krishna. He cautioned about the growing and conflicting demands for water on issues of food security commercial farming, fishery, domestic needs, increasing urban population, hydropower projects, industry, and damage due to rampant pollution.

He cautioned the major challenges in the riverine fisheries and suggested that the river fishery has to remain a contributor for inland production. Techniques have to be developed for different enhancements, mechanism to mitigate riverine loss which calls for major policy, financial and technology support at various levels to harness its potential. He suggested the different strategies for improving fish production which included coordinated efforts by fisheries, water authorities and environment department to prevent and reverse environmental degradation, rehabilitate aquatic habitats to sustain & enhance fishery, promote community based fisheries management practices in

common property resources, rivers and associated wetlands, estuaries and reservoirs, increased participation of fishers and fisheries personnel in allocation and use of water, coordinated action to conserve fish stock in natural waters at existing exploitable levels, implement system specific fishery management plans in reservoirs to offset riverine loss, appropriate institutional and policy support, provide congenial enabling environment for open-water fisheries development, issues of ownership, leasing, financial, technical support and the prime recognition of fisheries as one of the major development activity in reservoirs and wetlands. He outlined about the National Environmental Policy Approved by Cabinet in May 2006 which might provide an endeavor to resolve the ostensible conflict between conservation and development.

Dr. C Vasudevappa explained about the growing importance of Inland Fisheries and Aquaculture on account of providing food security, poverty alleviation, social well being, employment generation and economic development. He expressed his concerns on the threats to aquatic ecosystem due to the increase in population and anthropogenic activities, inorganic fertilizers, pesticides, herbicides and silt inflow, disposal of solid and liquid waste, transportation, municipal needs, damming for energy and irrigation and

floods and droughts. He suggested that the ecological approaches for inland fisheries policy should address biodiversity of fauna and flora, nutritional security and long term sustainable fish production. The restoration of the aquatic ecosystem should address policies to preserve and protect aquatic resources, restore ecological integrity, restore natural structure and natural function and work within the watershed and broader landscape context, understand the natural potential of watershed, address ongoing causes of degradation, focus on feasibility for anticipated future changes, involve the skills of a multi disciplinary designs for self sustainability, restore native species and avoid extortive species and use natural fisheries and bioengineering techniques. He suggested that the policies to address ecosystem management issues should include integrated catchments management, involvement of the locals and facilitate locals, support for environmental impact assessment (EIA), water resources management and land use planning, system approach recognizing individual component and establishing linkages between them

5. Technical Session III: Policy Issues in Aquaculture

Dr. Brij Gopal in his presentation reiterated that the policy is formulated for the wellbeing of fishers and the community involved in fisheries and aquaculture. Therefore the ideas should emanate from them. Their aspirations should be reflected in any policy matters. Further he sensitized the gathering that the maximization of production is not the right policy and the impact of fisheries on other components of the ecosystem shall be looked into. He cited the example of Kolleru Lake as aquaculture activities deteriorated the surrounding ecosystem and Supreme Court has to order its ban. Are we interested in quantity only or quality/healthy fish, he questioned. He also cautioned that the ground water contamination due to high organic load contributed by fish pond, Carrying capacity of the water sources, conflict between upstream and downstream uses and users, social and health problems shall be taken into consideration while we practice aquaculture.

Dr. M. V. Gupta, World Food Prize Laureate, in his presentation brought out the grave situation of plans and programs which emphasize production only not the livelihood and food security. He brought to the notice of the audience that production contribution from rural community

resources and aquaculture production totally missed out in the Statistical Year Book published recently. He called for a pro-poor approach and specifically emphasized the policy need for the management of common property resources. He expressed concern over non-availability of quality seed and suggested for encouraging women entrepreneurs for quality seed production. Further suggested for allowing private sector in producing seed in those species where the technology is available and government sector to concentrate on seed production in new candidate species. He placed the responsibility on Government sector to supply brood stock to the private seed producers by establishing brood stock centers.

Considering the high cost of feed and its major share in the cost of production, he suggested integration of aquaculture with agriculture and developing low cost feed and selection of right species. Farmers' access to knowledge and technology shall be facilitated by reorienting and restructuring the present extension transfer of technology systems, developing ecosystem-based and market-oriented technologies. He stressed the need to provide formal credit at low rates and micro-finance system to the farmers. He emphasized that the exploitation of farmers by middlemen in the market shall be eliminated.

Open Forum

After the expert lead presentations the house was opened for discussion from the participants who fervently jumped to register their opinions and raise pertinent concerns.

A fisher from Vallapata in East Godavari district highlighted the social problems like poor education and low standard of living. He demanded subsidy on fuel to small mechanized boats, closed season allowance as exists in Pondicherry, enhanced group insurance cover, easy norms for insurance claim in case of death while fishing in the sea, saving-cum-relief schemes to reach the target group, protection of fisherwomen when their husbands are away for fishing, creation of cold storage facility and production of good quality seed in case of shrimp and brackishwater finfish.

Mr. Arjalli Dasu, Vizag blamed the coastal aquaculture for pollution and he also highlighted about non-availability of drinking water in the coastal areas. He expressed his concern over the government schemes not reaching the target beneficiaries and lack of adequate market infrastructure and the resultant exploitation by middlemen. He strongly opposed the idea of displacing the fishers for the development of industries and Special Economic Zones. He called for protection of traditional fishers as their

livelihood is at risk because of trawlers. He stressed the need to promote fisherwomen cooperatives and establish special educational institutions (one school in each village, one college in each dist) for children of fishers and health care facilities in fisher villages.

Mr. T. Selvarajan, Vice President, Mechanized Boat Owners' Association, Kanchipuram Tamil Nadu was of the opinion that the near-shore trawling results in reduction of fish catch where fishers from Tamil Nadu are forced to fish in Andhra Coast which leads to conflict between Tamil Nadu and Andhra Pradesh fishers. Therefore, the trawling should be banned and the fishers shall be better equipped to fish in deep waters. He called for the modernization, maintenance of sanitation and cleanliness, establishment of cold storage infrastructure at fishing harbours on war footing, uniform imposition of closed season coinciding with north-east monsoon season in the Bay of Bengal, and implementation of mesh size regulations. He reiterated that these issues are to be dealt properly to achieve the expected growth in the economy and creation on enough employment in the country.

Mr. Govarthan Behara, PREPARE expressed concerns about the displacement of fishing communities, change in profession, and migration

towards cities. **Mr. Gilbert** expressed his concern over pollution along the coastal areas due to brackishwater aquaculture and industrial development.

Mr Naidu Venkateshwer Rao, Traditional Fishermen Association, Kakinada, represented the poor and status quo condition of traditional fishers and still following the age-old practices without adopting the modern technologies. He stated that government agencies neither come forward to uplift their condition nor created awareness on existing resources, regulations on mesh size, nets, gear, etc. He expressed the anomaly over the mesh size regulation as nets are made by industrials therefore the responsibility of adopting proper mesh size should fall on them. He demanded creation of awareness among fishers. He expressed the state of displaced fishers from their native place on account of implementation of Coastal Zone Regulation. He suggested for making these fishers as co-partners in coastal zone management. He demanded for ownership right over ocean.

Mr. V Kondal Raydu, Prawn Farmers' Association, Ongole, Andhra Pradesh pleaded that the brackishwater aquaculture is not polluting the environment and to some extent salinization of soil and water might have taken place but no chemical contamination of the resources is observed. He

expressed the problems faced by the farmers and demanded for treating aquaculture on par with agriculture for all purposes (electricity tariff, water charges, taxation, subsidies, insurance, credit, etc.). He called upon the researchers and scientists to foresee the future developments and problems in aquaculture and educate the farmers accordingly to avoid problems that arise in future.

6. Technical Session IV: Work Group Discussions

After the expert lead presentations, the participants were divided into four parallel work groups namely on Policy Issues in Marine Capture Fisheries, Policy Issues in Inland Capture Fisheries, Policy Issues in Freshwater Aquaculture, Policy Issues in Brackishwater Aquaculture. These groups consisting about 25-30 participants representing Department of Fisheries, Representative Fishers and Farmers, Representatives of Co-op Societies, NGOs, Entrepreneurs, Commercial Farmers, Industry Representatives, Academicians and Researchers from ICAR / SAU and Planners and Policy makers in the Government in addition to the PREPARE personnel and CIFE faculty. Each work group held intensive parallel discussions to analyse the present regulatory environment, identify the policy gaps and outline appropriate interventions in each of the sub sectors.

The outcome of the work group deliberations are presented below:

6.1 Work Group 1: Policy Issues in Capture Fisheries

- **Fishing Communities:** The Swaminathan committee appointed by the Ministry of Environment and Forests, Government of India to review

the Coastal Regulation Zone Notification, 1991, proposed a "vulnerability line" which includes the sea to form territorial limits (12 nautical miles), including its sea-bed to the administrative boundaries or the biological boundaries demarcated on the landward side of the sea coast and recommended that this area should be taken up for an integrated, cohesive, multi-disciplinary and multi-sectoral coastal area management and regulatory system. There is a fear among the coastal fishing communities that if this recommendation is implemented, the fishing communities would be displaced and their habitations lost making them even lose their traditional avocation of fishing. It is necessary to review this recommendation so that the coastal fishing communities are not displaced. The coastal fishing communities are traditionally dependant on fishing for their livelihood therefore asserts that living on the coast is their right as the coast is an integral part of their livelihood. The fishing communities are of the view that the governmental decisions are not based on consultations with them. Hence they are seriously concerned on the matter of their traditional right to fishing and wish that all policy decisions related to the marine capture fisheries sector,

coastal regulation zone and infrastructure development along the coast should be taken after due consultation with the coastal fishing communities who are the primary stakeholders.

- **Artisanal Fisheries:** The rules pertaining to the marine sanctuary along the Orissa coast create difficulties for the movement of vessels between fishing grounds and the landing centres. The matter therefore requires reexamination and suitable revised regulations. It is recommended that the Government of Orissa take suitable action to ameliorate the difficulties of fishing boats and permit the movement of the fishing vessels along the coast. There are a total of 1, 81, 284 Artisanal crafts landing an estimated 1, 96,000 t (7%), 44, 578 Motorized (traditional crafts) landing 7, 00,000 t (25%) and 53, 684 Mechanised vessels landing an estimated 18, 20,000 t (68%). This shows that about one million households are dependent on the artisanal sector for their livelihoods. There is no clear-cut policy pertaining to the artisanal fisheries in India. The following interventions are necessary for managing the artisanal sector. Allocation of user rights and access control, Allocation of fishery resources (e.g. between artisanal, motorized and

mechanised categories); Ban on certain nets like the ring-seine, Shifting to management through community-based initiatives and adopting new participatory and co-management approaches, Access to alternate livelihoods, Integrating with other sectors including aquaculture and possibly, Agriculture. In the context of the existing system of responsibilities and multi-organizational Jurisdiction, this subject needs to be thoroughly discussed/deliberated and a policy paper brought out. It is recommended that the Government of India in consultation with the state governments formulate a policy in this direction.

- **Fleet Size:** Considering the current annual marine fish yield by capture is of the order of 3 million tons which is close to the maximum possible yield in the currently fished grounds and in view of the fact that about 65% of marine fish landings in the country are taken by the mechanised vessels particularly trawlers, introduction of additional vessels to the fleet is not desirable. It is hence recommended that the concerned state governments do not permit additional vessels in the grounds.
- **Community Welfare:** Introduction of a closed season for fishing is known to

be one of the ways of rebuilding overexploited stocks but such an action results in loss of livelihood for the fish workers. Added to this there is a growing concern that the fishing communities/industry were not consulted while formulating the rules for seasonal ban on fishing along the east coast states. Governmental interventions are required to provide alternative livelihoods to provide sustenance to the fishers during the ban period according to the Minimum Rural Employment Guarantees Scheme (MREGS). It is therefore recommended that the Government of India, Ministry of Agriculture in consultation with the concerned state governments initiate a formal dialogue with effected parties and revise the rules etc.

- **Protection to Fishing Vessels & Fishers:** The occurrence of clashes between the people of artisanal fisheries and mechanised vessels and between those of small and large mechanised vessels resulting occasionally in death has become common. Besides, there are instances of open sea dacoities and robberies warranting a concerted effort to prevent recurrence of such incidences and protect the lives and property of those engaged in fishing. It is recommended that the government may consider suitable security

measures for the personnel engaged in fishing.

- **Research:** Fisheries research is carried out by the ICAR Institutes in the country and a large number of scientists are engaged to fulfill the mandate of research. Considerable expertise has been built up over a period of half-a-century. The research is carried out in three major categories: Basic, Strategic and Applied. The Institutes with their own expertise and in consultation with the experts outside the system plan and execute the research programs. There is however need for consultations with the Industry, Fisher folk representatives, maritime state government, MOA, MPEDA, MOEF, DOD, Some NGOs while planning applied research. It is necessary that Obligatory arrangements be made. This would also prevent any possible duplication of effort while resulting in need-based research. It is recommended that the ICAR together with MOA, MOEF and maritime state governments formulate a policy of consultations on annual basis for planning and implementation of Applied Research Programs.
- **Marine Ornamental Fishes:** Marine ornamental fishes offer vast scope for economic activity through export and

in the process help in providing the livelihoods for the coastal fisher folk. The country is blessed with vast resources of Marine ornamental fishes along the Gujarat, Kerala, Tamilnadu, Andaman and Lakshadweep regions. Though adequate database and knowledge are available from the Lakshadweep islands, similar information is not available from other regions in the country. Moreover, due to the association of these fishes with the coral reefs, concerns/fears are expressed in different for on matters relating to environment, intellectual property rights, degradation of habitat, marine biodiversity and overexploitation of these resources all of which are acting as factors against developing a sustainable ornamental fish fishery. It is therefore recommended that the Government of India appoint a taskforce to organize the required activities and come up with a Policy for sustainable harvest and export of marine ornamental fishes.

- **Elasmobranchs (Sharks, Rays, Skates):** Most sharks are pelagic: Live in surface/ subsurface waters. Rays and Skates live on or close to sea bottom. Most elasmobranchs attain larger sizes and live relatively longer, they mature 3-4 years after birth and give birth to young ones. The number

of young ones produced is about 1-40 per female per year (whale-shark produces up to about 300 pups). These characteristics make them highly vulnerable to overexploitation. The potential yield of elasmobranchs in the Indian seas is estimated as 97, 607 tones comprising Sharks (70 species known) 45064 t, Rays (32 species known) 22658 t, Skates/guitar fish (8 species known) 3686 t and Oceanic sharks 26200 t. Total landings of elasmobranchs in the year 2000 was of the order of 72, 000 t and in 2003-04, 63, 000 t. However the database on these fishes is grossly inadequate for formulating any conservation/management measures.

Besides, there is global concern on Elasmobranchs: there are International Plans of Action pertaining to Elasmobranchs conservation / protection but the database and knowledge on the taxonomy, biology, distribution etc is grossly inadequate. Under this situation, the Ministry of Environment and Forests, Government of India Banned fishing of sharks in 2001 under the provisions of the wildlife act, which lead to a crisis-like situation from several quarters representing marine fisheries interests in the country. The ministry was explained that the ban was not supported by data/facts, focused study was essential for effective conservation and the information

on hand was not adequate. Though the MOEF initially agreed to support database acquisition, did not support the activity. This is mainly because the MOEF is not the nodal ministry for fisheries. Hence there is urgent need for building up database and knowledge on this resource so as to formulate measures for conservation while implementing the obligatory provisions in the International Agreements/Plans of Action. It is recommended that the Ministries of Agriculture, Environment and Forests come together and in consultation with ICAR to formulate strategies for database generation and conservation towards fulfilling the obligations and assist in conservation of the resources

- **High Sea Fishing:** The potential yield of oceanic tunas is estimated as 0.22 million tones which is not tapped presently for want of proper trained manpower and fishing infrastructure. Considering the importance of tunas in the export market and potential of additional employment in this sector, it is recommended that the government of India take immediate steps to introduce tuna fishing in the country's EEZ.

- **Conservation:** There is a ban on fishing for gastropods and bivalves in the Andaman Sea as a measure of conservation. There is however vast

potential for culture of certain species which are known to produce high economic returns. Moreover production through culture is a good measure for conservation. In the Andaman Sea there is vast potential for pearl production using blacklip pearl oyster warranting immediate steps in this direction. It is hence recommended that the Ministry of Agriculture, Government of India take up the matter with the Ministry of environment and forests and Andaman administration to introduce culture of molluscs in the Andaman.

- **Management:** The fishery resources are renewable and therefore require to be effectively managed so as to ensure sustainable exploitation and prevent overexploitation. The first step in the management is monitoring the landings so as to understand the health of the exploited stocks. As the Indian marine fishery resources are exploited by different sectors: the artisanal, motorized, small mechanised and large mechanised vessels, there is always a conflict of interests and any management plan cannot be successful with regulatory measures alone. Moreover in view of the vast extent of the country's coast line and distribution of the landing centres, monitoring the landings by the state government agencies are

beset with financial, manpower and political implications besides the logistic and desirable reliability of the statistics so collected. It is desirable that the fishing communities are involved in monitoring the landings and formulation of management measures to make the fisheries management participatory. It is hence recommended that the concerned state governments and the central Government formulate a policy to involve the fishing communities in managing the resources.

- **Marine Fisheries Governance:** Marine fisheries (Research, HRD, Development, conservation and Trade) are administered through three different Central Ministries: the Ministry of Agriculture and its institutions (IFP, CIFNET, FSI & CICEF), the DARE and the Eight ICAR Research Institutes, the Ministry of Science and Technology (or Earth Sciences, with the DST, DOD, DBT and the CSIR with NIO, Ministry of Environment and Forests with the wildlife Institute, and the Ministry of Commerce with the MPEDA. At the state level the SAU fisheries colleges, some academic universities and the Fisheries and Forest departments administer the R&D of marine fisheries sector. The latest addition to these is the National Fisheries Development Board. All

these organizations implement their programs as per their mandate. Any set up like this, may cause hurdles/bottlenecks in the process of effectively implementing the overall objective of Development, Sustainable Utilization and Conservation of the resources, and addressing the socio-economic issues of the communities and the HRD needs. The mandatory provisions for decision making jointly, if in existence, are not either strictly implemented or only given a casual attention.

To strengthen the mandatory provisions for effective joint decision making and implementation of the various programs, it is necessary that, 'A Marine Fisheries Research and Development Authority' (MFRDA) Consisting of representatives of ICAR (Fy), MOA, MOC, MST (DOD, DBT), MOEF and all maritime state governments including the UTs, should be set up to oversee all the activities related to marine fisheries. Separate Working Groups from among the concerned Ministries and Departments should be constituted to address the Research, Development, HRD, Trade and Management needs of the Marine Fisheries Sector and report to the Authority. It is imperative to ensure that all activities of marine fisheries are placed under the jurisdiction of this Authority. It is therefore recommended that the Ministry of Agriculture being the nodal ministry for

fisheries, in consultation with other central ministries and maritime state Governments and union territories formulate a Policy in this regard.

- **International Cooperation:** Under the Management framework and procedures, the FAO Code of Conduct for Responsible Fisheries states that "To be effective, fisheries management should be concerned with the whole stock unit over its entire area of distribution..." and "...the best scientific evidence available should be used to determine, inter alia, the area of distribution of the resource and the area through which it migrates during its life cycle". In the Indo-Pacific region, a large number of species are exploited by the countries. Many commercial species are common to these countries. Some countries in the region are a part of the LME (Bay of Bengal) and Research, management, conservation strategies to be formulated together (e.g. ICES). For the management of the exploited resources which are common to several countries, it is essential that uniform database is available, data processing methodologies are the same and management strategies have to be drawn up together. The issue may appear to be sensitive (shared stocks), but should be

addressed sooner or later. Particularly for the heavily exploited stocks like species of penaeid prawns, pelagic finfish species of Bombay duck, sardines, mackerels, anchovies, carangids, Demersal finfish species of croakers, the threadfin breams, perches etc, the management plans by one country on the basis of the data available for that country will not be successful unless exploitation of the species in their entire range of distribution and exploitation is taken into account. It is hence recommended that the Government of India accords due attention to this issue starting with the SAARC countries. ICAR being the nodal agency in the country for fisheries research has to take the lead in the matter.

- **HRD and R &D Personnel:** The ICAR and SAUs are following Uniform syllabus in their graduate and postgraduate education programs, but the other universities offering Fisheries at Postgraduate level have their own syllabi which are not quite relevant, besides there is no uniformity in the syllabi and qualified and trained fisheries faculty are not available. Offering such courses does not serve any purpose and the candidates cannot be placed properly. There is need for recognizing that Fisheries science is 'Applied Science'

and adequate expertise is essential to carry out teaching Fisheries Science. There is need for a Policy initiative in this direction and an agency named as All India Council of Fisheries Education or Indian Fisheries Council similar to the All India Council for Technical Education or the Indian Medical Council needs to be immediately established to oversee all fisheries education in the country. It is recommended that the ICAR initiates consultations with the UGC and Government of India towards fulfilling this.

6.2. Work Group 2: Policy Issues in Inland Capture Fisheries

- Main framework of the policy for inland fisheries will revolve around sustainability of ecosystem, and fish stocks with fishers at the centre stage to sustain their livelihoods.
- Diverse and variable inland resources, with its growing multi-user demand, low level of priority to fishery sector, coupled with unorganized fishers operating in inland waters, necessitates different parameters to develop the policy framework for fishery development / management.
- There is strong scientific evidence that policy implementations for inland fisheries are not possible unless other nodal ministries connected with aquatic resources co-ordinate in implementation. Therefore, an organic coordination and involvement of all related Ministries viz., Agriculture, Water resources and Ministry of Environment and Forest including related departments is strongly recommended in implementing the policy.
- There is an urgent need to restore our river systems with adequate quantity and quality of water to sustain our aquatic biodiversity. Therefore, a policy on environmental flows needs to be developed and enforced strictly by nodal ministries.
- The policy for fishery development in our large river systems and associated ecosystems should be taken up in a holistic and sustainable manner from source to sink.
- A policy support is recommended to empower and devise strategies to exploit the opportunities offered by Clean Development Mechanism and Carbon Trading by treating the water bodies especially wetlands as carbon sinks.
- The policy framework should be clearly defined to promote and extend

scientific management to traditional fishery regime in large lakes / lagoons having unique biodiversity and strongly avoiding any large scale commercialization of fishery following the model of Chilika Lake as an example.

- The multiple ownership of open water resources make the inland ecosystems quite complex to manage. The conflicting interests of different owners / users shall be resolved by making the relevant departments, as party to the policymaking. The criteria for assigning and granting of ownership and fishing rights shall be clearly delineated. The present criteria of revenue generation for leasing and licensing of water bodies shall be redrawn and reoriented keeping the livelihood development as the primary criteria.
- The property regimes in the inland resources are quite complex and they shall not be considered on a polar or binary basis. Rather, property regimes based on different degree of contractual obligations and other shared property regimes shall be considered.
- The definition of IUCN has been followed for scientific definition of open waters and wetlands has become very contentious by making it more inclusive thus excluding the possibility of livelihood development through fisheries. The balance shall be drawn between regulation / conservation and development. The principle that livelihood development and conservation are not mutually exclusive and the former is not possible only through the latter.
- There shall be policy support for licensing/ contracting out the riverine/ stream stretches /lacustrine areas wherever possible and desirable for the purpose of increased livelihood development, revenue generation, conservation, angling and eco-tourism. Central govt. shall give a broad set of model guidelines for the states to adopt.
- It is recommended that on long-term the SYSTEM SUSTAINABILITY should be the central policy objective for our aquatic resource management and not just the individual resource productivity enhancement.
- It is strongly recommended that urban water bodies are the lungs of our congested cities / towns their conservation is of utmost importance. There shall be different approach for their conservation of urban water bodies as the priorities are different.

- The house strongly noted that our large river systems flowing through different states need holistic action plan for their conservation and development. The past experience of conservation plan of such river systems have met with little success mainly because water being state subject. It is recommended that our national river systems should be brought under the central control for effective conservation and management.

6.3. Work Group 3: Policy Issues in Brackishwater Aquaculture

- Aquaculture shall be considered on par with agriculture for all purposes - for tariffs and taxes, bank finance, crop insurance, electricity, water tariff, etc.
- National level assessment of suitability of coastal lands for developing aquaculture based on the stipulation of coastal aquaculture authority act 2005 using remote sensing and GIS.
- Uniform land leasing policy for brackishwater aquaculture in all maritime states and UTs needs to be developed.
- Leasing policy for use of coastal
- waters for culture of shell fish, finfish and sea weeds as a means of livelihood options for coastal fishers / SHGs needs to be developed.
- Location specific regulations for establishing new farms be made based on the carrying capacity of the water source.
- Seed / hatchery certification be made mandatory for the production of quality shrimp seed.
- Facility for the production of SPF and SPR of indigenous species of shrimp may be established.
- Cluster based management and implementation of Best Management Practices (BMP) be made mandatory.
- Excise duty and custom duty exemptions may be accorded for the feed additives and other inputs used in brackish water aquaculture.
- Certification of aquaculture inputs like feed, chemicals, drugs, pro-biotics etc., should be made mandatory.
- Domestic market should be developed for shrimps with the required cold chain.
- Diversification to other species of

shrimps, shell fish and finfish should be encouraged by providing incentives.

will be given to fisheries cooperative/ SHGs/ unemployed trained fisheries professional groups.

- National level census of brackishwater aquaculture and the database on production, disease prevalence should be maintained
- Organic aquaculture should be promoted.
- For Andaman and Nicobar islands, extensive culture of shrimps and other fin fishes may be permitted in the Post-Tsunami inundated areas with locally produced seed and feed.
- Different fish production technologies should be validated and demonstrated on a pilot scale with Government support before launching the same.
- Emphasis should be directed towards development of a sustainable aquaculture manner rather than maximization of production. Also, family scale integrated fish farming and diversification of aquaculture practices should be encouraged.

6.4. Work Group 4: Policy Issues in Freshwater Aquaculture

- Aquaculture should be treated on par with agriculture. The Kisan credit card should be extended to them. The benefits of the Prime Ministers Rojgar Yojna (PMRY), electrical tariffs should be extended to the fish farmers.
- All state owned water bodies will be under fisheries Department for development and management irrespective of ownership.
- The leasing period of state owned water bodies should be done for a minimum of 5 years. The preference
- Infrastructure for additional fish seed production should be developed.
- To support aquaculture setting up of aqua-clinics / aquashops should be encouraged.
- Watershed management approach should be followed for aquaculture keeping water in the center stage of all activities. It should consider conservation, protection, restoration, recharging and environmental consideration.

7. Technical Session V: Policy Issues in Processing, Markets and Trade

Prof. Samar K. Datta, in his lead presentation emphasized that subsidies *per se* are not bad, as long as they are net value adding in nature and may therefore be retained for net wealth creation by certain communities across the globe. At the same time there is a need for some discipline on mindless use of such subsidies. By dragging the matter to WTO forum, international bodies like UNEP seem to be unnecessarily passing on livelihood issues in the hands of WTO, which ought to address merely trade and competitiveness issues. Sustainable fisheries, as is being practiced by many a fisher folk around the world, produce not only tangibles and tradable, but also many intangibles like correction and preservation of environment or ecological factors.

However, many developed countries are still reluctant to agree to a global trade in intangible ecological values, as proposed under the Kyoto Protocol. Any international negotiation on fisheries subsidies or even a preparation for the same without providing any platform for encouraging the ecological values of fisheries can at best be incomplete, half-hearted and inimical to the interests of fish and fishers. Given serious lack of transparency in fisheries subsidies data across the world and more

so in the developed nations, there is a strong need for clarity in definition and utmost discipline in the operational structure of fisheries subsidies. Since most of the developing countries don't have much to lose by being transparent on this matter, such transparency and voluntary revelation may pose a threat to the developed countries and force them to be more transparent in the sharing of subsidies data. No meaningful discussion on and effective management of fisheries subsidies is possible, unless member countries are willing to undertake rigorous domestic sector reforms in a holistic framework. In fact, the current debate on fisheries subsidies can in fact be looked upon as an opportunity to the less developed nations to set the house in order.

Domestic reforms, he said, are required to avoid careless over-reporting of subsidies; ban on fishing in newly-notified wildlife sanctuaries irrespective of age-old fishing practices; import of good brood stock of exotic varieties of ornamental fish; Statutory or technical provision for sterilization of domestic breeds of ornamental fish; Effective framework for pollution monitoring & control in both inland & marine segments; Separation of Environment & making it neutral Ministry with equal representation from all relevant Ministries; Treating Fisheries (& its marketing) differently as compared to

agriculture; Creating baseline data base on cost of production / procurement of fish (unlike cost of cultivation data for agricultural crops) and data on fish processing activities; Inadequate action to handle surplus or shortages in fish seed supply & its quality ; Subsidy policy on diesel for fisheries in view of high duties & absence of bunkering facilities, unlike in many other competing countries; Unfriendly legal & operational policy framework for conversion of agricultural land (good/bad) into aquaculture bodies; Rigorous regulatory framework / apparatus, instead of a case by case approach, for aquaculture still missing; Laboratories to serve the needs of farmers missing; General extension failure to popularize integrated fish farming in spite of outstanding examples of integrated fish farming & (CIFT-claimed) technologies for byproduct and waste management; Too much reliance on foreign market despite huge Indian middle class demand for processed fish products; and Insufficient budgetary provision on infrastructure creation

International negotiations, he said, should deal with the issues like property rights problems of marine fisheries; Linking of trade and environment issues will make trade even less free and fair given tendency of developed countries to use NTBs like TEDs; Definition of fisheries subsidy must be theoretically superior and all inclusive to address all sectoral

problems / distortions; Unequal structural features of countries may be perpetuated by AMS style cap; Traffic light approach to subsidy discipline will allow travesty of Green Box to continue; Concern that climate of debate will not permit stock specific characteristics being subjected to moderate disciplines; Concern regarding conspiracy of silence on aquaculture – important for much of the developing world; Poor quality of subsidy notifications and lack of transparency, thus rewarding guilty and penalizing innocent; Possible inclusion of government services (including government regulatory services – i.e., FAO's category III subsidies) as subsidies; Peculiarity of government accounts means that cost equated to output – can penalize citizens of inefficient states who provide less service at higher cost

Dr S. C. Pathak, former GM, NABARD proposed the policy initiatives, where he mentioned that; Pondless / landless fish farmer SHGs should be given government water bodies on lease without auction; PMRY (Prime Minister Rojgar Yojna) under Rs.1 lakh is given as incentive should also be available to fisheries sector; Crop loan (short term loan) which is now being given in West Bengal should be made available in all states; Kisan Credit Cards (KCC) from banks be made available to fish farmer, Aqua Kisan, and fishers and they can avail

loan without security; SHGs should be encouraged is fishermen community on priority basis; Gender empowerment in fisheries through SHGs be given; Extension network be further strengthened to create awareness; Fishing harbours, Jetties, Landing centers Fish Markets developed by states be maintained and managed by local fishermen community/ Fish. Cooperative/SHG Federation; Foreign fishing vessels that are entering in our waters illegally and poaching our resources should be banned; There is a need to relook our Research programs and course syllabus to be made uniform; Eco-tourism, sanctuaries should be encouraged in Riverine & Lacustrine sector to protect bio-diversity as well as sensitize general people about need for conservation of water and fantastic resources; Periodical Refresher Course to be made mandatory to all state Govt. employees & should be linked to their career progression; CIFE Diploma Course for state employees be revived; FFDA program should be reviewed & amended in the present context.

wherein resource-poor farmers and fishers shall be given priority; Stopping the blame game on transfer of technology machineries and their capacity be build with knowledge package with social responsibility rather than subsidy package; Capacity building of co-operatives and Self-Help Groups to express their demands and problems; Reorientation of research and development towards providing livelihood security and sustainability.

Similar to the second day proceedings; following these two technical lead sessions, four work groups representing broadly all the stakeholders for detailed discussions the outcome of which is summarized below.

8. Technical Session VI: Policy Issues in HRD and Service Delivery System

This session discussed different concerns pertaining to HRD and service delivery system. This was conducted to find out the issues that need policy interventions in improving the HRD and Service Delivery Systems which many times the policy documents do not prioritize.

Dr. R. S. Biradar, Principal Scientist, CIFE, in his presentation on "promoting professionalism in fisheries sector" emphasized the need of professionalism in fisheries at this juncture. He suggested regular updating of knowledge and skill through STP/ Refresher courses, better promotional opportunities, attractive pay and allowances, establishing a professional body such as Fisheries Council of India, preference in service to professional degree holders, establishing Indian Fisheries Service, internship programs to researchers at DoFs of state governments, incentives for promoting entrepreneurship, incentives for responsible fisheries management and conservation tendencies of fishers, etc. for promoting professionalism in fisheries.

Dr. Jacob D. Raj, Executive Secretary, PREPARE, in his presentation on fisheries in the hands of fishers expressed his concern about the exclusion of resource dependant people in the management of resources. He sensitized the audience about the

importance of harnessing their social net expertise and knowledge for the fisheries development. He placed deep sea fishing and modernization as the reason for the ecological imbalance. He brought out the gross ignorance on the part of development agencies the role of artisanal fishers in maintaining ecological variability and sustainability. He stressed the need to have a comprehensive policy for their livelihood security and sustainability. He emphasized the advantages of encouraging artisanal fisheries such as fuel efficiency, sustainability, low impact of gears used on the ecosystem. He was of the opinion that protection of artisanal fisheries means protecting the entire fishery. He called for the formalization of resource allocation and ownership rights for the efficient management of fishery resources.

Dr. Rekha Gaonkar, Professor, Dept of Economics, Goa University in her presentation exposed the fishing conflict between trawlers and artisanal fishers in Goan waters. She also highlighted the issues like; Lack of adequate infrastructure at landing centres and poor sanitation leads to heavy post harvest losses and low price of the commodities; Re-looking into the mariculture activities in the light of social and environmental viability.

Dr Dilip Kumar in a nutshell comprehended the deliberation and emphasized on; People centered approach for sustainable aquaculture and fisheries

9. Technical Session VII: Work Group Discussions

9.1. Work Group 5: Policy Issues in Processing and Value Addition

- Hygiene conditions onboard the fishing vessels, landing centers and local processing units are very poor. There has to be a minimum standard for each category.
- Minimum infrastructure facilities should be developed at all landing centers to facilitate maintenance of hygiene and for getting good returns from the produces.
- Infrastructure for Tuna fishing, handling and storage at important fishing harbours of Paradeep, Vizag and Chennai should be strengthened. Subsidies and other promotions for tuna fisheries may be continued for some more time.
- Intrastate and inter-state marketing has to be linked and fish market information network be strengthened to reduce exploitation of farmers and fishermen. Market price on a daily basis should be available at information centers.
- Safeguards for protecting the interest of labour in processing sector is very much needed so as to have better livelihood for labours.

- Better utilization of wastes is need of the hour and therefore bio-waste management should be made compulsory. Punitive action taken against defaulters.

- Training on value addition for processor, vendors is necessary to increase the realization of value from their produce.

- Use of alternative source of energy for industrial use. Research programs should be undertaken to prepare dry ice indigenously by using solar energy.

9.2. Work Group 6: Policy Issues in Markets and Trade

- Trade and environment issues are to be dealt separately by the WTO

- Subsidies should be linked to responsible fisheries

- Contract farming is to be promoted with the involvement of cooperatives

- PPP model to be followed in marketing for promotion of domestic market for value added products and diversification of products. Private investments in fish marketing (establishment of cold chains..) is to be encouraged. Imparting knowledge/training to the stakeholders

with respect to hygiene, HACCP and certification procedures through public investment

- National Fisheries Development Board for marketing has to function on the same line of NDDB
- Creation of data on production cost, marketing cost. is to be done
- Gender-budgeting has to be an integral component of policy development. It is an attempt to break down or disaggregate the government's mainstream budget according to its impacts on women and men.
- Developing fish meal from the trash fish and by-catch can be a substitute to imported fish meal
- Cold containers for fish in the passenger trains can me provided (like for milk)

9.3. Work Group 7: Policy Issues in Human Resource Development

- High priority shall be given to HR development in Fisheries Sector with adequate financial and infrastructural support to all those involved in HR development.

- The HRD should included short-term refresher training to the officials of DoF, NGOs, Community and all other stakeholders.
- For DoF personnel, the refresher training shall be made mandatory for career advancement
- The HR development meant for resource managers to include regular interaction with the local communities to know their social, cultural, educational and environmental aspects
- The recruitment to DoF be based on professional fisheries background and preference be given to those from fisher communities
- The transfer of technology shall include the complete package including forward linkages (packaging, marketing, etc.)
- The resource managers shall interact with communities for developing database on indigenous traditional knowledge of fishers
- The role of private and non-governmental extension agencies shall be recognized and their capacity building be taken into consideration in HRD

- Sufficient hands-on training shall be imparted to the fisheries graduates and also during the refresher training courses
- Empowerment of fisher communities to collect and compile the data on fisheries and supply to government agencies and knowledge hubs.
- Recognition of R&D and academic institutions to develop and evaluate feasible technologies addressing communities and concentrate on issues related to primary stakeholders like fishers particularly the resource poor.
- All professional graduates / personnel coming out of fisheries educational institution should be provided with opportunities for rigorous on farm / onsite professional training on various aspects of fisheries / aquaculture in collaboration with private fish /shrimp hatcheries, seed farms, production farms, feed production unites, processing plants, fishing industry.

9.4. Work Group 8: Policy Issues in Service Delivery System

- HRD should have **bottom up approach** based on realistic HR needs.
- All stakeholders (resource user groups) involved in fisheries development should be made aware of technical developments with emphasis on social development and community involvement.
- Capacity building of all executive agencies (DoF and other agencies including NGOs) so as to improve the service delivery system for effectiveness and efficiency. And also to empower them to organize resource user communities for developing resources on their own. They shall also mobilize support from other GOs and NGOs to use the resources sustainably.
- Potential of public private community partnership shall be harnessed for fisheries development.
- Gender mainstreaming should be an essential element of all HRD programs.
- E-governance systems for effective service delivery systems should be created and regularly updated for easy access to fishers. Models like village knowledge centres can be emulated. Special cell on developing information on disaster warning, preparedness and management at local, state and national levels.

- The potential of ICT can be gainfully harnessed by service delivery systems for effective service delivery. Explore the feasibility of developing integrated models of service delivery like ATIC and One stop Aqua shop. Complete overhauling and restructuring of state DoF and its various wings / associated agencies with provisions for creating and using para-professionals on more professional lines for effective service delivery. This shall also involve increased autonomy, both financial and executive, and accountability of DoF.

10. Concluding Session

Draft recommendation was finally prepared and presented for the final approval in the concluding session for further refinement. **Dr. Ayyappan**, DDD (Fisheries), ICAR chaired the session. The recommendations that came out from the workshop are mentioned below sub sector wise.

Marine Capture Fisheries

Artisanal fisheries: though artisanal fishery contributes only about 7% to the total marine capture fishery production, the size of the population depending upon this vocation, its poverty, illiteracy, lack awareness on rights, exposure to natural disasters/calamities and so on, makes this sector the most important one from the livelihoods, management and vulnerability perspectives. The "Comprehensive Marine Fishing Policy 2004" of the GOI did not address the issues of artisanal sector. In the context of the existing system of responsibilities and multi governmental jurisdiction, this sector requires priority attention. Hence, it is recommended that the **Government of India in consultation with the State governments formulate a policy to address the needs of artisanal sector.**

Fishers' welfare

Introduction of closed season for fishing is known to be one of the ways of rebuilding

overexploited stocks but such an action results in loss of livelihood for the fish workers during the ban period. Governmental interventions are required to provide alternative livelihoods to provide sustenance to the fishers during the ban period according to the Minimum Rural Employment Guarantee Scheme (MREGS). The fisher participants informed that presently they are not receiving any relief during the closed season. **It is therefore recommended that the Government of India, Ministry of Agriculture in consultation with the concerned maritime state governments initiate a formal dialogue with affected parties and offer alternate livelihood opportunities.**

Considering the poverty of the small scale fishers all along the country's coast and the need to empower them, primary health, sanitation, free education, has to be made available and accessible for fisher communities. Also, old age pension has to be offered to all the fishers. **It is recommended that the governments of maritime states consider them as a priority and offer the required support to the fishing communities living below poverty line.**

Protection to fishing vessels/fishers: The occurrence of clashes between the people of artisanal fisheries and mechanised vessels and between those of small and

large mechanised vessels resulting occasionally in death has become common. Besides, there are instances of open sea dacoities and robberies warranting a concerted effort to prevent recurrence of such incidences and protect the lives and property of those engaged in fishing. It is recommended that the government may consider suitable security measures for the personnel engaged in fishing.

Fleet size

Considering the current annual marine fish yield by capture is of the order of 3 million tons which is close to the maximum potential yield in the currently fished grounds and in view of the fact that about 68% of marine fish landings in the country are taken by the mechanised vessels particularly trawlers, introduction of additional vessels to the fleet is not desirable. **It is hence recommended that the concerned state governments do not permit additional vessels in the grounds.**

Marine ornamental fishes

Marine ornamental fishes offer vast scope for economic activity through export and in the process help in providing the livelihoods for the coastal fishers. The country is blessed with vast resources of marine ornamental fishes along the Gujarat, Kerala, Tamilnadu, Andaman and Lakshadweep regions. Though adequate

database and knowledge are available from the Lakshadweep islands, similar information is not available from other regions in the country. Moreover, due to the association of these fishes with the coral reefs, concerns/fears are expressed in different forums on matters relating to environment, intellectual property rights, degradation of habitat, marine biodiversity and overexploitation of these resources all of which are acting as factors against developing a sustainable ornamental fish fishery. **It is therefore recommended that the Government of India appoint a taskforce to organize the required activities and come up with a policy for sustainable harvest and export of marine ornamental fishes. The NFDB may play a major role in this.**

Seasonal ban

There is an agreeably strong perception that the seasonal fishing ban is not based on scientific data and has not been formulated in consultation with the stakeholders. While the West Bengal says that the ban period should be three months during April-June along the East Coast States, the fisheries industry says that the ban period should be the same along both the coasts of the country. There is also a feeling that certain states are not implementing the ban effectively. **To sort out the issue and make the imposed ban effective, it is recommended that the ICAR along with the MOA should bring**

out a 'white paper' on this subject at the earliest.

Mesh size regulation

To ensure sustainable yield of the exploited stocks and prevent the excessive and undesirable exploitation of juveniles, regulations on mesh size and banning destructive gears have to be implemented very sincerely. Though 'safe' mesh sizes are mentioned for the cod end of trawls in several research papers and there are reports of destructive gears operating in the Indian seas, a policy paper on this regulation is yet to be issued by the Government of India and the maritime state governments. The fishing industry in general is in confusion on this aspect. It is possible that the governments are not equipped with the required information to come out with a policy and its implementation strategy. **In the light of the above, it is recommended that the ICAR Research Institutes dealing with marine fisheries bring out a "white paper" on mesh regulations and destructive gears in the Indian seas at the earliest and the concerned governments formulate policy on this for implementation.**

Review of Swaminathan committee recommendations

The coastal fishing communities are traditionally dependant on fishing for their livelihood and therefore assert that living

on the coast is their right as the coast is an integral part of their livelihood. The fishing communities are of the view that the governmental decisions are not based on consultations with them. The Swaminathan committee appointed by the Ministry of Environment and Forests, Government of India to review the Coastal Regulation Zone Notification, 1991, proposed a "vulnerability line" which includes the sea, to form territorial limits (12 nautical miles), including its sea-bed to the administrative boundaries or the biological boundaries demarcated on the landward side of the sea coast and recommended that this area should be taken up for an integrated, cohesive, multi-disciplinary and multi-sectoral coastal area management and regulatory system. There is a fear among the coastal fishing communities that if this recommendation is implemented, the fishing communities would be displaced and their habitations lost making them even lose their traditional avocation of fishing. Hence they are seriously concerned on the matter of their traditional right to fishing and wish that all policy decisions related to the marine capture fisheries sector, coastal regulation zone and infrastructure development along the coast should be taken after due consultation with the coastal fishing communities who are the primary stakeholders. It is also necessary to review Coastal Regulation Zone

Notification, 1991 recommendation so that the coastal fishing communities are not affected / displaced. The report should be reviewed in consultation with the fishers' representatives.

Nearly half the area available for fishing along the 480 km long Orissa coast is restricted for fishing due to the regulations pertaining to turtle conservation. There are doubts that the declaration of 20 km offshore as prohibited area for fishing is without basis as the turtles move in large numbers to this coast during December-March for breeding purpose that too in the shallow areas of 5 km offshore. This action has resulted in depriving the fishers from fishing in this area which is the most productive one for the artisanal sector. There is therefore need for well-informed demarcation of the prohibited area. Hence to ameliorate the fishing conditions of the poor artisanal fishers it is recommended that the Government of Orissa in consultation with MOA, MOEF, MPEDA and Wild Life Institute of India reviews the existing rules and redresses the issue.

In the case of missing persons, the Insurance Companies wait for seven years to settle the claims. While this is the general rule, in the case of missing fishermen engaged in sea fishing this period needs to be modified downward

considering the hazardous conditions in the sea and the poverty of fishers. Several fishers representatives explained the difficulties of the dependants of missing persons living in miserable conditions. It was felt that the number of years should be reduced. It is therefore recommended that the governments of the maritime states and the Ministry of Agriculture take up the matter with the insurance companies to work out methods to offer relief to the suffering fisher families.

Diversification from trawling

The grounds beyond 120 m in the EEZ of the country are not adequately exploited because of thrust on trawling in the inshore grounds and lack of shrimp grounds in the relatively deeper areas. As the coastal trawling grounds cannot offer scope for increasing production, the solution for increased harvests by diversifying to tuna, other large pelagic resources and oceanic squids. It is hence recommended that the MOA with the involvement of NFDB facilitate diversification of vessels of 60 feet and larger by providing all equipments and gear at subsidized rates.

The potential yield of coastal tunas is estimated as 65,000 tones, of pelagic sharks as 26,000 tones, barracuda as 20,000 tones and of oceanic tunas as 2, 20, 000 tones; these resources are not fully

tapped presently for want of proper trained manpower and fishing infrastructure. There is willingness among the enterprising boat owners to diversify to tuna fishing. However there is lack of trained manpower for tuna long lining, onboard preservation and processing. Considering the importance of tunas in the export market and potential of additional employment in this sector, it is recommended that the government of India formulate all inclusive comprehensive policy incorporating arrangements for development of human resources in tuna long lining, onboard processing, marketing etc. The NFDB has to play a major role in this.

Elasmobranches (sharks, rays, skates)

There is global concern on elasmobranches. There are International Plans of Action pertaining to elasmobranches conservation/protection but the database and knowledge on the taxonomy, biology, distribution etc is grossly inadequate. Ministry of Environment and Forests, Government of India, however, has banned fishing of sharks in 2001 under the provisions of the wildlife act. The ministry was appraised that as the ban was not supported by data/facts, focused study was essential for effective conservation. Though the MOEF initially agreed to support database acquisition, did not support the activity. This is mainly because the MOEF is not the

nodal ministry for fisheries. Hence there is urgent need for building up database and knowledge on this resource so as to formulate measures for conservation while implementing the obligatory provisions in the International Agreements/Plans of Action. It is recommended that the Ministry of Agriculture in consultation with Ministry of Environment and Forests, ICAR and State governments formulate strategies for database generation and conservation towards fulfilling the obligations and ensure conservation of the resources.

Marine fisheries research

Marine Fisheries Research is carried out by eight ICAR Institutes and SAUs / CAU in the country and a large number of scientists are engaged to fulfill the mandate of research. Considerable expertise has been built up over a period of half-a-century. The Institutes with their own expertise and in consultation with the experts outside the system plan and execute the research programmes. But applied research requires consultations with the stakeholders (fisher, industry, trade, state governments etc) to make the efforts most relevant. However, formal consultations with the industry, fishers representatives, maritime state govts., MOA, MPEDA, MOEF, MOES, NGOs are not held while planning applied research. It is necessary that obligatory arrangements be made in this regard. This would also

prevent any possible duplication of effort while resulting in need-based research. It is recommended that the ICAR together with MOA, MOEF, maritime state governments and other stakeholders formulate guidelines for consultations on regular basis for planning and implementation of applied research programs.

Management

The fishery resources are renewable and therefore require to be effectively managed so as to ensure sustainable exploitation. The first step in the management is monitoring the landings so as to understand the health of the exploited stocks. As the Indian marine fishery resources are exploited by different sectors: the artisanal, motorized, small mechanized and large mechanized vessels, there is always a conflict of interests and any management plan cannot be successful with regulatory measures alone. Moreover in view of the vast extent of the country's coast line and distribution of the landing centers, monitoring the landings by the state government agencies are beset with financial, manpower and political constraints besides the logistic and the reliability of the statistics so collected. It is desirable that the fishing communities are involved in monitoring the landings and formulation of management measures to make the fisheries management

participatory. It is hence recommended that the concerned state governments and the central government formulate a policy to involve the fishing communities in managing the fisheries resources.

A large number of rivers along the east coast flow into the Bay of Bengal. In Orissa, most of the fishing bases are situated near the river mouths which are sometime closed. To provide safe and easy passage for the fishing crafts, the river mouths have to be dredged at regular and periodic intervals. Incidentally this will also reduce the flood menace to a large extent and save the fisher from accidents, displacement etc. Moreover these river mouths act as physical barriers for the movement of fish into and outside the sea. Similar situation is seen in all the other east coast states also. **In view of the importance of dredging and de-silting along the river mouths, it is recommended that the Ministry of Surface Transport in consultation with MOA and the Government of Orissa and finalize an action plan for implementing the task of regular dredging.**

Marine biodiversity conservation

Marine Biodiversity protection and conservation are receiving increased attention. Under the conditions, the implementable management strategy is the ecosystem management which

requires identification and establishment of Marine Protected Areas and their monitoring. It is desirable to reorient the research, development and management activities in this direction. Development activities in such protected areas need the clearance from the DoF. **It is hence recommended that the ICAR, MOA and the state governments initiate action in this regard for the conservation of marine resources.**

The causal link between subsidies and over fishing should not be taken for granted. Over fishing and subsidies may both be symptoms of poor management of the fisheries rather than there necessarily being a causal link between them. A subsidy may also have a positive impact on the aquatic ecosystem, reduce overcapacity (e.g. a well-designed vessel decommissioning programme) and may enhance the sustainability of the resource, depending on the purpose for which it is granted, the circumstances in which is given and whether unintended impacts have been avoided. **Subsidies should be linked to responsible fisheries.**

The Government of India brought out the Biological Diversity Act , 2002 (MOEF-GOVT OF INDIA) and the Biological Diversity Rules, 2004, came into force on 15th April, 2004 which among others suggest procedure for access to biological resources and associated traditional

knowledge, restriction on activities related to access to biological resources, procedure for seeking approval for transferring results of research, procedure for seeking prior approval before applying for intellectual property protection, procedure for third party transfer under sub-section (2) of Section 20, criteria for equitable benefit sharing (Section 21), application of National Biodiversity Fund, constitution of Biodiversity Management Committees, appeal for settlement of disputes etc. **There is however a gap area pertaining to Policy on Marine Biodiversity Utilization, Protection, Conservation and the Research, Development, Monitoring and Management issues. This is again due to the fact that more than one ministry is involved in the aquatic resources. It is recommended that the MOEF (Nodal Ministry-Biodiversity) MOA (Nodal Ministry-Fisheries) formulate a policy on marine biodiversity.**

There is a ban on mariculture as a measure of conservation in A&N Islands. There is however vast potential for culture of certain species which are known to produce high economic returns. Moreover production through culture is a good measure for conservation. Scientific farming may not be banned if it leads to conservation. In the Andaman Sea there is vast potential for pearl production using black lip pearl oyster warranting

immediate steps in this direction. It is hence recommended that the Ministry of Agriculture, Government of India take up the matter with the Ministry of Environment and Forest and Andaman administration to introduce culture of mollusks in the Andamans.

Fisheries infrastructure

There is lack of cold-storage facilities in the fishing harbours leading to further post-harvest losses and reduced availability of fish protein to the public. There is also need for a review of the infrastructure facilities and hygiene in all the fishing harbours. **Considering the importance of these it is recommended that the center and the states should provide suitable water and landside facilities in the harbours.**

Lack of efficient marketing infrastructure is leading to the non-availability of regular/adequate fish for domestic consumption. **It is hence recommended that the concerned governments and the NFDB take suitable action for creation of marketing infrastructure**

Marine fisheries governance

Marine fisheries sector (Research, HRD, Development, conservation and Trade) is managed by different Central Ministries: Agriculture, Earth Sciences, Environment and Forests, Food Processing, Commerce, and Defense. At the State level the SAU

fisheries colleges and the Fisheries and Forest departments manage the R&D of marine fisheries sector. The latest addition to these is the National Fisheries Development Board.

This mechanism has lead to overlap in activities and programs and their ineffective implementation. There is need for joint decision making which is at present given only a casual attention. To strengthen the linkages and coordination among them, it is necessary that 'Marine Fisheries Research and Development Authority' (MFRDA) consisting of representatives of all Ministries and all maritime State governments including the UTs, should be set up to oversee all the activities related to marine fisheries. Separate Working Groups from among the concerned Ministries and Departments should be constituted to address the Research, Development, HRD, Trade and Management needs under the Authority. **It is therefore recommended that the Ministry of Agriculture being the nodal ministry for fisheries initiate the consultation with others and formulate a Policy in this regard.**

International cooperation

Under the Management framework and procedures, the FAO Code of Conduct for Responsible Fisheries states the following: 'to be effective, fisheries management should be concerned with the whole stock

unit over its entire area of distribution...', "The best scientific evidence available should be used to determine, inter alia, the area of distribution of the resource and the area through which it migrates during its "life cycle". In the Indo-Pacific region, a large number of species are exploited by the countries. Many commercial species are common to these countries. For the management of the exploited resources, which are common to several countries, it is essential that uniform database is available, data processing methodologies are the same and management strategies are drawn up together. Particularly for the heavily exploited stocks like species of penaeid prawns, pelagic finfish species of Bombay duck, sardines, mackerels, anchovies, carangids, demersal finfish species of croakers, threadfin breams, perches etc, the management plans by one country on the basis of the data available for that country will not be successful unless exploitation of the species in their entire range of distribution and exploitation is taken into account. **It is hence recommended that the Government of India accords due attention to this issue starting with the SAARC countries. ICAR being the nodal agency in the country for fisheries research has to take the lead in the matter.**

Legislative support: The collection of fry and juveniles of cultivable species of shrimp and finfish from the near shore

waters adversely affects the recruitment of the cultivated as well as non-cultivated species. As this also affects the biodiversity of the region, this practice needs to be prohibited. Though certain state governments banned this activity, implementation of the same is rendered difficult/impossible due to lack of criminal laws which enable punitive action against the violators. **Hence it is recommended that the concerned state governments examine the issue and enact suitable legislations to ensure effective implementation of the ban.**

Estuarine Fisheries: A very large number of people are dependent on estuarine fisheries for their livelihoods. It is known that the estuaries are nursery grounds for penaeid shrimps and for a large number of finfish. The current exploitation particularly in the Hooghly estuary is such that even zooplankton is exploited for human consumption. It is well known that such exploitation adversely affects the recruitment in the sea thus affecting the fish and shrimp stocks. However we do not have knowledge on the exploitation etc. **There is a need to develop policy on estuarine fisheries after consulting the stake holders.**

Inland Capture Fisheries

Many use rivers as a source of water or as discharge outlets. The health of fishes in the rivers is dependent on water quality which further depends on many factors/

parameters. Though fisheries are important to ensure livelihood and nutritional security of the masses, it receives poor attention. Main framework of the policy for inland fisheries will revolve around sustainability of the ecosystem and fish stocks with fishers at the centre stage to sustain their livelihoods. **The diverse and varying inland resources, with its growing multi-user demand, low priority given to fisheries sector coupled with poorly organized fishers necessitates development of appropriate policy framework.**

Industrial, agricultural and city wastes have made riverine fisheries the worst sufferer in the recent past. **Treatment of the pollutants before their discharge has to be monitored regularly. DoFs in consultation with fishers depending on these rivers should also be empowered to build, operate, regulates and monitors the treatment plants for less discharge of the pollutants. Such facilities should also be used for practicing the sewage fed aquaculture.**

There is strong scientific evidence that policy implementation for inland fisheries are not possible unless other nodal ministries connected with aquatic resources are involved. **Therefore, a nodal agency with the involvement of all related Ministries viz., Agriculture, Irrigation, Water resources, Environment**

and Forest including related departments is strongly recommended.

'Chilika Bachao Andolan' (CBA) or 'Save Chilika Movement' in which 'Meet The Students', a student forum of Utkal University played an important role in mobilizing the masses. In the course of the movement, some intellectuals and environmentalists extended their solidarity to the movement and gave a new twist to it by adding the environmental fallout of the project by raising the issue of Ramsar Convention. Presently, local people are caught between two grinding stones: the lake's deterioration on the one hand; the arrival of entrepreneurs and commercial interests on the other. **A clearly defined policy framework should promote and extend scientific management in large lakes / lagoons having unique biodiversity, avoiding any large scale commercialization of fishery following the model of Chilika Lake as an example.**

Revenue generation is given high priority while leasing out the water bodies. As a result the big contractors may get the lease of majority of water bodies and restrict the involvement of local fishers from fishing. Under such situation the livelihood concern of the primary stake holders may suffer. **Thus, the present criteria of revenue generation for leasing and licensing of water bodies shall be reoriented keeping the**

livelihood development as a primary criteria. The concept of co-management can be implemented.

By excluding the possibilities of livelihood development through fisheries, sustainability of the water bodies may not be attained. The definition of International Union for the Conservation of Nature and Natural Resources (IUCN) or "World Conservation Union" that has been followed for scientific definition of open waters and wetlands has become very contentious by making it more inclusive. It is assumed that the livelihood development and conservation are not mutually exclusive and livelihood development is not possible only through conservation. **The balance shall be drawn between regulation / conservation and development. This balance can be achieved by adopting co-management in fisheries.**

The inland water resources are subjected to multiple uses and therefore have multiple stake holders. Governance of such resources is difficult as it is undefined. There is a need to streamline the governance mechanism. Polarizing the system can be a mechanism. To polarize ownership and to promote responsible governance of the resources they can be given on contract to individuals who can further share with other stake holders. The property regimes in the inland resources

are quite complex and they shall not be considered on a polar or binary basis. **Rather, property regimes based on different degree of contractual obligations and other shared property regimes shall be considered.**

There is no national policy support for licensing / contracting out the riverine/ stream stretches / lacustrine areas wherever possible and desirable for the purpose of increased livelihood development, revenue generation, conservation, angling and eco-tourism. **Central govt. shall give a broad set of model guidelines for the states to adopt better management of the inland water bodies.**

Aquatic resource management also includes the stakeholders together forming a system. It is recommended that on **long-term the system sustainability should be the central policy objective for our aquatic resource management and not just the individual resource productivity enhancement.**

The past experience of conservation plan of river systems have met with little success mainly because water being a state subject. Large river systems flowing through different states need holistic action plan for their conservation and development. **It is recommended that our national river systems should be brought**

under the central control for effective conservation and management.

Brackish Water Aquaculture

Activities of brackish water aquaculture are similar to agriculture. There is also a need to promote brackish water aquaculture for nutritional and livelihood security. **Brackish water Aquaculture shall be considered at par with agriculture for all purposes like tariffs and taxes, bank finance, crop insurance, electricity, water tariff, etc.**

Brackish water aquaculture is in its early phase and needs incentives to pick up. **Incentives to brackish water aquaculture such as excise duty and custom duty exemptions may be accorded for the feed additives and other inputs**

Coastal Aquaculture Authority (CAA) monitors the aquaculture activities in the coastal areas. One of the major functions of the CAA is to survey the entire coastal area of the country and advise the Central Government and the State/ Union territory Governments to formulate suitable strategies for achieving eco-friendly coastal aquaculture development. **National level assessment of suitable coastal lands for developing aquaculture based on the stipulation of Coastal Aquaculture Authority Act 2005 using remote sensing and GIS is needed. Based upon the conditions laid by CAA**

there is a need to demarcate suitable sites for all kinds of aquaculture activities in the coastal areas.

The other important function of CAA is to fix standards for all coastal aquaculture inputs viz., seed, feed, growth supplements and chemicals/ medicines for the maintenance of the water bodies and the organisms reared therein and other aquatic life. Therefore, **Seed / hatchery certification be made mandatory for the production of quality shrimp seed. Certification of aquaculture inputs like feed, chemicals, drugs, pro-biotics etc., also should be made mandatory.**

The banking institutions and the insurance companies find difficulties in extending their services when the land leasing policy of the states are not uniform and are for a longer duration. **Uniform land leasing policy for brackishwater aquaculture in all maritime states and UTs is needed. There shall also be single window system to facilitate the services related to brackish water aquaculture.**

Culture of fin fish, shell fish and seaweeds needs institutional support in terms of leasing policy. **Leasing policy for culture of shell fish, finfish and sea weeds as a means of livelihood options for coastal fishers / SHGs is needed. Aquaculture has local issues and therefore location specific regulations are also needed. There should**

be some flexibility in the policy to adjust with the location specific issues and concerns. Disease outbreaks along the coast have seriously affected the shrimp production in the country. There has been vertical as well as horizontal transmission of pathogens. **Therefore, facilities for the production of Specific Pathogen Free (SPF) and Specific Pathogen Resistant (SPR) of indigenous species of shrimp may be established.** Clusters of fish farmers helps in better management of aquatic resources. Disease management is also easy in the cluster approach. Therefore potential aquaculture zones may be identified to allocate the ponds to cluster of farmers. **Cluster based management and implementation of Best Management Practices (BMP) needs to be encouraged.** Many of the shrimp farmers do not have adequate domestic market information. Often the farmers face the problems of preservation, storage and transportation of their fragile produce. **Therefore, farmers' associations should be encouraged to provide market information and private transporters should be encouraged to transport the produce through refrigerated vans. Accordingly, domestic market should be developed for shrimps with the required cold chain.**

Mono-crop farming is subjected to risks whereas diversified farming can adjust the

loss from one crop with gain of another. **Diversification to other species of shrimps, shell fish and finfish and crop rotation should be encouraged by providing incentives.** There is lack of national level data base on the production from brackish water aquaculture and therefore forecasting is not possible. **A national level census of brackish water aquaculture and the database on production, disease prevalence, etc should be maintained.** Organic aquaculture prevents degradation of the resources. Use of antibiotics and other chemicals are discouraged in the international markets. Certified produce from the organic farms are encouraged. **Accordingly, organic aquaculture should be promoted.** Tsunami has scared the fishers from going into the sea. Fishers have also lost their crafts and gears in that disaster. **Extensive culture of shrimps and other fin fishes may be permitted in the Post-Tsunami inundated areas with locally produced seed and feed.**

Freshwater Aquaculture

Presently aquaculture is not treated at par with agriculture. As a result they are debarred of facilities that the other farmers get. **Aquaculture should be treated at par with agriculture. Accordingly, the Kisan credit card should be extended to them and the benefits of the Prime Ministers Rojgar**

Yojna (PMRY), concessional electrical tariffs, etc. should be extended to the fish farmers. The water bodies are under different institutions. It is difficult to introduce aquaculture activities, if the water bodies are under some other department. This restricts the horizontal growth of aquaculture, which is one of the most potential sectors from the point of providing employment and nutritional security to the mass. All state owned water bodies will be under fisheries Department for development and management irrespective of ownership. Sustainability of production and equitable distribution of the income are the major concerns of inclusive development. Management of water bodies for de-silting and renovation activities consume time and money. When the leasing period is for one year neither the lessee nor the credit agencies are interested in bringing structural renovations. As a result productivity of the water bodies are not sustainable. The leasing period of state owned water bodies should be done for a minimum of 5 years. The preference will be given to fisheries cooperative/ SHGs/ unemployed trained fisheries professional groups. The technologies are local specific. General technological packages recommended for given zone may get setback because of some local constraints. Validation of the general package of practices for the local

situations cannot be left out as a risk. Failure of technology is also setback for its dissemination. Therefore validation of technology should be carried out by the experts in the DoF. Accordingly, different fish production technologies should be validated and demonstrated on a pilot scale with Government support before launching the same. Diversification is associated with risk minimization. If a crop fails to get the income, additional income from other crops compensates the same. Polyculture therefore is advised. Diversification of aquaculture practices is needed. Often the farmers and development agencies are guided by the principle of profit maximization, and less about long term sustainability per se. This may or may not be sustainable. Emphasis should be directed towards development of aquaculture in a sustainable manner rather than maximization of production.

Considering the need of seed, additional infrastructure for fish seed production should be developed and seed growers must be promoted. Still many farmers are practicing subsistence farming and the size of land holding is also declining. Aquaculture, in such cases, can play an important role in ensuring higher income from unit area. Integrated fish farming should be encouraged in such homestead farms. Water being a limiting

factor, it is necessary to sustainably use and conserve it. Watershed management approach may be an appropriate strategy in areas where aquaculture is concentrated. It should consider conservation, protection, restoration, recharging and other environmental factors. As far as possible, other farm activities shall be integrated for effective use of water and land resources. There should be greater economic and gender equity for more inclusive growth. The economic participation of women in aquaculture activity is minimal at present though there is scope for their greater involvement. Their role shall be encouraged in seed production, homestead aquaculture, marketing, etc.

Processing and Marketing Health and hygiene

Despite availability of standards very little is done to improve on ground the hygienic and sanitation conditions in most of the existing fishing harbours and landing centres. Presently, the concept of cleaner fishing harbours has gained momentum because of the insistence of food safety by fish and fish products importing countries. International standards shall be implemented for hygiene onboard fishing vessels, landing centers, and at the local processing units. Minimum infrastructure facilities for icing and cold chain should be developed at all landing centers to facilitate maintenance of

hygiene and for getting good returns from the produces.

Fishers' welfare

The working place in most of the processing units is not ergonomically comfortable. There is also a need to train the labour on different safety measures. Safeguards for protecting the interest of workers in processing sector is very much needed so as to have better quality of life for labours and better output for the industry.

Bio-waste management

At present there is no effective mechanism and a marketing network to utilize the bio-wastes from landing centres, peeling sheds, processing units and fish markets. This may be used for development of fish feed, manures and other industrial consumptions. Fishers' societies or entrepreneurs should be trained in scientific bio-waste management. Better utilization of wastes from peeling sheds, processing units and fish markets is need of the hour and therefore bio-waste management should be made compulsory.

Value addition

There are very limited number of training programs for the processors and vendors in value addition. Absence of comprehensive and regular market research and analysis has hampered

production and marketing of value added fish products. Besides, the DoF is not giving due importance to marketing including forward and backward linkages while implementing the development programs. **Market analysis and training on value addition for processors and vendors is necessary to increase the realization of value from their produce. Fishers / their associations should also be trained in the production of such products, may be in partnership with private agencies.**

Markets and Trade

In international fish trade, often importing developed countries resort to regulations in the guise of using environmental standards to protect their domestic markets. This has become a trade restrictive and discriminatory tool affecting export from developing countries. Experience of TED, eco-labeling standards, tuna-dolphin debate illustrates this. WTO has also favored linking the environment issues to the trade. In this context, **trade and environment issues shall be dealt separately under WTO regime.** PPP (public-private partnership) may have a scope in the marketing and export of fish and fish products. Scope of Private-public-community model/s in fisheries should be worked out and to be followed in marketing and export of fish and fish products. Domestic marketing of perishable commodities like fish requires

logistic support for transportation and storage further supported by adequate market information to sell the products before they perish. Accordingly, hygiene also plays an important role in the marketing of fish. Production and marketing of value added fish products and diversification of products is in its early stage. Landing centers sometimes get massive landing especially during pre-monsoon. On the other hand the fish are marketed within few kilometers of the landing centers which can buy only a few fish. Rest of the fish is dried. The dried fish is sold in other markets. Ice is not available to send fish to the distance markets. Refrigerated vans are also needed for long distance transportation. Market information regarding the emerging demand of fish in the cities is also lacking. Therefore, **Value addition, diversification of products (seaweeds), private investments in fish marketing (establishment of cold chains...) and imparting knowledge/training to the stakeholders with respect to hygiene, HACCP and certification procedures need to be encouraged. Domestic fish marketing and market information network needs to be strengthened to reduce exploitation of farmers and fishermen. There is a need to initiate an agency which will play a role in the dissemination of information on fish marketing in the country . Gender wise, fishermen are involved in capture and**

fisherwomen in sale of fish. In fisheries mostly the development efforts are targeted towards catch. There is a need to strengthen the marketing to promote fisher women. **Gender - mainstreaming has to be an integral component of policy development by including more gender sensitive programmes.** To encourage increased transportation and better marketing of fish, it is necessary to comply with the Railways stipulations including packing of 'fresh fish /iced fish' in thermocole boxes not exceeding 40 kgs. **Refrigerated containers for fish in the passenger trains can be provided by the Railways on the similar lines as provided for milk.**

Human Resource Development

Aquaculture is a fast growing food sector. And the professionals engaged in this sector have to play a more important role. **High priority shall be given to HR development in fisheries sector with adequate financial and infrastructural support to all those involved in HR development** These departments have to upgrade their know-how in the emerging fields of fisheries science. There is also a need to augment their social skills. **For DoF Personnel, the refresher training shall be made mandatory for career advancement in a national level training center developed for this purpose.** In order to raise the professional standards of the DoF, the improvements in the

recruitments have to be made. **The recruitment to DoF be based on professional fisheries background.**

The Colleges of Fisheries and the Fisheries Research Institutes have limited interactions with the entrepreneurs and the primary producers. Students are exposed to the field realities only for a shorter duration. **The curriculum in professional educational institutions should have inbuilt internship program / include rigorous on farm / onsite professional training on various aspects of fisheries / aquaculture in collaboration with private fish /shrimp hatcheries, seed farms, production farms, feed production unites, processing plants, fishing industry.** The ICAR and SAUs are following uniform syllabi in their graduate and postgraduate education programs. There is need to recognise that Fisheries science as 'Applied Science' and adequate expertise is essential to carry out teaching Fisheries Science. All such courses need accreditation. **There is need for a policy initiative in this direction and an agency named as Fisheries Council of India or Indian Fisheries Council similar to the All India Council for Technical Education or the Indian Medical Council needs to be immediately established to oversee all fisheries education in the country. It is recommended that the ICAR initiates consultations with the UGC and**

Government of India towards fulfilling this.

Service Delivery System

The service delivery system is mostly top down. Often the felt needs of the target communities are not taken into account and addressed. As a result the services are not reaching to the needy persons.

Service delivery system should have bottom up approach and should base on the needs of the fishers/fishfarmers.

Management of fisheries recourses will be more effective through participation and empowerment of the stakeholders. This will also ensure sustainability and equity. This will require capacity building of DoF and NGOs in aspects of community mobilization and organisation. Besides, there is a need to empower communities for taking decisions for the management of resources. They shall also mobilize support from other GOs and NGOs to use the resources sustain ably. Potential of public-private-community-partnership is not fully harnessed for fisheries development. **All stakeholders (resource user groups) involved in fisheries development should be made aware of technical developments with emphasis on social development and community involvement.**

The DoFs have become 'desk departments'. Mostly the department is engaged in enforcing regulations, collecting revenues

and facilitating the welfare programs. They are also involved in general administrative works. There is a shortage of staffs in the departments. Field level staff is also not well equipped with social skills. **Major restructuring of state DoF and its various wings / associated agencies is required.**

ICT is coming up as a cost-effective and interactive mechanism of delivering relevant information and knowledge to the stakeholders. **The DoFs should be trained on the use of ICT in their programs. E-governance systems for effective service delivery systems should be created and regularly updated for easy access to fishers. Models like village knowledge centres can be emulated. The potential of ICTs can be gainfully harnessed by service delivery systems for effective service delivery. Integrated models of service delivery wherein all the agriculture, market, rural development, and citizen related services & information can be bundled through a single ICT platform at the village level. The concept of one stop aqua shops may be taken up on pilot scale and demonstrated to the aspiring entrepreneurs/NGOs/Cos. This will improve easy access, save time, and reduce cost for farmers.**

Annexure I

PROGRAM SCHEDULE

Zonal Workshop on Fisheries and Aquaculture Policy:
Ecosystem and Livelihood Perspectives in East Coast States

22-24, March 2007 - MANAGE, Hyderabad

DAY I: 22.03.2007 Thursday

Venue: MANAGE, Hyderabad

INAUGURAL SESSION

17.30 – 18.30	Reception / Registration	
18.30 – 18.45	Welcome Address	Dr. Dilip Kumar Director, CIFE, Mumbai
18.45-19.00	Keynote Address	Mrs. Norma Alvares Senior Advocate and Social Activist, Goa
19.00-19.15	Address by the Guest of Honour	Dr. P. V. Dehadrai Former DDG (FY), ICAR
19.15-19.30	Presidential Address	Sri. Md. Fareeduddin Hon. Minister for Fisheries Govt. of Andhra Pradesh
19.30 – 19.45	Inauguration of the Workshop and Address by the Chief Guest Govt. of Andhra Pradesh	Mr. Kironmayee Nanda Hon. Minister for Fisheries Govt. of West Bengal
19.45 – 20.00	Vote of thanks	Dr. Jacob D. Raj Director, PREPARE
20.00 onwards	Dinner	

Time and Sessions	Chairperson and Co-Chairperson	Rapporteurs
9 – 1.30 pm	Technical Sessions	Executive Hall 1
9 – 10.30 am Technical Session I: Status of Fisheries and Policy Overview	Dr. P.V.Dehadrai, Ex-DDG (Fy), ICAR	Dr. P. S. Ananthan, Scientist, CIFE Ms. Aarthi, ATREE
11 – 12.30 pm Technical Session II: Policy Issues in Capture Fisheries	Dr. K.K.Vass, Director, CIFRI Mr. A.K. Ajit Patnaik, Director, Nandankanan, Orissa, (Former CEO, Chilika Development Authority)	Dr. Shyam S Salim, Scientist, CIFE, Dr. Emerson Kagoo, Asst. Director, PREPARE
12.30-1.30 pm Technical Session III: Policy Issues in Aquaculture	Dr. M. V. Gupta, World Food Prize Laureate	Dr.B.B.Nayak, Sr. Scientist, CIFE Dr. Vennila, Scientist, CIFE
2.30 – 4.30 pm - Four Parallel Group Discussions - Executive Hall 1 & Syndicate Rooms		
Group A – Executive Hall 1 Policy Issues in Marine Capture Fisheries	Dr. Ramchandramurty, Ex-Head, HOD, CMFRI / Consultant	Dr. Shyam S Salim, Dr. Latha Shenoy, Sr. Scientist, CIFE
Group B - Syndicate Room 1 Policy Issues in Inland Capture Fisheries	Dr. K.K.Vass, Director, CIFRI	Dr. P. S. Ananthan, Scientist, CIFE Dr. R. P. Raman, Sr. Scientist, CIFE
Group C - Syndicate Room 2 Policy Issues in Brackish Water Aquaculture	Dr. M. V. Gupta, World Food Prize Laureate	Dr. Vennila, Scientist, CIFE Dr. A. K. Reddy, Sr. Technical Officer
Group D - Syndicate Room 3 Policy Issues in Freshwater Aquaculture	Dr. D. P. S. Chauhan, Former Dy. Commissioner (Fy), Gol	Dr. B.B.Nayak, Sr. Scientist, CIFE Dr. Rami Reddy
4.30 – 6.00 pm Policy Issues in Freshwater Aquaculture	Plenary Session Dr. Ramchandramurty, Ex-Head, HOD, CMFRI / Consultant	Executive Hall 1 Dr. R. S. Biradar, Principal Scientist, CIFE Dr. Shyam S. Salim

Time and Sessions	Chairperson and Co-Chairperson	Rapporteurs
Technical Session - Executive Hall 1		
9.30 – 10.15 am Technical Session V: Policy Issues in Processing, Markets and Trade	Dr. S. Ayyappan, DDG (Fy), ICAR Speakers: Dr. Samar K Datta Dr. Ajit Patnaik Dr. S.C. Pathak Stakeholders Perspectives	Dr.B.B.Nayak, Sr. Scientist, CIFE Dr. Venkateshwarlu, Sr. Scientist, CIFE
10.15 – 11.00 pm Technical Session VI: Policy Issues in HRD and Service Delivery System	Dr. Y. S. Yadava Member Secretary, CAA & Director, BoBP-IGO Speakers: Dr. R.S. Biradar Dr. Jacob D raj Dr. Rekha Gaonker Stakeholders Perspectives	Dr. Vennila, Scientist, CIFE Dr. Bharat Sontaki, Sr. Scientist, NAARM
11.00 - 11.15	Tea	
11.15 – 1.15 pm - Four Parallel Group Discussions - Executive Hall 1 & Syndicate Rooms		
Group A - Executive Hall 1 Policy Issues in Policy Issues in Processing Sector	Dr. S. C. Pathak Ex-CGM, NABARD	Dr.B.B.Nayak, Sr. Scientist, CIFE
Group B - Syndicate Room 1 Policy Issues in Markets and Trade	Dr. Samar K Datta Prof., IIMA	
Group C - Syndicate Room 2 Policy Issues in HRD	Dr. Y. S. Yadava Member Secretary, CAA & Director, BoBP-IGO	Dr. Vennila, Scientist, CIFE
Group D - Syndicate Room 3 Policy Issues in Service Delivery System	Dr. Dilip Kumar, Director, CIFE	Dr. Bharat Sontaki, Sr. Scientist, NAARM
1.15 - 2.00	Lunch	
2.00 – 3.30 pm Plenary Session Executive Hall 1	Dr. Dilip Kumar Director, CIFE Dr. Samar K Datta, Prof., IIMA	Dr. Ananthan, P.S Dr. Bharat Sontaki
3.30 – 3.35 Vote of Thanks	Dr. R. S. Biradar, Principal Scientist, CIFE	

Annexure II
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10	Dr. Bharat Sontaki
11	Dr. Rami Reddy

Annexure IV
Feedback from Workshop Participants

The participants of the workshop were provided with a feedback form to evaluate the program on the utility, relevance, conduct, representation and other logistic designs. In addition they were asked to spell out the most impressing factors, possible improvements and inherent weaknesses of the workshop. The feedback provided will be utilized as a corrective mechanism in the organization of the future workshops. Of the 60 participants, 35 participants furnished the details the evaluation of the feedback revealed the following:

Sr.No	Parameter	No. of respondents		
		VS/SA	S/A	NS/SD
1	How do you rate the overall utility of the workshop?	32 (91.43)	3 (8.57)	0 (0.00)
2	Whether the workshop was relevant to your (organizational) needs?	28 (80.00)	5 (14.30)	2 (5.70)3
3.	Do you think the workshop was timely given the existing policy gaps?	25 (71.45)	9 (25.65)	1 (2.90)4
4.	Whether the workshop was conducted in a participatory mode?	26 (74.25)	8 (22.85)	1 (2.90)
5	Do you think the workshop objectives were satisfactorily addressed by the deliberations?	30 (85.70)	5 (14.30)	0 (0.00)
6	Whether the design and format of the workshop was satisfactory given the nature of objectives and expected outputs?	28 (80.00)	7 (20.00)	0 (0.00)
7	Whether the participants were representative of all stakeholders?	23 (65.70)	9 (25.65)	3 (8.65)
8	How do you rate the overall organisation of the workshop?	30 (85.75)	4 (11.50)	1 (2.90)
9	Are you satisfied with the venue and time of the workshop?	31 (88.50)	4 (11.50)	0 (0.00)
10	Are you satisfied with the accommodation arrangements?	29 (82.85)	5 (14.30)	1 (2.90)
11	Are you satisfied with food and refreshments?	29 (82.90)	6 (17.10)	0 (0.00)
12	Are you satisfied with the transportation arrangements?	28 (80.00)	6 (17.10)	1 (2.90)
13	Are you satisfied with the logistics support during the workshop?	28 (80.00)	7 (20.00)	0 (0.00)

Figures in parenthesis indicate percentage to total

VS Very Satisfied
S Satisfied
NS Not Satisfied

SA Strongly Agree
A Agree
SD Strongly Disagree

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