



CENTRAL INLAND CAPTURE FISHERIES RESEARCH INSTITUTE

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SYMPOSIUM ON RIVERINE FISHERIES AT CICFRI

(25-27 APRIL 1987)



His Excellency, Prof. Nurul Hasan, Governor of West Bengal inaugurating the Symposium. Next to Governor are Shri Kironmoy Nanda, Minister for Fisheries, Govt. of West Bengal and Dr. Arun G. Jhingran, Director, CICFRI (2nd from right).

National Symposium on the IMPACT OF CURRENT LAND USE PATTERN AND WATER RESOURCES DEVELOPMENT ON RIVERINE FISHERIES held at CICFRI, Barrackpore during 25-27 April, 1987 aimed at consolidating the present state of knowledge on the subject in a fisheries perspective with a view to promoting even and rational land and water use patterns. The *theme* was accordingly chosen as *Current status and future scope of fisheries management in river basins*.



Professor Nurul Hasan, Governor of West Bengal and Shri Kironmoy Nanda, Minister for Fisheries, Govt. of West Bengal at the inaugural session.

"There cannot be a place more appropriate than Barrackpore as the venue for this important symposium. Barrackpore and CICFRI have acquired a reputation for bringing out many significant technologies in developing the inland fisheries of the country. Research should ensure that people are provided not only with enough to eat but also with food of quality. Fishery experts have a definite role to play in this direction"

—Professor Nurul Hasan

INAUGURAL ADDRESS

The Governor Stresses the Role of Fishery Scientists in Raising Nutritional Status of the Poor

His Excellency Prof. Nurul Hasan, the Governor of West Bengal, emphasised the need for concerted research efforts to maximise fish production from different types of water bodies available in the country so that fish protein becomes available to the poor at reasonable price. While inaugurating the Symposium on "Impact of current land use pattern and water resources development on riverine fisheries" at CICFRI, the Governor urged the fishery scientists to put in their best efforts in this vital sector as fish alone can alleviate the protein deficiency among the poor. He pointed out that fish is a reliable source of protein, phosphorus, iron, vitamins and minerals. It is thus difficult to conceive a situation where fish does not form a significant component of the common man's diet.

Prof. Hasan reminded the scientific community about their share of responsibility in providing the masses with nutritionally rich diet and thereby improving their quality of life. Prof. Hasan reiterated the role of fish in the nutrition of growing children. He added that research should ensure that people are provided not only with enough to eat but also with food of quality. Fishery experts have a definite role to play in this direction.

Paying rich tributes to the contributions made by the Institute during the last four decades, the Governor said that there cannot be a place more appropriate than Barrackpore as venue for this important symposium. Barrackpore and CICFRI have acquired a reputation for bringing out many significant technologies in developing the inland fisheries of the country. Commenting on the recent trend of narrow specialization



in fisheries research, the Governor said that though narrowing down the circle of investigation might achieve greater depth in knowledge, all significant research had to have both depth and width. He said he was deeply concerned with the expansion of fisheries in the State of West Bengal. Food habits of people of West Bengal have changed; they are no longer dependent exclusively on freshwater fishes. Development of brackishwater and marine fisheries sectors is also equally important for the State. The Governor expressed the hope that the top-ranking scientists of the country who assembled for the symposium would deliberate upon the various man-made environmental changes in river basins during the technical sessions. He hoped that the symposium would provide worthwhile recommendations to the state and to the country which would lead to general improvement in the nutrition of masses.

The Symposium on "Impact of Current Land Use Pattern and Water Resources Development on Riverine Fisheries" was inaugurated by His Excellency, Prof. Nurul Hasan, the Governor of West Bengal on 25th April, 1987. The colourful inaugural ceremony was presided over by Shri Kironmoy Nanda, Hon'ble Minister for Fisheries, Govt. of West Bengal. Dr. M. Y. Kamal, Asst. Director General, Indian Council of Agricultural Research welcomed the delegates and Dr. S. N. Dwivedi, Additional Secretary, Department of Ocean Development, Govt. of India delivered the Key-note address. Shri S. S. Chattopadhyaya, Secretary (Fisheries), Govt. of West Bengal was also present. Dr. Arun G. Jhingran, Director, CICFRI gave a vote of thanks to the chair and the delegates.

PRESIDENTIAL ADDRESS



Shri Kironmoy Nanda, the Hon'ble Minister for Fisheries, Government of West Bengal stressed on the importance of capture and culture systems in the fisheries development of different regions of the country. While delivering his Presidential address at the Symposium on "Impact of Current Land Use Pattern and Water Resources Development on Riverine Fisheries" on 25th April, at Barrackpore, he said the two systems exist complimentary to each other. He pointed out that the marine fisheries resources are not inexhaustible and the brackishwater fish farming has to support the production systems of marine living resources. He was of the view that culture fisheries alone cannot cope with the needs of table fish in the country despite the noticeable development in aquaculture, and that capture fishery has to go hand in hand with culture fishery. However, he expressed his reservations on the issue of narrow specializations in research endeavours leading to the recent trifurcation of the Institute.

West Bengal, he pointed out, is the only state which is bestowed with enormous potential in respect of all the diverse fisheries resources. The State produced and met more than 75% of the total fish seed requirements of the country. West Bengal has enormous potential in capture sector too. He underlined the

"Capture and Culture Fisheries Have to Go Hand in Hand to Foster Fisheries Development"

—Kironmoy Nanda

need for adequate research support in different areas of fisheries development. He reiterated the need for multidisciplinary approach in research projects which was more meaningful and relevant to the needs of the State. Drawing the delegates' attention to the manifold problems faced by the riverine capture fisheries sector, he exhorted the scientists to actively deliberate upon the problems and come out with definite ideas leading to solutions of such problems. He hoped that the Symposium would succeed in identifying the core issues and providing plausible solutions to the problems that impair fisheries development in the riverine sector.

KEY-NOTE ADDRESS

"River basin management needs holistic, multidisciplinary approach"

—S. N. Dwivedi

Dr. S. N. Dwivedi, Additional Secretary, Dept. of Ocean Development, while delivering his key-note address, expressed the view that the theme chosen for the Symposium was a subject of topical importance which concerned the people in rural as well as urban areas. Management of river basins, he told, was a big challenge as this was a sector that demanded a holistic, interdisciplinary approach. He told that judicious application of all available technologies could make appreciable improvement in the riverine ecosystem without compromising the genuine developmental needs. He cited the example of Ganga river system where the man-made environmental changes turned out to be detrimental to the fish wealth. Riverine environmental degradation and the consequent ill-effects on fisheries were a global problem and he urged the scientists to examine the issues and come out with possible solutions.



Dr. S.N. Dwivedi delivering the key-note address.

"The man-made environmental changes in the Ganga basin have turned out to be detrimental to the fish wealth. Riverine environmental degradation and the consequent ill-effects on fisheries are a global problem and the scientists have to examine the issue and come out with possible solutions".

—S. N. Dwivedi

Man-made changes in the riverine environment not only affected the rivers but the adjoining agricultural land have also been affected adversely. In some parts of the country like Eastern U.P., Bihar and some parts of A.P. the paddy fields adjoining the river became water-logged and became unfit for agriculture. In other areas like Western U.P., Haryana, Punjab, and parts of Rajasthan they became saline and were lying fallow.

Dr. Dwivedi expressed an urgent need to amend the Indian Fisheries Act of 1897 which had become outdated. Rivers have always been held sacred by Indian society. The River Ganga, he told, had a tremendous capacity to purify itself and recycle its wastes. But there was always a limit which we seem to exceed now. We should introduce new technologies to deal with the problem of pollution.

He expressed the hope that the Symposium would come out with some concrete suggestions to improve the riverine environment and riverine fisheries in the coming years.

WELCOME ADDRESS

Earlier, Dr. M. Y. Kamal, Assistant Director General, Indian Council of Agricultural Research, New Delhi extended a warm welcome to the Governor, the Minister and other dignitaries. Recounting the valuable contributions made by His Excellency Prof. Nurul Hasan to the country's educational and scientific progress as well as the international understanding, Dr. Kamal said that the Council and the Institute were honoured and inspired by the presence of Prof. Hasan on the occasion of the inauguration of the Symposium. He extended a cordial welcome to Shri Kironmoy Nanda, Minister of Fisheries, Government of West Bengal who had graciously consented to preside over the function. A cordial welcome was also extended to Dr. S. N. Dwivedi, Additional Secretary, Dept. of Ocean Development, Govt. of India and Shri S. S. Chattopadhyaya, Secretary, Fisheries, Govt. of West Bengal.

Welcoming the distinguished scientists who were present on the occasion, he said that some of them had built up the very base on which the fisheries research and development progressed in the country. He also welcomed the senior officials of Barrackpore Sub-division, North Barrackpore Municipality and Palta Water Works.

He extended a cordial welcome to the members of press, Doordarshan and AIR who evinced a great interest in extensively covering the event.

VOTE OF THANKS

Dr. Arun G. Jhingran, Director, Central Inland Capture Fisheries Research Institute, in his vote of thanks, expressed a deep sense of gratitude to His Excellency, the Hon'ble Minister and other dignitaries for honouring the Institute with their exalted presence. Pleasently recalling his earlier meetings with Prof. Nurul Hasan, Dr. Jhingran pointed out that His Excellency had a long association with the Institute since the time of Dr. S. L. Hora. He said that the Institute and its scientists had benefitted considerably from Prof. Hasan's valuable advice.

Thanking Shri Kironmoy Nanda, the Hon'ble Minister of Fisheries, Govt. of West Bengal for sparing some of his valuable time to the symposium, Dr. Jhingran said that Shri Nanda was well known for his active interest and practical approach to the problems in fisheries development. He expressed the gratefulness of the Institute to the Hon'ble Minister whose valuable advice and thought-provoking remarks gave the necessary direction on such fisheries problems which needed priority.

Dr. Jhingran gratefully recalled the valuable suggestions, natural kindness and intellectual generosity of Dr. S. Z. Qasim, Secretary, Department of Ocean Development, Govt. of India, under whose guidance

the Symposium was planned. He mentioned that it was unfortunate that Dr. Qasim had to cancel his visit to Barrackpore due to unavoidable circumstances.

He was also grateful to Dr. S. N. Dwivedi for readily agreeing to deliver the key-note address despite his very busy schedule in Delhi. He assured Dr. Dwivedi that the points raised by him would be duly considered and discussed in the technical sessions.

Dr. Jhingran placed on record the Institute's gratitude towards Dr. R. M. Acharya, Deputy Director General (Animal Sciences) and Dr. P. V. Dehadrai, Deputy Director General, Fisheries, who were the guiding force behind the organization of the Symposium.

Dr. Jhingran thanked Shri S. S. Chattopadhyaya, Secretary (Fisheries), Govt. of West Bengal for always extending the help required by the Institute from the Govt. of West Bengal. He said, it was heartening that Fisheries Department of West Bengal was represented at its highest level. He thanked the Secretary, Director of Fisheries and the Jt. Director (Fisheries) for this active participation in the Symposium. He also thanked Dr. M. Y. Kamal, Asst. Director General, ICAR for his precious inputs in designing the Symposium.

He expressed his deep sense of gratitude to the local officials of Barrackpore administration, Municipality and Palta Water Works and the members from the media for the unflinching cooperation in the smooth conduct of the Symposium. He also extended his thanks to all the delegates who had taken the trouble to attend the Symposium. He was indebted to all others who had been of help in providing the physical facilities and in making the arrangements for the successful conduct of the Symposium.

EXHIBITION COMMEMORATING THE SYMPOSIUM

An exhibition was also arranged on the occasion of the Symposium depicting the landmarks achieved by the Institute during the last 40 years. The exhibition was inaugurated by His Excellency Prof. Nurul Hasan, the Governor of West Bengal. The work and achievements of the Institute were appraised on to the distinguished dignitaries and interested persons during the exhibition. The exhibition was aided by models, live fishes, charts etc. The pavilion had about 30,000 visitors.



CICFRI's exhibition pavilion depicting the landmarks achieved by the Institute in its 40 years of existence in the field of inland fisheries.



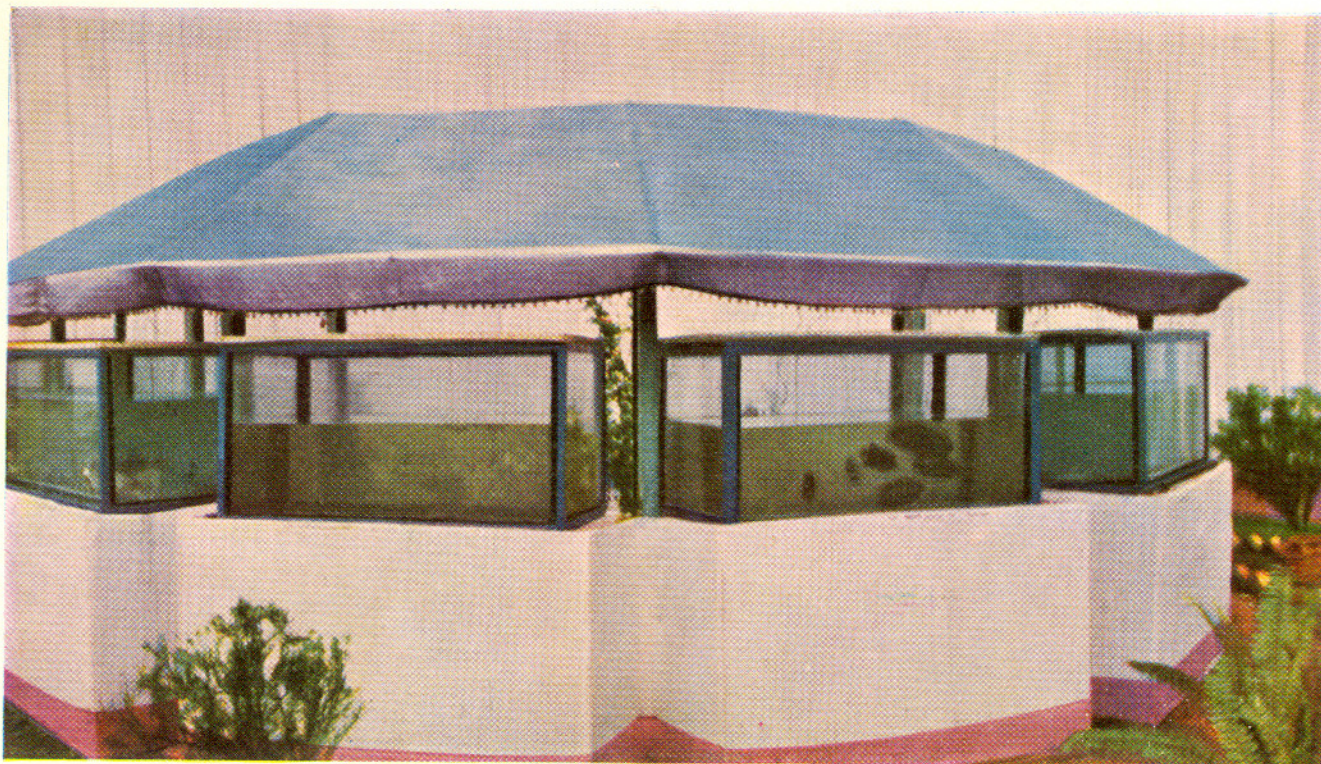
The Governor inaugurates the exhibition commemorating the symposium on riverine fisheries.



The Governor & the Minister were taken around the pavilion by Dr. Arun G. Jhingran, Director, CICFRI and Dr. M.Y. Kamal, Assistant Director General, ICAR and the senior scientists of the Institute. They were briefed on the scientific management of inland fisheries resources and the progress made by the Institute in the field.

Rural ponds help effectively converting agricultural and domestic wastes into fish flesh. The concept is explained to the Governor and the Minister.





The aquarium hall erected along with CICFRI exhibition pavilion exhibiting commercial and aquarium fishes.

TECHNICAL SESSIONS

The Symposium spanned into six Technical Sessions, viz. Environmental Modifications, Physico-chemical Processes, Primary & Secondary Production, Production Biology, Fishery and Natural Resources Management. Six invited lectures were delivered by eminent scientists during the technical sessions. The valedictory session on 27th evening took stock of the deliberations.

Draft recommendations prepared by Dr. S. Jones, Dr. E. G. Silas, Dr. P. S. B. R. James, Dr. G. P. Dubey, Dr. C. V. Kulkarni, Dr. Y. R. Tripathi and Dr. Arun G. Jhingran were approved in the valedictory session.

Session I : Environmental Modifications

The technical session on Environmental Modifications was chaired by Dr. V. G. Jhingran. Dr. S. P. Ayyar and Shri Apurba Ghosh recorded the proceedings. The invited lecture by S. N. Ghosh, Arunabha Mitra and A. N. Bose on 'Assessment of riverine fishery potential through IFG Model' was delivered by Prof. S. N. Ghosh. Thirteen papers were presented during the session on the effect of environmental modifications on various aquatic ecosystems like rivers, springs,

lakes, reservoirs, estuaries, and brackishwater impoundments.

Effects of hydraulic structures, industrial effluents and sewage water on limnology, productivity and fisheries in rivers like Cooum, Tungabhadra, Pennayar, Krishna, Hooghly and Bidyadhari were highlighted in the session.

Dr. Jayapaul Azaraiah, Dr. A. K. Bandopadhyay, Dr. S. L. Chonder, Shri R. K. Das, Shri K. O. Joseph, Dr. H. C. Joshi, Shri K. N. Krishnamoorthi, Shri A. B. Mukherjee, Dr. M. K. Mukhopadhyay, Dr. M. Ramakrishnaiah, Dr. K. Raman, Shri G. N. Saha and Prof. Tombi Singh presented their papers in the session.

Session II : Physico-chemical Processes

Four papers on changes in physico-chemical processes due to man-made environmental modifications were presented in the session chaired by Dr. S. Jones. Dr. K. Raman was the rapporteur in the session. The hydrobiological changes in Kulti estuary and Hooghly estuary around Kakdwip were presented by Dr. R. K. Banerjee and Shri A. R. Choudhury respectively. Dr. V. Pathak presented a paper on energy dynamics of open and closed beels in Ganga and Brahmaputra basins. Shri A. Sengupta, in his paper, dealt with the sedimentation dynamics in Bartala river connected to Hooghly estuary.

Dr. P. S. B. R. James delivered the invited lecture on Inland water resources of Kerala in relation to fisheries development.

Session III : Primary and Secondary Production

The session on Primary and Secondary Production was chaired by Dr. P. S. B. R. James. Dr. G. P. Dubey in his invited lecture dealt with the current status and scope of fisheries management of major reservoirs in Narmada basin in Madhya Pradesh.

Seven papers by Prof. N. C. Datta, Shri A. Ghosh, Dr. B. C. Jha, Shri A. C. Nandy, Dr. K. R. Naskar, Dr. T. Ramaprabhu and Shri V. V. Sugunan, dealing with plankton, primary productivity and faunal associations in different river systems and estuaries, were presented in the session. The papers dealt with the role of phytoplankton as indicators to pollution, species diversity indices, and river-bed vegetation.

Shri B. K. Sharma acted as rapporteur in the session.

Session IV : Production Biology

The fourth technical session on Production Biology was held with Dr. Y. R. Tripathi in the chair and Dr. K. K. Vass as the rapporteur. An enlightening lecture on the role of fish sanctuaries in river systems was given by Dr. S. Jones, the eminent fishery scientist, in the session. Three contributed papers were presented in the session. Mr. D. K. De and Dr. M. Sinha presented a paper on artificial fecundation of *Hilsa ilisha* as a possible approach to revitalise the depleted hilsa stock in Ganga. Dr. J. P. George talked on the use of turbid river water in Sathannur for breeding of major carps. Dr. M. A. Khan presented a paper on catch statistics, biology and population of *Labeo calbasu* in River Yamuna.



Technical Session—I chaired by Dr. V.G. Jhingran eminent fishery scientist and Ex-Director of the Institute. Mr. Apurba Ghosh (right) and Dr. S.P. Ayyar (left), scientists were the rapporteurs. Paper is being presented by Mr. S.N. Sen of Department of Fisheries, Govt. of West Bengal.

Session V : Fishery

The technical session on Fishery was chaired by Dr. G. P. Dubey. An invited lecture on rare and endangered Indian freshwater fishes was delivered by Dr. A. G. K. Menon. Dr. M. Ramakrishnaiah recorded the proceedings. Five papers were presented in the session by Shri A. K. Ghosh, Shri Ravish Chandra, Prof. Y. Sreekrishna and Dr. M. Subrahmanyam. The first two papers discussed the fisheries of Kolleru lake and Ganga river system respectively in the light of environmental changes. Prof. Sreekrishna described some unique fish catching methods in Indian rivers and Dr. Subrahmanyam talked on palaemonid prawn fisheries of Godavari Estuarine System.

Session VI : Natural Resources Management

Last technical session on Natural Resources Management began with Dr. T. A. Mammen in the chair. However, the latter half of the session was presided by Dr. A. G. K. Menon as Dr. Mammen had to leave for Delhi. Dr. V. K. Unnithan and Shri Ravish Chandra acted as rapporteurs. During the session an invited lecture on National Policy for the Management of Riverine Fishery Resources was delivered by Dr. B. S. Saxena. The twelve contributed papers presented in the session discussed the riverine fisheries resources and problems in their management in the context of land use pattern and water resources development. Two papers by Dr. Arun G. Jhingran and Shri R. A. Gupta reviewed the status of fisheries in Ganga during the last four decades with special emphasis on *Hilsa ilisha*. They described some perceptible changes that took place in the fisheries ecology of the river system due to a host of environmental changes ranging from hydraulic structures to water pollution. Shri V. R. Chitranshi, Dr. M. K. Das, Shri Apurba Ghosh, Shri S. Paul, Shri P. Ray & Dr. A. G. Jhingran, Shri B. Roy & V. V. Sugunan, Shri H. L. Sarkar, Shri Shivaprakash and Dr. K. K. Vass also presented their papers. Dr. P. Das in his paper emphasised the need for fish germ-plasm conservation and genetic stock improvement in river systems.

Valedictory Session

The Sixth Technical Session was followed by the valedictory session in the evening of 27th April. Earlier, a panel of eminent scientists comprising Dr. S. Jones, Dr. G. P. Dubey, Dr. T. A. Mammen, Dr. Y. R. Tripathi, Dr. Arun G. Jhingran and Prof. B. S. Saxena prepared draft recommendations based on the discussions that took place in the technical sessions. The valedictory session approved the recommendations with slight modifications. An enlightened discourse on *Barilius bola* was given by Dr. C. V. Kulkarni during his valedictory address. Dr. E. G. Silas chaired the valedictory

session. In his remarks, he congratulated the Convener and the other organisers for the successful conduct of Symposium. He expressed the hope that the recommendations adopted by the Symposium will be implemented in letter and spirit by the organizations concerned. A vote of thanks was given by Shri V. V. Sugunan Organising Secretary of the Symposium. He placed on record the Institute's deep sense of gratitude to all delegates who had participated in the Symposium.

Recommendations of the Symposium

The Symposium adopted the following recommendations:

1. The Central Fisheries Act is being revised and it will be desirable that each state review the provision of its Fisheries Act in the light of present day development and requirements and evolve suitable regulations for their implementation such as destruction of brood stock or young fish. In the event any state requires advice in the formulation of Fisheries Acts or regulations, the CICFRI may extend any help necessary towards modifications in the existing State Fisheries Acts and regulations.

2. In view of the considerable changes taking place and envisaged in the watershed areas of the riverine systems, the CICFRI may prepare a status report to enable extending advisory help where new river valley projects are to be undertaken.

3. The CICFRI should, through necessary surveys, identify and delineate in collaboration with the NBFGR, Allahabad, riverine and stream stretches which should be considered as "sanctuaries" or protected reserves. The Institute may cooperate with the Wildlife and Fisheries Departments of the states for the protection of endangered/threatened species of freshwater aquatic organisms. The possibility of having fishery river-guards for the protection of the water-ways in such sanctuaries and rivers may also be examined. The Institute should prepare an inventory of the species which need special protection.

4. The Symposium highlighted the depletion or decline in riverine fish stocks in some major systems, such as Indian major carps, mahseer, hilsa, the Indian trout etc. The CICFRI may take up a major programme of seed production of such species for stocking and rehabilitating them in riverine systems.

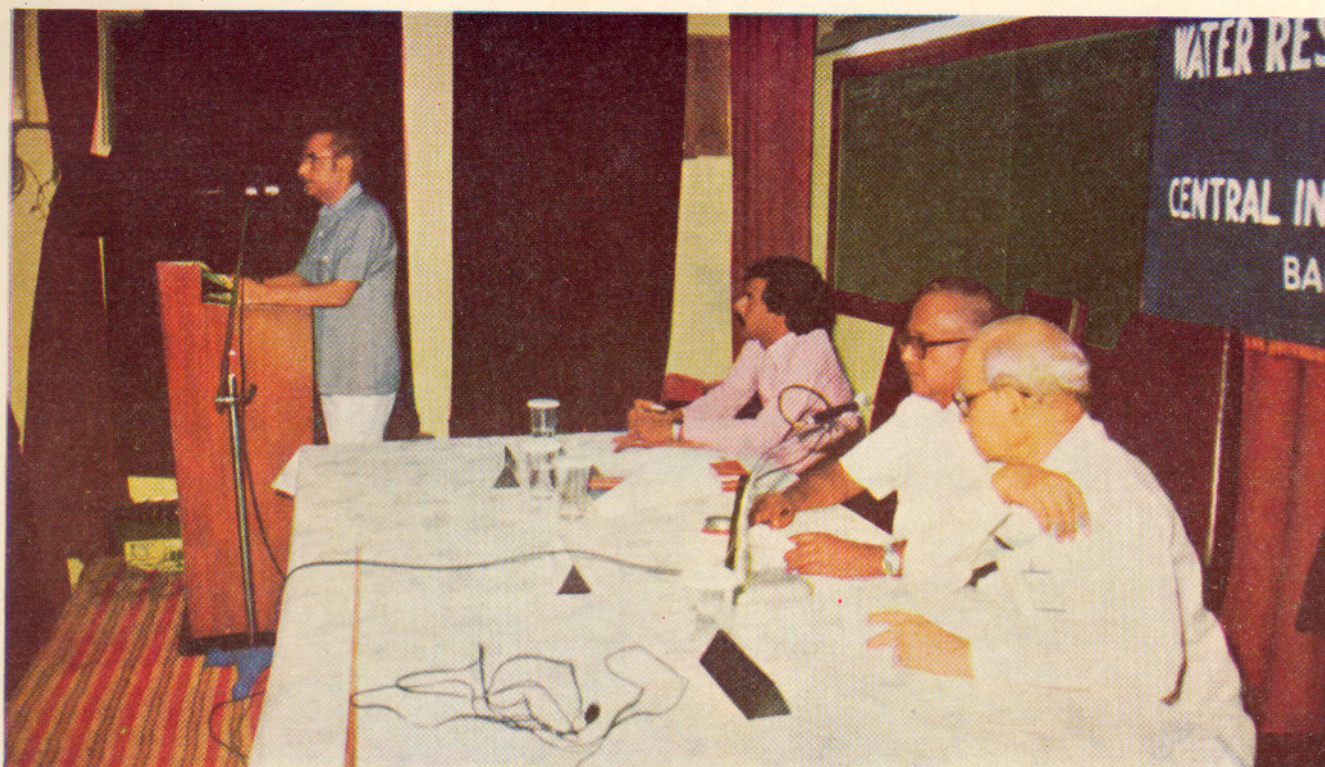
5. In view of the decline in some of the fish stocks in the riverine systems and the need for monitoring this, it will be necessary for the Institute to establish more centres on important rivers.



Dr. S. Jones, the eminent fishery scientist chairing session-II. Dr. V.G. Jhingran key speaker of the session (right) & Dr. K. Raman, scientist as rapporteur (left) are also seen on the dias



Dr. M.Y. Kamal, Asst. Director General (Fisheries), ICAR, addressing the symposium participants.



Dr. Arun G. Jhingran, Director, CICFRI presenting the recommendations of the symposium before the participants.



A view of the participants of the symposium.

6. The migratory habits and behaviour of riverine fishes have not been adequately studied to advise river valley projects on the construction of suitable "fish passes". The CICFRI may take up collaborative work with irrigation engineering and designing departments for designing suitable "fish passes" for augmenting natural stocking of reservoirs. If necessary the concerned scientists may be trained abroad to study the fish behaviour.

7. In view of the expertise on riverine fisheries available with the CICFRI, it is desirable that the Institute is consulted in major programmes such as the Ganga Action Plan aimed at restoring the purity of natural biota.

Many of the riverine areas are being polluted by domestic and industrial wastes and agricultural pesticides. There is need for monitoring of such ecosystems through biological indicators including benthic fauna.

8. The expertise of the Institute developed in sewage-fed aquaculture should be adopted at the various centres along the Ganga River System and also in other locations through training and consultancy.

9. The *jheels* and ox-bow lake fisheries in the country have been mostly neglected and there is an urgent need for intensive work in this area. The CICFRI should play an important role in developing the technology for maximum utilization of these water-bodies for augmenting fish production.

10. A strong data base on riverine and reservoir fish production is lacking. The CICFRI may expeditiously

develop a "data acquisition system" for estimating the exploited resources from these water bodies at the national level through the development of a Data Centre and other necessary infrastructure. Cooperation from the IASRI, New Delhi, and concerned State Governments may be sought to achieve this.

11. Among the migratory species, the anadromous *Hilsa ilisha* needs priority attention. A national coordinated programme may be developed at CICFRI for studying the hilsa stocks of the east and west coasts of India and the connected riverine systems in order to evolve proper management plans in collaboration with other organizations.

12. More information is needed on the behaviour and biology of game fishes of India and it is recommended that the CICFRI should take up programmes on such species.

13. In the past, little attention has been paid towards improvements in crafts and gear and post-harvest technology in riverine and reservoir fisheries in the country. The CICFRI may take up special studies in this neglected sector in collaboration with other Institutes, such as CIFT and State Fisheries Departments.

14. The utilization of large perennial canals for stocking and production of fish may be examined in consultation with the irrigation departments in selected areas as an additional fisheries resource.

15. Adequate attention should be paid by the Institute to study the ecology and fisheries of coldwater lakes and streams.

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