MINUTES OF 25th INSTITUTE RESEARCH COUNCIL MEETING

Submitted by:
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Inside this compilation:

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CMFRI

MINUTES OF THE 25th INSTITUTE RESEARCH COUNCIL
4th to 8th June 2018

The **25th Institute Research Council** (IRC) Meeting was held at CMFRI Headquarters from **4th to 8th June 2018** (5 days).

04/06/18 (Day-1)

On the first day, meetings were conducted at respective Divisions as per the schedule of the 25th IRC.

05/06/18 (Day-2)

Dr. K.S. Mohamed, IRC Member Secretary, wholeheartedly welcomed the Chairman and all the IRC members to the 25th IRC meeting. He appreciated the scientists for their sincere efforts for being present though this year IRC was delayed. He also added that meeting is commencing same day with the new academic year, the monsoon is in full swing and northern Kerala is facing serious issues of Nipah Virus outbreak. In spite of these inconveniences all the members could be present for this important annual meeting.

Secretary told that before the commencement of the IRC proceedings, the members should pay homage and respect to two former eminent scientists who passed away recently, Dr. E. G Silas former Director of CMFRI & doyen of marine fisheries and Prof. (Dr.) N. R. Menon, Chairman, RAC, CMFRI. All the members stood up and observed silence for a minute as a tribute to the departed souls.

Dr. Mohamed warmly welcomed three new members of the IRC, Dr. Eldho Varghese (FRAD, Cochin), Dr. Anuraj, A. (Mariculture Division, Karwar) and Shri. Manas K. M., (PFD, Visakhapatnam), who are attending the IRC for the first time. He also informed that this year two of our eminent scientists, Dr. V. V. Singh, SIC of Mumbai RC and Dr. K. Vijayakumaran, Principal Scientist, FEMD at Madras R.C., are leaving us and greeted them specially as both of them are superannuating this year and this was the last IRC.

Dr. Mohamed also apologised for the seating arrangement of the IRC. He personally felt that the arrangement made is not the right setting for the debates and discussion, and not a conducive atmosphere for the scientific meeting, even though efforts have taken to manage in the best way possible. He updated about the IRCs conducted at respective regional and research centres, however he mentioned that he is not sure about the conduct of stakeholder consultations as the reports of the same have not been received from many of the centres. He requested all those who are not submitted the report to send them as soon as they are back at the station.

He also reminded that June 5th is an important day being celebrated as "World Environment Day" and this year's theme of the day is "battle against plastics". India has taken a lead in this as

at New Delhi Prime Minister is going to proclaim this to the world. During April 2018, the Marine Biological Association of India conducted the national conference on "Marine Debris" and many of the inputs and recommendations of the conference have been requested by Ministry of Environment, Forests and Climate Change, and the Secretary MoEFCC had said that this would form a part of PM's speech. He informed that in connection with this important day, FEM Division of the CMFRI has prepared a pledge and he requested Chairman to read out the pledge and all the members to repeat the same.

WORLD ENVIORNMENT DAY PLEDGE

We, the responsible species of this biosphere,
will strive to preserve and sustain,
the delicate balance of this Earth system.
We, the Scientists of CMFRI,
pledge to avoid the use of single-use plastics,
in our day-to-day life.

Opening remarks by Chairman

Dr. A. Gopalakrishnan, Director, CMFRI and Chairman, IRC initiated his address by greeting all the members of the IRC. He told that at respective divisions all had good interactive sessions and apologised that he could not visit all the divisions due to the visit of many important personalities on previous day.

He expressed his happiness that most of the scientists pay fixation has been done and new salary has been received and at HQ majority of them got arrears also. He assured that the centres also would be getting it soon and the cases of pay anomalies would be given due attention to solve the problems the best possible way. Director thanked all the staff of Administration & Audit for their remarkable job in the pay fixation and arrears distribution. He also informed that instruction have been given to implement new travel DA so that scientists need not produce bills for the food expenditure for tour claim. Every year IRC used to provide lunch for the participants but the Administration raised an objection and the Chairman was compelled to opt for the second option put forward by them *i.e.*, each one has to pay for the daily lunch otherwise an amount from the daily allowance has to be deducted from scientists on tour.

Chairman started his remarks taking an anticipatory bail with regard to ATR for arranging a suitable venue for the conduct of 25th IRC. He informed that he had tried to modify the existing facilities for the IRC purpose however due to shortage of fund for non-plan works could not accomplish it. This year these modifications have been incorporated in the EFC, our existing car porch would be modifying to 1+2 level and ATIC sales counter would be shifted to main road side. So will try to utilize either the second floor of the proposed building or room number 301

would be modified suitably for our requirement. Chairman also informed that a room is ready for visiting scientists in fifth floor opposite to PME cell with computer facilities.

Director also shared the present strength of the scientists. Including Director and one KVK scientist as on 01.06.2018 we have 151 scientists including three newly joined scientists. Chairman also welcomed the new scientists to the 25th IRC meeting and to the CMFRI family.

Director presented the previous year's achievements, the salient points are given below.

- ✓ Marine fishery data brought out by FRAD
- ✓ Draft of Marine Fisheries Census data submitted to DADF in April 2018
- ✓ Administrative control of KVK in Kavaratti, Lakshadweep has given to CMFRI in February, 2018.
- ✓ New FMP Project for Lakshadweep has been initiated in November 2017
- ✓ MLS (Minimum Legal Size) for marine resources of four maritime states have been completed.
- ✓ Andhra Pradesh policy document is ready and the book on "Mariculture of prioritized species" published. Director congratulated SIC and team of Visakhapatnam RC, as the most productive and vibrant research centre.
- ✓ Under NICRA project we have come out with a new multivendor commerce website and a mobile App. and it would be inaugurated soon by the honourable Minister of Agriculture, at New Delhi, as informed by DDG, Dr. J.K. Jena.
- ✓ FEMD has come out with a Litter-Atlas and interactive map which is placed in the website.
- ✓ Two new fish parasite species *Tenuiproboscis keralensis* sp. nov. an acanthocephalan and *Chloromyx umargusi* sp. nov. a myxosporeanbeen identified by Dr. Sanil & team.
- ✓ Dr. Kajal Chakraborthy developed an anti-hypothyroidism (ATE) a nutraceutical from seaweeds which was about to commercialised. He also congratulated Dr. Kajal, as he is elected as NAAS fellow this year.
- ✓ SEETTD has estimated marine fish landings gross revenue from the landing centres.
- ✓ Seed production of *Lethrinus lentjan, Epinephelus coioides,Trachinotus mookalee,* and marine ornamental fish *Pseudanthias marcia* were developed from Vizhinjam and Visakhapatnam centres.
- ✓ Presently 1609 cages are under the technical guidance of CMFRI at different locations in India and Mariculture division received external funding from NFDB, 9 crores to Mandapam & Vizhinjam, 5 crores to Visakhapatnam and 13.12 crores for Kerala & Karnataka for training & cage culture.
- ✓ Mussel farming is getting popularity in Maharashtra and Vizhinjam centre has developed technology for up-scaling the mussel seed production and development of micro-nurseries and upwelling systems for spat rearing for commercial scale production of mussel and oysters.
- ✓ Dr. B. Santhosh & Dr. Jayasree Loka team developed culture protocols for 8 species of copepods suitable for larval feeding of marine finfishes.

- ✓ 1000 Km^2 of area suitable for sea cage farming were identified along the Gujarat coast with GIS back-up.
- ✓ Hyatt Hotel chain has modified their menu based on the advice of CMFRI-WWF as part of a responsible luxury initiative.
- ✓ Consolidated advisories on the Ockhi cyclone disaster has been presented to both Govt. of Kerala and Govt. of India.
- ✓ KMFR Act been modified based on the recommendations of a Committee which included Dr. Sunil Mohamed and major amendments have been made.
- ✓ CMFRI in collaboration with MSC and WWF have shortlisted 10 species for MSC certification.
- ✓ Two major policy documents brought out in May 2017- i) National Policy for Marine Fisheries, in which CMFRI played an important role by Dr. Sunil Mohamed, Dr. T. V. Sathianandan and Dr. P.U. Zacharia and ii) Guidelines for sea cage farming in India has been brought out by Mariculture division of CMFRI with NFDB.
- ✓ Characterized three complete mitogenome of *Sardinella longiceps*, *S. gibbosa* and *Etroplus suratensis* from Indian waters.
- ✓ Three winter/summer schools held during the reporting period and congratulated the directors Dr. Somy Kuriakose, Dr. Kajal Chakraborthy and Dr. Grinson George.
- ✓ Success of m-Krishi App. was mentioned by Prime Minister Shri. Narendra Modi, in the recent meeting held at Singapore and Chairman congratulated Dr. V. V. Singh and team.
- ✓ Director also congratulated various Award winners during the reporting year -
    - ➢ CMFRI Received 'SwachhtaPakhwada' Award-Director congratulated Dr. Shyam Salim and team for all their sincere efforts.
    - ➢ Dr K K Joshi won Best Biodiversity Researcher Award for the year 2016 instituted by the Kerala State Biodiversity Board (KSBB).
    - ➢ CMFRI received Kochi TOLIC Rolling Trophy for best Official Language performance every year from 2003 onwards.
    - ➢ CMFRI are Overall Champions in ICAR South Zone Sports Meet for the 3rd time and he congratulated Dr. Kripa, Chairperson & the whole team

Director also informed about the important meetings/events held at different centers of CMFRI and visits made by CMFRI scientists to various organisations and countries.

Director also shared his disappointments; main focus was on publication side and he urged the scientists to have a minimum total number of 200 papers in the following year. He added that it will certainly affect the promotions of the scientists and Director is helpless in this matter. He cautioned about the financial status and told that day by day support from government is coming less and less, so we must have more funds to carry out the research programme. He informed that above the principal scientist one more level is going to come with tough screening process and General Body has already approved that. So Principal Scientists cannot sit idle and SIC's has to generate work.

He instructed all HODs' to conduct video conferencing for their division scientists frequently atleast once in three months to review the progress; except Digha, all centers are equipped to carry out the same.

Action: (All HoDs')

He emphasized the importance of application of artificial intelligence and ICTs in our fisheries and aquaculture works, all the scientists especially the youngsters can think on these lines.

He reminded the scientists to be serious with the timely submission of completion reports for those over by 31.03.2017 he stated that completion reports of 20 projects yet to be received and instructed to submit the same as soon as the IRC is over by 18th June 2018.

(Action: All PI's those who not submitted RPP-III)

Also about the timely submission of the APARs – this year proforma has been changed which requires more attention while giving marks.

He urged the scientists to continue the good work which will ultimately help to sustain the marine resources and augment marine fish production through mariculture activities and concluded the session by wishing the members a productive and interactive IRC.

Action Taken Report – 24thIRC

Dr. Mohamed informed that the previous IRC had 31 action points, out of which eighteen were completed satisfactorily by the respective members, however the rest are not completed or partially completed. Hence, those ATRs' which are not fully fulfilled will remain as such and continue as action points, till it is accomplished. The Chairman reminded all the members to submit a copy of action taken report to PME also.

Please see Annexure-I

IN-HOUSE PROJECTS

HoD presentation – Dr. T.V. Sathianandan, FRAD

1) Georeferenced online information system for marine fisheries on GIS platform to formulate management strategies for sustainable harvest of resources - (FRA/GIS/01)-Dr. T.V. Sathianandan

Dr. Sathianandan requested the IRC secretary to note the title of the project as the title given in the programme is not correct. Dr. Mohamed informed that the project titles for the IRC schedule were prepared based on the list provided by the PME cell. He instructed the PME –in-Charge to take necessary steps to update the titles of the projects.

[Action: Dr. Boby Ignatius, PME-in-charge]

Dr. Joshi queried whether DADF has approved in principle that only CMFRI data is considered the official one and whether FRAD is conducting regional workshops as in earlier days. Dr. Sathianandan replied that DADF is in the process of approving CMFRI data as the official data and FRAD conducts regular zonal workshops/workshops. Prior to 2016 census conducted 3-day workshop, first day for census purpose and last 2 days for the FRAD general purpose. This year's workshop is planned for July.

Dr. Ramachandran congratulated the entire team for bringing out new and exciting information. He was eager to know whether the segregated data based on the status of the gear (banned or not banned), would be useful in the respective states Fisheries Regulation Acts. Dr. Sathianandan informed that CMFRI data is not biased, information on the resources harvested by different gears will be an input and that the same has been provided to DADF also.

Dr. Maheswarudu pointed out that many of the divisional scientists from research centres are facing problems in getting species-wise data from FRAD. He suggested that SICs' of all outstations should take up responsibility to overcome this lacuna and co-ordinating with FRA division each centre should arrange field identification trainings.

Dr. Mohamed also suggested to have a final check of the data by respective SICs to avoid mismatch of the species collected by FRAD staff and divisional scientists at respective centres.

He also enquired whether the "tab-data" comes directly to FRAD or it is possible to check the data before sending, to make the data error-free.

Dr. Sathianandan stated that skill has to be developed for identification and this can be achieved only by having permanent staff. He said that there is a provision for SIC's to check and also they can store the data in the system and later they can send the data.

Director suggested that for field identification soft copy for all the identification sheets can be uploaded in the tab and clarifications can be made whenever required. Wherever local language identification sheets are available use of those sheets would be much more beneficial for the survey staff.

Dr. Mohamed and **Dr. Zacharia** said that for the last couple of years they were pointing out the mismatch of the species composition and related FRAD data. So it is high time to rectify these

issues. They suggested to conduct surprise inspection as conducted in earlier days and hire more contractual staff to cover the survey centres. Dr. Mohamed added that actually they are struggling with manpower, unless we find a solution for this problem, our Institutes' reputation is at stake.

Director suggested to incorporate newly joined skilled supporting staff and train them, so that not only we get better output, can also save finance on TA expenditure that we spend by posting very senior people.

Dr. Akhilesh suggested to select one scientist from each research centres to look into the data collection. So, it is entrusted with the respective SICs to identify the Scientist for coordinating the FRAD survey.

(Action: All SIC's)

It is decided to **conduct a Workshop/Meeting** within 2 months' time (before September 2018) by FRAD and capture fisheries Scientists to sort out all issues related with data collection.

[Action: Dr. T.V. Sathianandan, HoD, FRAD]

2) Chlorophyll based Remote Sensing assisted Indian Marine Fisheries Forecasting System (ChloRIFFS) (FRA/CHL/02)-Dr. J. Jayasankar

Dr. R. Prathibha Rohit pointed out the issues with boat-hiring and Director told her to discuss it on the day of SIC meeting. Dr. Reeta Jayasankar also expressed her views on water quality parameters data collection.

Dr. T.V. Sathianandan highlighted the difficulties for the smooth conduct of the project. There was a discussion on various technical issues and data procurement etc. and he mentioned that latter problem is very severe.

Director told Dr. P. Jayasankar to submit a request to procure a "High performance computing facility" with a budget of 5 lakhs and assured it would be sanctioned and procured.

(Action: Dr. J. Jayasankar and Director)

Director and IRC Secretary suggested to Dr. J. Jayasankar to discuss in detail with the Head of FEMD and regularize the data collection accordingly.

Dr. Mohamed pointed out that two steps are to be taken- one is to make a data sharing policy and to issue official letters through Head, and second FRAD has to include newly added Co-PIs and 'Project Adjuncts' especially from FEM Division without fail.

(Action Dr. J. Jayasankar and Head, FRAD)

HoD presentation – Dr. R. Narayanakumar, SEETTD

3) Socio-Economic Assessment of Marine Fisheries Resource Use and Management in India (SEE/SOC/33)-Dr. R. Narayanakumar

Dr. K. S. Mohamed asked why the economic indicators like net operating income, capital productivity and gross value added in fishing are better in Maharashtra despite lesser marine fish

landings. **Dr. R. Narayanakumar** replied that the gross revenue per trip was high in Maharashtra due to high price of fishes especially at times of low landings.
Dr. V.V. Singh, SIC, Mumbai RC of CMFRI also expressed the similar view and informed that when the landings were low the price of fish was high.

4) Responsible Marine Fisheries Governance: Compliance Analysis and Peripatetic Capacity Development (SEE/GOV/34)-Dr. C. Ramachandran

Dr. M. Sivadas enquired whether the existing management measures are effective in the present scenario and **Dr. Ramachandran** informed that monsoon trawl ban is more effective because of its biological and political correctness, there being a trade-off between the two. MLS also found to be effective when biological and ecosystem reference points are taken into consideration.
Smt. Muktha opined that these studies are relevant, since in Kerala fisher folk are literate people. In other states they are illiterate and hence the success of these measures cannot be assured. Dr. Ramachandran told that he cannot agree on this, as far as concerned they are highly experienced and literate in their field i.e., fishing and it is a fact that many things we have to learn from them.

4a)Sub Project: A study on Compliance to fishery regulations along the Indian coastline (SEE/GOV/SUB/34)-Dr. P. Shinoj (DPI)

Dr. Muktha wanted to know how the private money lending can be reduced as the interest rate is high. Dr. Shinoj informed that the auctioneer gave the money based on 'Output-tie-credit" system, where the auctioneers make sure that demand and supply is steady. This advantage was not available in institutional sector since only when there was catch the auctioneers needed to be paid. Hence auctioneer lender would win in an institutional credit system.

5) Marine Fish distribution and consumption demand in India: A policy outlook (SEE/DCD/35)–Dr. Shyam. S. Salim

Dr. Sivadas wanted to know whether 'fish mobility' has been taken into consideration ie., fishermen catching the fishes in one place and marketing it in different place. For example in Tamil Nadu, tuna and billfishes catches been transported to Kerala. Similarly in Andhra Pradesh also, they are repacking these resources and sending to Kerala. Are we considering these factors for landing price and market price. Dr. Shyam replied that in the context of the project, we take two prices, one is landing centre price and other is retail centre price. The landing centre price is determined at the point of production. He explained with the example of sardine; suppose sardines landed at Karwar fetch Rs. 15/- and while retailing at Chembakkara market the price may be Rs. 60/- but during distribution there will be marketing margin and marketing cost. These will be covered in marketing studies and not in this.
Dr. Joe K. Kizhakudan suggested to check the prices for non-penaeid prawns shown, which he felt are abnormally high.

Dr. Sekar suggested to include cultured fishes also so that we can get more realization about the market prices. Dr. Shyam agreed to incorporate the same.

(Action: Dr. Shyam Salim)

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6) Alternate livelihood options and gender mainstreaming for entrepreneurship development in Marine Fisheries Sector of India (SEE/GEN/36)- Dr. P.S. Swathi Lekshmi

Dr. Sathianandan raised a doubt related with total man days and income generation with regard to cashew picking. Dr. Swathy informed that there were a total 23 mandays/year only, the land lease price is Rs. 2000/- acre and cashew fetches 70-80 /kg. She added that it is a family labour and income is shared equally among members in this particular case Rs. 4 lakhs income generated is shared by 4 members each gets one lakh rupees.

Dr. Reeta Jayasankar appreciated Dr. Swathi for taking up in-depth studies in Odisha.

Dr. Mohamed asked conceptually whether the project is working on alternative livelihood option for fishermen or just on livelihood options, as from the presentation this is not clear.

Dr. Ramachandran told that Dr. Mohamed has raised a valid point even in the division meeting it was discussed in detail. Under the diversified livelihood option, both alternative livelihood and augmented livelihood options are included. The latter may be more suitable term for the project and IRC Secretary suggested to make suitable modification.

(Action: Dr. Swathi Lekshmi)

6a) Sub project: Main streaming the Gender Perspective of SHGs in Indian Fisheries Sector (SEE/GEN/SUB/36) - Dr. V.P. Vipinkumar (DPI)

No discussion

HoD Presentation- Dr. Prathibha Rohit, PFD

7) Resource assessment and management framework for sustaining marine fisheries of Karnataka and Goa (PEL/RMS/03) - Dr. Prathibha Rohit

Dr. Zacharia asked about the status of catfish fishery in Karnataka. Dr. Prathibha replied that the fishery is improving especially the large species are emerging, though they have lost many fishing days due to conflicts between different fishers.

Dr. P. Jayasankar enquired whether they monitor presence of plastics in the trawl catch. She replied that they are not monitoring it in this project however, Dr. Bindu Sulochanan is working on this aspect in FEMD project. She identified and quantified different plastic item gearwise and Mangalore centre has conducted several awareness programme during last years. She also announced that CMFRI Mangalore Centre is not using any plastic bottles during functions for the last 3-4 years, instead only glass jars & glasses are used.

Dr. Joshi enquired where she is depositing the fish otoliths and Dr. Prathibha told that all those are deposited at PFD 'aging lab' at headquarters to study the growth. Dr. Joshi requested her to submit the otoliths to the Museum.

Dr. Mohamed suggested that as a part of educational awareness otoliths of different species can be displayed. He also told that accession numbers need not be given for the same.

(Action: Dr. Prathibha Rohit)

Dr. Ramachandran raised a query with regard to age and length relationship of sardine, whether morphologically derived age and chronologically derived age has an impact on MLS. Dr. Pratibha replied in affirmative.

Dr. Shyam and **Dr. Kripa** wanted clarification with regard to sustainability of sardine fishery in Karnataka. Also Dr. Kripa wanted to know why results of studies conducted by FEM Division have not considered while finalising the draft. Dr. Prathibha replied that they have worked it out for all India (East & West Coasts), whereas Dr. Kripa's findings confined to Kerala state only.

Dr. Mohamed further added that, Dr. Kripa was trying to raise the issue that when catch is crossing MSY, the Institute has not giving advisory to government or stakeholders, to limit or regulate the effort to manage the fishery. Dr. Mohamed also cautioned about the usage of the term RSA. The term stands is actually RSS for 'Rapid Stock Status' not Rapid Stock Assessment.

8) National Fishery Management Framework for Large Pelagic Resource(PEL/LPR/04)- Dr. E.M. Abdussamad

Dr. Ramachandran wanted to know the percentage of yellowfin tuna out of the 76000 tonnes of total tuna landings,. Dr. Abdusamad replied that it is 17% only and now the issue is that IOTC states that the tuna export is more than what India catch. So it is planned to fix quota for tunas, bill fishes etc.

Dr. Mohamed opined that we cannot relate export with that of same year catch, as most of the processing plants are having high storage capacity, as in the case of squids. This issue has been discussed with processors and MPEDA, many years back itself and confirmed.

Dr. Mohamed also asked what would be the scenario if we ban trawling of large pelagic resources which form 30-40% of the trawl catch. Whether catch of these resources, would be caught in gill nets and hook lines. He pointed out that future of trawling is not bright, so this project can model the scenario as younger stages of large pelagic are being caught in trawl. Dr. Prathibha informed, they have worked out in similar lines for seer fish *S. commerson* at Mangalore and came out with a paper. Dr. Mohamed suggested to follow similar kind of study for larger pelagics.

(Action: Dr. E. M. Abdussamad)

Dr. Sivadas informed that in Tamil Nadu during June, July and August months peak landings of juveniles of barracuda and seerfishes.

Dr. Zacharia remarked that during trawling ban in Kerala there was no shortage of fishes in the market which means they are caught by other gears.

9) Resource Assessment and Management Framework for sustaining Marine Fisheries of the Fishery of Lakshadweep (PEL/LAK/06) - Shri. Mohamed Koya

Dr. Ramachandran pointed out that tuna being a guardian fish as far as reef fishery is concerned and as new value chain is in place, do we need a special management plan for reef fishery. Shri Mohamed Koya replied at present 90% of the commerce is on tuna and groupers and snappers are other highly priced resources. Presently it is mainly consumed by locals and demand is increasing as tourism also developing. Certainly management plan would be required if reef fishes are being transported to mainland for different purposes.

Dr. Rekha Nair also pointed out that groupers and snappers are being fished from Lakshadweep (October-February) by other state fishermen.

Shri. Koya said that if the fishing is taking place outside the territorial waters of Lakshadweep, the other state fishers have the right to fish.

Smt. Muktha wanted to know about the 'illegal fishery', he has presented.

Dr. Mohamed suggested using the term "unregulated fishery" rather than "illegal" as far as we do not know the exact location of the fishery. Dr. Mohamed further explained that fishing become "illegal" when a boat fish from territorial waters without a license. He felt that it was a common practise everywhere not just in Lakshadweep.

10) Resource Assessment and Management framework for sustaining Marine Fisheries of Tamilnadu and Puducherry (DEM/RMS/08) - Dr. M. Sivadas

Dr. Sekar wanted to know whether any biological factors are there related with fluctuation in the catches as shown in the presentation. Dr. Sivadas told that during last year there was drastic reduction in effort due to oil spill in Chennai area as the demand was very poor for fishes. Otherwise these findings are based on supply, demand and effort.

Dr. Grinson told last year sardine-mackerel catches were good in all over India, while Tamil Nadu showed drastic decline of these resources, whether we can work out any link for these issues.

Dr. Sivadas added that Dr. Grinson is considering only the overall catch. If district-wise landings are analysed these are available in few months. As far as oil sardine is concerned it has discontinuous distribution and there was no sufficient quantity in last year for the ring nets to operate and it is one of the reasons for oil sardine depletion in Tamil Nadu. **Dr. Mohamed** opined that period is too short to make such conclusions.

Dr. Mohamed was also of the opinion that it is not easy to make conclusion on depletion in Tamil Nadu. Now most of the fishery is market driven and in Tamil Nadu nobody prefers oil sardine. He also enquired about how many large species were there which were being fished below MLS. Dr. Sivadas replied that yellowfin tuna, seer fish and cobia were some of the larger species which were being fished below MLS.

HoD Presentation- Dr. P.U. Zacharia, DFD

11) Resource Assessment and Management framework for Sustaining Marine Fisheries of Kerala (DEM/RMS/07)- Dr. T. M. Najmudeen

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11a)Sub project: Monitoring and assessment of juvenile fishery along the coast of Kerala - Dr. T. M. Najmudeen (DPI)

Dr. Sivadas raised the issue of cross-border landing of resources which was discussed in the last stakeholder meeting and he wanted to know how the fishermen in Kerala account for these types of activities.

Dr. Najmudeen and **Dr. Mohamed** informed that it is a policy issue. Kerala government allows to land fishes from other states if Rs. 25,000/- paid as an annual fee. So many boats from other states come to Kerala ports, especially units from Tamil Nadu. Dr. Mohamed added that they do not want to change this because primarily line fishing from Kochi is targeting almost entire west coast of India. This is a far reaching issue which make fisheries scientists work more challenging and difficult. So the recently held Potential Yield Committee decided to incorporate advisories such that country should declare fishery management areas and vessel licenses should be issued to such areas.

Shri. Mohamed Koya commented that fishing area is not in state boundaries. Any management has to be carried out in area based. Dr. Mohamed told we have to ultimately move towards for area based systems and the license given should be based on area, so that fishermen should adhere to the areas permitted for the licenses given only.

Shri. Koya suggested to have separate line for fishery management ie., instead of 12 nautical miles, we can start from 24 nautical miles and fishing is mainly happening beyond the territorial water.

Dr. Mohamed told that, that the constitution of India says it is 12 nautical miles that is very much difficult to change this as it is a constitutional matter. Each state has to set regional management zones for fishing and only then correct picture will be available and accordingly plans can be made.

12) Resource Assessment and Management framework for sustaining Marine Fisheries of Gujarat (DEM/RMS/09) - Shri. Vinay Kumar Vase

Dr. Sivadas raised a doubt that the rationale of finding out of catch per hour for stationery gears like gillnet and Shri. Vinay Vase replied that they are taking the actual fishing hours they are fishing. Dr. Sivadas told that there is a definite time for fishing and it is not an active gear like trawl net which operates different hauls per day. He suggested to take Catch Per Unit effort instead of CPH. However, Dr. Mohamed and Shri. Koya felt that there was more clarity when we use CPH.

Dr. Mohamed suggested Shri Vase to discuss with Dr. Sivadas on these aspects and settle the doubts.

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13)Resource Assessment and Management framework for sustaining Marine Fisheries of Andhra Pradesh (DEM/RMS/10)-Smt. M. Muktha

Dr. Sathianandan wanted to clarify on biomass estimate that Smt. Muktha has made from Visakhapatnam and he said both her methods are based on sampling only. He pointed out that swept area method in trawling the area covered through sweeping may be less and certainly it would reflect in the landings as the coverage is less and also not applicable to all resources. Smt. Mukta agreed that there are shortfalls and she hope by next year it can be rectified.

Dr. Vijayakumaran suggested to use grid system for the entire area of study as he did not find such system in the maps showing the pattern of exploitation for biomass estimation presented. He added that, she can procure such maps from local FSI, they have area wise maps.

Dr. Ramachandran expressed his views and concern about the stock assessment in general. All over the world, it is clear that we know that we are working on wrong fundamentals. We know that all these are highly irresolvable problems, but we cannot have consensus that the methods we are adopting here? First of all, we should have the definition of the stock and secondly we should avoid some sort of parochial feeling such as Gujarat stands first, Kerala stands first etc. Rather than we should say that this is the status of the stock and in the country, otherwise it is a wrong way of presentation.

Dr. Mohamed explained that species based assessment we have worked long back. For example, ten years back, we have projects on penaeid shrimp, threadfins etc. on national basis. We know that our resources are not distributed in uniform manner, i.e., the status of fisheries between the states are not the same and fisheries is administered by respective states. It is difficult for us to come to clear conclusion, probably needs more discussions and brain storming sessions. We do not have ready answers for many; we will have to allocate quotas for respective states for resources. We have to follow separate path other than western countries, as our resources and things are different from them. These all are discovery processes, it is a matter of time and we have to go through different processes. The solutions for our problem are yet to come.

Dr. Sathianandan opined that we are continuously improving our stock assessment methods; we are working with models and also doing validation. Indian fisheries are complex system as all of us know, multi-species, multi-gear etc. Our stocks are also not uniform, hence, stock of entire nation cannot be treated as one stock. We have to see it on regional basis rather than considering it as a single stock and we can have improvements from time to time.

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14) Developing management strategies for sustainable exploitation and conservation of elasmobranchs in Indian seas (DEM/ELS/11)- Dr. Shoba Joe Kizhakudan

Dr. Ramachandran wanted to know which is the better unit to express the vulnerability of these species by weight or in numbers, taking into consideration that these are sensitive fish species as well as their trade also sensitive.

Dr. Shoba told that to express the vulnerability of larger species it is always better to take the numbers, which gives the idea how good they represent and for smaller ones, weight would be better. They are taking numbers of large elasmobranchs and in previous IRC presented the details also.

Dr. Sivadas informed fishermen are facing a lot of harassment by the forest officials and coastguard authorities, so in future training programme they can be included so that they get better understanding about the species. Dr. Shobha replied that we are planning separate workshops for east and west coast in this year and this will be included.

(Action: Dr. Shobha Joe Kizhakudan)

Dr. Zacharia told that the harassment problem is happening only in Tamil Nadu state, other states have no issues. Also the project has distributed pamphlets and brochures for awareness amongst these officials about the species identification. Dr. Mohamed enquired about the management strategies for the species. Dr. Shoba replied that they are working on the action plan for sharks and document for CITES listed species. She told that definitely by the end of third year the project would come out with management plans. She added that they are working hand-in-hand with fishermen. At present level of data collection methods, it is difficult to make management plan for these species alone that is too in multigear, multispecies fishery.

14a)Sub project: Assessing the status of elasmobranchs protected under the Indian Wildlife (Protection) Act 1972 (DEM/ ELS/SUB/11) - Dr. K. V. Akhilesh (DPI)

Dr. Mohamed told that from the presentation it is understood whale shark catch is increasing. So he wanted to know by placing an animal under the Wildlife Protection Act, whether it really helps, as from the graph shown, it is not so. Dr. Akhilesh felt, WPA helps and awareness campaign also important. In Gujarat, government gives the fishers Rs. 25,000/- as compensation with a proof of recorded video, that they have released them back to the sea. Maharashtra is also planning to give compensation.

Dr. Asokan explained how in Gujarat, the religious leaders have taken a lead role in conservation and **Dr. Vinay Vase** told that in Gujarat it's some sort of triangle management by TATA Consultancy, Forest Department and WTI who are the leaders in whale shark studies. Annual meetings are conducted and they pay Rs. 25,000/- for entanglement.

Smt. Muktha informed that whale sharks are appearing in regular landing in Andhra Pradesh and fishermen are well aware not to land it, but always find the excuse of 'entanglement' and they get good prices for the same which mainly transported to Kerala where there is a good market.

HOD Presentation -Dr. G. Maheswarudu, CFD

15)Development of guidelines for "Best practices" for trawl fishery in India (CFD/BPT/12) - Dr. A.P. Dineshbabu

Dr. Grinson raised a doubt whether fishing effort is contributing to the change in the pelagic fishery community structure. Dr. Dineshbabu replied this is mainly because of the increase in the trawling speed, earlier it was 3 knots and now it is 6 knots and it is more than the swimming speed of fishes. So now we have to quantify the percentage of juveniles in that and how to sustainably fish these resources.

Dr. Sivadas added that not only the speed has increased but the size of the net also increased so bottom to top coverage is more now; according to the power of the boat they change size of the nets.

Dr. Dineshbabu also expressed his concern about the resilience, he is doubtful that how long it will last in Indian waters.

Dr. Zacharia asked whether the catch rate of the species increases with the speed of the vessel and Dr. Dineshbabu informed that with the increase of speed, coverage of area increased to almost double.

Dr. Mohamed asked whether it is correct that the pelagic or mid-water trawls are better than bottom trawling from an ecological point of view. Dr. Dineshbabu agreed with this opinion, however, he felt that the present speed of the vessel is not at all good.

Dr. Maheswarudu told that, if bottom trawlers are completely avoided, that would certainly affect the catch of crustacean resources.

Dr. Dineshbabu opined that while finalizing the best practices for management, all stakeholders' perspective should be considered *ie.*, trawl netters, gillnetters, purse seiners etc. rather than concluding it with scientists' perspective alone.

Dr. Asokan expressed his view on increase in the resources. He feels that apart from higher speed of the net, at present boats are able to reach/return from the fishing ground much faster so actual fishing hours will be more. Dr. Dineshbabu agreed and told that everything is interconnected and now CPH (Catch Per Hour) is more than earlier days.

Dr. Saravanan told that latest policy of government of India is that not to promote trawlers. He sought Dr.Dineshbabu's view on this aspect. Dr. Mohamed answered that government perspective with regard to Palk Bay conflict is like that, but not on all India basis. Dr. Maheswarudu added that this is to reduce the fleet size of the Palk Bay trawlers, as it is exceeded the optimum and government is not recommending complete ban on trawling.

Dr. Sathianandan also agreeing with earlier point raised by Dr. Mohamed that what will happen to the fishery if we stop trawling. Dr. Mohamed suggested to add few more objectives to the project ie., scenarios of best practices for (1) "bottom trawl" (2) "pelagic trawl" (3) "bull trawl" There are several classification of scenario and he requested Dr. Dineshbabu to incorporate these in the project.

(Action : Dr. A.P. Dineshbabu)

16)Resource Assessment and Management framework for sustaining marine fisheries of Maharashtra (CFD/RMS/13)- Dr. V. V. Singh

No discussion

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17) Implications of recruitment dynamics and spatio-temporal stock assessment of marine prawns of India for fisheries management (CFD/REC/14)- Dr. P.T. Sarada

There was a discussion about the usage of the terminology shrimp or prawn and Dr. Sarada expressed her views and that of the Division that it was decided to use 'prawn' based on the "Indo-Pacific Fisheries Council" held at Tokyo in 1955.

Dr. Mohamed opined that it is very old forum and Director also suggested to re-look into the issue with latest updates.

Dr. Mohamed wanted to clarify whether the peak spawning season is matching with the trawl-ban period in Tamil Nadu. Dr. Sarada told that along the east coast it is very clear, spawning season starts with July and lasts till September every year and so it does not match with the trawl ban period. She added that, the fishermen will not agree to change the ban period to spawning season, as it is the most productive season for them. Dr. Mohamed remarked that in Kerala also, fishermen are not ready to change the trawl ban period as they are practicing it for more than 25 years. He suggested Dr. Sarada to prepare a consolidated data with details of breeding period for east and west coast for major species of commercial prawns and publish it at the earliest.

(Action: Dr. P.T. Sarada)

Smt. Muktha wanted to know how recruitment studies have been carried out and Dr. Sarada replied that it is based on fecundity studies.

Dr. Prathibha wanted to add that trawl ban is observed during monsoons season to avoid the difficulty of fisherman go for fishing during rough weather; Dr. Mohamed told, that was the case during 1980's, now the vessels are modern and able to withstand the adverse conditions.

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17 a) Sub project: Investigations on commercial lobster fishing and live lobster trade in India CFD/REC/SUB/14- Dr. K. N. Saleela (DPI)

Dr. Mohamed wanted to know on what basis she has classified "Katcha" and 'Pakka" systems and she explained the same.

Dr. Sekhar enquired about the major lobster importing countries and she replied that mainly it is being exported to Singapore, Thailand and Switzerland.

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18. FMP for Northeast coast of India (CFD/NEC/05)

No presentation.

This project would be operating from Digha Centre and **Dr. Gyanranjan Dash**, Senior Scientist & SIC, is the PI of the project. It is approved by IRC.

(Action: PME Cell/Dr. Gyanranjan Dash)

06/06/18 (Day-3)

HOD Presentation - Dr. K.S. Mohamed, MFD

Dr. K.S. Mohamed requested for a Scientist at Veravel Centre for the Molluscan Fisheries Division, when new Scientists join the Institute.

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19) Resource Assessment and Management framework (FMPs) for the bivalve fisheries of India (MFD/BIV/15) - Dr. Geetha Sasikumar

Dr. Prathibha informed that there is a conflict going on between fishermen from Kerala and Tamil Nadu for the removal of mussels from submerged beds in Karnataka and it is a big issue now. About 20 years ago, there was a ban on it. Dr. Geetha said that inspite of the conflicts the landings of *Perna viridis* has increased two fold. In Karnataka, they are permitting divers from Kerala to dive off Malpe, based on some understanding with the Fisheries Minister. The earlier ban was not applicable throughout the year, only for a particularly period, thereafter fishermen use to collect the mussels.

Dr. Asokan said that in Karnataka, these mussel pickers have to pay "Nokkukooli", otherwise they will be beaten up. This information was gathered from mussel pickers from Malabar area.

Dr. Kripa wanted to know, whether Vizhinjam port activities have affected the mussel population/fishery there. Dr. Geetha said that during 2016, Dr. Anil had reported smothering of mussel beds due to these activities but 2017 status, she does not know. Dr. Gomathi has reported smothering of mussel beds due to Ockhi and during COMAD, Mr. Robert Panipilla also reported the same due to construction activities of the Port.

Dr. Kripa suggested carrying out sedimentation studies on few selected sites to know the real situation.

Director said he is in the hope that the phenomenon would be temporary, may be over and settle down as soon as the construction is completed. Moreover, the structure of the Vizhinjam port is different from Cochin port, it is a deep water port.

Dr. Mohamed suggested FEMD to carry out sedimentation studies in collaboration with MFD team at Vizhinjam.

(Action: Dr. Kripa, FEMD and Dr. M.K. Anil & Dr. Gomathi, MFD)

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20) Assessment of ornamental gastropod fisheries and studies on the shellcraft industry in India (MFD/GTR/16) - Dr. I. Jagadis

Dr. Joshi wanted to clarify a couple of things i) He wanted to know the gear used at Kayalpattinam and Kalavasal and the other resources caught apart from the gastropod. Dr. Jagadis replied it is by bottom set gillnet/chank nets and other species include crabs, lobsters, gorgonids, sponges etc. ii) He also enquired about the status of chanks and Dr. Jagadis informed that so far it is safe.

Dr. Mohamed also raised clarification on potential of *Turbinella pyrum* and Dr. Jagadis replied about 10 years back they have analysed the stock status and published in IJF. Same way it can be estimated upto 2017 and he agreed to share the data.

Dr. Zacharia wanted to know which estimates of gastropods would be used further; estimates made by the project or FRAD. Dr. Mohamed informed we are just flagging this issue ie., these gastropods are shelled animals and their weight is not similar to other animals with only flesh. Hence, some degree of awareness building is required and we should look into how best we can arrive at better estimates of these resources.

Dr. Grinson had a doubt whether gastropod is only because of weight problems and whether 'coverage' is also there? Dr. Mohamed told may be these two issues are important. Dr. Grinson added that FRAD face problems due to shortage of manpower especially at Mandapam. Dr. Mohamed suggested that FRAD should identify a Scientists/Technical person to tackle the issue of gastropod catch estimation.

Dr. Mohamed also pointed out that in Kerala due to strict implementation of MLS, fishermen are scared to land bycatch as they have to pay huge fine to the Kerala State Fisheries Department. So, there is impact on the gastropod landings which form a significant bycatch especially at Kollam. There may be sanitation issues also. Strict implementation of MLS can also result in these type of issues. About 5-6 years ago the European Union also taken a decision that no bycatch should be landed and all by catch were dumped back into the sea. Finally, 2-3 years later the EU has reversed this decision. He said that by sharing this, he is just flagging the issue.

(Action Head, FRAD and Dr. Jagadis)

Dr. Sivadas asked whether it is possible to estimate the available fossilized chanks and how long we can sustainably collect them. Dr. Jagadis replied that they have good association with chank divers, so that it is not difficult to gather information required for estimates and he assured that he will take up that work.

(Action: Dr. Jagadis)

Dr. Akhilesh enquired whether ornamental gastropods import from other countries are also taken into account and whether this affects our estimates. Dr. Jagadis told that it has been taken into consideration and imports are mainly coming from Mexico, USA, Australia etc. Dr. Mohamed informed that it will not affect our fishery catch estimate and in trade we are monitoring imports. There are also certain items imported and re-exported which is based on demand.

21) Popularizing Eco-friendly Molluscan Farming Strategies (MFD/MOL/17) – Dr. P. K. Asokan

No discussion

21a) Sub project: Development of advanced techniques for mass production of bivalve seed- Dr. M. K. Anil (DPI)

Dr. P.K. Asokan presented on behalf of Dr. M.K. Anil.

There was a discussion regarding the proposed bivalve hatcheries from Maharashtra and Kerala governments.

Dr. Mohamed stated that as a consultancy project we can help them in design, construction and initial trials but will not commit to run the hatchery. Dr. Asokan informed that it is made clear that once it is established they have to run the hatchery with trained personnel.

Director enquired whether brown mussel has any market. Dr. Asokan told that as far as mussel is concerned, Malabar is the biggest market and they prefer green mussel, not brown mussel. In South Kerala and Kanyakumari brown mussel is marketed as there is good demand.

HoD Presentation – Dr. Imelda Joseph, Mariculture (MD)

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22) Development of hatchery technologies for prioritized species in Mariculture (MDN/HCY/18) - Dr. A. K. Abdul Nazar

Dr. Jayasankar wanted to know the method used in the selection of male and female fishes of designer clowns and also enquired how many years since the work has been started. Dr. Nazar replied that brooders are selected based on the unique colour pattern of the larvae, i.e., mixed bar, tear drop etc. and it is almost 8 years' work.

Dr. Mohamed wanted to know the advantages of hybrid clowns and Dr. Nazar told that aquarium business is based on colours and the unique colours fetch high prices in the market. So they have tried this.

Dr. Mohamed also asked the reasons for the unsuccessful spawning in cobia at Mandapam ie., out of 6 spawnings, only one was successful. Dr. Nazar informed that in captivity cobia become mature in 3 years while in wild when it come to a weight of 8 kg it matures irrespective of the age. Due to shortage of funds the team could not procure wild broodstock, they were using the captive broodstock only. Moreover, during 2016, mortality of 600 numbers of cobia occurred due to Harmful Algal Bloom (HAB). Though spawning occurred during last year, except one all were infertile, so this issue will be addressed and more wild males procured.

Dr. Kripa enquired about the possibilities of cryopreservation and Dr. Nazar told that they have not tried that. Director added that it is not practical also, to handle the huge sized fishes.

Director instructed the Visakahpatnam group of mariculture scientists to apply for the patent for the novel device they have developed for the copepod nauplii collection. He also advised them to discuss with Dr. Kajal and apply immediately.

(Action: Mariculture Visakhapatnam Team)

Dr. Maheswarudu asked whether economics been worked out for the cobia and silver pompano hatchery seed production. Dr. Nazar replied that hatchery and farming economics have been worked out for both species and it is planned to bring out a booklet on that. The cost of

production for cobia fingerling of 5 inches and above would be Rs. 12/- and silver pompano fingerlings is around Rs. 1. 20. Marketable size farmed cobia comes Rs. 190/- per kg and silver pompano is Rs. 106/kg.

Dr. Mohamed asked whether they have discussed the economics aspects with CMFRI economics scientists. Dr. Nazar told it is worked out with mariculture team only.

Dr. R. Narayanakumar added that they have also worked out the details and presently our cost of production will be higher since it is been carried out on experimental basis. He is in the hope that certainly the profit would be much higher when this will be taken up on commercial basis. Dr. Nazar informed that now it is profitable, about Rs. 200/kg can be obtained for cobia.

Dr. Kaladharan queried whether failed spawning are due to water quality or feed issues and Dr. Nazar told that is solely due to poor quality of males, related with age.

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23) Innovations in Sea cage farming & coastal mariculture (MDN/CGE/19) – Dr. Imelda Joseph

Dr. Rekha Nair wanted to know the stocking size of the grouper in Visakhapatnam and source of the seeds. Dr. Imelda replied that they used hatchery raised seeds and it is further grown to a size of 20 cm and stocked in cages. The harvesting size was 1.14 kg in one year.

Dr. V.V. Singh and **Dr. Prathibha** requested for mariculture scientists at their centres as at both centres lot of mariculture activities are going on. Dr. Imelda told that we can incorporate FRM people in the mariculture projects.

Dr. Singh further told that he needs a full time mariculture scientist otherwise purpose will not be served.

Dr. Mohamed also supported their request, he opined that otherwise output for mariculture as well as capture fisheries scientists will not be good and both section would suffer.

(Action: HoD, Mariculture)

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24) Analyses of reproductive characteristics of prioritized species for Mariculture (MDN/REP/20) - Dr. Imelda Joseph

Director enquired whether *Acanthopagrus berda* is a protogynous fish and Dr. Imelda replied it is a protandrous fish. Director suggested publishing the findings related with reproductive biology of *A. berda* in a Fishery Biology journal.

Smt. Muktha suggested that it would be good if the size-ranges of the fishes used in the study are also incorporated.

(Action: Smt. Shilta M.T)

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25) Assessing the performance of artificial reefs deployed along north Tamil Nadu coast (MDN/FAD/21) - Dr. Joe. K. Kizhakudan

Smt. Muktha wanted to know the motivation behind the design change, is it for more settlement or any other reason. Dr. Joe replied that initial design was done about 20 years ago, at Vizhinjam and in the present reefs, they have increased the pipe diameter to facilitate the entry of groupers; likewise reef fish modules strengthened with additional coir ropes twinning etc., ultimately all these helped to improve the initial settlement.

Dr. Grinson enquired apart from Scuba-diving whether transect studies been conducted in the reef area to observe the abundance. Dr. Joe told that, they have conducted the studies one kilometer away from the reef area, as the area is mostly flat with sand bottom mainly confined with gastropods and some shoaling fishes. Coming towards the reef we get more communities. Current also plays an important role especially the northward current one can see fish stocks very clearly 20 m away from the reef.

Dr. Grinson also asked whether the abundance and community structure are matching with the FRAD catch data. Dr. Joe informed that they have fishermen sub-committees, they conduct the survey and we are getting information from them. FRAD coverage in these villages are poor, as it is not coming in the main landing centre list.

Dr. Mohamed enquired whether the work been carried out based on a statistical design. Dr. Mohamed suggested to plan and work accordingly, so that the presentation of the findings would be much better with good clarity.

(Action: Dr. Joe K. Kizhakudan)

Dr. Raju wanted to know cost involved for design, fabrication and installation for these artificial reefs. Dr. Joe told that it has been worked out, cost of one unit varies between 5000-7000 rupees according to the design for the concrete structure. For deployment, and transportation cost varies from coast to coast. Fishermen have their own design and fabrication which are much cheaper, but it is not working well. The life of the reef may be about 7-10 years without supplement.

Director enquired about the total weight of reef and Dr. Joe replied that it varies between 700-1000 kg.

Dr. Rekha Nair asked about the spawning aggregation in the reef and Dr. Joe told that many species are maturing and spawning in the reef area, citing the example of groupers and *A. berda*.

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26) Delineating the compensatory growth pattern in stunted fingerlings of marine finishes for production enhancement (MDN/GRO/22) - Dr. Suresh Babu P.P

Dr. Sivadas asked is it ethically correct, that deliberately stunting the fish growth, which gives lot of physiological and other stress. Dr. Suresh Babu replied that now it is a common practice, in Andhra Pradesh carp fish farmers are using "stunted fishes' to stock in their farms with one-year-old fingerlings, it is purely for commercial purpose. He wanted to check whether it is suitable for our marine species and not considering as harassment as the fish grows much faster during post-stunted phase.

Smt. Muktha enquired if he had observed any difference in mortality rates between the stunted and normal ones in field trial. Dr. Suresh Babu replied that both in normal and

stunted fishes, mortality was there, but in many of the cases 100% survival recorded for the stunted fish growth trials. Moreover, the present trials are short-term only, probably in long-term trials we can get clear pattern of mortality.

Director wanted to know the practical utility/main objective of these types of studies. Dr. Suresh Babu replied that main objective is to reduce the culture duration and in our situation during monsoon season 'stunting' can be carried out and when favourable condition comes we can stock the fishes and growth also will be faster.

Dr. Grinson suggested to share the technology to our KVK for farm trials for our technology transfer. Dr. Suresh Babu said that they are actually trying for a 'package of practice for stunting', within three three years it can be finalised and we can transfer the technology.

Dr. Mohamed asked whether he has any idea about the physiological process behind this process, he replied that it is 'hyperphagia' (takes more food).

HoD Presentation- Dr. P.Vijayagopal, MBTD

27) Health Management in selected finfish and shellfish & bio-prospecting from marine resources (MBT/HLT/23) - Dr. N. K. Sanil

Director enquired whether any remedial measures are possible for *Perkinsus olseni* infections. Dr. Sanil told that they start working on that last year only, with real time PCR, they may be able to find some relation. Director suggested to try with qPCR, with that they can get better results and comparison rather than eDNA based detection.

Director also pointed out that for comparative studies in *Etroplus suratensis*, actually optimal conditions should have been followed only then expression will be correct and also the EM/histology image will be clearer with 15 ppt, rather than 0 or 36 ppt.

27a) Sub project: Development of bioactive pharmacophores from marine organisms (MBT/HLT/SUB/23) - Dr. Kajal Chakraborty (DPI)

Dr. Mohamed enquired whether anti-hypercholesterolemic extract (Ace) is good for Alcoholic liver. Dr. Kajal replied that it is getting good results in fatty-liver also.

28) Marine food fish, ornamental fish and lobster nutrition research for mariculture (MBT/NTM/24)- Dr. P. Vijayagopal

Director asked how much percentage of shrimp/fish meal can be replaced with insect meal. Dr. Vijayagopal replied that, it can go upto 50% replacement without much problems and if 100% replacement means we have to incorporate several additives. EU has cleared the insect meal

during the end of 2017 and after that 100% replacement incorporated in salmon diets and already research papers started coming in this aspect and added that it requires PUFA enrichment also.

Dr. Sekar pointed out that the results of the growth performance of silver pompano with high and low stocking densities are contradictory to the findings of their study. So, he suggested to have further evaluation. Dr. Vijayagopal replied he is aware of the same and need more elaborative discussion of the topic and Dr. Prabhu, Dr. Suresh Babu & Dr. Sekar can join together and prepare the plan of work.

(Action: Dr. P. Vijayagopal and Team)

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29) Genetic and Genomic approaches for fishery resource management, conservation and sustainable mariculture (MBT/GEN/25)- Dr. Sandhya Sukumaran

No discussion

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30) Biomineralization of mantle tissue from pearl producing molluscs (MBT/TSU/26) - Dr. C. P. Suja

Dr. Amir Kumar Samal asked what are the other patterns of deposition, other than the brick-mortar and it has got any significance for the quality of the pearls. Dr. Suja explained the formation of pearl layers in a detailed manner.

Dr. Mohamed enquired about the result when she used plastics and other materials. Dr. Suja informed that she did not get any good results, though she could not get some crystal formation with *Pinctada fucata*. Dr. Mohamed shared his experience in mabe pearl production, there they could get good nacre deposition with plastics, shell powder, dental cement etc.

Dr. Sivadas asked if everything goes well as envisaged how much time it takes to get a tissue cultured pearl. Dr. Suja told within 4 months' time we can get the pearl if everything goes correctly.

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31) Environmental DNA (eDNA) Metabarcoding – based estimation of marine stocks (MBT/DNA/37) - Dr. P. Jayasankar

Dr. Madhu suggested correcting the species *Amphiprion perideraion* as *A. akallopisos*, according to the species shown in the presentation.

Dr. Kaladharan suggested to use 0.2 µ filter for water extraction in place of 0.45 µ.

HoD Presentation - Dr. V. Kripa, FEMD

32) Micro-level environmental management plans for selected critical habitats for ecosystem health and sustainable production (FEM/HBT/27) - Dr. D. Prema

Dr. Shelton Padua presented the project findings on behalf of Dr. D. Prema.

Dr. Sekar asked whether any impact assessment studies have been conducted. Dr. Kripa replied that they have conducted baseline survey in 52 stations and collected benthic and planktonic

samples. Before cleaning the canals, samples have procured and now also samples would be collected from the same locations and the results would be compared.

Dr. Sivadas raised a clarification with regard to the title of the project as it says management plan for selected critical habitats for ecosystem health and sustainable production; he wanted to know in what way the project deals with these aspects and sustainable production of which resource. Dr. Kripa informed that they are covering water quality with microbial and eutrophication parameters and have monitored *Escherichia coli* and *Salmonella*. With regard to sustainability, they would be selecting areas like earthen ponds and demonstrate how the conditions can improve and revival back to good condition. In other states, selected areas like seagrass beds of non-degraded and degraded areas, and with participatory approach, it would be possible to restore it.

Dr. Sivadas wanted to know which critical area need our attention to increase/sustain the production. Dr. Kripa explained that the issue directly related to plastic pollution in the area. The stake nets mainly catching prawns are facing serious production problems; they get only 500 g prawns and rest are plastic waste from the nearby households. If such issues are addressed, we can revive the ecosystem as well as resource production.

32a) Sub project: Role of climate extremes on ecosystem functioning with special emphasis on fisheries and mariculture (FEM/HBT/SUB/27) - Dr. V. Kripa (DPI)

Dr. Jayasankar asked whether the farmers are aware of salinity drop in mussel farms ie., to 15 ppt, there would be mortality and the stock has to be harvested immediately. He suggested to give some tips to them to monitor the salinity of the area. Dr. Kripa said that the study is in its initial phase and is based on simulated lab conditions. They have to confirm it with detailed studies.

Dr. Zacharia commented that how the project has come as a sub-project, when you consider the perspective and area of the study is wide and varied and should be a separate project.

Dr. Kripa replied that they had planned to have a separate project, but due to restriction on the number of projects, it was decided to make it a subproject of ecosystem management.

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33)Abatement of coastal pollution through bioremediation (FEM/PLN/28)-Dr. Reeta Jayasankar

Dr. Mohamed congratulated Dr. Reeta Jayasankar for getting a coastal industry data base. In all the stakeholder meetings with fishermen, they talk about coastal pollution and if we can tell the source of pollution (hot spots) in the form a map it would be very useful. He cautioned that we should be careful in categorising the industry and it would be beneficial if you can make an interactive map of industrial area with hotspots from where effluents are coming, like the litter map already prepared.

(Dr. Reeta Jayasankar)

Dr. Mohamed also requested classification on phyto-mining using *Eichhornia* and she replied that metals like zinc can be removed from the water and later it can be extracted from the plant.

33a) Assessment of coastal and marine pollution in selected maritime states of India (FEM/PLN/SUB/28)-Dr. P. S. Asha

Dr. Reeta Jayasankar enquired how oil-spill are being accounted and Dr. Asha replied that they are not collecting from the field, but have gathered information from the published works.
Dr. Mohamed suggested to make an oil-spill map to be put in the website.

(Action: Dr. P.S. Asha)

34) Marine Macrophytes in India-Resources dynamics & Ecosystem services (FEM/MPH/29) - Dr. P. Kaladharan

Dr. Mohamed asked how the meat and milk quality of the goats will be assessed. Dr.Kaladharan replied that by monitoring the milk output from the goats and conducting 'meat-taste' feasts quality will be compared.
Dr. Mohamed also pointed out that eggs shown in the presentation is not cuttlefish eggs but it is squid eggs and Dr. Kaladharan agreed to correct the same.
Dr. Ramachandran wanted to raise a general question that making advisories for micro-management is a novel objective however, if a parliamentary question comes to us asking the impact of pollution in coastal areas and the resources etc., do we have enough database to answer. Secondly, he also felt that our role is to support statutory national and state level bodies like Pollution Control Board etc. where they have research gaps and we have to check in such areas.
Dr. Kripa informed that the Division is now trying to come out with a map indicating the different type of pollutants entering the system by various industries which is not available so far. But we do not have the facility to identify the chemicals which are responsible for the mortality of the fishes/coastal pollution.
Dr. Reeta Jayasankar suggested to have collaboration with pollution control boards of respective states, so that duplication of work can be avoided and utilise the facilities they have by sharing our technical manpower.

HoD Presentation -Dr. K.K. Joshi, MBD

35) Developing Conservation Plan for Biologically Sensitive Areas along the Indian coast (MBD/CNS/30) - Dr. K. Vinod

Dr. Mohamed commented that he felt that the project was covering too many sites and it may be narrowed down. However, in the meantime information from the project should not get into the hands of environmentalists as their criteria does not take into account human habitation, fishing grounds etc. If Ministry of Environment gets an idea that these are vulnerable areas, it will

create a risky situation. So he advised, to prioritize them giving ranking/weightage, otherwise these will lead to wrong conclusions.

36) Assessment of resilience potential of coral reefs (MBD/CRL/31)- Dr. K. R. Sreenath

Dr. Grinson appreciated the presentation, however he pointed out that being a scientific forum the survey report must include more data and trends, such as live coral reef decreased or increased, status, transect results etc. Further added that the impact of Ockhi is also important and that also could have been discussed. Dr. Sreenath explained the difficulties he faced with transforming the data as there was delay in the start of the project. He promised that next IRC these would be rectified and more data can be presented.

Director asked about causative agent of pink coral disease and Dr. Sobhana answered that they could not prove etiological agents from the Koch's postulates in the challenge studies conducted from these corals. Even the sample collection was difficult from massive corals. Exact pink line samples could not be obtained and samples collected from near-shore areas are isolated with different *Vibrio* spp. To prove the exact reason is difficult, as manifestation of parasitic and cyanobacterial infestations also give colour variation and in publications also it is reported as syndrome only.

Dr. Sivadas opined that we have to study systematically the coral degradations and also essential to look into the depth wise changes in the coral ecosystem. Dr. Sreenath informed that they are following standard methods like NOAA and there are 62 indicators, out of that only 11 indicators are considered in the present study. Dr. Mohamed intervened and told that his presentation must have included more data and information rather than presenting loosely made statements.

Dr. Dineshbabu suggested to come out with management measures for fast degrading coral areas by the completion of 3 years of the project rather than waiting for 7 years to complete the project. Dr. Sreenath replied that project is planning to come out with management plan for Lakshadweep area and that would be submitted to the Forest Department of Lakshadweep.

37) Investigations on the Scyphozoan and Cubozoan jellyfishes diversity and distribution along the Indian coast (MBD/JLY/32) -Dr. R. Saravanan

Dr. Zacharia queried whether the Jelly fish abundance is increased along our coasts, if so, which are the species and reason for its increase. He told that it is a debatable issue globally. We really do not know whether the swarming is increasing or decreasing. Dr. Saravanan explained that though earliest records on jellyfishes in India were from 1927, we still not have sufficient data regarding swarming. It has been noticed that *Acromitus flagellatus* forms huge swarms within 5 km of inshore waters. Also *Margavia stellata* is a resident along the coasts forming swarms. We do not have a data set like other countries, citing the example of Japan, who have dataset from 1940. Reports are there that swarming increases with increase in SST. During the Indian summer

also when salinity and temperature rise there is increased swarming. Reconnaissance survey was the methodology used to detect swarms abroad. We have to device our own methodology.

Dr. Grinson asked how the quantity is assessed and any approximate estimation is available. Dr. Saravanan said that estimation is difficult, methodology is to be standardized. For example, jelly fishery along Visakhapatnam is about 600 t/ season (30-40 days) that also oral arm is only processed that forms 30% of the total weight.

Dr. G. Maheswarudu said that experimental trawls could be conducted to assess swarming. He asked whether jellyfish scare fishes or were predators.

Dr. Saravanan replied that jellyfish were "nuisance biodiversity". Some fishes were medusivores while some jellyfishes were piscivorous.

Dr. Mohamed remarked that previously FRAD was collecting landing data for jellyfish and that there was an export market to Southeast Asia. He said that jellyfish were future food and suggested to contribute the data collected in the project with FRAD database and also to assist them in identifying the species.

(Action: Dr. R. Saravanan)

Externally Funded Projects

1) Advanced Phytoplankton Cultivation Method for Hatchery method for hatchery feed with special emphasis on mussel seed production (KSCSTE)-Dr. M. K. Anil

Smt. Surya, S. presented on behalf of Dr. M. K. Anil.

A discussion on the design of the raceway for phytoplankton culture was held in which **Dr. Reeta Jayasankar** pointed out that in raceways of international standard, depth is an important factor and in that raceways with more depth paddle wheels were provided. Dr. Mohamed commented that since the depth of the present raceway was shallow, this was not a requirement.

2) Enhancing production of farmed silver pompano (*Trachimotus blochii)* through the establishment of broodbank, hatcheries, nursery units and farms at selected locations (NFDB) - Dr. M. K. Anil

Dr. B. Santhosh presented on behalf of Dr. M. K. Anil.

No discussion

07/06/18 (Day-4)

3) Piloting and upscaling of Pan India Fisher Mobile Application in Karnataka (MSSRF)-Dr. R. Prathibha Rohit

The discussion on the PAN India Fisher Mobile Application was led by **Dr. K.K. Joshi** who requested the comments of Dr. V.V. Singh who was a co-developer of the m-Krishi Application.

Dr. Singh opined that the major issue was the increased consumption of data by this application. He felt there was increased data load on the mobile and also this application could be jointly

upscaled with mKrishi. Dr. Prathibha mentioned that one of the major constraints was that there was limited signal range for the device, as a result of which multiday fishing operations could not use the application properly once they go beyond a certain distance.

Dr. Sathianandan sought to know the difference between this application and mKrishi. Dr. Prathibha said that this could be downloaded and used by anyone with a smart phone. 15 options were available in 10 languages.

Dr. Mohamed commented that apart from TCS, Reliance Company was also active in this field. Reliance gives message facility so fishermen those who are not well verse with smart phone usage can easily get messages in their mobile phone.

Dr. Mohamed sought to know why all the comments in the presentation quoted owners of vessels and not the fishers. Dr. Prathibha replied that owners maintained the devices as it could not be taken on board as it may get wet. The owners would transmit the information to their fishers. She said that the disaster alert system would work even if the fishers were far out at sea.

4) National Initiative on Climate Resilient Agriculture (NICRA)-Dr. P. U. Zacharia

Discussion on the objectives of NICRA was held and it was felt that some repetition was occurring with FEMD work especially in Blue Carbon estimation etc. which may be sorted out separately. It was felt that the permission of HODs is necessary before including scientists in projects like NICRA.

5) Global learning for local solution: Reducing vulnerability of marine dependent coastal communities (Belmont Forum through MOES)-Dr. A. Gopalakrishnan

Dr. Shyam S. Salim, presented on behalf of Dr. A. Gopalakrishnan.

Dr. M. Sivadas wanted to know details of the suggestion for migration of fishers to agriculture practices. He said that in Tamil Nadu there is limited land available for such migrants. The occupation of fisheries included simple harvesting techniques and only related inputs, whereas, in agriculture there was a need to own land, procure seed and have the means to run the agriculture occupation. In this scenario, how will be possible to attract fishers to land agriculture? Dr. Shyam Salim admitted that such detailed thought had not been applied to the problem. He suggested that fishers could take up allied agricultural activity such as seaweed farming wherein the inputs would be less intensive. He said that the recommendations were made from studies in area such as Ramanathapuram where land was available for agriculture.

Dr. Kalidas added that there were many schemes for attracting fishers to agriculture such as free goat and poultry distribution schemes.

6) Outreach activity on fish genetics stocks (ICAR- Outreach)-Dr. A. Gopalakrishnan

Dr. P. Vijayagopal, presented on behalf of Dr. A. Gopalakrishnan.

Dr. P. Jayasankar led the discussion by pointing out that there was confusion regarding gonochorism and hermaphroditism. He said that it was easy to mistake fat tissue with testis. He cited the example of the Chinese, who had reported *Lutjanus* as hermaphrodites, whereas we

claim it to be gonochoristic. **The Director** defended the work done by stating that histological examination was carried out thoroughly in all through detailed histology, which produced confirmed results. He said that a paper was under preparation.

Dr. Reeta Jayasankar wanted to know that since this was an outreach project what part of it was reaching the farmers. Dr. Vijayagopal stated that "outreach" does not take that connotation and that it was meant for undertaking work which could not be included in in-house projects. The Director clarified that, if all research work for outreach to farmers in the basic sense then the very existence of Institutes such as NBFGR could be questioned. He said that in this project we were undertaking research, which could not be done by institutes under their routine activities. In this approach such activities as stock characterisation of species was mandated.

7) Impact Vulnerability and Adaptation Strategies for marine fisheries of India - (NATCOM)- Dr. A. Gopalakrishnan

Dr. Grinson George presented on behalf of Dr. A. Gopalakrishnan.

Dr. Joshi queried whether the ultimate model of predictions for 2020, 2050, 2080 scenarios were through statistical packages. Dr. Grinson replied it was through models based on existing knowledge for the predictions.

Dr. Reeta Jayasankar wanted to know what the best scenario with regard to temperature increase was for the next 30 years. Dr. Grinson replied that in the next 30 years there would be less than 1°C increase in temperature as per predictions.

Dr. Reeta also wanted to know why there were good catches of pelagics where chlorophyll or primary production is low. Dr. Grinson replied that there were many forcing factors for the catches of pelagics other than primary production.

Dr. Ramachandran wanted to know whether the models where reductionist or synthetic. He felt that there was a dynamic interplay of many factors, all of which needed to be considered. Dr. Grinson replied that these were not single value based predictions and that an integrated approach was being applied.

8) Derivations and characterization of embryonic stem (ES) cell lines from the marine ornamental maroon clown fish *Premnas biaculeatus* and induced pluripotent stem (iPS) cell lines from the humpback grouper *Chromileptes altivelis*. (DBT) - Dr. K. S. Sobhana

No discussion

9) Remote sensing & GIS for ecosystem based marine living resources management (SAC)-Dr. A. P. Dineshbabu

Dr. M. Sivadas expressed doubt about the veracity of log-sheets supplied by fishers, whether there is any mechanism to check this. Dr. Dineshbabu replied that cross-checking was very simple, since the speed of the boat is known and the distance covered could hence be calculated.

Dr. Sivadas clarified that it was not just positional log-sheets, which had to be validated but also the catch reported by them. Also regarding positional log-sheet, it could not be verified whether the distance covered was parallel to coast or perpendicular to it. Dr. Dineshbabu reiterated that

cross-checking could be done since the fishers usually fished in a group and the log-sheet provided by all boats in the group could be cross checked.

Dr. Mohamed felt that once AIS/ VMS Systems were installed in the boats much more clarity could come into the issue.

Dr. Mini pointed out that in this project result, parameter coefficient between chlorophyll and SST showed very high correlation, at more 80%, and whether this was correct? Dr. Dineshbabu replied that the results were calculated by the Geo Statistical Team which included SAC members and a scholar from CMFRI and told that results would be verified.

10) Modelling biogeochemical cycles in coastal oceans (SAC)-Dr. Vinayakumar Vase

Dr. Reeta Jayasankar questioned why the absorbance above 560 nanometer was not been measured as chlorophyll has two maximum absorption spectra. Dr. Vase replied that this limitation was because measurement methodology was already predetermined and they were working with an inbuilt algorithm.

Dr. Reeta Jayasankar also questioned why they were concentrating only on Chlorophyll-a. Dr. V. V. Singh observed there were limitations with satellite data as bandwidth was decided before the launch of the satellite and was specified after taking the opinion of experts for designing the satellite. It would also depend upon the positioning of the satellite and that there were several limitations while deciding on multi use sensors. Dr. Mohamed observed that satellite based measurements always have limitations.

Dr. Amir Kumar Samal raised a query about the P:N ratio and questioned whether at high concentrations they could be termed as limiting factors for phytoplankton growth? Was it possible to determine what the limiting nutrient was? Dr. Vase replied that the ratio of P:N was important and may be the determining factor.

Dr. Saravanan wanted to know whether any *in situ* studies had been done to confirm the areas marked our as phosphate limited areas according to the red field ratio. Dr. Vase confirmed that it was through *in situ* studies that these results were obtained.

Dr. Bindu Sulochanan commented that Carbon, Nitrogen and Phosphate were interlinked and had definite ratio. In coastal waters phosphate is abundant due to anthropogenic activities and carbon content due to plankton is diverse and dynamic. In coastal waters the values were always dynamic and there is no definite system.

Dr. P. P. Suresh Babu observed that R^2 value was less than 0.5 and queried what the lowest value could be for it to be significant. Dr. Vase clarified that in biological studies 0.5 was a significant value.

11) DBT sponsored National Training Programme on molecular biology and biotechnology for fisheries professionals (DBT)- Dr. P. Vijayagopal

Dr. Mohamed queried whether the project was closed. Dr. Vijayagopal replied that the number of participants in the project was very low and hence at the review meeting the project was brought to closure. Dr. Mohamed also enquired whether the budget of the project was fully utilized. Dr. Vijayagopal affirmed that it was so and that a lot of equipment had been purchased under this project.

12) National surveillance programme for aquatic animal diseases (NFDB)- Dr. N.K. Sanil

Dr. Muktha queried whether the mass mortality in Northern Kerala and that which was noticed in Central Kerala were linked. Dr. Sanil replied in affirmative and said that it was prevalent throughout Kerala.

Dr. Mohamed observed that in Mangalore and Ponnani no mortality was observed and asked for the reason. Dr. Sanil replied that it was due to sampling differences. He also observed that in Lakshadweep pathogen was not present whereas it was observed both in farmed and wild mussels in Kerala. Dr. Mohamed enquired whether there were any solutions for the farming community. Dr. Sanil replied that crop holidays can be suggested but did not know the efficacy of this. He said spread of the pathogens was rapid with *Perkinsus* detected earlier with it and now it is also detected in *Perna viridis.* Also it was originally detected in Kollam and now it was found all along Kerala.

Dr. Mohamed enquired whether there was cyclic nature to this and how it was in other places in the world. Dr. Sanil replied that when salinity and temperature were high there would be out-breaks everywhere as this is the nature of the parasite. Dr. Mohamed asked whether any anti-protozoan drug was available and whether the dipping the mussels at the seeding stage would be an effective treatment. Dr. Sanil replied that only limited success had been achieved under laboratory conditions. Dr. Mohamed opined that some farms trials can be initiated in this aspect and an entire farm could be treated with drugs at seeding stage. Dr. Sanil said that this aspect could be explored as the project was extended till September 2019.

(Action: Dr. N.K. Sanil)

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13) Consortia - research platform (CRP) on vaccines and diagnostics (ICAR)- Dr. N.K. Sanil

The Director enquired, whether there was any dialogue between Mandapam RC and Headquarters regarding vaccines. Dr. Sanil replied that recombinant DNA work was being done and he recommended that Dr. Rameshkumar from Mandapam RC can be included in the project, as it will be helpful in conducting field trials. Scientist-in-Charge, Mandapam Camp, agreed to include him.

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14) AINP - Fish Health (ICAR) - Dr. N.K. Sanil

The Director suggested that the full form of oxytetracyclin (OTC) should be mentioned somewhere in the beginning of the presentation. He added that it was a common suggestion for all presentations.

Dr. Anikuttan queried whether any attempt was made for OTC immersion studies instead of incorporating it in the feed. Dr.Sanil replied that we should know the changes precisely to estimate and the amount of antibiotic entered in the animal etc., even though some leaching would be there and hence incorporating in feed was opted for.

Dr. Anikuttan also asked whether it was feasible in hatchery tanks. Dr. Sanil replied that it was not advisable in open culture systems, and moreover many factors we have to consider like water hardness in immersion studies.

The Director enquired whether metronidazole was in the banned list and Dr. Sanil replied that though it was not in the banned list, it was not permitted; only OTC was permitted.

15) Molecular taxonomy and phylogeny of Cones (Cone snails) and Strombs (Mollusca, Gastropoda) of the Indian coast (DBT)-Dr. P. Laxmilatha

Dr. P. Jayasanker raised a query whether the genomics was done from the shell or the flesh of animals and whether tissues from dead animals were being used. Dr. Laxmilatha replied that all samples were live, freshly collected flesh from the locations and no samples were collected from landing centres.

Dr. P. Jayasankar also wanted to know how robust the database available in BOLD. Dr. Laxmilatha replied that there were several confusions but by and large the database was very good and that there was a strong international group working on strombs and conchs.

16) Bivalve farming (FIMSUL)-Dr. P. Laxmilatha

Dr. Sekar wanted to know whether the demand for clam and oyster meat for hatchery use was there in Chennai like in Andhra Pradesh for brood stock feeding. She told that actually these are mainly used for hatchery purpose only and local consumption is very little. Dr. Laxmilatha added that but in comparison there was higher demand for bivalves as compared to 10-15 years ago as there were many resorts now in Chennai and Pondicherry where bivalves are served on the menu though, this is for an elite clientele. A lot of promotion was required for the domestic market to pick up.

17) Genetic tagging of spawning populations of Indian oil sardine, *Sardinella longiceps* along south west coast of India using microsatellite markers (KSCSTE)-Dr. Sandhya Sukumaran

Dr. Laxmilatha enquired whether the samples were collected only from the west coast. Dr. Sandhya confirmed this, though in a study conducted in 2016, oil sardine spawners were collected from Cuddalore and in 2017 collected from Puri also. She appealed that she may be contacted if anyone could procure spawners from the east coast.

The Director opined that the number of samples per location could have been added. Dr. Sandhya replied that 100 samples were genotyped per location for genotyping of spawning populations.

Dr. Reeta Jayasankar suggested that the usage "southwest coast of India" should be changed to "east and west coasts of India" for the project.

18) Estimation of marine fish landings in Tamil Nadu with enhanced sampling coverage (FIMSUL) - Dr. J. Jayasankar

Dr. Mohamed felt that there was a mismatch between FIMSUL and FRAD data collected from the same location. He wanted to know whether this was because the FIMSUL staff lacked training. Dr. Jayasankar said that he was aware of this and the main difference was that the per boat catch reported by FIMSUL staff was low. Dr. Mohamed said that this is because FRAD staff are well

aware of the unloading methods of the catch, especially by multiday trawls though it may vary in each harbour. Dr. Jayasankar observed that the discrepancies were only with regard to the catch from mechanised trawlers.

Dr. Mohamed enquired whether this app was developed for phone or tab. Dr. Jayasankar replied that it could be used for both and was an android app. Dr. Mohamed further enquired if it would be linked to CMFRI tab. Dr. Jayasankar replied in negative and said that the server was to be handed over to the Fisheries Department. Dr. Mohamed questioned why the two were not compatible. Dr. Jayasankar replied that it was not a question of compatibility. We were obligated to develop an app and give it to the Fisheries Department. Dr. Mohamed felt that the two should be compatible especially since our tab is developed to be implemented on a national basis. Dr. Jayasankar replied that their requirement is slightly different from ours and hence the need to develop a different app. Dr. Mohamed said that in a single state there are going to be two systems. He felt that these should be compatible. He also felt that we should be in a position to dictate terms as the design and pattern of the tab was CMFRIs. Dr. Jayasankar replied that the CMFRI tab is much better funded and could not be compared. For the Rs 2 lakhs allotted to the FIMSUL product nothing better could be envisaged. The Director confirmed that at the higher level meetings held before taking up this project they were not willing to spare more money for development of tab.

Director wanted to know if the data generated by the FIMSUL app could be used in the CMFRI tab. Dr. Jayasankar replied that the data tables generated could be augmented by our tab. He said that our tab and app could not be given to FIMSUL. For the money that was made available by FIMSUL we could not use platforms beyond SQL Lite and Linux whereas in our tab ORACLE and R was used.

Director wanted to know if our app would be copyright protected. Dr Jayasankar replied that it should be. Dr. Mohamed enquired whether all states were to be involved for development of similar apps. Dr. Jayasankar opined that apps like FIMSUL will have more value than the CMFRI app since the CMFRI app was neither a full-fledged app nor available on-line.

Dr. K. R. Sreenath made a related suggestion that since CMFRI has now developed several apps it was time to start a Developer Account in Google Playstore to include them. This was confirmed as a good suggestion.

(Action: Dr. J. Jayasankar)

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19) AINP Mariculture (ICAR)- Dr. Boby Ignatius

No discussion

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20) Nutrient profiling and evaluation of fish as a dietary component (ICAR Outreach) - Dr. Kajal Chakraborty

A discussion was held on the role of the ink sac of cuttlefishes in cadmium contamination of tissue.

Dr. P. Jayasankar queried whether the cadmium content of tissue would be different when the ink sac is intact and when it is broken. Dr. Chakraborty replied that such studies were limited and not done presently. Dr. Jayasankar recommended that it be done.

Dr. Mohamed cautioned that the PHT Division of ICAR-CIFT was also trying to resolve the matter and there are chances for a clash of interests. He felt that the biochemical pathways etc. could be worked out but we should stop making any recommendation.

Dr. Akhilesh commented that the EU was on the verge of banning cephalopod meat from India due to its high cadmium content. Dr. Asokan enquired about the source of the cadmium. Dr. Chakraborty replied that cadmium was absorbed from surrounding seawater. He said that the metallothioneins had a high affinity for cadmium. Rupture of the ink gland during post-harvest handling caused the ink containing the cadmium to be soaked into the tissue.

Dr. Vijaygopal felt that there should not be any conflict of interest with ICAR-CIFT as it was already decided at SMD level that ICAR-CMFRI would work on cephalopods. Dr. Chakraborty affirmed this. Chairperson informed that for all AINP projects there was going to be a rigorous screening by the Council and the PIs should be prepared for this.

Shri. M. Koya expressed the doubt whether the rupture or release of ink was taking place during post-harvest handling. He opined that trawling itself was stressful to the cuttlefish which would release the ink at the time of being fished and hence very little could be done about contaminating with ink. Dr. Mohamed refuted this angle saying that ink secretion was a defense mechanism employed by the animal to escape predators. He reiterated that it was a post-harvest handling problem with the breaking of the ink sac taking place at the time of packing. He felt it is possible to remove the ink sac on board after the catch is hauled. He also said that there was commercial demand for the ink.

Dr. Asokan observed that cuttlefish ink was a medicine used by homeopathy practitioners. He felt that the practice of fishers to soak the cephalopods after landing to increase weight resulted in the ink leaching into the tissue.

21) CRP Health Foods: Development of nutraceutical supplements from molluscs, marine algae and shrimps (ICAR) - Dr. Kajal Chakraborty

No discussion

22) Development of small molecular weight angiotensin II converting enzyme inhabitors from marine organisms (DBT) - Dr. Kajal Chakraborty

No discussion

23) ICAR Mega seed Project – Dr. K. Madhu

Dr. Mohamed raised a doubt regarding the status of this project. Dr. Boby Ignatius, SIC PME cleared the doubt and said that the project was not closed.

24) A model for primary production in the Indian coastal waters (DST)- Dr. Grinson George

Dr. Reeta Jaysankar enquired on the impact of downwelling on production. Dr. Grinson replied that generally downwelling caused low productivity though severe downwelling could produce a nutricline leading to increased nutrients. Dr. Sivadas sought a reply to how low productivity during

August to October could sustain sardine juveniles. Dr. Grinson replied that the answer was not known. He suggested that there could always be a minimum threshold of productivity which would sustain the juveniles during the downwelling phases. Dr. Reeta Jayasankar enquired as to how the productivity studies are being done. Dr. George replied that it was being studied only through modelling. Dr. Reeta said that *in situ* studies were required and that it could be done with the involvement of an FEMD scientist.

Dr. Vijayakumaran stated that east coast was being left out, this being a very interesting area for such studies and particularly good for modelling. Wind driven upwelling off Odisha caused good upwelling there. He requested Dr. Grinson to concentrate on the east coast also. Dr. Grinson stated that studies were concentrated on the west coast at present as a well-defined oceanography was available for the Arabian Sea as compared to the complex oceanography of the east coast. He said that the attempt was to come up with a model for the west coast which could be then augmented for the east coast also. Dr. Sandhya Sukumaran wanted to know whether and where eddies were located and if larval retention was taking place. Dr. Grinson said that large scale mesoscale eddies were located in the southwest coast. These eddies could become permanent and translate into potential fishing zones. Dr Sandhya said that it would be good if correlation between eddies and larval abundance is studied since larval retention will cause stock structure changes in pelagic fishes. Dr Grinson said that he was willing to share the data with Dr. Sandhya.

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25) Biodiversity and valuation of ecosystem services of the Kadalundi - Vallikunnu Community Reserve, Kerala, India (KSBB) - Dr. K. Vinod

Dr. Reeta Jaysankar commented that fish seed exploitation was a banned activity and should not be shown. The suggestion was accepted.

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26) Enhancing production of farmed cobia (*Rachycentron canadum)* through the establishment of broodbank, hatcheries, nursery units and farms at selected locations (NFDB)-Dr. A. K. Abdul Nazar

Dr. Kripa enquired whether feeding was automated in the hatchery. Dr. Nazar replied that it was manual. As there was manual labour available at present and the operations were not on a very large scale, manual feeding was suitable. Also behavior of the broodstock was to be considered for feeding. Automation could be recommended for grow out systems and fingerling stage. He said that automation could be resorted to if operations were stepped up.

27) Identification, forecasting and monitoring of potential fishing zone for Tamilnadu coastal and offshore waters (SAMUDRA TDP R&D) SAC-ISRO (SAC-ISRO)-Dr. Shoba Joe Kizhakudan

Dr. Mohamed enquired about the role of SAC in producing PFZs. He said that for the past 15-20 years INCOIS used to fund the prediction of PFZs and that it was only now that SAC is coming into picture. Dr. Grinson observed that the PFZs were first conceived by SAC and the technology transferred to INCOIS which now gives realtime data. Now SAC again predicts PFZs. Dr. Mohamed said that initially SAC may have developed this but NRSA was then doing this activity which was

later given to INCOIS. Now it is given back to SAC. All should be aware of the changes. Dr. Sathianandan informed that this project was meant for improving the already existing algorithms. This matter was discussed during the inception of the project.

Krishi Vigyan Kendra - Dr. Shinoj Subramaniam

Dr. Reeta Jayasankar enquired whether any technology was being given by KVK for terrace gardening. Dr. Shinoj replied that KVK was promoting terrace gardening through appropriate technology recently a farmer in Palluruthy had produced 5000 mangoes from terrace garden following KVK advice.

Dr. Reeta asked whether technology for floriculture in particular orchids was being promoted. Dr. Shinoj said that this area was not focused on so far, but could be taken up.

Dr. Ramachandran wanted to know what the level of demand was for fishery related agencies in the Districts. Dr. Shinoj replied that since this KVK was specialised in fisheries, receive lot of queries from such agencies. Even at National level all queries regarding fisheries are directed to KVK, CMFRI at the District level there was good collaboration with agencies such as ADAK for technology backstopping.

HRD Cell -Dr. Boby Ignatius

Dr. P. Jayasankar who wanted to know whether any specialized in-house training was given to Skilled Support Staff and whether they were sent on tour to various research centres. He said that many were highly educated and the potential needs to be utilized. Dr. Boby Ignatius said that HRD Training has been given to Skilled Support Staff.

Dr. Mohamed enquired, whether internship or volunteer programme can be started. Dr. Boby replied 3 months training was available @ Rs.10000/- per training. Dr. Mohamed said that short term work could be undertaken by interns, however, we should pay them as is done in all other branches of education. The Director said that this could not be done without the permission of ICAR. The matter had been discussed in Director's meeting and was not agreed upon as in other Institutes there have been instances of data theft etc. Dr. Vijayagopal also endorsed this and said that the Audit objections would come. Dr. Mohamed observed that if we wanted it, it could be accomplished as the advantages are several. There was high demand among the student fraternity and would result in the growth of the Institute. He said that this was only a suggestion and it was upto the Director to implement.

The Director enquired about the budget of the HRD. Dr. Boby replied that it was 10 lakhs. He committed that next year onwards budget and revenue also would be presented.

Dr. R. Narayanakumar said that the Scientists should fill up the ICAR-ERP immediately after publications were made, training or meetings attended. Dr. Mohamed agreed to take this up as an action point.

(Action: All Scientists)

Library- Smt. Geetha

Director informed that former Director, Dr. E. G. Silas had passed away before signing an MoU with CMFRI for his book collection. Those of his books not handed over to RGCA were to be

handed over the CMFRI, the first lot of which have already arrived. There were almost 1300 books of which 3/4thcataloguing had already been done by Dr. Silas.

Dr. Reeta Jayasankar asked whether the Library was preserving regional news clippings. The Director told that whatever received by the Director, CMFRI, was being sent to the Library. He encouraged all to submit such items.

Dr. Reeta Jayasankar observed that at present there were no default charges in the Library and people were keeping books for years together. Dr. Mohamed suggested that there should be high charges fixed for defaulters so that books are returned in time.

Dr. Sreenath suggested that exploratory works can be translated for the public. Ideas could be collected and publicized. He suggested that an agency could be contacted for helping scientists write articles and research papers as is done abroad. Dr. Mohamed felt this is a racket. The Director said that salient observations on CMFRI research work were already published on the website.

Dr. Zacharia observed that the world ranking of the e-prints repository is going down. The librarian explained that in 2016 Cybermatrix has stopped the practice of making world ranks. Dr. Mohamed observed that he could not access the repository from abroad recently. Many foreigners have also expressed difficulty. He also said that the search engine requires to be fine-tuned as any search given brings up a lot of irrelevant information. He also said that research updates were not being updated. This was done regularly when Shri Mohan was serving at Headquarters. The Director said that Dr. K. S. Sobhana would look into these matters. 1004 additions were made this year. He observed that citations of scientific papers in journals were important. In areas such as fisheries the publications were few and far between and not cited very often.

Dr. Shyam Salim told that users' statistics are not updated. The librarian said that the statistics are being rectified. Dr. Saravanan, said that in the e-prints content policy required rectification as a principal languages were cited as only English and Malayalam. The Director said that it needs to be corrected for all Indian languages. The Director informed that ICAR wanted to have a single database, but this was strongly opposed by CMFRI as e-prints was very visible. He said that such an exercise would not be at the cost of e-prints CMFRI.

Dr. Rekha Nair wanted to know the reason for password protection for papers in e-prints and why restriction is necessary when access from intranet. The Director asked Dr. J. Jayasankar to comment. Dr. Jayasankar said that the intranet can be accessed publicly at present. If any VPN type of logging is required, it will be for intranet users only. Shri. Manjeesh said that this was true as e-prints had a public IP, whereas the GPF link had a local IP. And hence, password protection of papers is required in the current situation.

Estate & Maintenance Cell –Shri. N. Viswanathan

Director informed that Dr. Madhu and Dr. Rema Madhu were the main forces behind developing a separate road to KVK. They were applauded for the same.

Dr. V. V. Singh informed that the roof in Mumbai RC is leaking and how this problem can be solved. He asked whether any money allocated for this under minor repairs head. The Director observed that prior approval for such matters should be taken without waiting for the last minute. Shri Viswanathan said that the building is very old and this is a routine work.

Dr. Shyam Salim raised the issue of rewiring for the fourth floor. Shri Viswanthan assured that already provision is made for rectification.
Dr. Kripa raised the issue of solid waste management, as at present there is no proper mechanism for disposal of fish and other waste, for which some provision has to be made. The Director said that this should be taken up as an action point.

(Action: Shri. N. Viswanathan)

Dr. Divu Damodaran said that in Veraval RC the roof as well as false ceiling was falling down. He said that the DG had asked him to give a letter during his visit in this regard. Shri. Viswanathan said that the roof had been heavily damaged during the earthquake. Estimates had already been submitted and the matter will be taken care.
Dr. Reeta Jayasankar raised the issue of chemical's smell from the third floor in filtrating the second floor. Dr. Vijayagopal said that it was seepage from the toilet that was causing the problem and not chemicals from the laboratory. Shri. Viswanathan said that the problem was not from the toilets but leakage from concealed drain pipes from the laboratory. He said the matter is being look into.
Dr. Mohamed asked for clarity in this matter. Shri. Viswanathan admitted that the problem was from the concealed drain pipes from the laboratory. Dr. Mohamed remarked that the matter should be solved in two months' time and he agreed.

(Action: Shri. N. Viswanathan)

Dr. Zacharia informed that there is acute space crunch on the fourth floor and there is no room for keeping equipment purchased under NICRA. Shri. Viswanathan said that the matter should be settled by the Room Allotment Committee and could be taken up by the 24th GBM.

PME-Cell – Dr. Boby Ignatius

Director remarked that there would be external evaluation of RPPs in future. Dr. Narayanakumar said that after empanelment of a Committee this would be taken up.
Dr. P. Jayasankar, clarified that with regard to usage of Co-PIs' and Adjuncts the only difference is the matter of terminology and Dr. Boby Ignatius agreed on that.
The Director remarked that the in the case of publications, research scholars could be first authors of research papers, however, the corresponding author should be a permanent employee of the Institute.

RFD-HYPM – Dr. R. Narayanakumar

Dr. Shyam Salim remarked that HYPM is an unnecessary exercise and **Smt. Muktha** added that it was very difficult to enter a Co-PI's name. Dr. Narayanakumar, intervened and stated that all have to first complete the PERMISNET then only could be reflected in HYPM.
Dr. Reeta Jayasankar suggested that there should be only one annual target submission. She felt that HYPM was burdening the scientists.
The Director remarked that IASRI was finding complainers as defaulters. The Secretary IRC suggested that the ARS forum should take up the issue. Dr. K. G. Mini, Principal Scientist suggested that at least one person from the Administration should be dedicated to help with the upkeep of the 3 databases. The Director agreed this should be an action point. He said that one

Skilled Support Staff can be trained and kept exclusively for this purpose. Dr. K. G. Mini said that the PERMISNET is an everyday activity and that scientists were overloaded with filling it up. Dr. Mohamed said that the ARS forum should take up the issue.

(Action: Director)

Vessel Maintenance Cell - Dr. P. U. Zacharia

Dr. Shubhadeep Ghosh opined that separate funds were required for the vessel as it is difficult to manage from the Office funds. He said that dry docking of the vessels is long overdue and is urgently required. The Director asked him to forward the proposal immediately. He enquired about the berthing charges for CIFT & CMFRI and whether there was any waiver for the same. Matter would be taken up with DADHF. Dr. Ghosh said that payment was being made to the Visakhapatnam Port Trust at present. The Director asked him to explore options.

Dr. P. Jayasankar remarked that Nansen bottles are not available aboard FV Silver Pompano. He said that the water sampling is an important part of all research work. Dr. Zacharia said that a Rosette water sampler was to be procured for FV Silver Pompano. He said that twelve old Nansen bottles have been procured for the vessel from NIPHATT and that hereafter there would be no problem for sampling.

Dr. Madhu said that Coastal Police were calling him regarding FV Silver Pompano as and when our vessel moves in and out. He requested Dr. Zacharia to contact the Coastal Police regarding vessel movement. Dr. Zacharia said that this would be done after holding discussions with the skipper. The Director remarked that there should be recruitment of permanent crew for the vessel.

Concluding Remarks by the Chairperson, IRC

Chairperson thanked all the members especially the out station members for attending the meeting and for the healthy discussions held during the meeting. He is happy to note that in stock assessment part there was good debate and discussions and improved with the adopted latest techniques and methodologies. He emphasised that similar way mariculture and bio diversity aspects we have to criticize and analyse our own work, identify our minus points then only we can improve. He added that rather than confining to respective divisions must have more interdivisional discussions in the coming IRCs'. All of the scientists must know that why full participation is insisted during IRC. There was a suggestion that juniors have to attend only division IRC to reduce the financial burden. However, he felt that youngsters have to learn and develop an idea how the institute been working and in future they have to steer this prestigious organisation. He advised younger generation to have overall exposure, CMFRI scientists get rare opportunity to know about three main aspects of marine fisheries *i.e.,* marine harvest fisheries, mariculture and marine bio-diversity which is uncommon in other ICAR institutes, those mainly work on one-crop system. Many of you have expertise in your field of working, but remember that it is important to have overall idea about other subjects and areas, so full time participation during IRC is a must.

Director also commented on the presentations made during the meeting. Some of the presentations were good and some are not up to the expectations. Though it is an in-house gathering all of us should know how to condense our presentation covering objectives and with proper conclusion in given time frame. He pointed out that some of the presentations are with 70-80 slides, some others with raw data tables without any concrete conclusions and he instructed members to train themselves to avoid such shortcomings in future presentations.

Director has a strong feeling that we should have a separate group to analyse the immense data we have from 1947 onwards. If we separately analyse these historic data, definitely we can come out with very good publications and certainly which will help in the policy decisions.

He also suggested for a training on "how to take good quality photographs", to train ourselves to take the photographs of fishes and other resources. He told that most of the photographs submitted from the institute to SMD, ICAR is miserably in bad condition. So he suggested HRD-in-charge to arrange such a training in the coming year clubbed with some other meeting when SICs' and other scientists are coming at HQ, to save TA/DA.

(Action: Dr. Boby Ignatius, HRD-in-Charge)

He requested all the PIs', Co-PIs' and Adjuncts to improve their interactions and utilize the communication facilities of the institute – Skype/ Video conferencing/ phone call- then only regular progress can be achieved in our research. Same way HODs' and division scientists also should have regular such interactions.

(Action: All HoDs' & All PIs')

He reiterated the timely submission of RPP-I, II, III and HYPM. He instructed all PI's to submit the RPP-III in stipulated time. He told that all the Co-PIs & Adjuncts of Non- FRAD dependent projects

should submit the reports, RPP –II, to their respective PIs before RAC. All the Co-PI's and Adjuncts also should submit hard copies to the PIs' apart from the soft copies.

(Action: All PIs', Co-PIs' & Adjuncts)

For externally funded projects whenever you get a sanction order or when progress reports are made submit a copy of the same to PME.

(Action: All PIs' of Funded Projects)

Director reminded all the scientists to increase the number of publications, which will also help to increase the rating of the institute. The number of publications should be more than 200 nos./year.

Director thanked Shri. Mohamed Koya and Dr. Ramachandran for their efforts in taking over the KVK at Lakshadweep, which would be helpful to initiate mariculture activities at Lakshadweep.

Seaweed culture is getting importance, so he requested FEMD & Mariculture divisions to pay lot of attention on seaweed farming and IMTA activities.

Another important matter to develop mariculture activities in Gujarat, as it is Prime Minister's state special attention to be given and we have to focus and plan on mariculture activities for the state.

He told all the centres with TSP activities have to accomplish the given tasks/activities and timely expenditure of money.

He advised the junior scientists to learn from the seniors those who are 25-30 years' experience, as they may retire within few years' time. He requested the juniors to have more field experience rather sitting in front of the computer which would help to be stronger in the subject as well in getting new ideas.

He specially thanked Dr. V. V. Singh and Dr. K. Vijayakumaran as they are superannuating this year completing more than 30 years' service and 25th IRC is their last IRC.

Director concluded the remarks thanking Dr. K. S. Mohamed for the smooth conduct of IRC for the last four years.

Vote of Thanks by IRC Secretary

Dr. K. S Mohamed, Secretary, IRC thanked the Chairperson for all the support extended for the successful completion of the 25thIRC. He thanked the team of IRC Secretariat, the "silent team" lead by Dr. Josileen Jose and Dr. Miriam Paul Sreeram, recording the complete minutes of the entire proceedings. He thanked both Ms. K. Smitha and Smt. Bindu Sajeev and specially Smt. Bindu, for her relentless support for making IRC preparations in a wonderful way in stipulated time. He also thanked Shri. A. Padmanabha, Shri. Joseph Mathew & Shri. Biju George, for their sincere efforts for the hall and screen arrangements; Shri. R. Manjesh and Shri. V.K. Manu, for their assistance in presentations and Shri. M. Ratheesh, Shri. Akhil Babu and Shri. S. Pakkiri Muthu, for their assistance and support throughout the meeting. He whole heartedly thanked Chairperson, Canteen and Shri. Alloycious, P. S., and the entire team of food committee including the cleaning staff for serving delicious food for the entire IRC period.

Before concluding IRC secretary reminded the Chairperson that the venue for the IRC is not an ideal location for these kind of meetings and requested Chairperson, IRC that by next year a suitable venue should be ready.

He thanked all of the members once again for all the support and cooperation given to him and also for adhering to the timings. He also shared his happiness that most of the members are now learnt how to make brief presentation in short time. IRC Secretary wished all the members a safe journey back and reminded that this year's message is "keep interacting". With this, he declared the 25th IRC closed.

ANNEXURE-I

Sl. No	Name of the Scientist/s	Action points
		Part-A : Action points of 25th IRC
1	**Director**	Arrangement for suitable venue for the conduct of 26th IRC for accommodating all the IRC members conveniently.
2	**All HoDs'**	Conduct video conferencing for the division scientists frequently, at least once in three months to review the progress.
3	**All PIs' & All Scientists**	Timely submission of RPP-III and RPP-II & HYPM
4	**Dr.Boby Ignatius, PME-in-charge**	Updating the project titles and Project codes and finalisation of the list.
5	**All SIC's**	SICs' to identify one Scientist from respective centre for coordinating the FRAD survey.
6	**Dr. T.V. Sathianandan, HoD, FRAD**	Conduct a Workshop/Meeting within 2 months' time (before September 2018) by FRAD and capture fisheries Scientists to sort out all issues related with data collection.
7	**Dr.J. Jayasankar and Director**	Procurement of a "High performance computing facility" in ChloRIFFS project and Director has to sanction the purchase of the same.
8	**Dr. J. Jayasankar and Head, FRAD**	a. Make a data sharing policy for the ChloRIFFS project and issue official letters through Head. b. FRAD to include newly added Co-PIs and 'Project Adjuncts' especially from FEM Division.
9	**Dr. Shyam S. Salim**	Include Cultured fishes also in the project SEE/DCD/35 to know the consumption demand and to get better realization of the market price.
10	**Dr. Swathi Lekshmi P. S.**	Modify the title of the SEE/GEN/36 suitably as suggested by IRC Secretary.
11	**Dr. Prathibha Rohit**	Deposit otoliths of possible species of fishes at the CMFRI HQ museum for display.
12	**Dr. E.M. Abdussamad**	Develop scenario for large pelagics if trawling is banned totally.
13	**Dr. Shobha Joe Kizhakudan**	To conduct a training/ workshop for forest officials & coast guard authorities for the identification of the ETP species in the project DEM/ELS/11.
14	**Dr. Dineshbabu, A. P**	Inclusion of few more objectives to the project, CFD/BPT/12, i.e., best scenarios for bottom trawl, pelagic trawl&, Bull Trawling.
15	**Dr. P.T. Sarada**	Consolidation of data with details of breeding period for major species of commercial prawns for both east and west coasts and publish the same at the earliest
16	**Dr. Gyanaranjan Dash & PME cell-in -charge**	Project "FMP for Northeast coast of India (CFD/NEC/05) would be operating from Digha centre and Dr. Gyanaranjan Dash is the PI of the project.
17	**Dr. Kripa, HoD, FEMD and Dr. M.K. Anil & Dr. Gomathi,**	Carry out sedimentation studies at Vizhinjam with regard to the project MFD/BIV/15, in collaboration with MFD team at Vizhinjam.

18	**Dr. I. Jagadis & HOD, FRAD**	a. Identify and allocate scientist/technical personnel for assisting the FRAD staff for the identification of the gastropods landed at important centres (MFD/GTR/16). b. To solve the shortage of survey staff at Mandapam area (with regard to Cephalopod and Gastropod landing)
19	**Dr. I. Jagadis**	To carry out estimation of fossilized chanks in the project (MFD/GTR/16).
20	**Dr. Joe K. Kizhakudan**	Carry out the work on impact of artificial reefs deployment (MDN/FAD/21) based on a statistical design.
21	**Dr. Reeta Jayasankar**	Prepare an interactive map showing the hotspots of coastal pollution. (FEM/PLN/28)
22	**Dr. P.S. Asha**	Prepare a map showing the areas of "Oil Spill" for uploading in CMFRI website (FEM/PLN/SUB/28).
23	**Mariculture team, Visakhapatinam**	Apply for patent for the copepod nauplii collection system/device developed at the centre.
24	**Dr. Imelda Joseph**	Posting Mariculture Scientist at Mumbai and Mangalore RCs' of CMFRI as requested by the SICs' of the centre.
25	**Smt. Shilta, M. T., MD**	Publish a paper on reproductive biology of *Acanthopagrus berda* in a good Fishery Biology journal as suggested by the Director.
26	**Dr. P. Vijayagopal & Team**	Convene a meeting to discuss on the growth performance of Silver Pompano, in the project MBT/NTM/24 with team members Dr. Linga Prabhu, Dr. Suresh Babu & Dr. Sekar and prepare work plan for the rest of the project period.
27	**Dr. R. Saravanan**	Contribute the data collected in the Jelly fish project MBD/JLY/32 with FRAD database and also to assist the FRAD staff in identifying the different species.
28	**Dr. N. K. Sanil**	Carry out trials in use of anti-protozoan drugs during seeding both in field and in the laboratory.
29	**Dr. J. Jayasankar & Dr. K. R. Sreenath**	Start a Developer Account in Google Play Store to include the different apps developed by CMFRI.
30	**All Scientists**	Scientists should fill up the ICAR-ERP immediately after publications were made, training or meetings attended.
31	**Shri. N. Viswanathan**	a. To develop a proper waste management system for the disposal of fish waste at the HQ. b. To rectify the problem of "chemical odour " due to leakage from concealed drain pipes from the laboratory, in few rooms in second floor at HQ
32	**Shri. N. Viswanathan**	Proper action to be taken to complete the repair and maintenance works at Mumbai and Veraval RCs'.
33	**Dr. Boby Ignatius, HRD-in-Charge**	Arrange a training on "how to take good quality photographs", to train scientists to enable them to produce/improve the quality of photographs of resources taken for scientific purpose.
34	**All PIs' of Funded Projects**	Whenever externally funded projects get a sanction order or when progress reports or any other important documents are made, submit a copy of the same to PME.
		Part-B : Action points continuing from 24th IRC
1	**Director**	Arrangement for suitable venue for the conduct of 25th IRC for accommodating all the IRC members conveniently (Item: no.1)
2	**HoD, FRAD**	A meeting to be convened to address the issues related with FRAD data collection including hiring contractual staff at different centres (Item: no.2)

3	**Capture Fisheries Division HoDs – DFD,PFD,CFD,MFD & HoD, FRAD**	A meeting should be arranged to discuss the issues related with landing of catches in different states other than from fished state and work out possible ways to minimize the errors while estimating the catch from respective states (it can be clubbed with the FRAD meeting/workshop (Item: no.4)
4	**Dr. C. Ramachandran**	Reframe the short film on responsible fisheries to one or two minutes giving emphasis on the judicious use of fishing gears for telecasting on national channels/ popular channels (Item: no.5).
5	**Dr. M. Sivadas**	Conduct Fisheries meets at different places with Commissioner of Fisheries, Tamil Nadu and stakeholders in connection with the implementation of proposals given in policy guidance of Palk Bay and Tamil Nadu before next IRC meeting (Item: no.7a)
6	**SIC, PME Cell**	a. Formulate dynamic database system for Institute/externally funded projects (Item: no.8b) – Partially done. b. Regularise the Video Conferencing and also include Digha Centre. (Item: no.8c)
7	**Dr. I. Jagadis**	Carry out mapping of the gastropod beds/grounds in the project MF/GAST/13. (Item: no.9)
8	**HoD, Mariculture & team**	Submission of Mariculture policy guidelines to Govt. of India before the next IRC. (Item: no.14)
9	**Smt. M. Muktha**	Re-working the Resource Assessment Framework based on CMFRI-estimated vulnerabilities(Item: no.19b)
10	**Dr. K. Madhu**	Explore the possibilities to include sale of mussel seeds and agriculture crops in the ICAR revolving fund (Item: no.20)
11	**Shri N. Viswanathan**	Proposal to install on of Solar Power Units of CMFRI, HQ (Item: no.23).
12	**Smt. Muktha, Dr. Rekha J. Nair, Dr. Somy Kuriakose, Dr. Lakshmi Pillai and Dr. U. Ganga**	Modify the Resource Assessment Framework Methodology, using the vulnerability criteria developed earlier by CMFRI team under the leadership of Dr. E. Vivekanandan (Item: no.29).
13	**Dr. Joe K. Kizhakudan & HOD, MD**	Formation of a new team for lobster culture at Chennai for furthering the work and regularly monitoring the progress (Item: no.30)- Partially fulfilled.

ANNEXURE - II

Scientists & Technical Personnel to be included/excluded as Co-Principal Investigators/Project Adjuncts APPROVED BY 25th IRC (As recommended by HODs'/SICs')

Sl. No	Name of project	PI	To be Included	To be Excluded
1	Resource assessment and management framework for sustaining marine fisheries of Karnataka and Goa (PEL/RMS/03)	Dr. Prathibha Rohit	Shri. U. Jayaram, Technical Officer, CMFRI, Mangalore	
2	National Fishery Management Framework for Large Pelagic Resource (PEL/LPR/04)	Dr. E. M. Abdussamad	Shri Manas K.M.,Scientist, Vizag, (Co-PI)	
3	Resource Assessment and Management framework for sustaining Marine Fisheries of Tamilnadu and Puducherry (DEM/RMS/08)	Dr. M. Sivadas		Shri. Rajan Kumar & Smt.Shikha Rahangdale, Scientists, Veraval & Dr. I. Jagadis, PS, Tuticorin.
4	Resource Assessment and Management framework for Sustaining Marine Fisheries of Kerala (DEM/RMS/07)	Dr. T. M. Najmudeen	Shri V.A. Leslie, Sr. Technical Officer, MBTD, Vizhinjam RC	Shri. Subal Kumar Roul Scientist, Puri FC of CMFRI.
5	Resource Assessment and Management framework for sustaining Marine Fisheries of Andhra Pradesh (DEM/RMS/10)	Smt. M. Muktha	Shri. Manas K.M. Scientist, Vizag, & Dr. Eldho Varghese, Scientist, Kochi (Co-PIs')	Dr.Vivekanand Bharati, Scientist, Kochi
6	Developing management strategies for sustainable exploitation and conservation of elasmobranchs in Indian seas (DEM/ELS/11)	Dr. Shoba Joe Kizhakudan	Smt. Shikha Rahangdale, Scientist, Veraval & Shri. Subal Kumar Roul, Scientist, Puri FC of CMFRI (Co-PIs').	
7	Development of guidelines for "Best practices" for trawl fishery in India (CFD/BPT/12)	Dr. A.P. Dineshbabu	Shri. Subal Kumar Roul, Scientist, Puri, & Dr. S. S. Raju, PS, Vizag (Adjuncts). Shri. U. Jayaram, Technical officer, CMFRI, Mangalore.	
8	Implications of recruitment Dynamics and spatio-temporal stock assessment of marine prawns of India for fisheries management (CFD/REC/14)	Dr. P.T. Sarada		Shri. U. Jayaram, Technical Officer.
9	Assessment of ornamental gastropod fisheries and studies on the shell craft industry in India (MFD/GTR/16)	Dr. I. Jagadis		Shri. Rajesh Kumar Pradhan, Scientist (Co-PI)
10	Popularizing Eco-friendly Molluscan Farming Strategies (MFD/MOL/17)	Dr. P. K. Asokan	Shri. Karamathulla Sahib (Sr. Tech), Mangalore.	Shri. Sampath kumar (T-3) (Retired)

11	Resource Assessment and Management framework (FMPs) for the bivalve fisheries of India (MFD/BIV/15)	Dr. Geetha Sasikumar	Shri. Rajesh Kumar Pradhan, Scientist (Co-PI)	
12	Development of hatchery technologies for prioritized species in mariculture (MDN/HCY/18)	Dr. A. K. Abdul Nazar		Dr. Imelda Joseph, PS, Kochi.
13	Innovations in Sea cage farming & coastal mariculture (MDN/CGE/19)	Dr. Imelda Joseph	Smt. Gomathi, P., Scientist, Vizhinjam (Adjunct) Shri. Raghu Ramudu & Smt. Saloni Shivam, Scientists, Karwar (to continue)	
14	Analysis of reproductive characteristics of selected potential species for mariculture (MDN/REP/20)	Dr. Imelda Joseph	Dr. Shoji Joseph, PS (PI) & Dr. Imelda Joseph, PS (Co-PI) and Dr. Jayasree Loka, PS, Karwar, Dr. M. Sakthivel, Scientist & Dr. R. jeyakumar, SS, Mandapam Camp (Adjuncts)	Dr. Jayasree Loka, PS (Co-PI)
15	Assessing the performance of artificial reefs deployed along north Tamil Nadu coast (MDN/FAD/21)	Dr. Joe K Kizhakudan		Dr. P. Laxmilatha
16	Delineating the compensatory growth pattern in stunted fingerlings of marine finfishes for production enhancement (MDN/GRO/22)	Dr. Suresh Babu P P	Shri. A. Anuraj, Scientist, Karwar & Dr. Biji Xavier, Scientist, Vizag (Co-PIs)	
17	Environmental DNA (eDNA) Meta barcoding – based estimation of marine stocks (MBT/DNA/37)	Dr. P. Jayasankar	Dr. K.G. Mini, PS & Dr. M.A. Pradeep, Scientist (Co-PIs)	Dr. M. P. Paulton (Tech. Officer)
18	Biomineralization of mantle tissue from pearl producing molluscs (MBT/TSU/26)	Dr. C. P. Suja	Shri. Linga Prabhu D. Scientist, Tuticorin, (Adjunct)	
19	Genetic and Genomic approaches for fishery resource management, conservation and sustainable mariculture (MBT/GEN/25)	Dr. Sandhya Sukumaran	Shri. M. Sankar, Scientist, Mandapam Camp (Co-PI)	
20	Abatement of coastal pollution through bioremediation (FEM/PLN/28)	Dr. Reeta Jayasankar	Dr. Shelton Padua, Scientist, Kochi (Co-PI) Dr. N. Aswathy, SS, Kochi & Shri. Rajesh Kumar Pradhan, Scientist, Puri (Adjuncts) Smt K. P. Salini, TO, Kochi.	
21	Assessment of coastal and marine pollution in selected	Dr. P. S. Asha	Dr. R. Jeyabaskaran, PS (Adjunct)	

	maritime states of India (FEM/PLN/SUB/28)			
22	Investigations on the scyphozoan and cubozoan jelly fishes diversity and distribution along the Indian coast (MBD/JLY/32)	Dr. R. Saravanan	Dr. Molly Varghese, PS (Co-PI) Shri. Subal Kumar Roul, Scientist, Puri & Dr. Gyanranjan Dash, SS, Digha (Adjuncts).	
23	Developing Conservation Plan for Biologically Sensitive Areas along the Indian coast (MBD/CNS/30)	Dr. K. Vinod	Dr. R. Narayanakumar, PS (Adjunct)	Dr. R. Narayanakumar as CO-PI
24	Socio-Economic Assessment of Marine Fisheries Resource Use and Management in India (SEE/SOC/33)	Dr. R. Narayanakumar	Dr. J. Jayasankar, PS, (Co-PI)	
25	FMP for North east coast of India (CFD/NEC/05)	Dr. Gyanaranjan Dash (PI)	Shri. Vivekananda Bharati, Scientist, Kochi (Co-PI).	
26	Role of climate extremes on ecosystem functioning with special emphasis on fisheries and mariculture (FEM/HBT/SUB/27)	Dr. V. Kripa (DPI)	Dr. Reeta Jayasankar, PS, Kochi (Adjunct)	

ANNEXURE - III

List of participants of 25th IRC meeting

1. Dr. A. Gopalakrishnan, Director & Chairman, IRC
2. Dr. K.S. Mohamed, Head I/c, MFD & Secretary, IRC
3. Dr. G .Maheswarudu, Head I/c, CFD
4. Dr. P.U. Zacharia, Head I/c, DFD
5. Dr. V. Kripa, Head I/c, FEMD
6. Dr. K.K. Joshi, Head, MBD
7. Dr. R. Narayanakumar, Head I/c, SEETTD
8. Dr. T.V. Sathianandan, Head, FRAD
9. Dr. P. Vijayagopal, Head in-Charge, MBTD
10. Dr. Imelda Joseph, Head in-Charge, MD
11. Dr. Prathibha Rohit, Head in-Charge, PFD & SIC, Mangalore
12. Dr. V.V.Singh, SIC, Mumbai
13. Dr. Jayasree Loka, SIC, Karwar
14. Dr. P.K. Asokan, SIC, Calicut
15. Dr. A.K. Abdul Nazar, SIC, Mandapam
16. Dr. Subhadeep Ghosh, SIC, Visakhapatnam
17. Dr. P. Laxmilatha, SIC, Chennai
18. Dr. M.K. Anil, SIC, Vizhinjam
19. Dr. P.P. Manojkumar, SIC, Tuticorin
20. Dr. Gyanaranjan Dash, Scientist & SIC, Digha Centre
21. Shri Subal Kumar Roul, Scientist & SIC, Puri Field Centre
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59. Dr. S.S. Raju, Principal scientist
60. Dr. Mini K.G., Principal Scientist
61. Dr. C.P. Suja, Principal Scientist
62. Dr. T.M. Najmudeen, Principal Scientist
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64. Dr. R. Jayakumar, Senior Scientist
65. Dr. Vidya Jayasankar, Senior Scientist
66. Dr. Kajal Chakraborty, Senior Scientist
67. Dr. Rekhadevi Chakraborty, Senior Scientist
68. Dr. V. Venkatesan Senior Scientist
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70. Dr. Sandhya Sukumaran, Senior Scientist
71. Dr. Bindu Sulochanan, Senior Scientist
72. Dr. N. Aswathi, Senior Scientist
73. Dr. R. Jayabhaskaran, Senior scientist
74. Dr. Rajesh K.M, Senior Scientist
75. Dr. K.N. Saleela, Senior Scientist
76. Dr. Shinoj Subramanian, Senior Scientist, KVK
77. Dr. Miriam Paul Sreeram, Senior Scientist
78. Dr. T. Senthil Murugan, Senior Scientist
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80. Dr. Shelton Padua, Scientist

81. Dr. P. Shinoj, Scientist
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122. Ms. Saloni Shivam, Scientist
123. Shri. Nakhawa Ajay Dayaram, Scientist

124. Shri. M. Rajkumar, Scientist
125. Shri. S. Thirumalaiselvam, Scientist
126. Shri. Rajan Kumar, Scientist
127. Smt. Shikha Rahandgale, Scientist
128. Shri. Rajesh N, Scientist
129. Smt. P. Gomathi, Scientist
130. Shri. Kurva Raghu Ramudu, Scientist
131. Shri Anuraj K., Scientist
132. Shri. Ambarish P. Gop, Scientist
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134. Dr. Mahesh V., Scientist
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137. Smt. M. Kavitha, Scientist
138. Dr. Jeena N.S., Scientist
139. Dr. Sumithra T. G., Scientist
140. Shri M. Sankar, Scientist
141. Shri Manas K. M., Scientist