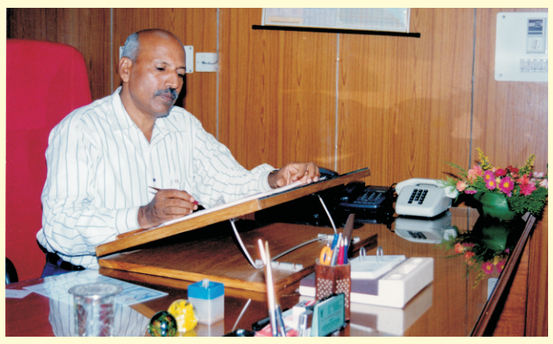
NEWSLETTER

ICAR RESEARCH COMPLEX FOR GOA

Vol. 7 No. 2 JULY TO DECEMBER - 2005

From the Director's Desk .....



West coast region is distinctly different from the East coast in having a narrow strip of land wedged between the Sahyadris and the Arabian Sea. Included in the twelfth agro-climatic zone of the country, it has about 1,400 km of coast running along Maharastra, Goa, Karnataka, Kerala and a small part of Tamil Nadu. The region has many west flowing short rivers which are fed by the monsoon. The annual precipitation ranging from 2,000 to 4,000 mm, influence the flow of freshwater in the river on one side and saline water incursion from the sea on the other side and create unique brackishwater and estuarine system in the narrow coastal plain.

Goa has a large scope for fisheries production, particularly through brackishwater and marine production and a restricted freshwater potential as well. Annual marine fish production of Goa is over 60,000 tonnes and production from inland waters is about 2,000 tonnes. The contribution of Goa to the national marine production is around 2.5 % though its coast line of 105 km constitute only about 1.3 %. Goa has nine rivers and a riverine network of 555 km. It has about 18,500 ha of *Khazan* (salt affected) land of which about 4,000 ha of brackishwater area is suitable for aquaculture, with an enormous export potential. Goa also has 3,250 ha of riverine submersion, over 100 ha of freshwater ponds and about 200 ha of mine reject pits, which offer reasonable scope for production of fast growing carps.

Per capita fish consumption in Goa is 7.4 kg as against the national average of 5.0 kg and the recommended average of 11.0 kg. About 81 % of fish are utilized fresh while the rest are sun dried, salted or manured. Important commercial species are prawns, followed by marine fishes such as mackerels, sardines, seer fish, pomprets, thread breams and soles and inland species like mullets, cat fish, ambassids, seabass, Megalops, Elops and pearl spot. Besides, considerable quantity of molluscs like green mussels, edible oysters and clams and crabs are harvested, the production of which has to be enhanced.

Aspects of importance to Goa and the adjoining coastal region consist of development of fisheries as a component in the watershed development, integrated fish farming systems for the holistic development of coastal region, freshwater aquaculture to a limited extent, utilization of old mine reject pits, brackishwater aquaculture, marine capture fisheries, mariculture and subsistence fisheries in inland waters. Effort is to be oriented towards the above topics taking into consideration, local needs and requirements for adoption, technical support from other institutions, extension programme for making the technologies easy for adoption, prioritization of work and reorientation of research projects to meet the requirements. Methodology, techniques, and measures that may assist in the fisheries production may also be provided to the end users through the development machinery.

The annual marine fish production of Goa over the last four years is to the tune of about Rs. 35.0 crore. However, there is enough scope for further increase in production and export through scientific and planned strategy. The potential marine resources of EEZ of Goa including pelagic and demersal of shelf and oceanic areas are estimated to be 1,89,600 tonnes with a projected sustainable yield of 1,14060 tonnes per year. Marine catches of Goa comprise of about 41 varieties including mackerel, sardines, seer fish, cephalopods, pomfrets, ribbon fish, cat fish, croaker, shrimp, threadfins, silver bellies, soles, elasmobranchs and others, the bulk of the catch being mackerels and sardines (46%).

The fishing crafts and fishing zones had a gradual growth over the years. The number of mechanized vessels increased from mere 10 in 1965 to 100 in 1970, 180 in 1980, 600 in 1985 and 1,000 in 1995. From 1995 onwards, fishing competition in the 50 to 200 m depth zone was added by joint venture and chartered vessels, which not only put the local fishermen in economic tight corners, but also caused depletion of catch, probably due to over fishing.

About 20,000 fishermen are engaged in marine fishing, who are distributed in 3,380 households situated in 61 villages of the five coastal talukas of the State. Goa has about 50 landings centres. About 25% of the marine catch comes from traditional fishing while landings of three talukas namely Marmugao, Salcete and Bardez contributes 75% of the total catch. There are five boat jetties in the State and two more major ones are being added by the Fisheries Department, besides 25 ramps and auction-cum-net mending sheds for the benefit of small scale operators.

Over fishing and extensive fishing in shallow and near shore area resulting in depletion of catch, conflicts between traditional and mechanized vessels, resulting in frequent clashes and loss of fishing gears, monsoon fishing of broodstock which come near shore for breeding, which reduces the fish stocking in commercially important species, post harvest losses due to lack of proper landing, sorting, icing,

storage, drying and lack of market facilities and environment and habitat degradation and damage resulting in loss of fisheries are some of the problems in fisheries..

Enforcement or implementation of some of the following measures would improve the situation and enhance the sustained fish production on a long term basis: Exploitation of deep sea resources beyond 200 m depth for which repair of old vessels, modernization of crafts and gear and provision of scientific stock data to fishermen, can be implemented, prohibition of mechanized trawler in the 5 km area throughout the year, complete prohibition of fishing during monsoon (ban), prohibition of mechanized fishing in in-shore waters and estuaries, protection of mangroves which are feeding ground for important marine fisheries, facilities for storage, drying yard, fish meal plant, fish processing and marketing may be given emphasis and support.

Inland fish production of Goa, which comprises of both capture and culture yields, is restricted to 3,509 ton per year. However, it has enormous potential to enhance production through diversification of aquaculture and utilization of hither too unutilized areas. The fish catch consists of prawns, mullets, milk fish, sea bass, cat fish, lady fish, pearl spot, croakers, carangids, snappers, etc. Goa has about 3,500 ha of potential brackishwater areas for fish culture, of which about 2,000 ha are fit for aquaculture. Only 80 ha is actively put under scientific shrimp farming by private sector in Goa, supported by BFDA. Another 19 ha area is being promoted by MPEDA. There are about 100 shrimp farms registered with BFDA/Fisheries Department. About 50 ha brackishwater areas are put under traditional fish farming. Taking up fish and molluscan farming in Khazan areas and integrating fish with rice, poultry and other livestock in the coastal area, it is possible to increase fish production and economic output. Major brackishwater fisheries of the saline areas include prawns, mullets, pearlspot, catfishes, milkfish, seabass, *Epinephelus* sp., *Lutjanus* spp., *Sillago* spp., *Ambassis* sp., estuarine crab and molluscs.

Present aquaculture in the west coast is mainly restricted to two species of shrimps namely Tiger prawn and White prawn, besides culture of edible oysters and mussels in some parts of Kerala and Karnataka. Prawn aquaculture is done purely for export. The need for diversification of culture of other species of prawn, shellfish and fin fish, are being slowly felt by the fish farming communities. Seeds of many potential species are available on natural collection or their breeding and seed production is standardized, some even being taken up on commercial scale.

The concept of integrated farming can be very well adopted and implemented in the coastal areas. In the upper reaches of rivers having adjoining freshwater areas, rice based fish and vegetable cultivation can be taken up. In the lower reaches having saline water ingress from the sea and the nearby saline lands, some of the crop-fish/prawn and livestock-fish integration could be adopted. Mangroves formed in between the saline lands and the sea would act as a purification system before the water from the high intensity system enter the sea and also be a feeding grounds for many of the marine species of fish and prawn.

Many of the freshwater systems and some of the brackishwater systems can be effectively put to integrated fish farming systems. These systems will be ideally suited for the small and poor farmers who are facing the acute problems of fragmentation of lands, financial crunch and shortage of inputs and labour. The fish integrated system include: Duck-fish integration, Chicken-fish integration, Pig-fish integration, Rabbit-fish integration, Goat-fish integration, Rice-fish integration for low-lying rice fields, other Rice based fish integrations including Rice-freshwater prawn integration, Rice-fish/prawn integration in saline areas, Coconut-prawn/fish integration, Mushroom-fish integration, etc.

Over the years, about ten fish processing companies have been started in Goa. At present, only three companies are operating. Non-availability of continuous supply and quantity of products making the operation uneconomical is a reason for discontinuance of the processing companies at Goa. Export from Goa constitutes 2.01 per cent of the national fisheries export total. Goa exported around 10,000 ton, valued at Rs.35 crore, over the last three years.

Important fish varieties exported from Goa comprise of shrimps, squids, cuttle fish, breams, ribbon fish and mackerel, which constitute 58 per cent of the total species sent. Main buyers are China, Japan, South East Asian countries like Malaysia and Hongkong, Gulf countries, etc.

Fish processing and export of fisheries products help not only corporate sector but also the rural fishermen. Following are some of the means to improve the processing and export industry: with the fast changing export scenario, high value products, value addition, live fish export, preprocessing facilities: proper preprocessing facilities like landing site, peeling and sorting shed, etc., are very essential for maintaining hygienic standards in handling the perishable commodities and to get good price. Products should be prevented from contamination by pathogenic bacteria, so as to maintain the high international standards. Preprocessing facility should be modernized and situated near the landing center. Fast and refrigerated transport is essential in keeping the standards.

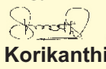
The institute had a focus on work on fish nutrition as feed is the major input in fish farming system and is responsible for about 60 % of the operational cost. The institute's earlier work had identified twenty six locally available feed ingredients and their availability as well as cost were ascertained. The proximate composition of these feed ingredients was analyzed.

Three carp starter feeds having 31-32 % crude protein were formulated using fish meal and its replacement at 50 and 100 % levels with groundnut oil cake as protein source. Four iso-protein ornamental fish feeds formulated using animal source protein materials (chicken liver, prawn meal, squid meal and mussel meal) and compared with commercially available ornamental fish feeds like tubifex worm and brine shrimp flakes, for growth performance on gold fish, *Carassius auratus*.

Ongoing research programmes in Fisheries include study on large scale production of *Spirulina* and *Moina* as nutritive live feeds for ornamental fishes, their nutrition and seed production. A project on 'Validation of Potential Fishing Zone advisories along Goa coast with an attempt to study the possible advantages of PFZ advisories for different types of fishing activities' funded by INCOIS, Hyderabad, is implemented which benefits the marine fishermen in saving fuel, search time and human effort.

Future areas of research work involve, brackishwater aquaculture aspects, fish/prawn nutrition and feed formulation, ornamental fish culture, location specific edible oyster and mussel culture involving advanced eco-friendly techniques in shrimp farm and shallow bays, integrated fish farming systems, crab culture, sea weed culture, promotion of freshwater carp rearing on commercial lines, application of satellite generated PFZ data in marine fisheries etc.

Being a part of the productive West coast region, Goa can be a model state to usher in technology based marine and inland fish production.



V. S. Korikanthimath

RESEARCH HIGHLIGHTS

Direct rain water harvesting and recycling by smaller farm ponds

Smaller farm ponds are designed to harvest the rainwater from the self-catchments area of pond during the rainy season. The harvested water can be used to irrigate (as protective) to the mango, cashew and any other similar type of plants for their initial establishment. Smaller size ponds having the dimension of 2m (L) x 2m (W) x 1m (D) or 4m (L) x 1m (W) x 1m (D) to be excavated in the center of the area having about 8 to 10 plants at the field. The dimensions can be decided depending upon the soil depth. If the soil depth is deep and enables to excavate up to 2 m deep, the pond having dimensions 2 m X 2 X 1 m may be adopted. If the soil depth is shallow and the soil above one-meter depth is too hard, it is better to go for 4 m X 2 m X 1 m size pond. The total cost per pond varies from Rs.1,923/- to Rs.2,924/- depending upon the dimensions and type of the soil. Harvested water can be irrigated for 8 to 10 cashew plants during summer months arbitrarily at the rate of 10 liter per week per plant. The pond has to be covered with suitable vegetation or lids and neem oil also can be applied to avoid evaporation losses. The irrigation should be done with combination of mulching. The study conducted at ICAR Research Complex for Goa, Old Goa indicated that the utilizable rainwater is varying from 3.0 to 3.2 Cu.M per pond.

MAJOR EVENTS

XIXth Meeting of ICAR Regional Committee No. VII held

Nineteenth meeting of ICAR Regional Committee No. VII hosted by the Institute was held at International Centre, Dona Poula, Goa during 18-19 November 2005. Dr. V.S. Korikanthimath, Director of Institute welcomed the dignitaries and participants. Hon. Shri. Anees Ahmed, Minister of State for Animal Husbandry, Dairy Development and Fisheries, Government of Maharashtra was the Chief Guest and Dr. Mangala Rai, Secretary DARE and DG, ICAR chaired the inaugural session. Dr. Nawab Ali, DDG (Engg.) co-ordinator of the VII Regional Committee briefed about regions' activities and how this were well co-ordinated by the State and Centre keeping this Regional Committee Meeting as a platform.

Dr. Mangala Rai, Secretary, DARE and DG, ICAR, New Delhi emphasized the importance of the meeting and its role in assessing and reviewing the various issues and bringing out useful recommendations for implementation.

Hon. Shri. Anees Ahmed, in his inaugural address mentioned the efforts of Shri. Sharad Pawar, Hon. Minister of Agriculture, Government of India with regard to animal welfare in the state. He expressed the need to have livestock for long term as well as short term. He also informed that a consultative meeting would be held to work out a micro -plan for livestock production and genetic improvement of cow and buffalo.

A number of publications from ICAR Research Complex for Goa, Goa were released on the occasion. Dr. B.M. Khadi, Director, CICR, Nagpur and Member Secretary proposed the vote of thanks. Later in the technical session chaired by Honourable DG, a number of issues pertaining to different ICAR Institutes and State Agriculture Universities were discussed and further action plan was chalked out. The meeting was attended by Additional Secretary, DARE, Deputy Director Generals and Assistant Director Generals of ICAR, Vice Chancellors of SAUs, Director of Research and Extension of SAUs, Directors of ICAR Institutes and progressive farmers.

Director General, ICAR visits the Institute

Dr. Mangala Rai, Hon. Director General, ICAR and Secretary, DARE visited the institute on 18th November 2005. During his brief visit to the institute, he inaugurated new office building of Krishi Vigyan Kendra of the institute. Later, he visited piggery unit, rabbit unit, feed technology unit, fisheries field laboratory.

World Food Day celebrated

The World Food Day was celebrated on 16th October, 2005 at Dhargal, Goa. Dr. Nigam, Scientist ICRISAT was the Chief Guest on the occasion. Dr. V.S. Korikanthimath, Director of Institute welcomed the gathering and Mr. V.Y. Gaonkar I/C Training Organizer, KVK proposed the vote of thanks. About 50 groundnut farmers participated in the programme.

National seminar on Rice and rice based systems for sustainable production organized

A National Seminar on "Rice and rice based systems for sustainable production" was organized at the Institute during 18-19 October, 2005 in collaboration with Directorate of Rice Research, Hyderabad, Central Rice Research Institute, Cuttack, and Directorate of Agriculture, Government of Goa. The seminar was inaugurated by Shri J.K. Dadoo, Hon. Development Commissioner, Govt. of Goa. Dr. V. S. Korikanthimath, Director, ICAR research Complex for Goa welcomed all the dignitaries and delegates and gave an account of rice production in the state and briefly highlighted the local problem confronting rice growers. He also briefed about various field trials on rice at the Institute. In his address, the Chief guest, Shri J.K. Dadoo, Development Commissioner, Govt. of Goa narrated various sectors of development and called upon to increase the contribution of agriculture. He pronounced the potential of India to be a leader with its vast skilled manpower. Dr. S.V. Subbaiah, Director, DRR, Hyderabad and Dr. R.N.S. Sundaram, President, Association for

Coastal Agricultural Research also spoke on the occasion. About 100 delegates from all over India participated and presented papers both in oral and poster sessions spread through five technical sessions in addition to Inaugural and Plenary sessions. The problems of rice cultivation in general and Goa in particular were discussed and deliberated.

Kisan Mela held

A Kisan Mela was organised by Krishi Vigyan Kendra at the Institute on 13 October, 2005 . Shri. Mikky Pacheco, Honourable Minister for Agriculture, Govt. of Goa inaugurated the Mela. Dr. V.S. Korikanthimath, Director of Institute welcomed the gathering. Shri. R.G. Joshi Director of Agriculture also spoke on the occasion. During the Technical Session farmers shared their experiences. About 150 farmers participated in the Mela. Shri. V.Y. Gaonkar, I/C, Training Organizer proposed vote of thanks.

Seminar on Poultry Production held

A Seminar on "Strategies for improving poultry production in Goa" was organized on 5th August 2005 at ICAR Research Complex for Goa with an aim to make poultry farmers aware of the present status of poultry farming in Goa. The seminar was inaugurated by Dr. T.T. Naik, Director, Department of Animal Husbandry and Veterinary Services, Govt. of Goa. The dignitaries present at the seminar were Dr. V.S. Korikanthimath, Director, ICAR Research Complex for Goa, Dr. R.N.S. Sundaram, Principal Scientist and Head, Animal Sciences and Mr. V. Y. Gaonkar, Training Organizer I/c, Krishi Vigyan Kendra. The seminar deliberated on evolving a strategy for improving the status of poultry farming, revival of sick units and improving the economic status of poultry farmers by improving the production and marketing of poultry and poultry products.

About 70 delegates including poultry farmers from all over the state participated in the seminar. State Government officials, poultry farmers and private entrepreneurs took active part in discussions and deliberations at this seminar. The experts spoke on different areas of poultry nutrition, production and management, disease control and marketing. Further there was an open house session for interactions among entrepreneurs, farmers, researchers, extension functionaries and financial institutions. The seminar provided useful information on the present status and future prospects of poultry farming, the strategies to further improve the farming situation so as to boost the poultry production in Goa to the prospective entrepreneurs,

poultry farmers and Government officials and all those interested in poultry farming.

The following recommendations/suggestions were arouse out of the discussion

- Adoption of contract farming to coordinate better technical services and marketing
- Reduction of the role of middlemen by forming federation or societies for better marketing of the poultry and poultry products
- State Govt. should take up the provision of subsidy in feed to small and marginal farmers
- Further research may be conducted on low cost substitute feed to come out with specific recommendations for the end-users.
- Promotion of non-hybrid breeds i.e. backyard poultry like vanaraja and others to improve the local poultry production.

Seminar on Role of Self Help Groups held

A seminar on Role of Self Help Groups was organised at the Institute on 7th December, 2005. The Seminar was inaugurated by Dr. Wilfred D'Souza, Deputy Chief Minister, Government of Goa. About 150 self help groups from different villages of the Goa participated in the Seminar. The programe was organised by involving different organization involved in activities for Self Help Groups like Gram Vikas Kendra, Savoi-Verem, Nirmla Vishwa, Ponda All India womens Centre, Panaji, Department of Science and Technology, Saligao and

National Co-operative Union, Ponda, Goa. Special lecturers were arranged for the participants.

Workshop on Fruit Flies Management held

A final review workshop on management of fruit flies was organized by ICAR Research Complex for Goa during 6-7 October, 2005. The workshop was inaugurated by Dr. S.N. Pandey, ADG (Hort.), ICAR, New Delhi. In his inaugural address he stated that fruits and vegetables could be grown free of fruit fly infestation by trapping and baiting, without insecticidal sprays.

Prof. J. Mumford, Dy. Director and Dr. J. Stonehouse, Imperial College, London who were closely involved in the project also spoke on the occasion. Earlier Dr. V.S. Korikanthimath, Director of the Institute welcomed the guests.

Dr. Abraham Vargese, Principal Scientist and Principal Investigator and Dr. J.R. Faleiro, Sr. Scientist were also present. The workshop discussed topics like IMFFI results and implications, South-Asia fruit fly network and planning future activities.

PARTICIPATION IN SEMINAR / SYMPOSIUM / WORKSHOPS

Dr. K. N. Mohanta, Scientist, Sr. Scale attended Regional Seminar on "Antarctica Research: An Emerging Science", held at PES College, Farmagudi, Ponda during 21- 22 August, 2005.

Dr. R.N.S. Sundaram, Principal Scientist and Dr. B.K. Swain, Scientist, Sr. Scale attended National Symposium on "Safety first : Farm to Fork" held at Midas Touch Hall, Naikawaddo, Calangute during 16-17 September, 2005.

Dr. J. R. Faleiro, Senior Scientist attended Special workshop on contract labour (regulation and abolition) act 1970 conducted by National Institute of Public Administration, Bangalore held at Varca, Goa during 19-20 September, 2005.

Dr. V. S. Korikanthimath, Director, Dr. J. R. Faleiro, Senior Scientist and Dr. R. Ramesh, Scientist, Sr. Scale attended final review workshop of ICAR-UK Project entitled "Integrated Management of Fruit Flies in India" held at Hotel Majestic, Porvorim, Goa during 6-7 October, 2005.

Dr. S. Subramanian, Principal Scientist attended Kisan Call Centre meeting for the level I and II officers on Fisheries Development in India at CIFE, Mumbai on 9 October, 2005.

Dr. S. Subramanian, Principal Scientist attended Indo Norwegian Workshop on Coastal Management and Coastal Aquaculture held at NIO, Goa during 10-11 November, 2005.

Dr. V. S. Korikanthimath, Director, attended SYMSAC II-National Symposium on current trends in onion, garlic, chillies and seed spices - production, marketing and utilization held at NRC Onion and Garlic, Rajgurunagar, Pune during 25-27 November, 2005.

Dr. S. B. Barbuddhe, Scientist, Sr. Scale attended National workshop on "Preparedness for highly pathogenic avian influenza" held at Pune during 25-26 November, 2005.

Dr. J. R. Faleiro, Senior Scientist attended the First International Workshop on red palm weevil held at IVIA, Valencia, Spain during 28-29 November, 2005.

Dr. B.L. Manjunath, Senior Scientist attended National Seminar on Strategies for improved farming and ecological security of costal region held at CTCRI, Trivandrum during 21-24 December, 2005.

Dr. J. R. Faleiro, Senior Scientist attended WTO out reach Workshop organized by Goa Chambers of Commerce and Industry, held at Panaji, Goa during 22-23 December, 2005.

Dr. K. N. Mohanta, Scientist, Sr. Scale attended workshop on Marine Biodiversity and Bioinformatics at NIO, Goa during 5-6 December, 2005.

Dr. M.Thangam, Scientist (Horticulture) attended Winter School on "Advances in Vegetable Breeding" held at Indian Institute of Vegetable Research, Varanasi during December 1-21, 2005.

Dr. R.N.S. Sundaram, Principal Scientist Dr. E.B. Chakurkar, Senior Scientist, Dr. S.B. Barbuddhe, Scientist, Sr. Scale and Dr. B.K. Swain, Scientist, Sr. Scale attended Technical seminar on " Preparedness for Avian Flu" held at Panaji on 30 December, 2005.

PERSONALIA

Promotions

Dr. S.B. Barbuddhe, Scientist Sr. Scale was promoted to Senior Scientist w.e.f. 5-7-2005.

Dr. K.N. Mohanta, Scientist Sr. Scale was promoted to Senior Scientist w.e.f. 11-7-2005.

Shri. S. Mannivanan, Scientist was promoted to Scientist Sr. Scale w.e.f. 5-10-2004.

Dr. R. Ramesh, Scientist was promoted to Scientist Sr. Scale w.e.f. 6-2-2004.

Dr. M. Thangam, Scientist was promoted to Scientist Sr. Scale w.e.f. 26-2-2005.

Mrs. S. Priya Devi, Scientist was promoted to Scientist Sr. Scale w.e.f. 19-11-2005.

Shri. Ashok Kumar Jangam, Scientist was promoted to Scientist Sr. Scale w.e.f. 25-11-2005.

Appointments

Shri. Minanath Jalmi was appointed as Technical Assistant (T-1) w.e.f. 27-9-2005

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