REPORT OF THE INTERNATIONAL SYMPOSIUM ON FRESHWATERPRAWNS HELD AT KOCHI, INDIA FROM 20th TO 23rd AUGUST 2003.

FRESHWATER PRAWNS, 2003, the international symposium on freshwater prawns held at Kochi, India from 20th to 23rd August 2003 was a major event in the history of freshwater prawn culture development, particularly in India. Attended by about 500 delegates from 14 countries (India, UK, USA, Israel, France, Australia, China, Thailand, the Philippines, Vietnam, Sri Lanka, Bangladesh, Iran and Malaysia) the Symposium was featured with interesting presentations from a galaxy of international experts. Mr. Michael New OBE, President of EAS and past President of WAS, whose enlightening presence throughout the proceedings of the symposium was most encouraging, presented the keynote address. The event was organized by the College of Fisheries, Kerala Agricultural University, Kochi. Dr. C. Mohanakumaran Nair was the General Convener of the Symposium. A total of 137 scientific papers were presented during three days of the Symposium.

The College of Fisheries has been serving as a nodal agency in *Macrobrachium* research and development in India for the past few decades. The Symposium was richly supported by the international agencies like NACA, and the Indian Fishery Industry that included M/s Marine and Agro Products (P) Ltd., C.P. Aquaculture India Ltd., Avanti Feeds Ltd., Higashimaru Feeds India Ltd., Ananda Group of Companies, Natures Way Hydrofauna and so on. Government support came from the Govt. of Kerala, represented by the Dept. of Fisheries, the Agency for Development of Aquaculture, Kerala (ADAK) and MATSYAFED; the Govt. of India represented by the Ministry of Food Processing Industries, the Dept. of Biotechnology, and Dept. of Animal Husbandry and Dairying, New Delhi; the Marine Products Export Development Authority (MPEDA), Central Marine Fisheries Research Institute (CMFRI) and the Central Institute of Fishery Technology (CIFT), Kochi. Professional fisheries organizations like the All India Shrimp Hatcheries Association (AISHA) and the Seafood Exporters Association of India (SEAI) were also some of the major sponsors of the Symposium.

The Symposium was inaugurated by Prof. K. V. Thomas, Minister for Fisheries, Kerala, in a function attended by Mr. Michael New, Dr. Mohan Joseph Modayil, Director, CMFRI, Mr. Jose Cyriac, Chairman, MPEDA, Dr. M. Sakthivel, President, AFI, Dr. Devadasan, Director, CIFT, Dr. A. I. Jose, Director of Extension, KAU, Dr. D. D. Nambudiri, Dean, Dr. C. Mohanakumaran Nair, Convener, FWP 2003, Mr. U.K.V. Raju, Chairman, Ananda Group and Mr. M. Sudarsan Swamy, President, All India Shrimp Hatcheries Association. An Exhibition was also inaugurated as part of the event. The participants of the Exhibition included Marine & Agro Products (P) Ltd., Chennai, the distributors of Cyclop-eeze & other Argent Products in India; CP Feeds India Ltd., the global giants in prawn feed manufacture, Avanti Feeds Ltd., Higashimaru Feeds India Ltd., and The Waterbase Ltd., leading prawn feed manufacturers in India; Gujarat Multi Gas Base Chemicals (P) Ltd., Gujarat, manufacturers of Zeolite; K.C.P. Sugar Industries Corporation, producers of biofertilizers; Wintech Aquafarm Tamil Nadu; Frontliners, Chennai, Rudhira Exports, Nellore, and Tropical Biomarine Systems (P) Ltd., Chennai, distributors of *Artemia* and other aqua products; Everest Blowers Ltd., New Delhi, manufacturers of airblowers; Maharaja Aquatics, Nellore; Export Inspection Agency (EIA), apart from research Institutions like CMFRI, CIFT and so on.

The Symposium sessions began with the much-awaited **Keynote address** by Mr. Michael New OBE on 21st August 2003. In his keynote address which was titled "Freshwater Prawn Farming: Global status, Recent research and a Glance at the future", Mr. New reviewed the current status of freshwater prawn farming globally with comments on the statistical information available. Some scenarios for future expansion were also explored. Mr. New highlighted the developments of Freshwater Prawn farming in China and Brazil, and urged to adopt similar models in developing countries. Going by statistical information of FAO for 2001, India produced 24,230 mt. of *Macrobrachium rosenbergii,* standing at the 3rd position after China and Vietnam, which produced 128,338 mt and 28,000 mt respectively. He predicted that national production of scampi in India would be well above 50,000 mt/year by 2010. He suggested that the research priorities in freshwater prawns need to be focused more on farming and nursery rearing, since enough work has already been done on hatchery development.

The keynote address was followed by the session on **Global status**, depicting the progress of freshwater farming in various countries. The session was chaired by Mr. Jose

Cyriac, Chairman, MPEDA, India. A paper entitled 'Current status of freshwater prawn farming in Thailand with special reference to backyard hatcheries', was presented by Dao Hey Giap of AIT, Bangkok on behalf of Dr. Yang Yi. Mr. Michael New presented the paper on the status of freshwater prawn culture in China and future prospects, on behalf of the author Dr. Miao Weimen, Director of Freshwater Fisheries Research Centre, Wuxi, China. Similarly, a paper on the current status of freshwater prawn culture in Brazil authored by Dr. Wagner C. Valenti, Professor of Sao Paulo University, Brazil, was presented by Dr. M.N. Kutty, in the absence of the author. *Macrobrachium rosenbergii* is the only species in the small farms concentrated in the southeast region of Brazil. However research projects are being carried out with developed technology to produce the native species *M. amazonicum.* Monoculture and polyculture with Tilapia were performed. Productivity varied from 1000 to 4500 kg/ha/year and total production cost might reach $ 3-4/kg whereas the selling prices range from US$ 4-8/kg.

Another interesting presentation was made by Dr. Melchor Tayamen, Director, National Freshwater Fisheries Technology Center, Philippines on the "Status of Giant Freshwater Prawn *M. rosenbergii*: Program in the Philippines". He gave a brief update of the technology development of freshwater prawn with emphasis on the Bureau of Fisheries and Aquatic Resources, national programmes and strategies commercialization. Dr. N.T. Phuong, Vice Dean of the College of Fisheries, Can Tho University, Vietnam, presented a paper on "Development of Giant Freshwater prawn farming in Vietnam". He pointed out that Vietnam had 90 prawn hatcheries by the end of 2002 and produced over 115 million post larvae. The Vietnam model was notable due to simplicity, limited use of water and Artemia, high productivity up to 50 to 75%, survival rate and high profit. A paper on the "Status of Freshwater prawn *M. rosenbergii* farming in Sri Lanka was presented by Mr. A. M. Jayasekara, former Director General of the National Aquaculture Authority, Sri Lanka in which he mentioned that the Government of Sri Lanka has envisaged to bring 300 ha of area for freshwater prawn farming in the country. It was also planned to construct a new hatchery with a capacity of 4 million post larvae annually under the ADB funded Aquatic Resources Development and Quality Improvement Project.

Dr. J. Bojan, Director, MPEDA, presented the paper on the "Status of scampi farming in India". Scampi is cultured in 34630 ha area in the country. The average

production per ha ranges from 880 kg to 1250 kg. He noted that 62% of the scampi culture operation is in Andhra Pradesh. Presently 71 hatcheries are operating in various states supplying 183 billion scampi seeds to the farmers in India. The high cost of seed and feed is a problem facing scampi farmers in India. A paper entitled "Overview of research and development of *Macrobrachium* culture in the USA" was presented by Dr. David Yasharian of Kentuky State University, USA on behalf of Dr. James Tidwell. He reported that the culture of *Macrobrachium* in temperate zones offered positive opportunities despite the inability to culture year round. Farming with the best management practices by combining factors such as evaluating and maximizing the relative contributions of natural feeds, effects of artificial substrates on growth and prawn population structure, and grading of animals prior to pond stocking to reduce heterogeneous individual growth have enabled to intensify the production without decreasing average sizes or deteriorating water quality. Using best management practices, production of 1500 to 1800 kg/ha has been achieved in commercial pond on 110 days.

There was also a paper from Bangladesh titled "Freshwater prawn status in Bangladesh; its strategy and policy" presented by Ms. Rahima Nahar, Deputy Chief, Department of Fisheries and Livestock, Govt. of Bangladesh. She stated that Bangladesh has about 40,000 saltwater shrimp farms covering 1,70,000 ha, and 105,000 Golda farms covering 30,000 ha. The Department of Fisheries of Bangladesh Government has formulated the Fish Inspection and Quality Control Act based on the National Fisheries Policy for maintenance of quality between harvesting and processing.

The session on country status was followed by the presentation of five papers on the status of prawn farming in the various States of India. Mr. Iliah, Addl. Director of Fisheries, presented the status of scampi culture in Andhra Pradesh. Dr. B.S. Saharan, Director of Fisheries, Haryana presented a paper on the progress and prospects of freshwater prawn culture in his State. Dr. M.C. Nandeesha, Professor, College of Fisheries, Tripura presented the progress made in freshwater prawn farming in Tripura State. The development of scampi farming in Kerala was presented by Mr. G. Rajagopal, Deputy Director of Fisheries (Inland), Dept. of Fisheries, Kerala. The status of freshwater prawn culture in Tamil Nadu was presented by Mr. T. Govindan, Jt. Director of Fisheries (Inland), Tamil Nadu.

The session II on the **Fishery Biology and Capture Fisheries** was chaired by Dr. Mohan Joseph Modayil, and the lead paper titled "Biodiversity of freshwater prawns belonging to Palaemonid genus *Macrobrachium*, Bate 1868 and atyid genus *Caridina* H. Milne Edwards, 1837, from parts of Maharashtra and Karnataka States, India" was presented by Dr. K.N. Sankolli. A total of 21 papers were presented in this session which included a paper titled "commercially important freshwater prawns in Luzon and Panay Islands, Philippines" by Dr. Edna V. Agasen, Sr. Aquaculturist, B.F.A.R. Philippines and another paper by Dr. Jane M. Hughes of Griffith University, Australia, titled "The *Paratya australiensis* species complex in eastern Australia: the implications for translocations and inter-basin water transfers". Twelve species of freshwater prawns were reported from the Philippines, the largest among these being the giant freshwater prawn *Macrobrachium rosenbergii*. P. Das (CIBA, Bhubaneswar) described the genetic characteristics of the species of *Macrobrachium* using RAPD PCR profiling.

The session III on **Biotechnology and Genetic Engineering** was chaired by Dr. J. Bojan. The lead paper titled "The androgenic gland and monosex culture in prawns: Biotechnological perspective" was presented by Prof. (Dr) Amir Sagi of Ben Gurion University, Israel. Dr. Peter Mather, Queensland University of Technology, Brisbane, Australia presented another notable paper, which was captioned "The patterns of molecular divergence in the wild stocks of the giant freshwater prawn *Macrobrachium rosenbergii*". A total of 9 papers were presented in this section.

The session IV on **Disease and Health Management** was chaired by Dr. I. Karunasagar, and the lead paper "Health Management in aquaculture: issues and responsibilities" was presented by Dr. C.V. Mohan, NACA, Bangkok. He gave an overview of the issues and responsibilities involved in health management in aquaculture. Dr. Mohan stressed the need for strict adherence to national, aquatic animal health strategies aimed at minimizing the risk of trans-boundary spread of dangerous pathogens. In this session, two important papers namely "Characterization of 2 viruses (*Mr*.NV and XSV), pathogenic agents of the White Tail Disease (WTD) of the giant freshwater prawn *M. rosenbergii*: An unusual viral association" and "Genome-based detection methods of *Mr*.NV and XSV, the pathogenic agents of WTD in *M. rosenbergii*: Possible use in the study of viral association and the evaluation of disease severity" were presented by Dr. Jean-Robert Bonami and, Dr. Joannes Sri Widada, Research Directors at IFREMER,

France. They suggested that due to its sensitivity and ease, the use of RT-PCR appeared to be a versatile method for early diagnosis of White Tail Disease which causes a high mortality of *M. rosenbergii*. Sahul Hameed (Abdul Hakeem College, Vellore) discussed the clinical and histopathological signs of white tail disease of *M.rosenbergii*. A total of 10 papers were presented in this session.

The fifth session, **Hatchery Technology** was chaired by Mr. Michael New, in which 20 papers were presented that included a paper "The effect of tank colouration on larval development, and overview of temperate production" authored by David Yasharin and James Tidwell of Kentucky State University, USA. Dr. Supis Thongrod of Coastal Aquatic Feed Research Institute, Dept. of Fisheries, Thailand, made an interesting presentation on the seed production of *Macrobrachium rosenbergii* in earthen pond. Dr. Nani Gopaldas (University of Chitagong, Bangladesh) reported on the rematuration of hatchery used wild spawners of *M. rosenbergii* in captivity. C. Vasudevappa (University of Agricultural Sciences, Bangalore) reported that freshwater cladoceran (*Moina* sp.) can be substituted for larval rearing in freshwater prawn *M. rosenbergii*.

The Chairman of the sixth session on **Farming Technology** was Dr. A.M. Jayasekara of Sri Lanka. In this session, as many as 23 papers were presented. The lead paper was presented by Dr. Ilan Karplus of Israel whose paper "Social control of growth in *Macrobrachium rosenbergii*" touching areas of the crucial research to a gain better understanding of growth regulating mechanism of *M. rosenbergii*, evoked considerable interest. He also showed a video depicting the various behavioural aspects of *M. rosenbergii* in relation to feeding, breeding and territorial behaviour. Dr. N.T. Phuong of Vietnam presented a paper "River pen culture of giant freshwater prawn in Southern Vietnam". Dao Huy Giap of AIT, Bangkok presented a paper on the "effects of fertilization and feeding regimes on the production of integrated rice-prawn culture". Vu NM Son (Asian Institute of Technology, Thailand) presented a paper on the river culture of giant freshwater prawns of *M. rosenbergii* in South Vietnam. There was another paper authored by Dr. James Tidwell and David Yesharian titled "Effects of stocking different grades of prawn juveniles on production". There were four papers from Bangladesh in this session. A paper on "pro-poor prawn farming in Southern Bangladesh" was presented by K.I. Azam of GNAEP. Mr. Wahidunnabi Choudhary of PBAEP presented

a paper on integrated rice prawn farming, moving from South-west to mid-coast of Bangladesh". The third paper was by Ms. Debbie Williams, Shrimp Seed Quality Programme, Bangladesh, which was titled "Growing giant freshwater prawn in Bangladesh; prospects for future growth". Also another paper "The prawn fish culture in backyard waterbeds in Bangladesh: Caritas initiatives" was presented by Mr. K.M. Nurul Islam of Caritas Fisheries Programme, Bangladesh. Hardayal Singh (Ludhiyana Centre of of CIFA) reported that record growth of production of giant freshwater prawns *M. rosenbergii* in Haryana.

The session VII, **Nutrition and Feeds was chaired** by Dr. M. N. Kutty, and the lead paper "*Macrobrachium* Nutrition, Feed and Feeding" was presented by Dr. Mali Boonyaratpalin, Senior Advisor to the Royal Ministry of Fisheries, Thailand. She suggested that a level of 30 to 35% of protein in diet of freshwater prawns *M. rosenbergii* is ideal. Brood stock feed of high level of 18: 2n-6 and n-3 HUFA (13 and 15 mg/g BW) has been found to improve fecundity, egg hatchability and overall quality of the larvae. Madhumita Mukherjee, West Bengal reported that feeding with natural food alone up to 9th day and artificial food thereafter resulted in successful production of post larvae of *M. rosenbergii.* A total of 15 papers were presented in this session.

The session VIII on **Post Harvest Technology** was chaired by Dr. K. Gopakumar. The lead paper was titled "A quality criteria for aquaculture scampi" presented by Dr. M.K. Mukundan, of CIFT, Kochi. He said that chemical contaminants and antibiotic residues were threats for scampi raised by aquaculture. However, he mentioned that microbial quality of farmed giant freshwater prawns in India did not exceed the tolerance limits. Cadmium, lead and mercury were found within limits. It was also mentioned that to reduce TPC, antibiotics were being used in Processing plants which was causing threat to the marketability of the products. Dr. Mukundan suggested that a farming package based on sanitation and hygienic safety had to be developed for ensuring production of good quality giant freshwater prawns. Dr. K.A. Devadasan (Director, CIFT, Kochi) highlighted the salient features of the post harvest technology in giant freshwater prawn. In this session 9 papers were presented.

The session IX on **Economics and Marketing** was chaired by Dr. M.K.R. Nair, Fisheries Development Commissioner, Govt. of India. The lead paper "Role of freshwater prawn farming in coastal aquaculture diversification" was presented by Dr. J.

Bojan, Director, MPEDA.) who reported that in India there was a spurt in the freshwater prawn farming activity in recent years resulting in a production of 30,450 mt. from 34,630 ha in 2002-03. He attributed this mainly to the availability of water bodies, establishment of hatcheries, production of low cost prawn feed and enthusiasm of entrepreneurs. J.V.H. Dixutulu (Editor, Fishing Chimes, Vizag) stressed the need for nation-wide promotion of giant freshwater prawn farming through survey of sites, assured aquaculture inputs and technical support for farming, processing and marketing. A total of 11 papers were presented in this session.

The session X on **Sustainability and Environment** was chaired by Dr. G. Santhanakrishnan, Secretary, MPEDA, India. The lead paper "Towards sustainable freshwater prawn aquaculture - lessons from the rise and fall of shrimp farming" was presented by Dr. M. N. Kutty. In his paper, Dr. Kutty highlighted the need for establishing sustainable aquaculture systems of scampi, which are environmentally acceptable and socially responsible. He said that the annual expansion rate of freshwater prawn farming in the world during the decade ending 2001 was estimated as 29% and that between 1999-2001 as high as 48%. He emphasized the requirement of establishing sustainable freshwater prawn farming systems as per the guidelines formulated by FAO and other agencies in order to prevent an unexpected collapse as in the case of shrimp farming. A total of 8 papers were presented in this session.

Interactive session

In addition to the technical sessions, there was a farmers-scientists-officials-industrialists interactive session, which was chaired by Dr. M. Sakthivel, President, Aquaculture Foundation of India. The speakers at this session included Mr. Michael New, Dr. Ilan Karplus, Mr. U.K. Viswanatha Raju, Mr. Sudarsan Swamy, Dr. Sahul Hameed, Mr. Ajith Singh Patil, Mr. Haribabu and officials from Government, Banks and insurance firms. More than 100 scampi farmers from different States of India participated in the interactive session. Mr. Haribabu (College of Fisheries, Nellore) translated the gist of presentations in Telugu

Presentation of Awards

Various awards for distinguished service in scampi fisheries and aquaculture were given away during the Symposium on 22nd August, 2003 in a function presided over by Mr. O.P. Kaler, Registrar, Kerala Agricultural University. The Awards were presented by Mr. Michael New. The Pioneer Award for establishing the first scampi hatchery in India was bestowed upon Mr. U.K. Viswanatha Raju, Chairman of Ananda Group of Companies, Bhimavaram, Andhra Pradesh. Dr. V. Gopal Reddy, an innovative farmer of Nellore, Andhra Pradesh, received the best freshwater prawn farmer of India Award, while the best State Award went to Andhra Pradesh, in recognition of the extent of scampi aquaculture development in that State.

The best exporter of scampi Awards was given to Mr. K. Eravikumar, Managing Director, Five Star Marine Exports (P) Ltd., Chennai and Victoria Marines and Agro Exports (P) Ltd., Chennai, being the biggest exporters of scampi from India, during 2002-03.

Dr. C. Mohanakumaran Nair, College of Fisheries, Kochi received the Aquaculture Foundation of India- Outstanding Scientist Award, for his pioneering efforts in the development and dissemination of the freshwater hatchery technology in India. The Young Scientist Award was presented to Mr. K. R. Salin, Natures Way Hydrofauna, Cherthala, for his paper "Live transportation of Scampi without water", presented in the Symposium.

Mr. Michael New was presented with the Scampi Excellence Award for his lifelong contributions to the development of scampi, by Mr. O.P. Kaler, Registrar, Kerala Agricultural University.

Plenary Session:

The Plenary session was chaired by Mr. Michael New. After lively discussions based on various points raised by some of the delegates, Mr. Michael New succinctly summarized the proceedings.

At the outset, Mr. Michael New congratulated the organisers for developing this fascinating programme that attracted more than 500 participants from 15 countries. The only problem was that the organizers had enough material to fill five days, not three, or several more concurrent sessions. He said that he was very much impressed with the

enthusiasm shown for scampi production in India and its rapidly expanding output. His estimate was that Indian national freshwater prawn production would be much more than 50,000 MT/yr by 2010.

He observed that this was the first conference on freshwater prawn farming, with a dedicated, though a small, exhibition attached. In view of the rapid global expansion of this form of aquaculture, Mr. New expressed confidence that this trend would continue. He was optimistic that perhaps an annual *Macrobrachium* exhibition of this kind in India would one day rival those organized annually by the World Aquaculture Society.

Pointing out that confusion and inaccuracy of production statistics was obvious from his own keynote paper and the various country status reports, particularly when developments in China and Vietnam were discussed, Mr. New said that several countries needed to report the production of other species, not only *M. rosenbergii*, in their returns to FAO. The need for India to separate production data for *M. malcolmsonii* from *M. rosenbergii* was evident and there was clearly a feeling that the potential of the former species was being neglected. Pointing out that the main feature of Indian production was one based on exports, and that this aspect was also generally true of Bangladesh and Vietnam, Mr. New said that the other leading producing nations, (such as China, Thailand and Brazil), however had so far relied on their domestic market for freshwater prawns. He predicted that this would change. Consistent quality must be the key feature for continued success, he added. Dr. M. N. Kutty was also of the opinion that FAO shows no or little production, even for more recent data, when the production in India has shot up by the developments in Andhra Pradesh. The MPEDA figures may be more export oriented and, they are likely to have missed some domestic productions. However, since they have development programmes and subsidies assistance throughout the country, the MPEDA production estimates are more correct – and possibly are underestimates.

Regarding hatchery technology, he suggested the need for having small seasonal hatcheries on all farms or for co-operative seasonal hatcheries that serve a number of small local farms. Breeding programmes to improve performance, and possibly the production of hybrids that exhibit the favourable characteristics of more than one species, are desirable. Mr. New put in focus the prevailing problems at many places in respect of utilization of hatcheries when demand for PLs was only seasonal, for example, in India and Vietnam. In his opinion, small versatile hatcheries were more easily adaptable than

large ones. Hatcheries that could produce fry of other crustacean or fish species when *Macrobrachium* PLs were not in demand for grow-out were ideal and the experience of Thailand in this respect was valuable, he observed.

He recalled the importance of maintaining captive broodstock banks as highlighted by several of the participants. His comment on the use of berried females from grow-out ponds or natural resources would not serve the purpose satisfactorily in the long run. Breeding programmes to improve performance, and possibly the production of hybrids that exhibited the favourable characteristics of more than one species, were desirable. According to him, there was also a need to protect the natural resources in a country like India where the major cultured species were indigenous. Emphasising that conservation of genetic diversity was critically important, he recalled the emphasis laid by several of the participants on the need to be careful about the transboundary transfer of broodstock.

For Michael New, (and also for most others) one of the most important papers presented at the Symposium was given by Dr. Amir Sagi, on the routes towards all-male culture. It is widely accepted that all-male culture of *Macrobrachium* is beneficial. This can be achieved either by the administration of substances derived from the androgenic gland to induce all-males or by the production of all-male progeny through the development of functional neo-females mated with normal males. Michael New said that the latter solution might lead to global dominance by a few major hatcheries that would control the supplies of superior stock, an analogous situation to that pertaining in the poultry industry globally. The former solution would better to protect the small operators around the globe.

Mr. New said that a paper from Australia gave some hope to him that breeding programme to improve the performance of farmed freshwater prawns may be successful by showing that there was a large amount of genetic diversity in the wild population of *Macrobrachium* which was yet to be exploited.

He recalled that the scientist-farmer-interactive session of the conference gave a tantalizing glimpse of the technical, financing, regulatory and competitive issues faced by the industry. He said that, in Brazil (another huge country), as noticed in Wagner Valenti's status paper, there was a permanent national society (GTCAD, of which he was an honourary member) that linked scientists, administrators, farmers and entrepreneurs.

GTCAD produced a newsletter, had regular meetings and conducted e-mail discussions. He suggested that this might be the route suitable for India also. Perhaps regular scientist-farmer interaction sessions on a State level would also be useful. Certainly there was much to be usefully discussed and considerable efforts should be made to fill this need, he commented.

It was mentioned that the new (disease? deficiency?) problem identified by Nellore farmers in Andhra Pradesh (swollen carapace), brought to the fore the fact that freshwater prawns were not immune to the diseases which affected all farmed animals, whether they be terrestrial or aquatic. Deprecating the manner in which the blame was put on PLs that were imported from abroad, he said this attitude was not constructive. He was glad that an appeal was made for institutions, both national and international to take up this topic and to help the farmers.

Valedictory Function

The valedictory function of the Symposium was held on the afternoon of 23rd August 2003. The session was chaired by Dr. A.M. Krishnappa, Vice Chancellor, University of Agricultural Sciences, Bangalore, India. The meeting was presided over by Mr. M. K. R. Nair, Fisheries Development Commissioner, Govt. of India. The Vice-chancellor gave the valedictory address and also presented the mementos to the foreign dignitaries. Dr. C. Mohanakumaran Nair gave a vote of thanks.

The organizers provided a measure of relief to the participants by arranging entertainment events. The traditional Kathakali dance programme was a welcome relief to the participants, particularly to the foreign delegates. Lunches and Dinners hosted by M/s Marine and Agro Products (P) Ltd., Chennai, C.P. Aquaculture India Ltd., the Seafood Exporters' Association of India, Avanti Feeds Ltd., Hyderabad, Higashimaru Feeds India Ltd., Kochi etc., and the farewell party given by the organizers gave an opportunity for the delegates to exchange views and develop personal contacts. Several delegates also availed of the occasion to visit places of interest in and around Kochi and other places of tourist attraction in Kerala, which is listed as one of the top fifty tourist paradises by the National Geographic Traveler.