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5th Zonal Workshop on

Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States

Bihar, Chattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh

Patna

25 - 27 October 2007

Proceedings



5



Central Institute of Fisheries Education

(Deemed University-ICAR)

Fisheries University Road, Versova, Mumbai - 400 061

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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 fifth Zonal Workshop on 'Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States' held in Patna during 25 - 27 October 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

ASRB	Agricultural Scientist Recruitment Board	NCDC	National Co-operative Development Corporation
CCRF	Code of Conduct for Responsible Fisheries	NE	North Eastern
CIFE	Central Institute of Fisheries Education	NECC	National Egg Coordination Council
CIFT	Central Institute of Fisheries Technology	NGO	Non Governmental Organization
CMZ	Coastal Management Zone	PG	Post Graduate
CRZ	Coastal Regulation Zone	PPP	Public Private Partnership
D.F.Sc	Diploma in Fisheries	PPCP	Public Private Community Partnership
DDG	Deputy Director General	PRI	Panchayati Raj Institution
DoF	Department of Fisheries	R&D	Research and Development
EIA	Environment Impact Assessment	RS	Remote Sensing
ETP	Effluent Treatment Plant	SHG	Self Help Group
FAO	Food and Agricultural Organization	SPF	Specific Pathogen Free
FFDA	Freshwater Farmers Development agency	SPR	Specific Pathogen Resistant
FISHCOFED	Fisheries Co-operatives Marketing Federation	TDS	Trickle Down System
FTC	Fisheries Training centres	UG	Under Graduate
GDP	Gross Domestic Product	UGC	University Grants Commission
GIS	Geographic Information System	WTO	World Trade Organization
HDI	Human Development Index		
HR	Human Resources		
HRD	Human Resource Development		
ICAR	Indian Council of Agricultural Research		
ILO	International Labour Organization		
IMC	Indian Major Carps		
ITK	Indigenous Technical Knowledge		
KVK	Krishi Vigyan Kendra		
MoEF	Ministry of Environment and Forest		
MPEDA	Marine Products Exports Development Agency		
NABARD	National Bank for Agricultural and Rural Development		

Executive Summary

Fisheries and aquaculture have been the fastest growing food production systems during the last three decades. Their significance and contribution towards the economy and the society in general and the food and livelihood security of the poor, though enormous, have been understated so far. Considering that there are still vast underutilised and untapped resources having potential for development, the absence of comprehensive and an enabling policy framework for fisheries development at the Central and State levels has been recognised as one of a limiting factor in realising the growth potential of the fisheries sector, recognised as a *sunrise* sector. Ironically, the importance of policy and HRD aspects has not been given sufficient attention so far.

In this 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. The facilitation process has involved organisation of consultative workshops at different levels involving all the stakeholders. Since December 2006, four workshops were conducted in different parts of the country and this is the report of 5th Zonal Workshop on 'Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives

for Central States' of Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh and Uttar Pradesh held in Patna during 25 - 27 October 2007. It was organized jointly by Department of Animal and Fish Resources (DAFR), Patna and Central Institute of Fisheries Education (CIFE), Mumbai in partnership with IFA, GOI, NFDB, ICAR-RCER.

The workshop consisted of inaugural session, policy status overview session, special session on Fisheries Development in Bihar, parallel working group discussions, plenary session and a concluding session. About 180 participants consisting of Dy. Chief Minister & Fisheries Minister of Bihar, Fisheries Minister of U.P., Secretaries, Directors and other Staff of Fisheries Departments, Scientists, NGOs, Fishers, Farmers, Bankers and Entrepreneurs actively participated in the workshop with open mind which was conducted in a truly consultative and business like mode. The following is the summary of the workshop proceedings.

In the inaugural session, Dr. Dilip Kumar welcomed the gathering and emphasised the need for national level policy particularly to address the various inter-sectoral issues as well as State specific policies since fisheries is a State subject. Mr. Anil Kumar, Principal Secretary, Fisheries, Govt. of Bihar, appreciated the role of CIFE, called for strengthening the

extension network while Mr. Deo Datta, Secretary, fisheries, Govt. of Uttar Pradesh felt about the need for bringing more ponds under aquaculture. Dr. S. Ayyappan, DDG (fisheries), ICAR stressed infrastructure support and wanted State Departments to make use of investment opportunities provided by NFDB. Dr. P.V. Dehadrai, former DDG (Fisheries), ICAR lauded the Bihar Govt. for declaring aquaculture at par with agriculture and emphasized need to promote entrepreneurship, while Dr. V.R.P. Sinha, Former Director of CIFE, stressed on the need make *right to water* including for fisheries and aquaculture as a policy measure so as to accord due rights. Dr. K.K. Vass, Director, CIFRI highlighted the requirement of water management policy and its synchronization with fisheries policy. Dr. W.S.Lakra, Director, NBFGR wished that each State should declare one fish as its State fish so as to create biodiversity awareness.

Mr. Jamuna Prasad Nishad, Minister of State for Fisheries & Army Welfare, Govt. of Uttar Pradesh briefed the progressive measures taken by his Govt. for fisheries and fishers in U.P. and wanted CIFE to actively participate in U.P. fisheries development and policy formulation. Mr. Sushil Kumar Modi, Deputy Chief Minister & Minister of Animal & Fish resources, Govt. of Bihar outlined his vision of development of aquatic resources of Bihar as a major economic activity and source of

income for rural poor. He also appreciated the work of CIFE in preparing the draft Fisheries Policy for the State of Bihar.

In the policy status overview session, Mr. Afsar Hussain, Deputy Director, DOF, Chhattisgarh outlined the available fisheries resources and extent of its utilization, present leasing policy for water bodies and the policy issues confronting the State of Chattisgarh. He specifically called for making aquaculture at par with agriculture, lowering the production cost of fish seeds, removal of stamp duty during leasing of reservoirs. Similarly Mr. H. N. Dwivedi brought out the status of fisheries development and policy issues in Jharkhand. Developing a proper management plan and strategy for reservoir fisheries development was highlighted as an important requirement.

Giving an overview of development status in Madhya Pradesh, Mr. H. S. Sidhu, Director, DOF, Madhya Pradesh highlighted need for developing fisheries in newly developed large water bodies, involvement of Dept. in reservoir planning, developing fish seed certification standards by GOI, strict provision for elimination of harmful exotic fish species, and increasing compensation given during close season to Rs. 3000 from Rs. 1500. Mr. Deo Datta highlighted the development features during various five year plans in U.P and flagged of pertinent policy issues

namely need for a Fisheries Policies at National and State level, aquaculture to be made at par with agriculture, strengthening of Database and Information networking, restricting the environmental degradation in inland water, and integrating water bodies for the multiple use of water, etc.

In the special session on Bihar Fisheries presentations by Mr. Manoj Kumar and Mr. Tun Tun Singh detailed the status of Bihar fisheries and highlighted the features of the recently prepared draft Fisheries Policy of Bihar. Some of the challenges requiring attention are periodic occurrence of natural disaster (flood / drought), unorganized fish marketing system, lack of established system of authentic data collection, inadequate seed supply, especially after floods, inadequate departmental extension personnel, lack of motivation and refresher courses for technical personnel, unwillingness of insurance companies and banks to extend credit and insurance services to fishers / farmers, etc. Mr. Rishikesh Kashyap put a strong case for reform of fisher co-operative societies to make them truly democratic, transparent and professional. Mrs. Suman Singh vociferously put forward the case for making the Fisheries Department a field oriented development Department from the present regulation and settlement oriented revenue Department.

Dr. Ayyappan, DDG (Fy.), ICAR outlined the strategy for making Bihar fish surplus State and highlighted the need to develop district level plans to bring more area under scientific aquaculture management, organising off-campus training programs, publication of package of practices and awareness materials in local languages, etc. Remarking that even after 30 years of the implementation of FFDA, only 2.2 tons /ha productivity has been achieved and there is still widening extension/yield gap, Dr. Dilip Kumar made a passionate plea for *rethinking some of the developmental assumptions* in the light of limited success of three decades of top down development experience. As a way forward, he wanted a paradigm shift and suggested a community centered and management oriented development strategy, capacity building of developmental and extension staff and restructuring the service delivery system.

Shri Sushil Kumar Modi said that the State of Bihar has declared aquaculture at par with agriculture for promoting aquaculture on fast track. He noted with satisfaction that the trainees trained at CIFE Kakinada Center have become entrepreneurs and wished that capacity of the CIFE training centers at Andhra Pradesh is increased. He also emphasized the reform of State fish seed farms, encouraging banks to provide loans and need for Calamity Relief Fund to provide for fisheries and aquaculture as

well. Humble Chief Minister of Bihar, Shri Nitish Kumar while formally inaugurating the workshop stated that the State has a special passion for fish as in some places fish is considered as vegetarian food. As the State is left with only one major resource that is water after bifurcation, he called for priority development of fisheries and aquaculture. He wanted that the Millennium Development Goals are appropriately incorporated in the policy. To him, the policy should also help increasing the production from crops and animals along with fish production. Instead of just Blue Revolution, the State should aim at Rainbow Revolution, he desired.

The second day consisted of intense and focused five parallel work group deliberations involving different stakeholders. The salient features of workgroup recommendation are as follows.

Work Group 1 on Policy Issues in Riverine and Reservoir Fisheries recommended that conservation of riverine resources shall be given due priority and for that it shall be brought under concurrent list on one hand and involvement of local government and communities, SHGs, NGOs should be ensured for effective implementation of regulatory measures. The policy measure shall ensure minimum environmental flow, put in place appropriate licensing structure, adopt one endangered fish as State fish,

and provide for coordination with multiple agencies involved for conservation. The focus on reservoir fisheries shall be productivity enhancement, appropriate licensing regime with priority to local fishers and women, enhanced role of DoF vis a vis Irrigation Dept., strictly enforcing the ban on catching of broodstocks, provision for stocking of adequate quality seed, reforming the co-operatives, and strengthening the infrastructure for reservoir fisheries development.

Work Group 2 on Policy Issues in Oxbow lakes, Flood Plains and Other Wetlands felt that the overall objective of the fisheries and aquaculture policy shall be increasing the production on a sustainable and equitable basis with particular emphasis on benefit to rural poor (fisher and farmer). The group favoured a long term leasing policy, 10% of total projected annual gross income as lease rent with priority of leasing to Fishers' co-ops jointly with private entrepreneurs, SHGs of fishers adjacent to water bodies, fishers' co-ops, individual fisher, private entrepreneurs, farmers, educated unemployed youth / fisheries graduates and corporate in that order. The policy shall promote cluster development approach as overall management strategy for these water bodies, while creating and forging effective marketing linkages. The needed investment shall be mobilised from multiple sources. It was felt that the policy should ensure transparency and

accountability in the functioning of departmental staff and field level functionaries. The policy shall recognize the unique property regime in the floodplains and other wetlands and an appropriate management strategy. Giving high priority for co-operative society reforms, the group suggested various practical measures to ensure greater degree of accountability and professionalism in their functioning, and equitable distribution of benefits.

Work Group 3 on Policy Issues in Aquaculture felt that alleviating poverty and enhancing the livelihood of the resource poor rural people through increased aquaculture production shall be the policy objective. Reiterating that fish is a bio-indicator of ecological health, aquaculture should be encouraged to improve aquatic ecosystem beside as a profitable economic activity. The group strongly felt the need to treat aquaculture at par with agriculture, and called for policy measures for initiating massive program for pond renovation, species diversification, promotion of sewage fed aquaculture, strengthening the credit mechanism, insurance and promotion of micro-finance, strong linkages between DoF and ICAR/SAUs, rationalization of multiple water use ensuring water use rights for fisheries, strengthening govt. broodstock farms and ensuring availability of seed and low cost feed, disease

surveillance mechanism, long term lease of water bodies with priority to fish farmer co-operatives.

Work Group 4 on Policy Issues in Processing, Markets and Trade called for creation of marketing cell within DoF to strengthen marketing infrastructure and promote fisheries marketing at different levels. Establishment of proper fish landing centers in reservoirs and large water bodies, provision of cold storage and Transportation facilities, setting up of hygienic fish markets and aqua-shops, promotion of value added products, training and capacity building require appropriate policy measures, the Group felt.

Work Group 5 on Policy Issues in Human Resource Development and Service Delivery System wanted the following policy measures: creation of separate Ministry of Fisheries and Aquaculture at State and Central levels, technical person, as against bureaucrats, to head the Department of Fisheries at State level, bringing professionalism in DoF, filling up of vacancies on a priority basis with adequate women participation, linking career advancement for DoF personnel with performance, mandatory registration of fishers, regular farmers' and trainers training, use of ICT tools in service delivery, empowering marginal farmers to access common property resources, etc.

In the concluding session Dr. Dilip Kumar presented the general guidelines for policy framework emerging from the workshop. The workshop felt that potential to contribute to human development and social empowerment cannot be fully realized without comprehensive policies that encourage sustainable development. It also called for strengthening of institutional capacity to establish and implement regulatory framework that are both transparent and enforceable, capacity building of the primary producers, sincere co-operative sector reforms, ecosystem based approach for development of fisheries complementing other farming systems, recognising the legitimate right of fisheries sector for water, and promotion of farmers-led extension system approach. Shri Sushil Kumar Modi expressed his desire to make Bihar the top fish producing State in the country after attaining self sufficiency and reiterated role of fisheries in improving the livelihood of rural poor.

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. The facilitation process involves organizing consultative and participatory meeting at different levels involving all the stakeholders. CIFE has planned to organize five zonal workshops across the country and a concluding national workshop with active support and participation of different stakeholders.

Since December 2006, four workshops were conducted involving North Eastern States in Guwahati (7-8 December, 2006), involving East Coast States in Hyderabad (22-24 March, 2007), involving West Coast States in Goa (21-23 June 2007) and involving Northern States in Chandigarh (6-7 July 2007).

This is the report of 5th Zonal Workshop on Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States of Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh and Uttar Pradesh held in Patna during 25 - 27 October 2007. It was organized jointly by Department of Animal and Fish Resources (DAFR), Patna and Central Institute of Fisheries Education (CIFE), Mumbai in partnership with Indian Fisheries Association (IFA), Mumbai, Government of India (GOI), National Fisheries Development Board (NFDB), Hyderabad, ICAR – Regional Center for Eastern Region, Patna with the following

specific objectives:

- To sensitize and facilitate the process of developing an overarching Fisheries and Aquaculture Policy Framework at the Centre and a comprehensive fisheries policy in the States
- To critically review the quality of the services delivery system in the fisheries sector and suggest innovative measures and strategies to make it more effective and efficient
- To flag off desired HRD requirements and strategies for institutional strengthening of the fisheries sector

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.

2. Session I: Fisheries Development and Policy Issues - An Overview

Dr. Dilip Kumar, Director, CIFE, welcomed the dignitaries and the participants of the workshop. He briefed about the background and the rationale of the workshop and the initiative of CIFE in facilitating the process of developing policy framework and organisation of zonal workshops at Guwahati, Hyderabad, Goa, and Chandigarh.

He reiterated that fisheries are common property resources that provide livelihood for millions of poor people. It also has inter-sectoral and inter-state issues and therefore a national policy is the need of the hour. He further said that since fisheries and aquaculture is state subject, CIFE will also facilitate in developing the state fisheries and aquaculture policy.

Shri Anil Kumar, Principal Secretary, Fisheries, Government of Bihar also emphasized the need for a State fisheries policy and therefore he expressed that the steps taken by CIFE, Mumbai was very timely. He further appreciated CIFE for training thousands of farmers from Bihar at its Kakinada Center located at Andhra Pradesh in aquaculture. In his address he also emphasized on the need to strengthen the existing Extension Network.

Shri Deo Datta, Secretary, Fisheries, Govt.

of Uttar Pradesh, felt about the need for bringing more ponds under aquaculture, strengthening the welfare measures for the fishers, and developing marketing infrastructures, cold storage facilities, and mobile vans to transport fish to distant places.

Dr. S. Ayyappan, DDG (Fisheries), ICAR, in his remark said that fish is a choice food. He stressed on the need to develop marketing, export, and aqua-shops. He said that NFDB has provided opportunities to increase the investment in fisheries and aquaculture, which the Department of Fisheries should take advantage of.

Dr. P.V. Dehadrai, former DDG (Fisheries), ICAR, emphasized the need to reclaim the ponds mainly from water hyacinth. He also emphasized on the need to promote entrepreneurship in fisheries and aquaculture sector. He further expressed his gratitude towards Government of Bihar for declaring aquaculture at par with agriculture for providing concessional electricity tariff, credit, freight rate, water tariff, tax exemption, etc.

Dr. V.R.P. Sinha, Former Director of CIFE, expressed his concerns for low primary productivity of the water bodies and stressed about the need for a model that can depict development as resulting from fisheries and aquaculture. He also emphasized about the need to restore the

water bodies, especially from water hyacinth. He stressed on the need make *right to water* including for fisheries and aquaculture as a policy measure so as to accord due rights. Integrated farming, he said could be taken up in the oxbow lakes.

Dr. K.K.Vass, Director, CIFRI, Barrackpore highlighted the requirement of water management policy. He further said that such a water management policy, and the fisheries and aquaculture policy should go together. He also felt that that regulation and governance should also form part of such policy.

Dr. W.S.Lakra, Director, NBFGR, Lucknow in his remark expressed the need to augment the biodiversity of aquatic animals. He emphasized that each State should declare one fish as its State fish so as to create awareness about importance of fisheries biodiversity and its conservation.

Shri Jamuna Prasad Nishad, Honourable Minister of State for Fisheries and Army Welfare, Govt. of Uttar Pradesh and Co-chairman of the Session stated that the Department of Fisheries in U.P is very small and needs strengthening. He invited the CIFE to organize a similar workshop in his State and help in developing the fisheries and aquaculture policy of U.P.

Shri Sushil Kumar Modi, Honourable Deputy Chief Minister and Minister of

Animal & Fish Resources, Govt. of Bihar who was the guiding force of the workshop chaired the session. He noted that for Bihar, water resources are the most abundant and important resource, and so the State is looking towards development of fisheries and aquaculture as a major economic activity and source of income. He appreciated the work of CIFE in preparing the draft Fisheries Policy for the State of Bihar.

Later, the workshop objectives, expected outputs and the structure of deliberations particularly the format of focused work group discussions were explained by Dr. Dilip Kumar in the second part of the session.

After a short tea break, the session continued with the presentations on status of fisheries and aquaculture, existing policies and regulatory environment, and flagging of policy related issues by respective Dept. of Fisheries of Chhattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh States. While the Deputy C.M. continued to chair the session, Dr. Archana Sinha and Dr. P. S. Ananthan acted as rapporteurs.

Shri Afsar Hussain, Director, Fisheries, Chhattisgarh made the presentation on present Status of fisheries and aquaculture in Chhattisgarh. He explained that the State has 1.55 lakh ha of water area out of which

46 percent come under ponds and 54 percent come under reservoirs. Of the total ponds 85 percent have been brought under aquaculture and 93 percent of the water areas under reservoir have been covered fisheries development. The State has two major river systems viz. Mahanadi and Godavari with their tributaries forming a network of 3576 km.

With respect to the existing policy and the regulatory environment, he mentioned that leasing of water bodies are done by the Gram Panchayat for the water body upto 10 ha average area, Janpad Panchayat for the 10 to 100 ha area, Zila Parishad for 100 - 200 ha area, and Fisheries Department for the water area above 200 ha. Govt. recently (on 8th Sept. 2007) revised the policy with following amendment. Water bodies of 200 - 1000 ha and those above 5000 ha have to be leased out to fishermen co-operative societies on priority by the Department. Water bodies of 1000 – 5000 ha is to be allotted to C.G. Matsya Mahasangh on royalty basis. The duration of lease is 5 years. Priority for leasing of water bodies will be for: Registered fisherman co-operatives, Fisherman groups, Individual fisherman, Persons displaced on account of submergence caused by irrigation, Self help groups in the absence of above four, water body below 1 ha is allotted to individual fishermen and above 1 ha water body is leased to fishermen society and groups for a period of 5 years at a time.

He flagged off the following policy related issues in his State: aquaculture has to be made at par with agriculture, production cost of seeds needs to be lowered down, stamp duty required during the leasing of the reservoirs needs to be removed.

Shri H. N. Dwivedi, Dy. Director (Fisheries), Jharkhand made the presentation on Jharkhand fisheries. He explained that the State has 138750 ha of water area out of which there are 29 percent under ponds, 68 percent under reservoirs, and only about 3 percent under check dams. Fish production in the State is about 54000 tons and the demand is about 86000 tons. Reservoirs contribute maximum to the production. While detailing the existing policies and regulatory environment in his State, he said that the Department is emphasizing on renovation of old ponds, fish seed production, stocking of fingerling in reservoir, and construction of new tanks. Matsya Mitras are formed in the State. Presently 883 Matsya Mitra were selected and trained by Directorate level. Through F.F.D.A, 40 of the progressive Matsya Mitras were sent to CIFRI Barrackpore for special training. Raising of fish seed through Matsya Mitra / Fishermen Co-Operative Societies near the reservoirs is the major thrust area of the Department at present.

He flagged off the following policy related issues in his State as requiring attention: provision for treating / reclaiming laterite

and acidic nature of soils, provision for de silting the traditional ponds, recording the traditional system of fish culture, ensuring supply of adequate quality and size of fish seed, developing a proper management plan and strategy for reservoir fisheries, augmenting the capacity of officers and fish farmers.

Shri H. S. Sidhu, Director, Fisheries, Madhya Pradesh gave the presentation on Madhya Pradesh fisheries, its status, regulatory environment and policy issues. According to him, the State has 3.23 lakh ha water area available for fish culture in the form of irrigation reservoir (2.70 lakh ha) and village ponds (0.53 lakh ha). Out of total 3.14 lakh ha, 97% has been brought under fish culture. State is drained by 17088 km of rivers and rivulets. State is enriched with rich fish fauna - 172 fish species available in the water area of the state.

Regarding the existing policies and regulatory environment, he said that the leasing of the water area is done at different levels for different area - Gram Panchyat 0-10 ha, Janpad Panchyat 10-100 ha, Zila Panchyat 100-2000 ha, M.P. Matsya Mahasangh above 2000 ha. Leasing of water bodies for fish culture up to 1 ha is given to fisherman and more than 1 ha to primary fishermen cooperative societies. For the development and conservation of the fish diversity, State has enforced the

Fisheries Act 1948 and amended it in the 1981. The State has also formulated M.P. Fisheries Riverine Rule, 1972, for conservation of rivers and reservoirs. M.P. Fisheries Cooperative Rule was formulated in the year 1972 for providing assistance to cooperative societies. To assure economical and social security, Dept. of Fisheries implements Janshree Insurance Scheme following provisions for its beneficiaries:

- On normal death nominee gets Rs. 30,000/- on accidental death/permanent disability gets Rs. 75000/-
- In the scheme fishermen has to pay Rs. 50/- as contribution, DoF sisters contributing to Rs. 50/- and rest Rs. 100/- is borne by LIC.
- 2 children of beneficiaries studying from 9 to 12th class get Rs. 100/- per month as scholarship

The state has also launched river ranching programme for enrichment of fish fauna in the rivers which create new avenues for livelihood for thousands of fishers with the objectives of:

- To promote fish production prize for an outstanding fisheries cooperative societies, fishermen and fish farmers.
- To provide assistance from various employment generation schemes like NREGS, BRGF, SGSY for infrastructure

development in fish seed production, renovation of seasonal ponds, training centre establishment.

- To promote Fishermen Credit Card Scheme for financial assistance for fish culture

Some of the policy issues requiring attention in M. P. are: provision for the establishment of fish seed production units, provision for infrastructure for fishing for newly developed large water bodies, provision for training centre, post harvest infrastructure, and fishing implements, fisheries Department should be requested to participate in reservoir planning right from the beginning, there should be a provision for fish seed certification and the standard norms should be decided by the GOI, there should be the strict provision for all States for the elimination harmful exotic fish species, like farmers, the credit card facilities should be provided to all fishers for their social and financial upliftment immediately, fishing in close season period should be strictly followed by all states, saving cum Relief scheme should cover all fisher community. And the amount to be given during close season should be raised upto Rs. 3000 (Rs. 1500 in 2 months), ICAR should establish a well equipped laboratory in different agro climatic zone in the state to suggest measures for fisheries development in local conditions, for conservation of fish diversity, there should be a national programme for stocking of

water resources with endangered and threatened species, acquisition of land, cost of construction of fish farm should be included in the project planning of the large reservoirs, like other farmers in case of excessive rains or untoward draught conditions, fishers should compensation for their losses, fisher census should be carried out at regular intervals to identify active fishers, and fisheries requires to be treated at par agriculture sector to promote the fisheries development.

Shri Deo Datta, Secretary, Fisheries, Govt. of Uttar Pradesh in his presentation on the status of fisheries and aquaculture in U.P. said that reservoirs (more than 2 lakh ha) constitute a large water area in the state. Fishery management in such areas is vested in different departments, which pays the fixed percentage of total income to irrigation department as royalty. Ponds (1.61 lakh ha) are under the ownership of State Revenue Department which leases ponds for fish farming. Rivers are dominated and controlled by Ganga with most important territories as Yamuna, Gram Ganga, Gomti, Ghagra and Gandak. The prevalent fishing arrangements in the rivers are i) free fishing without restriction, and ii) through open auction by irrigation and revenue department. Wetlands are concentrated mostly in riverine and flood prone belt where water bodies are under multiple ownerships, and their lease remains controversial issue at local level.

Productivity of ponds is 2.9 tons per hectare against 2.2 tons national average. Yield of reservoirs is 21.56 kg per ha per year against national average 30 kg. Output in rivers is not registered due to absence of any mechanism. Yield in lakes is less than 30 kg / ha against 500 – 1000 kg /ha in other states. On the whole the production is 2.89 lakh tons against total inland production of 3.55 million tons, of which 9.88 lakh tons is from West Bengal and 6.8 tons is from Andhra Pradesh.

Talking about the existing policies and regulatory environment, he noted that U.P. Fisheries Act came into existence in 1948. During 1950, 50 districts were covered by U.P. Fisheries Act, and in 1966, independent status of Fisheries Department was provided. During the 1st Five Year Plan, some waters were transferred to Department, in the 2nd Five Year Plan emphasis was given on the organization of Fish Co-operative Societies and giving emphasis in bringing Extension under the Private Sectors. In the 3rd Five Year Plan, fishing rights of 16 large and 12 medium reservoirs were transferred from Irrigation Dept to the DoF. During 6th Five Year Plan there was an establishment of Fisheries Development Cooperation. In the 7th Five Year Plan, large hatcheries in Govt. Sectors were constructed besides implementing welfare schemes for fishing communities. During the 8th and 9th Five Year Plan, fish seed production was initiated under private sector through many

hatcheries besides development of reservoir fisheries. Under 10th Five Year Plan there was an enhancement in productivity of fish and improvement of socio-economic condition of traditional fishermen.

He flagged off the following policy related issues in U.P.: need for a Fisheries Policies at National and State level, early settlement of properties regime, aquaculture to be made at par with agriculture, strengthening of Department of Fisheries, strengthening of Database and Information networking, development of Fisheries Institutes, development of Infrastructure for the development of fisheries, Fisheries Development Authority is needed to look into the developmental issues, water logged areas need to be brought under fish culture, increase in coverage area under fisheries and aquaculture, augmenting the productivity in reservoirs, ponds and tanks, increasing access to quality seed, establishment of cold chain, restricting the environmental degradation in inland water, integrating water bodies for the multiple use of water, integrated fish farming - prawn culture, duck culture, etc.

3. Session II: Special Session on Fisheries Development in Bihar - Prospects and Challenges

Shri R.N. Choudhary, Director, Fisheries, Bihar welcomed the gathering. This was followed by the presentation on status of Bihar fisheries by Mr. Tun Tun Singh, FEO, Bihar and on the recently drafted Fisheries Policy by Mr. Manoj Kumar, Dy. Director, DoF, Bihar. Highlighting that Bihar is rich in water resources, Mr. Tun Tun Singh provided the following details. Wetlands including the flood plains and chauras, cover 53 percent of the total water area (1 lakh ha), followed by ponds and tanks covering 39 percent of the water area (70,000 ha), reservoirs 0.06 percent (11,000 ha) and oxbow lakes 0.05 percent (70000 ha). In addition to that there are 3200 km of rivers. The state has 121 govt. seed farms, 26 hatcheries under private sector.

Mr. Manoj Kumar He remarked that settlement of Govt. water bodies has been brought under the ambit of the Bihar Water Bodies Management Act 2006 which was amended in 2007. Settlement of *jalkars* in the State is aimed at maximizing fish production and productivity and further increasing more avenues of employment for fisher-folk. It also aims for making the leasing policy of water bodies transparent and production oriented. It suggests short term settlement of water bodies for five years and long term of settlement of water

bodies for ten years. It further suggests that the water bodies may be settled with Fishermen Co-operative Societies also for ten years if selected under any scheme of development. The Act says that the fishing in rivers shall be prohibited between June 15th and August 15th, and the fishing net or gill net, used in the rivers, should not have mesh size less than 4 cm. The Act prohibits the use of dynamite or poison in rivers as well as ponds. **Fisheries have been given the status of Agriculture in Bihar.** This entitles lesser registration fee on lease of land for farms, water rent from irrigation canal as per agriculture rate, bank loan on agricultural interest, and Kisan credit card facility.

He also flagged some of the policy related issues in Bihar: inadequate departmental extension personnel, periodic occurrence of natural disaster (flood / drought), recurring occurrence of different diseases, unorganized Fish Marketing System, over exploitation of natural resources, depletion of natural aquatic resources, lack of established system of authentic, factual and periodic data collection, poor infrastructure of ponds and lakes, lakes and wetlands attaining a derelict state due to colonization of macrophytes, there is also pollution and as a result loss of breeding grounds, seeds and feed supply is inadequate. Awareness about the seed is also less, and there is scarcity of large fingerlings and yearlings after floods, lack

of management, motivation and refresher courses for technical personnel, and extension agents, insurance coverage not yet finalized by the insurance companies and poor availability of credit cards and financial support

Shri Rishikesh Kashyap, Chairman, COFFED, a federation of self supporting fisheries co-operative societies made a presentation on the need for radical reform of fisher co-operative societies to make them truly democratic, transparent and professional. He proposed creation of a Technical & Promotional Cell under COFFED for providing different types of technical backup to the members of the affiliated societies of the COFFED. This Technical & Promotional Cell will be instrumental in augmenting fish production in the state by enhancing the capacity of the fisher communities. For the coming 5 years a total inflow of about 5 crores will be required and that will be provided by the NCDC and for another 2 years total inflow will be Rs. 2.6 crores of which 80% of the same will be provided by the NCDC and rest 20% will be provided by State Govt. Technical & Promotional Cell will be further run for another 5 years by the COFFED and the Govt. of Bihar. This Cell through its skilled, trained and motivated staff will be able to make a positive impact and improve the quality of life of this weaker section of the society. It will also collect lot of authentic data on different parameters of

fisheries and socio-economics which will be of immense use.

Smt Suman Singh, Secretary, SAKHI, an NGO working among the fisher women in Darbhanga district, presented the activities of the NGO. The target group of the NGO is marginalized women and children who are mobilised to form SHGs, cooperatives, village disaster preparedness committee, etc. She highlighted the issues like the need for provision of loan to the landless fishers, encouraging the field staffs of the DoF to visit the fields and encouraging the formation of SHGs in the States. She vociferously put forward the case for making the Fisheries Department a field oriented development Department from the present regulation and settlement oriented revenue Department.

Dr. S. Ayyappan, DDG, Fisheries, ICAR, made a detailed presentation on the activities of NFDB. He mentioned that Bihar by virtue of its geographical location is bestowed with diverse aquatic ecosystems supporting very rich aquatic biodiversity including the fish fauna. He stated that NFDB has classified the inland fisheries of Bihar as Running water fisheries (Rivers, Canals), Fisheries of impounded waters (Reservoirs), Fisheries of semi-confined waters (Floodplain Lakes), Fisheries of confined waters (Ponds/Tanks), and Miscellaneous/non-conventional fisheries.

He highlighted the need to increase fish production by bringing more area under scientific aquaculture, increasing production of floodplain lakes through scientific management, diversification of activities such as adequate attention on prawn and freshwater ornamental fish culture, giving adequate attention on integrated fish farming, conservation efforts for protecting precious endemic fish germplasm, identification and protection of deep pools along river stretches, regulation on mesh size of nets with immediate ban on the operation of "fine meshed mosquito clothing nets and strict surveillance on wanton killing of fish brooders and juveniles, fish population dynamics assessment in the face of emerging threat perceptions and monitoring of water quality on regular basis to understand the status of pollution/eutrophication for developing mitigation action plan. For development of culture based fisheries in floodplain lakes, the suggested activities are partial clearance of weeds, rational stocking protocol (@ 2000 advanced fingerlings/ha), species enhancement (IMC + Grass carp), raising of fish seeds (fingerlings) in pens utilizing the shallow marginal areas of the lakes and training to target groups. For renovation of ponds / tanks (weed clearance and desilting) he suggested adoption of scientific carp culture with production target of 3-5 tons/ha/year, diversification of culture systems, incorporation of

freshwater prawn under mono and polyculture systems, freshwater ornamental fish culture, promotion of integrated fish farming, organising off-campus training programmes, publication of package of practices and awareness materials in local languages. He further emphasized on the need to develop district level plans. This will make the State of Bihar fish surplus.

Dr. A.K.Sahu, Principal Scientist, CIFA, Bhubaneswar in his presentation highlighting the achievements of CIFA drew attention to following issues: encouraging marketing of carps mainly in fresh condition, use of insulated vans for transportation, and sale of live fishes. He also emphasised for developing a comprehensive leasing policy for water bodies, diversification in culture practices, lowering cost critical inputs, strengthening of extension network and linkages, improving the database, infrastructure, credit facilities, insurance, organic farming, water budgeting, selective breeding for other carps and freshwater prawn, and adoption of raceways and recirculatory systems

Dr. Dilip Kumar, Director, CIFE made a passionate plea for *rethinking some of the developmental assumptions* in the light of limited success of three decades of top down development experience. He remarked that after 30 years of the

implementation of FFDA, only 2.2 tons /ha productivity has been achieved and there is still – widening extension/yield gap. Also, there lie still vast underutilized / unutilized resources. Hence he posed the following questions: Will the course of fisheries development be any different in the next 30 years?, Can technological solutions be the panacea for all the ills?, Can we bring the communities at the centre of the development strategy?, Will the management centered development strategy be of any further help?.

As a way forward, he wanted a paradigm shift from conventional development paradigm that is top down flowing from the Ministry and/or from Research Institutes to the DoFs and to the user groups which is technology and subsidy driven system, is supported by ad hoc / narrow policies. He suggested a community centered and management oriented development strategy which should incorporate community empowerment for making aware, organized and skilled resource users, capacity building of developmental & extension staff with technical & social mobilization skills, restructuring or strengthening the service delivery system, effective implementation mechanism & strategy, and inter-departmental coordination: the missing link.

Shri Sushil Modi, Honourable Deputy Chief Minister, Govt. of Bihar, amidst applause,

said that the State of Bihar has declared aquaculture at par with agriculture for bringing aquaculture on fast track of development. The State has also been implementing a massive program to train about 1 lakh fish farmers in five years and already about 1000 farmers have been trained at CIFE Kakinada Center, Andhra Pradesh. He noted with satisfaction that the trainees have started practicing what they have learnt. However, he brought out the following issues: there is a need to increase the capacity of the CIFE training centers at Andhra Pradesh to accommodate more trainees, the State farms given to the fishers are not giving desired results, need to develop strategies for using flood affected areas for fisheries and aquaculture, banks should be encouraged to provide loans to the landless fishers, the seed farms that are not functioning are to be started under public private partnership (PPP) mode, and that the Calamity Relief Fund should have the provision to support fisheries and aquaculture too.

Shri Nitish Kumar, Honourable Chief Minister, Govt. of Bihar graced the function as the **Chief Guest** and formerly inaugurated the session by lighting the lamp. In his address, congratulating the delegates for their active participation stated that the State has a special passion for fish. There are places in the State where fish is considered as vegetarian food, and places where many houses have a pond to

grow fish. Opining that the bifurcation of the state is a blessing in disguise, he remarked that the State is now left with one resource, a precious one, which is water. Therefore he stressed that the adequacy of this resource has the advantage of developing rural economy and through fisheries and aquaculture based rural livelihood development. He further wished that more such workshops should be organized in future to promote the cause of fisheries development.

He said that the State would look into the issue of fishers being replaced by non-fishers and in turn take disproportionate advantage. He wanted that the Millennium Development Goals are appropriately incorporated in the policy. To him, the policy should also help increasing the production from crops and animals along with fish production. Instead of just Blue Revolution, the State should aim at more comprehensive Rainbow Revolution, he desired.

4 Session III: Focus Group Discussion

4.1 Work Group 1: Policy Issues in Riverine and Reservoir Fisheries

The work group discussion was chaired by Dr. P.V. Dehadrai, and co-chaired H.S. Sidhu while Dr. Shyam S. Salim and Mr. Nishat Ahmed acted as facilitators. Following recommendations emerged after intensive day long deliberations.

Riverine Fisheries

- **Conservation** : Conservation of the ecosystem should be the major thrust and priority in designing any policy interventions in riverine fisheries.
- **Concurrent list** : The riverine fishery is a resource that lies across several States and hence riverine management system should be included under the concurrent list of the Central government. Till then a inter-State river management authority to be constituted for the effective riverine resources management
- **Responsibility of management** : The responsibility of management of the river whose course is within the boundary of the state should lie with the state government. Based on the convenience and requirement and priority the management can be entrusted to public, private or communities.
- **Ownership right** : The ownership right of the riverine resources should remain with the State government. However fishing rights be allocated to traditional local communities/less privileged groups by organizing them into SHG, fishers association and other co-operative societies
- **License fee** : The license fee structure for the stretch of river which is given for can be determined based on the fisheries potential of the river. The foremost objective and thrust of any such licensing will be on conservation and sustainable utilization of the resource. The licensing should also ensure that the practices are directed towards conservation of the riverine resources, habitat restoration in addition to the livelihood support of the local disadvantaged communities.
- **Minimum environmental flow in Dams** : The dam authorities should also ensure the minimum environmental flow as per the requirement of the riverine ecosystem. It is also suggested to provide fish pass for the free movement of the fish species. The deep pool areas within the river zones which are breeding sites are to be protected
- **Additional delegation of power** : For the strict enforcement of the different

laws, regulations and act, additional and appropriate power is delegated to the Directorate of Fisheries. DFO be given power to arrest and handed over the non-compliance to the police, lodge a FIR.

- **Destructive gears :** Ban on the destructive gears can be done following a holistic approach of periodic inspection, enacting legislative measures, initiating awareness campaign etc.
- **Adopt one endangered fish :** In line with the Government of West Bengal, each state should adopt at least one endangered fish species and ban on its sale. Research complemented this endeavour and monitoring. An irresponsible introduction of exotic species in aquaculture has brought serious consequences.
- **Exotic fishes :** Presence of exotic fishes has affected the life cycle and cultivable population of indigenous fisheries in open waters. Any decision for the introduction of any exotic should be based on proper scientific appraisal of the ecosystem in question and for that the country has a national level committee. The decision of the committee be strictly implemented

- **Liaison with multiple agencies:** Pollution control measures are to be strengthened by generating more expertise. The pollution abatement can be done with the help of collaboration and linkages between the different partners and strict enforcement of the laws and regulation. The Pollution Control Board is required to develop adequate liaison with multiple agencies including Department of Fisheries, the precautionary approach and polluter pay principle will serve as mitigating measures to check pollution.

Reservoir Fisheries

- **Optimize quantum of fish:** Reservoirs should flourish in terms of quantum of fish. The guiding principle for any reservoir development policy related to fisheries is productivity enhancement coupled with revenue generation.
- **Fishing rights:** The fishing rights of the reservoir can be allotted to the Department of Fisheries. The priorities in the fishing rights should be given to the displaced /affected/ousted population by forming fishers associations/co-operatives and SHGs as a means of their rehabilitation process. In the absence of traditional fishers/less privilege communities, displaced people, the reservoir can be leased out to private individuals /

entrepreneurs / public undertaking / registered companies through open auction and sealed tenders. The lessee or the successful bidder shall have to engage genuine fishermen of the locality for exploitation by paying fishing wages.

- **Enhanced role of DoF:** The Irrigation Department should continue to exercise its control over the reservoir development. Hence, the DoF has to be involved in any policy measures involving fisheries in the reservoir development plan. Fisheries Department should be taken into confidence and that Department will initiate steps to save the reservoir.

- **Leasing:** The objectives of leasing of water bodies shall be revenue generation, livelihood security and fisheries development. The primary focus should be based on the people involved or in other words people countries natural resource development. To ensure sustainable resource use the lease period should not be less than ten years considering the occurrence of natural calamities and also for better institutional scope. The method of leasing either be the - revenue sharing method or long term leasing. The lease amount can be determined based on the productivity of the reservoir and the lessee at stake.

The leasing authority will be the DoF.

- **Ban on catching of brood stocks:** There should be a ban on the catching of brood stocks of Indian major carps and economic species from time to time during monsoon to allow every fish to breed at least once in its lifetime. Capture and sale of major carps below 250 mm length to be banned in order to prevent indiscriminate killing of juveniles and young fishing population.
- **Closed season:** Ban on fishing during closed season period should be strictly enforced by all States sharing the common resource.
- **Enforcement of existing rules and regulations:** Strict enforcement of rules and regulations is required to ensure complete ban on destructive fishing, introduction of exotic fish, implementation of closed season and mess size regulation. The Inter departmental coordination committee / Department of Fisheries shall evolve an effective monitoring mechanism.
- **Ranching:** Ranching by government, private and community partnership has to be initiated for the enhancement of the fisheries resources. It is to be ensured that quality seeds are judiciously stocked. It is also important

to check for the compatibility of the different fish species with the native fauna before stocking.

- **Revamp the co-operatives:** The principle of co-operatives still holds good for the economic upliftment of the displaced /weaker /less privileged sections of the society. However in practice it is very few cooperatives are working as expected. There is a need to revamp the co-operatives for better efficiency and increased effectiveness by strengthening of process and democratic/active participation of both men and women members of fishing communities.
- **Infrastructure:** Adequate steps are to be taken to provide basic infrastructure in the existing irrigation projects to facilitate fishing activities in the reservoir such as approach roads, fish landing centers, seed rearing tanks etc. There should be provision for seed production units, training centre, post harvest landing infrastructure, fishing implements etc. Welfare of the displaced and affected persons be inbuilt into the planning process in construction of large reservoirs.
- **Seed banks:** Fish seed stocking is the main input for resuming fisher development. There is an immediate need to establish *seed banks* in the

vicinity of the reservoir with adequate governmental support.

4.2 Work Group 2: Policy Issues in Oxbow lakes, Flood Plains and Other Wetlands

Dr. Alok K. Sikka and Dr. Dhaneshwar Rai were chair and co-chair respectively, while Dr. P. S. Ananthan and Mr. Manoj Kumar acted as facilitators. After a participatory exercise, including heated but constructive arguments, the following recommendations emerged through consensus.

The group felt that the overall objective of the fisheries and aquaculture policy shall be to increase the production on a sustainable basis. Livelihood development, Equitable benefits, Employment generation, Conservation of fisheries resources, creating greater social awareness about aquaculture and fish consumption shall be equally important. Recommendations specific to this work group are as follows:

Leasing policy

- **Leasing aim:** The guiding principle of leasing of ox-bow lakes shall be to enhance fish production for the benefit of rural poor (fisher and farmer). Revenue generated through leasing shall be utilized for maintenance and conservation of this highly diversified natural resource.

- **Lease period** : The lease period shall be generally of long term (12 -15 years). However, different lease periods based on size – long term for large water bodies and requiring civil/ renovation works to be evolved. Mid-term performance review shall be built into the leasing policy.
- **Lease rent** : The lease / rent amount shall be 10% of total projected annual gross income of the lessee. Fisheries Dept. to provide technical assistance and collect the rent.
- **Prioritizing the lessee** : The priority for leasing shall be in the following order: Fishers' co-ops jointly with private entrepreneurs, SHGs of fishers adjacent to water bodies, fishers' co-ops, individual fisher, private entrepreneurs, farmers, educated unemployed youth / fisheries graduates and corporate. Unsettled water bodies to be given to interested federations on long term lease
- **Lease terms** : The terms of lease, among others, shall include the following: mesh size regulation for IMC and exotic carps; fishing boats are to be compulsorily registered with Fisheries Dept.; closed season to be followed from 1 July to 15 September; and only advanced fingerlings shall be encouraged to be stocked.

Management strategy

- **Cluster development approach** : Policy to encourage cluster development approach (developing nursery ponds nearby the ox-bow lakes for raising yearling and stocking them in open water bodies) wherever possible. Resource users be encouraged to integrate other farming activities with enhanced fisheries.
- **Seed bank** : The policy shall be oriented towards availability of adequate and quality seed of stockable size at the local level. It shall encourage the lessee to satisfy his or her own seed requirement by developing adjacent area / part of lake for seed rearing. Government shall facilitate development of seed bank in public sector / private sector / public – private partnership mode for ensuring *round the year availability* round the availability of quality seed at local level. Incentives shall be given for yearling production.
- **Empowerment to prevent poaching** : The policy shall provide for elimination of poaching, illegal fishing and poisoning through innovative combination of regulatory and participatory mechanisms. These shall be considered as offence under IPC with appropriate punishment (both jail term and fine). DoF, user groups and

the local communities are to be empowered to prevent poaching

- **Community ownership** : The policy shall encourage involvement of local communities in developing and managing the ox-bow lakes. The communities shall be helped to develop a sense of ownership of these water bodies so as to sustainably manage these ecologically significant resources.
- **Comprehensive database** : The policy shall provide for development and regular updating of reliable and timely data about the resource at different levels. GIS&RS based approach to be adopted for mapping and developing a Comprehensive database which shall be made readily and easily accessible to all and for future planning. Village based volunteers
- *Matsya/Meen mitra* shall be appointed on contract basis for collection, validation and updating of data by physical verification.
- **Mobilize investment** : The resources required for development of ox-bow lakes shall be mobilised by increasing the public investment, promoting public-private-community partnership, and encouraging private investment.
- **Eradication of weeds** : Biological weed control, besides mechanical and manual weeding, is to be given major emphasis in eradication of weeds.
- **Transparency and accountability** : The policy should ensure transparency and accountability in the functioning of departmental staff and field level functionaries. Creating awareness and implementing provisions of RTI Act shall get priority focus. Performance based incentives and facilities shall be introduced. Self assessment and participatory evaluation shall be part of this process.
- **Marketing** : Effective marketing linkages shall be established to ensure fair price to the fishers and farmers. Measures like buffer ponds, developing chain of mini cold storage facilities & ice plants, refrigerated trucks for efficient transportation to distant markets shall be taken. Processing and value addition shall be encouraged.
- **Insurance** : The policy shall provide compensation for loss of fish produce due to natural calamity, flooding, etc.
- **Empower DoF to control pollution:** The policy shall empower DoF staff to protect the water bodies from pollution. Coordination and consultation with State Pollution

Control Boards to be institutionalized for strict implementation of the existing pollution control regulations.

Floodplains (*chaurs*) and other wetlands

- **Property regime:** The policy shall recognize the unique property regime in the floodplains i.e. the multiple individual owners having ownership on part of the total water spread area. Co-operative / collective management wherein crop cultivation is integrated with fisheries (crop acreage as individual commodity / property, water spread area as a common property) shall be the major focus. DoF to facilitate demonstration of model at pilot scale the possibility & profitability of aquaculture in *chaurs*, and also facilitate provision of inputs through schemes of NFDB, NFDC, etc. Contract farming (group of farmers contracted out to private entrepreneur or joint development venture) shall be given major thrust.

- **Technological intervention:** Farming system apprehension, Integrated aquaculture, diversification of aquaculture with special emphasis on culture of air breathing native fish species and ornamental fish shall be the major focus for technological interventions. However any technological intervention must fit into the existing ecosystem and seasonal variations.

- **Coordination:** DoF shall play a facilitating role (awareness raising, motivation, arranging financial support, purely technical support etc.) and coordinating role (as these are multi-purpose water bodies and involve different Depts.) in developing the floodplains for fisheries production

- **Data base:** An authentic data base on individual land ownership as well as clear demarcation of village area (w.r.t. Water spread area) shall be developed and validated. Watershed based planning shall be based on authentic data created on seasonal variation in water area of the floodplains, cropping pattern, water flow, landscape, etc. by the stakeholders themselves.

- **Biodiversity Conservation:** The policy should conserve indigenous species including ornamental fishes in ox-bow lakes / other wetlands by identifying and declaring select water bodies as sanctuaries – *in situ* conservation

- **Right to use water bodies:** Right to utilize the perennial water bodies for aquaculture shall be recognized. DFO / DDF to register the farmer group for aquaculture activity in floodplains which will have legal status and any disputes about ownership/share w.r.t aquaculture to be settled by a stakeholder committee with DFO / DDF as member of the committee.

Reforms in Co-operatives

- To ensure greater degree of accountability of the fishers' co-operatives, strengthening democratic system and bringing about equitable distribution of benefits, following measures shall be initiated: all societies shall have joint account preferably in nationalized banks; all members shall have photo ID cards and the list to be available for public scrutiny; incentives and awards to best performing societies based on overall production as well as socio-economic parameters; power of registration of societies and settlement of their disputes to be given to Dept. of Fisheries as in other States like MP, UP, and WB; all transactions be made only through cheque/DD and no cash transaction; extension of lease period be given based on performance; and regular independent survey of socio-economic status of members about the impact of co-operative societies
- **Professionalism:** To bring professionalism in the fishers' co-operatives and make them main vehicles of promoting livelihood development through scientific aquaculture, technical and promotional cells in apex fisheries federations shall be promoted.

- Secretaries of co-op societies shall be minimum matriculate pass (UP govt. has recently made this) and preference to fisheries graduates / persons having knowledge in fisheries. To encourage education among fisher communities, preference as office bearers shall be given to fishers whose children are school going or educated.
- Compulsory primary education for all fishers' children by 2012 shall be a major policy objective. DOF to mobilize support from on-going projects and schemes of Department of Fisheries.

4.3 Work Group 3: Policy Issues in Aquaculture

Dr. V.R.P. Sinha and Shri Afsar Hussain were chair and co-chair respectively, while Mr. P. Krishnan and Mr. Y. K. Madhup acted as facilitators. After a participatory exercise, following are the recommendations.

- **Objective:** The primary objective of the Aquaculture Policy for the Centre and States should be to alleviate poverty and enhance the livelihood of the resource poor rural people through increased aquaculture production in view of its role in nutritional and environmental security, and social and gender equity.

- **Recognizing fish as bio-indicator :** Besides production of cheap protein, fish should be viewed by all as an ecological player, and fish culture should be viewed as a tool for improving the aquatic ecosystem.
- **Restricting eutrophication:** DOF should ensure the optimal utilization of aquatic primary productivity so that progressive expected increase of eutrophication is controlled. For this, use of primary production dependent aquaculture technology especially of herbivore fishes should be encouraged.
- **Population pressure:** Ever increasing population of human beings, animals, birds will put additional pressure on aquatic environment. This will be leading to aquatic ecosystem being converted into terrestrial ecosystem at alarming rate. This needs Government's intervention.
- **Aquatic weeds:** In view of heavy infestation of aquatic weeds particularly water hyacinth and Iponea, it is essential that this is eradicated as fast as possible. This will not only help to restore the aquatic ecosystem for aquaculture production but will also have positive effect on public health and hygiene. Therefore, the Government needs to initiate a specific massive programme for its eradication following an appropriate approach for making its productive use.
- **Pond renovation:** Any State department or program undertaking the renovation or desiltation works of the ponds and small water bodies should follow the norms and guidelines of the Department of Fisheries of the respective State in consonance of the fish culture requirement in terms of pond size, farm size, farm design, etc to facilitate fish culture. Collaborating with Gram Rojgar Yojana will be highly useful for mobilizing required resources.
- **Promote sewage fed fisheries:** It is also important that waste water should be viewed as wealth in view of its nutrients. Therefore, sewage treatment plant should have fish farm as an integral part of it so that sewage fed fisheries could be promoted.
- **Aquaculture at par with agriculture:** Aquaculture should be treated at par with agriculture in terms of credit, taxation, energy charges, water tariff and land allocation owing to the similar nature of the two sectors, resource use pattern and providing food and livelihood to the rural poor.
- **Credit mechanism:** The fish farmers seeking credit upto Rs.50,000 as credit

should be exempted from providing collateral for double the credit amount and paying 25% of the credit amount as advance. A mechanism is required to be put in place to assess the value of water and its productivity in the pond in addition to that of the land alone, while valuating the farmers' ponds for collateral security purposes, since fallow ponds with unutilized productivity is a great resource loss.

- **Ensure micro-finance:** Fisheries and aquaculture should be recognized as a priority sector for the purposes of credit. Since aquaculture is a season sensitive activity, the credit for farm operations need to be provided in time, which could be achieved by strengthening micro-finance institutions, disbursement of credit through co-operative societies, introducing a suitable variant of *kisan cards* and by following single window system for credit and subsidy.
- **Insurance:** Crop insurance scheme should be extended to the fish farmers as for the agriculturists in order to guard their losses from disease outbreak, natural calamities, poaching and willful destruction of the crops, etc.
- **Effective database on fish production:** The fish farmers should be mandated to maintain a stocking record with details on date of stocking, initial size of stocking, feeding schedule, sampling data, etc. in order to maintain an effective database on fish production. Such records could be useful for seeking Institutional finance and insurance claims too.
- **Establish linkage between DoFs, CoFs and ICAR in farmers training:** The Department of Fisheries should strengthen its linkages with Central Fisheries Institutions in order to provide regular training to the fish farmers of the State and also to update the skills of the District and Field level Fisheries Officers on different aspects of aquaculture and aquaculture extension service management.
- **Restrict banned fish species:** The Government should restrict the entry of banned fish species through existing regulatory mechanisms. However realizing its peak experience on compliance of fisher acts and regulation, it could be imperative to mobilize and encourage stakeholders to enhance compliance level.
- **Diversification of aquaculture:** Govt. should promote diversification of aquaculture by promoting catfish culture, giant freshwater prawn culture, ornamental fish culture, etc., so as to use the available water

resources and market opportunities optimally. Besides composite fish culture, it is imperative to propagate different site-specific integrated farming of crop-livestock-fish. The silt and humus of the water logged areas or the pond bottom need to be utilized for such farming system judiciously.

- **Ensure quality water for aquaculture:** Government should ensure availability of required quantity of quality water and there should be and legal mechanism for this.

- **Community water bodies :** Community water bodies are being put to use for multiple purposes. The effective usage of the same through aquaculture should be encouraged. Appropriate measures shall be evolved for this purpose.

- **Rationalize water abstraction :** The abstraction of water from water bodies for agricultural purposes, especially during summer should be highly rationalized because it affects the active period of growth and breeding of fish.

- **Modify water bodies as per fisheries:** The fishers should be given the water use rights so that the human-made modifications of the aquatic ecosystem do not affect the breeding and life cycle of the fishes. This should be

made applicable to all the water bodies in public domain within the state.

- **Right to Water:** The fish culturists should have the *Right to Water* to put them into best possible use, particularly in command areas where canals can be profitably used for pen and cage culture.

- **Exploring the possibilities of bundh breeding:** Possibility of bundh breeding should be explored in topographically suitable areas where the catchment is large. This would help reduce inbreeding depression and mass scale seed production. Such activities and areas should be recognized as cottage industry. In order to avoid inbreeding and conserve genetic diversity, the brooders should preferably be collected from rivers.

- **Women Fisheries Officers:** It is imperative that representation of women in Department of Fisheries should be progressively increased along with social scientists to redress the issue of social and gender equity.

- **Encourage women for seed production:** Women should be encouraged through incentives in the seed production activity through backyard hatcheries and nurseries.

- **Establish government brood stock farms:** Government officials should ensure that quality brood stocks are maintained under their supervision in Government farms to facilitate seed production in private farms. Broodstock ponds and nurseries should be established at district level in order to ensure timely availability of good quality fish seeds. Surplus seeds may be raised in heavy stocking density to make available the seed through out the year.
- **Seed certification :** The implementation of draft proposal of seed certification and quarantine as initiated by the central government should be expedited.
- **Reduce the risk of aquatic animal pathogens:** Suitable regulatory frameworks should be developed to check the introduction and movement of live aquatic animals in order to reduce the risks of introduction, establishment and spread of aquatic animal pathogens and subsequent impact on the aquatic biodiversity.
- **Create facilities at flood protected upland areas to stock fish seeds:** In the flood prone States, the Government should create suitable facilities in flood protected upland areas of the state to stock fish seeds and protect them from seasonal floods, and thereby ensure round the year supply of fish seeds.
- **Disease monitoring:** The Government should adopt the disease reporting systems developed by FAO/NACA/OIE to collect and analyze aquatic animal health information for use in disease forecasting and mitigating action.
- **Ensure feed supply:** Nutritionally balanced feed for seed and brood stock is imperative where as for table size fish conventional feed should be advocated.
- **Lease period:** The lease period for the government owned water bodies should not be less than 10 years in order to ensure long term investment by the leasee and also to enable the lease owner to avail institutional credit.
- **Encourage locally formulated feed:** CIFA has standardized different formulation of fish feed for brood-stock, seeds and table size fish, based on which cheap feeds should be formulated using locally available ingredients.
- **Leasing rights:** The leasing rights of government ponds should be with the Department of Fisheries of the respective state, which may stipulate the parameters for leasing out the

ponds. The lease amount should be determined based on the productivity of the pond also, besides other accepted parameters.

- **Priority of lease:** While identifying the beneficiaries for leasing, among others, SHGs, fish farmers' co-operatives should be given preference followed by the individual fish farmers, women, unemployed fisheries graduates etc.

4.4. Work Group 4: Policy Issues in Processing, Markets and Trade

Dr. M.Y. Kamal and Dr. S.C. Pathak were chair and co-chair respectively, while Dr. S.N.Ojha and Mr. Durga Prasad acted as facilitators. After a participatory exercise, including heated arguments, the following recommendations emerged through consensus.

- **Marketing Cell within DoF:** There should be a marketing cell within DoF with a marketing officer at district level to provide market information and for facilitating the fish marketing in the district.
- **Landing centers:** Handling of fish catch is difficult in inland fisheries when compared to marine fisheries. Landing centers for marine fishes are well defined. Similarly, landing centers for

fresh water sector should also be identified. Such fish landing centers should be accessible to the fishers. They should also be equipped and strengthened with infrastructure facilities. Cold storage/ice plant facilities should be developed specially near the landing centers of reservoirs.

- **Transportation:** Fish, being a perishable product, its transportation is a difficult task. There is a need to establish cold chain. Mobile refrigerated transportation facilities should be encouraged. Insulated ice boxes for carrying the fishes from the landing centers to the market should be encouraged. To encourage the sales of products by fish vendors, they should be provided with insulated boxes along with bicycles.
- **Hygienic Fish Market:** Fish are generally sold under very unhygienic conditions. Fish markets should be established at the identified places in the blocks/sub-divisions/districts, in consultation with the stake holders. Such identified fish markets should be provided with sheds/ washing, waste disposal and other facilities. Department of Fisheries should also register the retailers /whole sellers of the state. Such registered whole sellers/retailers/ should be permitted to use such markets. Each fish market should have an ice plant.

- **Fish Marketing Associations:** Sale of fish and fish products should be taken up on the pattern of SUDHA/Mother Dairy/PARAG by the Fisheries Federation.
- **Fish marketing in flood plains:** During times of higher catch in the flood plains in the rainy season, no effective marketing system exists. Excess fish should be transported to other places during this season.
- Due to moist weather during monsoon it is difficult to continue with fish drying activities. To overcome such problem, appropriate alternative processing and preservation methods should be made available. SHGs/NGOs/Coop Soc can be encouraged to take up such activities.
- **Value added products:** In order to give better returns to the producers the concept of value addition in the fresh water fisheries should be encouraged and producers of the value added fish products should be given the status of small scale industry. Fisherwomen should be encouraged to take up the production VAP (Fish pickle, fish nuggets like *badi*, fish curry, fish sausages, etc.)
- **Aqua-shops:** Aqua-shops should be established at fish markets for easy availability of quality inputs and finished products. It should be run by SHG/Coop. Soc.
- **Quality Standards:** Quality standards of fish and fish products should be defined, publicized and enforced.
- **Market Promotion:** Awareness about the quality of products, hygiene and sanitation has to be created through various tools of publicity like radio, TV and print media
- **Credit:** In order to boost marketing, banks should extend need based credit.
- **Training:** Training for skill development and awareness for better marketing should be imparted
- **Health camps:** Health problems of the people involved in fish related activities need to be addressed properly by organizing health camps for them.
- **Course on fish marketing:** Since marketing, processing and export is the weakest link in overall fisheries development, the group strongly recommends for their inclusion in fisheries courses.

4.5. Work Group 5: Policy Issues in Human Resource Development and Service Delivery System

Dr S.A.H Abidi and Mr Mehta were chair and co-chair respectively, while Dr Tabrez Nasar and Dr R.P. Raman acted as facilitators. After a participatory exercise, the following recommendations emerged through consensus.

- **Ministry of Fisheries and aquaculture:** Separate Ministry of Fisheries and Aquaculture should be established at State and Central levels
- **Professionalism:** Technical Staff of DoF should be deployed ONLY for Fisheries extension and development programs. Also, Technical person should head the Department of Fisheries to make it more professional.
- **Shortage of Staff:** Most of the Depts. of Fisheries face acute shortage of staff and there is a need for vacancies to be filled up on a priority basis.
- **Women extension Staffs:** More women should be employed in the department especially to mobilize women
- **Job specification:** Needs assessment of HR vis-à-vis the specific jobs have to be worked out.

- **Performance appraisal for career advancement:** Career advancement for DoF personnel be linked to the performance (periodic assessment of performance) evaluation and not merely the seniority in the cadre.
- **Involve sociologists:** Social dimensions have to be taken care of by bringing in sociologists into the department
- **Trainers' Training:** For capacity building and competency development there is a need of orientation courses, need based short term and medium term refresher training programs at regular intervals.
- **Farmers' Training:** Training programme on KSA (Knowledge, skills and attitude) is a must for departmental officers at ALL levels and also similar programme for the fishermen communities from production to marketing.
- **Monitoring and Evaluation:** Every Department of Fisheries should have an effective Monitoring, Evaluation, data and information cell to monitor its development programs to assess its impact on the community.
- **Delegation of power:** In order to speed up decision making, certain delegation of financial and administrative powers up to block level is need of the hour.

- **Follow-up of training:** Training programs should essentially follow a Participatory approach and should include all stakeholders.
- **Orient engineers towards aquaculture and vice-versa:** Engineers in the department should be trained in aquaculture and vice-versa.
- **Registration of fishermen:** Registration of fishermen and issue of ID cards for fishermen and their family members is needed.
- **Empower marginal farmers to access common property resources:** Access to Common property resources should be adequately made especially for the marginal and landless farmers.
- **Promote ICT :** ICT should be increasingly used in all aspects of management and service delivery.
- **Promote fisher-centered extension programs :** To cope up with staff shortage, fisher-centered extension programs such as 'trickle-down extension approach' should be brought into use. It should be participatory extension system in which farmers/fishers play equally important and active role.

5 Session IV: Plenary Session and Workshop Recommendations

Dr. A. K. Sikka welcomed all and remarked that the workshop has been able to achieve the stated objectives successfully. He specially welcomed the Honorable Deputy Chief Minister, Government of Bihar, Shri Sushil Kumar Modi along with all the dignitaries in the house. He appreciated that even on the final day the house was fully packed and the participants attentive. This depicted the success of the workshop. Finally he requested Deputy Chief Minister, Government of Bihar to release the News Letter of CIFE, Mumbai.

Dr. Dilip Kumar also welcomed the delegates while presenting before the house the general guidelines for policy framework that has emerged from the deliberations of the workshop. He specially thanked everybody for providing their valuable contributions in the workshop. In his remark he said that policy should encourage growth and sustainability, while regulations should restrict the unwanted developments. He further emphasized that the human resource development and social empowerment should also be promoted through the policy. The capacity of the DoF has to be raised by incorporating institutional reforms.

Shri Sushil Kumar Modi, Honorable Deputy Chief Minister in his address reiterated that Bihar is rich in water and management of this water is a major problem. Therefore he said that for poverty alleviation agriculture and fisheries will play a major role. He emphasized that the state is interested to prepare the road map for its development with the help of experts and he urged to conduct such workshop every year in this state. He finally expressed his desire to make Bihar the top fish producing in the country after attaining self sufficiency.

Workshop Recommendations

1. The workshop felt that the potential to contribute to human development and social empowerment cannot be fully realized without consistent, responsible policies and goals that encourage sustainable development.
2. Investments in education and training are essential to build the knowledge, skills and attitude of all the different stakeholders involved in the sector.
3. Efficient management of the sector requires improved information flows at the state, region and national levels.
4. One of the key issues for the growth of aquaculture will be the ability of state and organizations to strengthen their institutional capacity to establish and

implement policy and regulatory framework that are both transparent and enforceable.

5. Considering the dearth of fisheries staff in the department all the vacancies are to be filled up on a priority basis. The Staff should be adequately oriented with priority towards extension services including adequate social mobilization skills and accessing the support of other departments. There is also an immediate need to develop their capacity.
6. Divesting the authority of leasing system by formulating a comprehensive and development oriented leasing policy for allotment of water bodies. The lease should be of long term with preference to traditional fishers, co-operatives, women SHG, etc.
7. Equally important is the capacity building of the primary producers of the fisheries sector through practical hands on training, result demonstrations and cross country visits. Besides technical prescription, the skills of the stake holders are to be augmented for the collective management of resources.
8. The cooperative institutions need to be strengthened to ensure

transparency ensuring active participation of all the members in decision making and laying sound democratic norms.

9. It is required that the Technical persons should head the Department of Fisheries so that they have long term concern and perspective on the development of the sector.
10. Water shed/ ecosystem based, holistic approach is required for the development of fisheries and aquaculture complementing with other farming practices to be considered as a priority option.
11. *Right to water* is emphasized on account of the growing importance of fisheries and aquaculture systems. This also calls for effective inter departmental coordination for resources use optimization.
12. Farmers/fishers led extension system approach should be the guiding principle in the transfer of technology and primary producing role in sustainable resource use.
13. Looking into the increasing relevance of aquaculture and fisheries a separate Ministry of Fisheries in the State and Center may be created

Annexure I

PROGRAM SCHEDULE

5th Zonal Workshop on Fisheries and Aquaculture Policy:
Sustainable Development and Livelihoods for Central States

25-27 October 2007

DAY I : 25.10.2007 Thursday

Venue : Hindi Bhavan, Patna

INAUGURAL SESSION

9.30 am	Registration of the participants	
9.00-10.00	Reception / Registration	Registration
10.00-10.05	Welcome Address	Dr. Dilip Kumar Director, CIFE, Mumbai
10.05-10.10	Address by Guest of Honour	Dr.S.A.H.Abidi Former ASRB Member,
10.10-10.15	Address by Guest of Honour	Dr. P. V. Dehadrai, Former DDG (Fy.), ICAR
10.15-10.20	Address by Guest of Honour	Dr. S. Ayyappan DDG (Fy.), ICAR
10.20-10.25	Address by Guest of Honour	Shri Deo Datta Secretary ,Fisheries ,UP
10.30-10.40	Address by Guest of Honour	Shri Anil Kumar IAS Principal Secretary, DAFR, Govt. of Bihar
10.40-10.55	Inauguration of the Overview session and Address by the Chief Guest	Shri Jamuna Prasad Nishad Hon'ble Minister of Fisheries,UP
10.55-11.00	Vote of Thanks	Dr. R. C. Choudhary Director, Fisheries , Bihar
11.00-11.15	Tea Break	
11.15- 13.15	Session I Policy Overview	Chair: Dr. P. V. Dehadrai Rapporteurs: Dr. S. N. Ojha and Dr. Manoj Kumar
	Presentations on Status of fisheries and aquaculture, Existing policies and regulatory environment, & Flagging of policy related issues in concerned States	Department of Fisheries Chattisgarh, Jharkhand, Madhya Pradesh, Uttar Pradesh
13.15 – 14.15	Lunch Break	
14.15 - 15.45	Session II Open Forum Stakeholder Perspectives on Policy Issues in Fisheries and Aquaculture	Chair: Shri Anil Kumar, Principal Secretary DAHF, Govt. of Bihar Rapporteurs: Dr. R.S.Biradar and Dr. P.S.Ananthan
15.45-16.00	Tea break	

**Inauguration of the Special Session on the
Fisheries Development in Bihar: Prospects and Challenges**

16.00-16.05	Welcome Address	Dr. Dilip Kumar Director, CIFE, Mumbai
16.05-16.15	Address by the president of the function	Shri Sushil Kumar Modi Hon'ble Dy. Chief Minister, Government of Bihar
16.15-16.30	Inauguration of the Workshop and Address by the Chief Guest	Shri Nitish Kumar Hon'ble Chief Minister Government of Bihar
16.30-18.00	Session III Special Session: Fisheries Development in Bihar: Prospects and Challenges	Chair: Dr. V. R. P. Sinha Rapporteurs: Dr. Nishad Ahmed / Dr. Shyam S. Salim

DAY II Friday 26th October 2007

9.30-10.00	Work Group Discussion : Objectives and Expected output	Dr. Dilip Kumar
10.00 – 13.00	Session IV Work group discussions	Team Leader Facilitator
1.	Policy Issues in Riverine and Reservoir Fisheries	Dr Shyam .S. Salim
2.	Policy Issues in Oxbow lakes, Flood Plains and Other Wet lands	Dr. P. S. Ananthan
3.	Policy Issues in Freshwater aquaculture	Mr. Krishnan. C
4.	Policy Issues in Processing, Markets and Trade	Dr. S. N. Ojha
5.	Policy Issues in Human Resource Development	Dr.C.S.Purushothaman
6.	Policy Issues in Service Delivery System	Dr. R. S. Biradar
13.00-14.00	Lunch break	
14.00-17.00	Session IV (Contd) Parallel Work Group Discussions	
	Session V Plenary Session	
9.00- 12.00	Presentations by the 6 working group and discussion	Team Leaders, Working Group
12.00-12.30	Tea Break	
12.30-13.30	Valedictory / Concluding Session Recommended Inputs for Policy Framework	

DAY III Saturday 27th October 2007

9.00- 12.00	Session V Plenary Session	
	Presentations by the 6 Working Groups and Discussion	Team Leaders, Working Group
12.00-12.30	Tea Break	
12.30-13.30	Valedictory / Concluding Session Recommended Inputs for Policy Framework	

Annexure II
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Annexure III
List of Participants in Work Groups

Work Group I:
Policy issues in Policy Issues in Riverine and Reservoir Fisheries

1.	Dr. Dehadrai	Ex. DDG (Fy.), ICAR-Chairperson
2.	Mr. H. s. Siddhu	Director, Fishereis, M. P. Co-Chairpoerson
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5.	Mr. Anil Kumar	Principal Secretary
6.	Dr. B.C. Jha	Principal Scientist
7.	Ms.Pushpalata Dubcy	Senior Lecturer
8.	Dr.Rama Sharma	Sr. Technical Officer
9.	Dr. S.P. Roy	Professor & Head
10.	Shri G.P. Singh	Executive Secretary
11.	Shri Vishwanath Nishad	Representative
12.	Mr. Keshri	DFO
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14.	Mr.Umesh Kumar	DFO, Khajaria
15.	Mr.Suman Jee	DFO
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28.	Mr. Pramod Bhagat	FEO, Banka
29.	Mr. Vinay Kumar	FEO, Munger
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**Work Group 2:
Policy Issues in Oxbow lakes, Flood Plains and Other Wetlands**

1.	Dr. Dhaneshwar Rai	District Fisheries Officer, Vaishali
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6.	Mr. .Jai Pi"akash	D. F. O. Vaishali
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22.	Mr. Sanjay Kumar	J. E., Koshi Range, Sahara
23.	Mr. Subodh Kumar	D. F. O. Siwanl Gopulgaj
24.	Mr. Manoj Kr. Kanwar	J. E. Begusarai
25.	Dr. Mamhl Kumari	Lecturer, IF&F, R. D. S. College
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29.	Mr. Sheoshankar Chaudhary	F. E. O. Nawada
30.	Dr. Sikka	Director, ICAR-RCER, Patna - Chairpoerson

Work Group 3:

Policy Issues in Aquaculture

1. Dr. V.R.P. Sinha Ex-Director, CIFE-Chairperson
2. Dr. B. N. Pandey Prof & Head
3. Mr. Afsar Husain Director, Fisheries, Chattisgarh
4. Mr. P. Krishnan Scientist, ICAR
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Work Group 4:

Policy Issues in Processing, Markets and Trade

1. Dr. M.Y .Kamal Ex- YC, SKUAST, Srinagar, Chairperson
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Work Group 5:

Policy Issues in Human Resource Development and Service Delivery System

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