MINUTES OF 21ST INSTITUTE RESEARCH COUNCIL MEETING

24-28, JUNE 2014

The 21st Institute Research Council (IRC) Meeting was held at CMFRI Headquarters during 24th to 28th June 2014. On 24th June, meetings of Head of Divisions and respective scientists in the division were held to discuss and present achievements of projects by each scientist.

Day 2, Wednesday 25th June 2014

Dr. G. Gopakumar, Secretary, IRC welcomed the Director, Dr.A.Gopalakrishnan, to his first IRC at CMFRI. He also welcomed all the HoDs, SICs and other scientists to the meeting. He mentioned that the IRC is a meaningful platform to discuss and focus on research activities carried out during the year and the achievements made. Project outputs should be relevant and bring appropriate interventions to bring a smile on the face of the fishermen and fish farmers. Healthy debates and positive criticisms can help in achieving our research goals. He requested the scientists to make crisp presentations highlighting their results and welcomed meaningful discussions during the process.

Dr. A. Gopalakrishnan, Director, CMFRI and Chairman, IRC in his opening address stated that the research strength of CMFRI is commendable with exemplary achievements. He stated that attendance at IRC is compulsory for all scientists unless they are on deputation or exempted for some emergency reasons. To avoid any absenteeism in future, the forthcoming IRCs shall be held in the month of February itself and scientists may appropriately schedule their activities and be present for the IRC meeting without fail. The Director listed significant research achievements during 2013 -14 of the Institute and complimented the scientists for their efforts. This included the Press Release of data on marine fish landings of India which will henceforth be an annual feature; Marine Stewardship Council (MSC) certification for the short neck yellow clam fishery of Ashtamudi Lake, Kerala which is the first fishery in India to be so certified; release of the trawl ban report with 66 recommendations to the Govt. of Kerala which has found wide acceptance among various sections of stakeholders; tagging studies carried out on yellow fin tunas in collaboration with INCOIS; abundance maps for oceanic squids under NAIP project, Marine Fisheries Policy briefs prepared for states of Karnataka-Goa and Gujarat; National maps for marine litter threats and marine habitat grading; the extensive survey of coral reefs of Lakshadweep taken after a long interval of 35 years; the estimation of carbon emission and vulnerability indices of coastal states in relation to climate change under the NICRA project in the capture fisheries sector. On the mariculture front, brood bank for the two high valued species like cobia and silver pompano has been established and the off-season seed production of these two species has also been achieved ensuring seed supply; commissioning of the indigenous RAS with a significantly reduced cost at Mandapam RC; successful breeding of silver pompano at Vishakhapatnam, preparation of a list of prioritized species for mariculture, Draft plan for mariculture development; the customized training in aquaculture carried out for the benefit of SAARC countries; small scale hatchery development in Mandapam and establishing mass culture of copepod *Temora turbinata* for up scaling hatchery programs were significant achievements during the year. Marine biotechnology division has been crucial in the preparation of a cost-effective diagnostic kit RTLAM for diagnosing beta noda virus in marine fish; screening for Perkinson's virus in molluscs; and also contributed significantly in the study on oil sardine and mackerel genetic stocks.

The institute has successfully conducted the pre-census workshop ahead of the Marine Fisheries Census scheduled in 2015 and the SHELLCON program which popularized the varied taste of molluscs to the general public and was a big success. Action on creating a geo-referenced marine fisheries database is also progressing well with several landing centres in Gujarat, Karnataka and Kerala covered. The institute has bagged the Rajarishi Tandon award for significant works done in Hindi and the Beaver Award for scientific documentary.The E-prints repository of CMFRI is presently is one among the top 3 repositories in India, sharing the honours with institutions like IISC, Bangalore and the Indian Academy of Sciences which is a pride-worthy achievement. However, during the year only 95 scientific papers were published which has to be improved with at least two papers for each scientist annually, in future.Regarding infrastructure, the fishing vessels *Silver Pompano* has been commissioned at Cochin. The new hatchery at Vizhinjam is also ready for commissioning while the Central Fisheries Biology lab at headquarters

started functioning during the year. The KVK functioning under CMFRI has helped fish farmers earn higher income through adoption of integrated farming of *pokkali* and pearl spot culture and made farm works easier with the introduction of mini tiller for pokkali rice farming activities. On the HRD front, 65 students are presently enrolled for PhD programme in the institute which is a recognized centre for Mangalore University, CUSAT, Kochi and CIFE, Mumbai.

Regarding future programs, Director said that the Press release of CMFRI marine fisheries landings data will henceforth be an annual feature. The data on landings of ornamental gastropods/ ornamental fishes/ seaweeds /sea cucumbers, sponges even if only fragmentary also have to be suitably incorporated as they are unconventional resources of prime interest. Policy briefs for various resources like sea cucumbers and also for the marine fisheries sector of the various maritime states have to be made. Multi-species modeling for capture fisheries management is also to be initiated by FRAD. Joint venture with NIO through an MoU is on the anvil for research collaboration in physical oceanography and environment aspects of mud bank fisheries. The Policy Cell of the institute will be revived soon. The distribution of RDBMS tablets have to be speeded up by FRAD. On the mariculture front, MPEDA has mooted interest in promoting oyster farming developed by the institute. Upscaling of pompano and cobia seed production is also required especially focusing on stocking density and feeding schedules. Species diversification with species like *T.mookalee, L. argentimaculatus* and *Gnathodon speciosus* is also envisaged along with a National Consultation on Mariculture.

Director announced that the renowned scientist Dr. Trevor Platt from Royal Society of London, Plymouth is coming to CMFRI on a Jawaharlal Nehru Fellowship from Govt. of India. Scientists should imbibe as much knowledge as possible from him regarding fisheries oceanography to implement in our research activities. The MECOS 2 is being planned during 2014 and all scientists should be actively involved making it a grand success. The EFC document of the institute has not yet been approved but all scientists should be aware of contents of the same while planning and carrying out their research activities. Regarding delays in receiving funds from the Ministry of Earth Sciences projects, the matter has been taken up with the higher authorities including Secretary, MoES.

Plagiarism is a serious issue and all scientists should be aware of its implications when preparing / reviewing papers. Care should be taken to acknowledge sources whenever required. Dr. Sunil Mohamed pointed out that lots of publishing houses with dubious identity are inviting papers promising quick publication but the scientists should themselves introspect before selecting such outlets and maintain certain quality standards as presently authors can directly submit to various journals. Director informed that PME cell will soon issue a circular to streamline these issues and hereafter only those publications routed through HoD/PME will be listed in the Institute Annual Report.

Regarding the *Marine Fisheries Information Service Technical and Extension Series*, it was decided that only articles scrutinized at the division / research centre level only will be considered for publication by the editorial committee of MFIS . Dr. Vijayakumaran suggested that authors should be held responsible for the article submitted so that quality is ensured. Dr. Vijayagopal pointed out that MFIS has no copyright allowing articles to be reproduced without any permission due to this lacuna. Director suggested to get **copyright for the MFIS** as well as to place all the institute publications on the online book store Amazon.com for better publicity (**Action: SIC, Library**)

Director said that ICAR was expecting more new products like nutraceuticals and suggested the Marine Biotechnology Division should deliver some new items on the lines of GME and GAE. (**Action: Head, MBTD)**

Director also conveyed that periodically ICAR is asking for achievement highlights from various institutes. Hence all the centres of CMFRI should submit one slide with minimum 5 points /achievements at half yearly or annual basis so that the same can be compiled as needed at Head Quarters. (**Action: All SICs/PME cell**)

All the administrative issues at various centres have to be solved for which frequent interaction with the HQs is necessary. Director asked all the SICs of the various centres to finish the allotted money for each quarter as early as possible and not in the end of the year.

Director mentioned that NABL accredited labs are planned in CMFRI and suggested an accredited Pathology lab on similar lines as that of RGCA, because expertise is available and 6-7 diseases are being studied in detail by the

institute. He also mentioned that the ISO certification process for the institute and its various labs is in full swing and will be soon be completed successfully.

The Secretary, Dr. G.Gopakumar thanked the Director for his speech. This was followed by Action Taken Report. The Action taken report was followed by the presentation of in-house projects by PIs. Secretary, IRC invited Dr. T. V. Sathianandan, Head, FRAD to start the presentation.

GIS based management advisory support information system for the marine fisheries sector-FISHCMFRISIL201200200002

Dr. T. V. Sathianan, Head, FRAD presented the salient findings. Dr. Gopakumar suggested to include the landings of non-conventional resources also in the catch data. Dr. Sathianandan expressed the difficulty as FRAD is working within a pre-designed sampling design in which only regular landings data are collected. Dr. Sunil Mohamed suggested that the data of species which are listed in wild life protection list as well as of gastropods also be included as this will help to prepare the strategic policies. Dr. Kaladharan was identified to provide seaweed production data estimates. It was suggested that providing the CMFRI species code book expanded with the diagram and key diagnostic features and tablet with preloaded images to the FRAD field staff will improve their identification skill. Correction in the data sheets can be made at SIC level before sending it to the Headquarters. Dr. Sunil Mohamed proposed that inspection is also needed for FRAD staff, to ensure regular data collection from the landing centres (**Action: Head, FRAD and SICs; Dr. Kaladharan**).

Remote sensing assisted biodynamic forecasting paradigm for Indian marine fishery resources-FISHCMFRISIL201200100001.

Dr. J. Jayasankar presented the results of the project. Dr. Vijayakumaran enquired about the collaboration with FSI. Director mentioned that previous collaboration with FSI for similar work has not progressed satisfactorily and hence CMFRI can handle the data collection on its own. Regarding methodologies, the model which is going to be used in this project is a data hungry one, multiparameters are necessary including radiometric corrections and data on several environmental and water quality parameters has to be collected. Director asked to submit a softcopy and 2 hard copies of documented sample collection procedure to the library **(Action: Dr. J.Jayasankar, PI).**

Next, Dr. M. Sivadas presented the achievements of the **Pelagic Fisheries Division on behalf of Dr. Prathibha Rohit**. Dr. Gopakumar asked about the relevance of rapid stock assessment to which Dr. Sivadas replied that it is basically a comparative assessment with the historic maximum and the average of last three years and is done annually as per the decisions taken at previous IRC. Dr. Sunil Mohamed commented that the method is best applied at a state level, using species specific data rather than for groups or on a national level basis and recently the method has been reappraised and refined with more parameters added. During the discussions on the status of oil sardine resource, the role of environmental factors in the sardine recruitment process, the impact of high juvenile fishing and the annual mean size as an indicator of the success of the recruitment to the fishery was highlighted. It was decided that the revised Rapid Stock Assessment method would be adopted in future. **(Action: All HoDs and scientists of FRAD, PFD, DFD, CFD, MFD).**

Development of Fishery Management Plans for sustaining marine fisheries of Karnataka and Goa-FISHCMFRISIL201200600006.

Dr. Dinesh Babu presented the project on behalf of Dr. Prathibha Rohit (PI) who was on deputation .

Development of strategies to sustain the stock and fishery of large pelagics in Indian waters-FISHCMFRISIL201200700007

Dr. Shubhadeep Ghosh presented the works on behalf of Dr. E Abdusamad, PI (away on deputation). Dr. V. V. Singh commented on the difficulty to take measurements of samples. Dr. Ghosh replied that at Visakhapatnam they have approached processing plants and traders to get measurements and samples depth of fishing operation information is collected for yellowfin tuna fishing units from Vizag.

Development of Fishery Management Plans for sustaining Marine Fisheries of Tamil Nadu and Puducherry- FISHCMFRISIL201200800008.

Dr. Sivadas presented the work carried out. Dr. Gopakumar said that though the data under the project is excellent the burning issue of over-capacity in terms of number trawlers in the Gulf of Mannar was being ignored by the project. A document can be prepared which can act as a guide to revise the existing MFRAs. Similarly CMFRI can make efforts to identify which species need to be banned or regulated under the Indian Wildlife Act based on current status of the species especially in the Gulf of Mannar. (**Action: PI, especially on Gulf of |Mannar research activity**).

Trawl fishery of the North east coast of India: An appraisal- FISHCMFRISIL201203200032.

Dr. Shubhadeep Ghosh presented the achievements under the project. Director wanted to know whether stock assessment of Hilsa is being done. Dr. Ghosh replied that no stock assessment was done but the RSA was carried out and the reason for decline of *Hilsa* along Andhra coast is probably due to lack of run-off from catchment areas of river Godavari resulting in spawning failure.

Next, Dr. P. U. Zacharia, HoD, DFD presented the salient achievements of the division. He said that several publications on elasmobranchs are in the pipeline including a document called National Plan of Action (NPOA) on elasmobranchs. Director observed that the NPOA document should be brought out at the earliest (**Action: Head, DFD).**

Development of Fishery Management Plans for Sustaining Marine Fisheries of Kerala and Lakshadweep- FISHCMFRISIL201200300003

Dr. P.P. Manojkumar presented the work done under the project. Dr. Gopakumar commented that using the term "collapsed" might lead to wrong ideas among people since the stock could revive later on. Dr. Sunil Mohamed replied that RSA methodology should be used with caution and should aim at developing recovery plans wherever stocks have collapsed **(Action: PI, Kerala FMP Project)**.

Development of Fishery Management Plans for Sustaining Marine Fisheries of Gujarat- FISHCMFRISIL201200400004.

Shri Mohammed Koya presented the highlights of the project.

Assessment of Elasmobranch Resources in the Indian Seas- FISHCMFRISIL201200500005.

Dr. K S Shobhana presented the work on behalf of Dr. Shoba, PI. Director enquired why species-wise RSA was not done for elasmobranchs. Dr. Sobhana replied that species level historic data available with FRAD is only from 2007 onwards. Regarding query about the status of the National Plan of Action on Sharks (NPOA) she had attended the first National Mission Meeting on sharks at Trivandrum but CMFRI was officially not a part of NPOA preparation. Dr. Sunil Mohamed observed that since CMFRI is providing the shark data for this venture, it should take a lead role in preparation of the NPOA document (**Action: Head, DFD and PI**).

Derivation and characterization of embryonic (ES) and induced pluripotent (iPS) stem cell lines from selected marine fish species aimed at mariculture/conservation- FISHCMFRISIL201203100031.

Dr. Sobhana presented the details. Director wanted to know whether there was multiplication of blastomeres and regarding the harvesting of colonies from the feeder fibroblasts. It was replied that successful *in vitro* attachment and multiplication was observed, but typical stem cell colonies have not yet been obtained.

GIS based resource mapping of distribution and abundance of finfishes and shellfishes off Indian coast for suggesting operational based strategies for fisheries management- FISHCMFRISIL201200900009.

Dr. Dinesh Babu presented the highlights of the project**.** On the issue of technical problems and related issues of connecting to the Arc GIS at CMFRI HQs from Mumbai centre raised by Dr.V.V. Singh, Director suggested to discuss the same with Dr. J Jayasankar.

Development of Fishery Management Plans for sustaining marine fisheries of Maharashtra - FISHCMFRISIL201201000010

Dr. V. V. Singh presented the achievements of the project. He said that each scientist was given the charge of one district so that that it would lead to a more focused approach. Director opined that no water-tight compartments should be there with respect to work.

D**evelopment of Fishery Management Plans (FMPs) for Sustaining marine fisheries of Andhra Pradesh-FISHCMFRISIL201201100011.**

Smt. Muktha presented the work carried out. After discussions regarding ageing of fishes like oil sardine grown in cages using otoliths, Director suggested that caution is required while interpreting the growth rings and it should also be validated properly.

Next, Dr. Sunil Mohamed presented the highlights of the Molluscan Fisheries Division especially the results of ageing of cephalopods initiated recently.

Development of Fishery Management Plans (FMPs) for the bivalve fisheries of India-FISHCMFRISIL201201200012.

Dr. Venkatesan presented the highlights of the project on behalf of Dr. Geetha Sasikumar, PI.

Evaluation of ornamental gastropod fisheries in India and assessment of shell craft industry-FISHCMFRISIL201201300013.

Dr. I. Jagadis presented the work. Regarding query on availability of right handed *Turbinella* he said these are very rare but never missed by the fishermen due to the way they handle the shells and the high market prices for them. Dr. Philipose mentioned a chank fishery in Goa which needs to be surveyed to understand its potential. Dr. Sunil Mohamed commented that first we need to get the methodology standardized and then it can be extended to other places Dr. Jagadis said that the personnel also were limited in the project.

Day 3, Thursday 26th June 2014

Sustainable molluscan mariculture practices- FISHCMFRISIL201201400014.

The third day of 21st IRC meeting started with the presentation by Dr. P. K. Asokan. Dr. Gopakumar suggested to estimate the carrying capacity of the brackish water area earmarked for mussel farming to be used for licensing to avoid excessive eutrophication and also suggested cluster farming as a viable option for open sea mussel farming. Dr. Reeta Jayasankar enquired about the possibility of mussel farming in Chilka lake and Dr. Sunil Mohamed replied that it is difficult to find market for mussels in Odisha and always better to adopt farming in the natural habitats of the animal as it will not affect the stability of the ecosystem. The possibility of reviving pearl farming in Kollam was also discussed but the presence of borers and foulers was considered to be an impediment. Director raised a query regarding the presence of harmful algal blooms in mussel farms and Dr. Asokan responded that it is not a major problem in brackishwater farms.

Next, Dr. G. Gopakumar presented the details of the divisional projects and achievements. He highlighted the upcoming RAS facilities at Karwar Research Centre and low cost indigenous RAS system created in Mandapam Regional Centre of CMFRI. He also explained about the success made in breeding, seed production and grow out culture of prioritized commercial important groups (like cobia, pompano, grouper, snappers, mullets, Indian halibut and sand lobster) across the centres. The Director and all the staffs complimented Dr. G. Gopakumar for the untiring efforts and success achieved in Mariculture in India in recent years.

Development and standardization of seed production technologies for selected high value finfishes and shellfishes-FISHCMFRISIL201200600024.

Dr. G. Gopakumar presented salient features and commented that lack of timely availability of seeds is the most important impediment to large scale mariculture operations. Regarding breeding and culture of *Psettodus erumei*, he admitted the lack of information on reproductive biology of such fishes is a major constraint. Director commented that studies on reproductive biology of prioritized cultivable fishes would be taken up this year by mariculture division.

Innovations in Sea cage farming & Coastal mariculture- FISHCMFRISIL201200700025

Dr. K. K. Philipose presented the achievements of the project. Director suggested the use of essential amino acid rich cultivable insects, substituting fish meal/soy bean, for formulating fish feed, The problem of oil sardine fed *Lutjanus* fishes having oily flavor was discussed and it was suggested feeding different varieties of foods is the best option to avoid it.

Integrated approaches for improving the reproductive performance of selected marine food fishes-FISHCMFRISIL201203000030.

Dr. Divu. presented the details of the project. The possibilities of using nano particles for administration of hormones and its efficacy were debated.

Next, Dr. K.K. Vijayan, Head, MBTD presented the salient achievements done by the division through the in-house and external project involved.

Health Management in selected finfish and shellfish for mariculture and aquariculture&bioprospecting from marine resources- FISHCMFRISIL201200300026.

Dr. K. K.Vijayan presented the details of the project. Dr.G. Gopakumar raised the issue of parasitic diseases like *Amyloodinium* and *Caligus* infections in culture conditions and suggested that preparation of a small document/book on health management protocols will be beneficial to the farmers. Dr. G. Gopakumar also suggested to develop health management protocols for hatchery and brood stock management to support the existing seed production systems in CMFRI. (**Action: Head MBTD**)

Development of tissue culture technology for *in vitro* production of pearls from the blacklip pearl oyster *Pinctada margaritifera* and refinement of in vitro pearl formation in Pinctada *fucata* - FISHCMFRISIL201200400029.

Director asked Dr. C. P. Suja about the status of patenting pearl production through tissue culture He advised Dr. Kajal to organize some sessions regarding the rules and regulations of patenting for the benefit of scientists (**Action: Dr. Kajal Chakraborty**).

Genetics, genomics and biotechnological applications in mariculture and fishery resources management-FISHCMFRISIL201202800028.

Dr. K. K. Vijayan presented the achievements of the project. The importance of genetic stock structure studies of Indian oil sardine using mitochondrial and microsatellite markers was thoroughly discussed. Initial truss analysis reveals two morphotypes (round and lean bodied) from the sampling sites. Director asked to deposit the two morphotypes in Marine Biodiversity Referral Museum, Kochi. **(Action: PI / Head, MBTD)**

Aquatic feed biotechnology for mariculture and aquariculture- FISHCMFRISIL201202700027.

Dr. K. K.Vijayan presented the achievements of the project and Director mentioned about the importance of using insects as an alternate protein source in fish feeds. He also pointed out the urgent need of an extruder as it is very essential for large scale feed production.

Next, Dr. V. Kripa, Head, FEMD presented the salient achievements of the division in the in-house and externally funded projects and also made a request for more manpower, especially in Veraval Centre since a number of technical personnel had superannuated. The major achievement of the Division for the year was the development of

a carbon-dioxide dispenser and recorder (CDR-Prototype 1). Dr. Gopakumar suggested that currents, oceanography and other parameters related to fisheries and mariculture environment also needs to be studied.

Ecosystem process of critical marine habitats and development of protocols for restoration- FISHCMFRISIL201200200018.

Dr. Kripa presented the achievements project. Dr. Gopakumar wanted to know whether the mud banks being studied under the project could be termed a critical habitat. It was replied that ecological processes taking place in a habitat also have to be understood. Dr. Sunil Mohamed suggested collection of information on gut contents of coastal birds through innovative methods for ecosystem modeling studies.

Pollution and litter in the coastal and marine ecosystem and their impact- FISHCMFRISIL201200100019

Dr. P. Kaladharan, PI of the project presented the salient findings. Dr. Gopakumar suggested that since pollution (industrial pollution etc.) was a cause for concern, studies in the project should cover a broader perspective, instead of focusing only on beach litter. Dr. Kaladharan said that studies on the impact of local problems such as sewage is planned. Dr. Sivadas was of the opinion that litter thrown away by boats can also be quantified, to which Dr. Kripa replied that a full document covering items on different types of litter will be published shortly. Dr. Sunil Mohamed stated that the data compiled can result in a policy for disposing and recycling waste.

Next, Dr. Rani Mary George, Head, MBD presented the salient achievements of the division through the in-house projects. She informed that a book on bio resources of the South West coast with special emphasis on sponges and corals will be brought out shortly. Director observed that the Marine Biodiversity Division should move beyond its activity of documenting the resources and urgently initiate studies on economic evaluation of resources ecosystem wise and bring out Policy documents **(Action: Head, MBD)**

Investigations on vulnerable coral reef ecosystems of Indian waters with special emphasis on formulation of management measures for conservation- FISHCMFRISIL201201600016.

Dr. Rani Mary George presented the results of the above project. The Director suggested that more work should be carried out on corals with diseases Dr. Vinod to continue his involvement with the work progressing on soft corals in Mandapam, along with Mr. Saravanan. Dr. G. Gopakumar pointed out that the distribution of zooplankton and corals had been made based on only one survey, but in future it should be made based on periodic surveys and suggested that the MB Division can have a program in Mandapam to address the *Kappaphycus* affecting the coral reef there. He pointed out that a document on the status of resources already included under the Wild Life Act should be made. Dr. Rani Mary George responded that inputs from all divisions were necessary to do this (**Action: Head, MBD**).

Bio inventorying and biodiversity valuation of marine organisms in selected marine ecosystems along the Indian coast- FISHCMFRISIL201201500015

Dr. K. K. Joshi, PI of the project presented the salient findings. Director suggested that if the study area was made state-wise it would go hand-in-hand with the state fisheries management programs**.**

Assessment of the fishing impacts on biodiversity loss, with special reference to the threatened species, to formulate management options for their protection- FISHCMFRISIL201201700017.

Dr. K. Vinod presented the salient findings of the project. Director wanted to know whether any economic evaluation of juveniles and by-catch had been planned in the project, to which Dr. Vinod replied that Dr. R. Geeta was going to take it up. Director suggested that Dr. M. Sivadas could also coordinate and collaborate in the project and CMFRI can join hands with CIFT to suitably modify the traditional gears for reduction of biodiversity loss. Dr. G. Gopakumar, stated that all the findings of the project should be appropriately communicated to the State Fisheries Department for necessary inclusion/amendment in MFR Act (**Action: Dr. K.Vinod**).

Next, Dr. S. Narayanakumar, Head, SEETD presented salient achievements of the division through the in-house projects. Director wanted to know whether the decision taken at the previous IRC meeting to hold stakeholder meets in all states under the FMPs had been carried out. He informed the scientists that all FMP projects should present the results of the Centres at the meeting with the stakeholders. He also emphasized that stakeholders' meets have to be conducted prior to the IRC meeting and the report has to be sent. **(Action: all PI s of FMP projects**)

Economics of marine fisheries and sustainable management: Policy Issues and Interventions- FISHCMFRISIL201202000020.

Dr. Naryanakumar, PI presented the salient findings. Dr. Sunil Mohamed highlighted the issue of migrant labour and bonded labour in the fisheries sector in certain countries like Thailand and wanted to know whether any evaluation of migrant labour in the Indian fisheries sector had been made. Dr. Narayanakumar replied that Dr. P. S. Swathilakshmi had made a few studies on migrant labour from Tamil Nadu to Karnataka and Kolachal to Munambam.

An Input Output Economic Optimization Model for Marine Fisheries at Tuticorin Fishing Harbour- FISHCMFRISIL201202100021. Dr. N. Aswathy presented the results of the project for which Dr. M. S. Madan is the PI.

Capacity Development for Ecosystem Based Responsible Fisheries Management in India - A Co-Learning action research- FISHCMFRISIL201202200022.

Dr. C. Ramachandran, PI of the project explained about the activities carried out in the project. During the discussions it was agreed by all that fishermen need to be made aware of the importance of conservation and a holistic ecosystem approach to ensure sustainable fisheries. Director conveyed that specific works and an action plan that will address the issues in the Indian context should be taken up by this project to achieve its goal. **(Action: Dr. C. Ramachandran, PI)**

Supply chain management of marine fisheries sector In India- FISHCMFRISIL201202300023

Dr. Shyam. S. Salim, PI of the project presented the results achieved in the project and the new program developed for up to date data on fish prices at landing centres which can be available on CMFRI website. Dr. G.Gopakumar wanted to know that since fish prices vary from day to day and also landing centre-wise, how were the prices fixed. After discussions Director informed that it was up to the CMFRI website maintenance committee whether this program should be included in the CMFRI website but the existing Fish watch will not be replaced on the website.

Day 4, Friday 27th June 2014

During this session, the respective principal investigators of the external funded projects presented the research work carried out and highlighted the important outcomes. Followed by the presentations, discussions with the active participation of members were carried out.

Commercial viability of black pearl production in the A&N Islands and Conservation mariculture of ETP gastropods (MoES- CMLRE)

Dr. Sunil Mohamed,PI of the project presented the salient findings of the project.

Prior to initiating the scientific discussions, Dr.Vijayakumaran asked the reason for the non-availability of funds in projects funded by MoES/CMLRE. Director explained that the situation is due to some technical issues related to funding agencies and that CMFRI has submitted all the required statement of expenditure and utility certificates and the issue has been appraised to MoES(Secy.) by DDG (Fy.). Director also cautioned the scientists and advised to make sure the timely availability of funds while taking projects funded by MoES. Director also informed that Rs. 47 lakhs is pending from MoES and the same is to be distributed to Research scholars working in different projects. Dr.

Sunilkumar Mohamed suggested that the ICAR should come up with schemes of sufficiently high budget outlay. Director informed the gathering about ICAR plan to revive the AP Cess Fund for projects.

Dr. G. Gopakumar asked about the commercial viability of black pearl production and Dr. Sunil Mohamed replied that it would be viable if carried out in natural ecosystem like Andamans and implanting is to be performed by the skilled consultants. Dr. Rema explored the possibility of bringing spat from Andamans for rearing in local areas to which it was replied that a species survives in its natural ecosystem and it is not at all advisable to displace the same to a new environment for rearing.

Utilization strategy for oceanic squids in Arabian Sea: A Value chain approach (NAIP)

Dr.K.Sunil Mohamed, PI of the project, presented the salient findings. Regarding query about using the lighting techniques to aggregate squids. he replied that the methodology for abundance study for squid is a standard one taking into consideration the width of lighted zone during operation.

Assessment of Deep-Sea Fishery Resources of the Continental slope of the Indian EEZ (MoES- CMLRE)

Dr. U.Ganga, PI, presented the major findings of the project.

Resources assessment and Barcoding of Elasmobranchs (MoES- CMLRE)

Dr. P.U. Zacharia, PI presented the details. Dr. Sunil Mohamed wanted to know about the origin of the sharks landed in bulk at Cochin fisheries harbour and suggested that the geo locations of the actual catches should be collected by gridded map with latitude and longitude provided to fishermen.

National Initiative on Climate Resilient Agriculture (NICRA)(DARE-ICAR)

Dr. P.U. Zacharia, PI presented the details of the works carried out. Dr. Reeta Jayashankar informed the IRC that during recent Phailin cyclone there were cases of sea water intrusion and submergence of villages in Gopalpur area in Odisha and also about earthquake in Paradip. Director replied that the SIC, Puri Centre should intervene when such incidents happen in coastal areas of Odisha. Dr. Maheswarudu enquired about the observation of reduction in mean size at maturity due to climate change. Dr Sunil Mohamed explained it in the light of feed availability and feeding conditions that affect the maturation process and thus the indirect influence of climatic factors.

Development of a library putative probionts from marine environment belonging to the genus P*seudomonas*, M*icrococcus* and *Bacillus* for application in mariculture systems (ICAR – AMAAS)

Dr. K.K. Vijayan ,PI, presented the achievements. Dr. Gopakumar asked about its potential as the feed in larval rearing. He replied these are promising species as the nutritional quality is preserved even after spray drying and is a good single cell protein source. It is accepted by shrimp and further work is progressing.

Studies on the genetic stock structure Mackerel, *Rastrelliger kanagrta* (FAO – BOB-LME)

Dr. K. K. Vijayan, PI explained the works initiated and further works are being carried out in collaboration with NBFGR.

Global learning for local solution: Reducing vulnerability of marine dependent coastal communities (Belmont Forum through MOES)

Dr. Shyam. S. Salim presented the details. Dr. G. Gopakumar asked how the climate change/hot spot concept was evolved and whether it is a duplication of the NICRA project. It was stated that the objective of the NICRA climate change project and the present project was entirely different and there would not be any duplication in data collection, work elements/activities between NICRA and GULLS projects. He said that this project increased the visibility of the institute worldwide and will further facilitate inter-institutional tie-ups on a global scale. Dr. Reeta suggested that the project should also look into the problems of the north- east coast which is very vulnerable to cyclones and storms.

State of diversity of commercially important seaweeds along the West Coast of India (ICAR – NFBSFARA)

Dr. V. V. Singh presented the project details. Dr. Maheswarudu queried on the temperature range for *Kappaphycus*. Dr. Jonhson explained the results of growing *Kappaphycus* at 31- 34^{0}C in environmental chamber which proved that the species prefers lower temperatures as it is a sub-tropical species and does not survive beyond 30^{0}C.

Strategies to enhance adaptive capacity to climate change in vulnerable regions- World Bank-GEF (NAIP-GEF)

Dr. Singh Presented the project. Dr. Imelda queried about the similarity with TSP cage culture project. Dr. Singh replied that the project was a precursor to TSP as done only through NAIP support. Dr. Reeta jayasankar enquired how different was m krishi, from the service which is provided by M. S Swaminathan Research Foundation to the fishermen regarding weather parameters. Dr. Singh replied this service is available even in more offshore areas facilitated by CDMA technology of TCS and provide additional information on wind and wave height.

Stock characterization, captive breeding, seed production and culture of hilsa (*Tenualosa ilisha*) (ICAR - NFBSFARA)

Dr. Ritesh Ranjan presented the project which is in collaboration with CIFRI and explained about the site selection study, transportation of the cage to the site and its installation, the silt, bottom condition and current in the Ganga river estuary. After discussions the House concluded that the sites selected by CIFRI were not feasible for cage farming and should be appropriately communicated by PI citing reasons for failure of cages to remain moored. **(Action: PI, Hilsa project**)

Towards developing models for prediction of recruitment success in major Indian marine fish stocks (MoES - CMLRE)

Eco-biological investigations on major pelagic fishes and eco biological modeling of the epipelagic habitat off Kerala and Lakshadweep (MoES - INCOIS)

Dr. Kripa presented the two projects. Dr. Reeta Jayasankar enquired about the Continuous Plankton Reader (CPR) method. Dr. Kripa elaborated that it is used in other countries, for study of eggs and larvae and that it could be fabricated in India and attached to our vessel for a lesser cost. Dr. Gopakumar observed that spawning need not lead to recruitment and that the critical environmental factors need to be taken into consideration to which it was replied that is already one of the project objectives and being addressed.

Microbial Diversity and Identification – Fish Microbes which are of application in aquaculture and / or allied industries (ICAR – AMAAS)

Dr. Imelda Joseph said that the project was completed on 31st March 2014 and made a brief presentation of the whole project and its achievements.

A Value chain on oceanic tuna fisheries in Lakshadweep Sea (NAIP).

Completion report of the Project was presented by Mr. K.P. Said Koya.

A Value chain on high value shellfish mariculture (NAIP)

Dr.V. Venkatesan presented the project details of the completed project.

National Surveillance Programme for aquatic animal diseases (NFDB)

Shri. N. K. Sanil, Scientist presented the major objectives and methodology of the programme and emphasised the initiative carried out on the targeted screening of bivalves for parasites in Kerala. Dr. Gopakumar expressed concern over the frequent occurrences of diseases in farming bivalves.

Satellite telemetry studies for understanding environmental preferences and migratory patterns of yellowfin tuna, *Thunnus albacares* in the Indian Ocean (MoES- INCOIS)

Dr. K. M. Rajesh on behalf of the PI, Dr. Pratibha Rohit presented the major achievements. Dr. K. K.Vijayan asked if the INCOIS is sharing the satellite processed data of tuna movements after tagging. It was replied that presently, very few results post-tagging are being shared by INCOIS.

Seed Production of Marine Food Fishes and Ornamental Fishes (ICAR- Revolving Fund)

Dr. K. Madhu, PI of the project presented the work carried out, budget allocation and income generated from this project.

Mapping and Resource Assessment of Pearl Oyster banks of Tuticorin (Central) Division of Gulf of Mannar (MoEF).

Dr. I. Jagadis, PI, presented major objective of the project as to assess the status of pearl oyster population and explained the salient achievements made. A typical pearl bank map of Gulf of Munnar involving 50 pearl beds was prepared using Arc GIS software and observed clear damage happened to the peal beds. Dr. Kripa suggested to compare his observations earlier reports of pearl oyster survey by Dr. Mahadevan and team years back.

Integrative taxonomy of deep sea shrimp resources along the southern coast of India (DST)-

Dr. Rekha Devi Chakraborty,PI, presented the major objectives of this project as the collection, identification, validation and documentation of integrative taxonomy of deep sea shrimp species. Dr. Rani Mary George asked about the submission of sample to museum and the PI said one species was submitted. Dr. Ganga mentioned that a paper on the misidentification of *Plesionika spinipes* has been already published in 2011. Director said that all new records/ species in these kinds of studies must be submitted to the museum and deposits must have an accession number **(Action: all HODs**).

Development of protocols and capacity building on stranding, beaching and post-mortem analysis of Cetaceans (GOI-UNDP-GEF)

Dr. M. Sakthivel, PI, presented the work carried out under this project in Sindhudurg district of Maharashtra with a budget allotment of Rs. 25 lakhs for 6 months.

Flow of matter through trophic levels and biogeochemical cycles in marine and estuarine ecosystems (MoES)- Dr. Sujitha Thomas

Dr. Dinesh Babu, in lieu of PI, Dr. Sujitha Thomas, presented salient achievements of the project.

ICAR Outreach activity on fish feeds (ICAR-Outreach)-

Dr. K.K. Vijayan presented the achievements in lieu of Dr. P. Vijayagopal, PI of the project .

Polyunsaturated fatty acid enriched formulations from locally available low value fish and fishery by-catch for use as nutraceuticals and aqua feed (DST).
Nutrient profiling and evaluation of fish as a dietary component (ICAR- Outreach).
Development of antimicrobial, anti-inflammatory and anticancer agents from the marine –organisms and micro-organisms (MoES).
Characterization of Poly saccharides and Phenolics from Marine Macroalgae as Defense metabolites against oxidative stress and inflammation (DST).
Intellectual property management and transfer/commercialization of Agricultural technology scheme -IP & TM (ICAR).

Dr. Kajal Chakraborty (PI) presented major achievements of the above five funded projects. Dr. Rani Mary wanted to know which algae were used to extract components to reduce thyroid related disorders. Dr. Kajal replied that the bioactive components separated from various algae are being evaluated for their activities under in vitro and in vivo models. Regarding query about the availability of colourless, odourless PUFA he said the methodology has been standardized.

Day 5, Saturday 28th June 2014

The last day of IRC commenced with presentation on KVK. Dr. Shinoj Subramaniam presented the achievements by KVK. In the discussions, Dr. Ramachandran observed that the fishermen category is missing in the KVK's stakeholder priorities and CMFRI has an important role to play. Therefore, awareness packages can be given by KVK with support of SEETTD on basics of fisheries management, responsible fisheries, misuse of destructive gears, use of legal mesh sizes etc. Dr. Gopakumar suggested that KVK can adopt one village as a model where

fisheries will be a main component. Dr. Kripa suggested creating awareness among shrimp farmers regarding collection and analysis of water samples jointly by by KVK and FEMD. Director suggested to adopt a village where fishing activities are predominant and submit a project proposal to NFDB (**Action SIC, KVK).**

This was followed by the presentation by Dr. C. S. Purushotama on the the activities of the HRD cell. Dr. Gopakumar opined that many scientists desired to attend short term training programs in foreign countries. Director added that Rs.10 lakhs is earmarked for such training programs and each scientist can avail Rs.40,000/- each which can be maximum with a ceiling of 25% of total expenditure incurred. The deputation committee has to send their recommendations to ICAR. He added that one can also try to generate funds from DBT or persuade the organizing committee to waive the registration fee.

Afterwards, Mr. Edwin joseph presented the achievements of library and documentation cell. Dr. Gopakumar congratulated him for bringing about an information revolution in the institute. CMFRI publications have achieved global viewership. There is increase in NAAS rating of the *Indian Journal of Fisheries*. It was also decided that henceforth all pamphlets/brochures prepared at the centres will have the continuous catalogue numbers (as it is done in Headquarters) and all centres will have to send the training manuals (soft & hard copy) that they prepare for various training programs and workshops, to the library . (**Action : SICs Regional & Research Centres; SIC Library**).

Next, Mr. Viswanathan presented the completed and ongoing works under Estate and Maintenance cell. Subsequently**,** Dr. Narayanakumar, In-charge, PME cell suggested that following for consideration of all concerned:

- PI's should include the changes approved in the IRC in the RPP and submit the same with the signatures of the Co-PI's. The list is already in the website. **Action all PIs**
- PI's should update the changes in Research Projects in the PIMS website for which they should contact Dr. Jayshankar **Action all PIs**.
- All the divisions should provide the email address of their scientists to PME for easy communication **Action All division HOD's**.
- All scientists from centres can communicate to the PME email id on matters relating to the PME cell.

Dr. Narayankumar, informed that last year RFD, CMFRI scored 98.7 points. The draft RFD for the year 2014-15 is also approved. In between, Director instructed that all scientists should submit RPP before IRC. Subsequently, all the proposals regarding change in project personnel, technical programmes etc. was approved by the IRC.

The next session was the presentation of new projects, in which four new proposals were presented. The first presentation was by Dr. Laxmilatha. After a lot of discussions, the project was approved with a specific Island from Karwar instead of Andaman & Nicobar Islands. Director asked to submit the project for external funding also. He said that meanwhile the project can start in the Institute mode. He also asked to modify the project and submit as Island reef ecosystem (**Action: Dr. P. Laxmilatha).**

Dr.Vipinkumar presented a new project proposal. The project was approved with modifications. He was asked to restrict to one zone and suggested to include Dr. Reeta Jayasankar in the project **Action Dr.Vipinkumar**.

The new project by Dr. Kaladharan on seaweeds was also approved by IRC.

This was followed by the presentation by Dr. Imeda Joseph. The project was approved with modifications. She was asked to remove the technical programs on growth, food & feeding and retain only reproductive physiology **Action Dr. Imelda Joseph**.

IRC appreciated and thanked the long committed service put up by Dr. G. Gopakumar and Dr. A.P. Lipton, who are due to retire during the year following. This was followed by the concluding remarks by Chairman, IRC.

Dr. A. Gopalakrishnan thanked all the staff for a productive IRC and also thanked Dr. Gopakumar for conducting IRC in a smooth manner. He said that IRC is a learning process and should be viewed seriously with attendance at IRC compulsory for all scientists. A circular will be issued on these lines. Director suggested that all should improve their power point presentations and said that except for few presentations others were not up to the mark. A

copy of all publications brought out by regional/research centres should be submitted to the library(**Action:** all SICs). Scientists/PIs should deposit specimens to museum repository and get accession number for new species/records. The results of studies in FMP projects of all states should be presented to stakeholders before IRC and submit a report of same to PME for record and all project presentations at IRC should include at least two slides on biology of various resources, and use revised methodology for RSA (**Action all FAM PI's**). FMP Tamil Nadu & Puducherry should look into the optimum number of trawlers that are permissible in Palk Bay and the carrying capacity of the region. This should be included in the project so that it is reflected in the Policy document (Action **TN & Puducherry FMP PI)**. Director listed out the following for publication **-** brochure or booklet on copepod culture **Action: Dr. Santhosh,** on brackishwater cage culture **Action Mangalore centre,** multilingual (Hindi, Bengali, Oriya & Telugu) book on identification of fishes for north-east coast **Action Dr. Subhadeep Ghosh.**

Director congratulated Dr. Dineshbabu for making GIS software popular among the scientists of CMFRI and his contribution in the significant improvement of presentations with GIS maps. He said that a GIS lab will be set up at headquarters. Director informed that immediate steps will be taken up to procure protein skimmer and overhead tank at Mandapam. The matter on feed extruder will also be speeded up after discussion with Dr. Vijayagopal. Director informed that shortage of scientists in MFD will be taken care of. He suggested creating a database comprising gastropods (by MFD), Seaweeds (by FEMD), ornamental fish (by MD) and sea cucumber, sea horse and jelly fish (by FRAD) (**Action: respective HODs**). A policy cell will be set up soon.

During discussions regarding MFIS Dr. Imelda informed that invited articles from senior scientific staff members and highlights of the quarterly fishery trends on a regular basis are proposed. Dr. Sunil Mohamed asked the editorial committee to revamp the cover page of MFIS as they are planning to project the cover of MFIS in the new website of CMFRI. (**Action Editorial team MFIS)**. Director also suggested a compilation of the cartoons made by Dr. A.Jayaprakash, Rtd.PS, CMFRI.

Director congratulated Dr. Joshi for taking up the economic evaluation of biodiversity and asked him to proceed with the work seriously during the next year and get help from Dr. Krishnan (CIFE) or any other scientists/Professors from Economics Stream/Schools, if necessary. He asked Dr. Vinod to join with CIFT to suitably modify fishing gears of that area to reduce biodiversity loss. He was asked to continue to be involved in the soft coral project at Mandapam (**Action Dr. Joshi & Dr.Vinod)**.

Director asked SEETTD to include the issue of migrant and bonded labourers in their work plan He appreciated Dr. Shyam Salim for his idea of fish market grid which will be useful information for traders and middlemen. He said that KVK and SEETD should join in packaging information generated by the fisheries division and create awareness among fishermen **(Action Head SEETTD)**.

Director informed that steps are being taken to rectify funding irregularities from MoES. With regard to SATTUNA project in which CMFRI has played a critical role, Director will ask INCOIS to share the data on tagged oceanic tuna and vertical profile data which it receives from the satellite tags. In the end, Director thanked the Member-Secretary Dr. G. Gopakumar, PME In-charge, Dr. R. Narayanakumar, all HODs, SICs, Scientists, administrative staff and others who helped in the smooth conduct of the IRC.

The IRC ended with the vote of thanks proposed by SIC, PME cell, Dr. R. Narayanakumar.