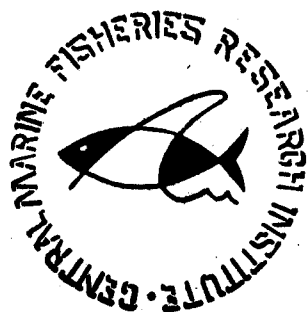




RESEARCH PROJECTS

1984-'85

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
COCHIN-682 018

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
RESEARCH PROJECTS FOR 1984-85

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FISHERY RESOURCES ASSESSMENT DIVISION

Projects completed in March 1984

FSS/FRA/1.2	Frame Survey (All India Marine Fishermen Census)
FSS/FRA/1.4	Standardisation of fishing effort
FSS/FRA/1.15	Determination of sample size for length frequency studies

On-going Projects

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2.	FSS/FRA/ST.1	National Marine Living Resources Data Centre	3
3.	FSS/FRA/1.5	Survey of Estuarine Fisheries	5
4.	FSS/FRA/1.16	Evaluation of change in the pattern of catch and composition in the artisanal and mechanised units in Tamil Nadu.	7

FISHERY ECONOMICS AND EXTENSION DIVISION

Projects completed

FE&E/5	Economic evaluation of Paddy-cumPrawn culture
FE&E/6	A study of the role of women in small-scale fisheries
FE&E/7	Study on the motorisation and its impart on the socio-economic conditions of fisherfolk of Kerala Coast

On-going Projects

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DEMERSAL FISHERIES DIVISION

Projects completed

- | | |
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|------------|--------------------------------------|

On-going Projects

- | | | | |
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Projects completed

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| CF/RE/1.1.5 | Shrimp and other crustacean resources beyond the littoral zone of the Exclusive Economic Zone. |
| CF/CUL/1.1.4 | Design of low cost hatchery for prawns |
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MOLLUSCAN FISHERIES DIVISION

Projects completed

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* New Project

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MBO/EE/1.3	Intensive study of the seasonal changes in the productivity of the different trophic levels in the regions off Cochin
FED/MC/E 1.2	Design and development of structural work opposite main sluices to minimize sand deposition
FED/Misc/2	Behaviour of reef fishes of Lakshadweep

* New Projects

FED/Misc/6

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FED/IT/2

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On-going Projects

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On-going Projects

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* New Projects

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* New Projects

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RESEARCH PROJECT - 1984-85

1. Institute Code No. FSS/FRA/1.1 2. I.C.A.R. Code No.

3. Name and address of
Research Institute: C.M.F.R. Institute, Cochin

4. Title of project: Assessment of Marine Fishery
resources of the Exclusive Economic
Zone.

5. Title of sub-project: Acquisition of data on exploited marine
fishery resources for stock assessment in Exclusive Econo-
mic Zone.

6. Name and designation of
Project Leader: S.K. Dhammaraja S-2

7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work
to be done.

centre	Name	designa- tion	Time to be spent (%)	Work to be done
	T. Jacob	S-3	30	As per colm. 10.
Cochin.	K. Alagaraja	S-2	25	
	S.K. Dhammaraja	S-2	50	
	M. Srinath	S-1	50	
	K. Narayana Kurup	S-1	20	
	K. Balan	S-1	50	
	K. S. Scariah	S-1	35	
	K. Vijayalakshmi	S	20	

Technical Assistance: C.R. Shanmughavelu, Syed Basheeruddin,
S.S. Dan, J.P. Karbhari, G. Balakrishnan, U.K. Sathyavan, Varughese
Philipose, Varughese Jacob, G. Krishnankutty Nair, P. Sivaraman,
V. Rajendran, V.P. Annam, A. Kanakkan, P.K. Mahadevan Pillai,
S. Haja Najumuddin, P.L. Ammini, C.J. Prasad, K.C. Yohannan, Joseph
Andrews, Abha Kant, S. Siddalingiah, and Technical staff at
out-stations.

8. Location of the research Project: Cochin

9. a) Objective: To facilitate estimation of exploited stocks
of various fish population in E.E.Z.

b) practical utility: Estimation of exploited fish stocks
will help in the formulation of fishery development and
management policies.

10. Technical programme: 1. To facilitate stock assessment; i) Acquisition of data on marine fish landings and effort expended on region-wise and species-wise basis. ii) Biological data on items such as length and weight of species landed. iii) Environmental data on wind pattern and movements of current 2) Price of important species at landing centres and 3) scrutiny and verification of data for processing.

Work done: Estimates of marine fish catch were got ready for the financial year 1982-83 as well as for the calendar year 1982 and were published. Catch particulars for important fisheries harbours/mechanised landing centres were furnished under two categories 1) in respect of landings of boats in which mechanisation is employed both for fishing operation and propulsion and ~~also~~ for propulsion only. provisional estimates of fish landings for the year 1983 were made.

Work envisaged in the current year:

Acquisition of data for the year 1984-85 on;

1. catch, effort, biological and environmental aspects and price details in coded form, region-wise and species-wise, from the coastal waters on the basis of stratified multistage random sampling design.
2. the operations of larger vessels belonging to Govt. of India and private sector and those operating under chartered arrangement.

11. date of start: April 1982 12. Likely date of completion: March 1985

13. Estimated man-months: 33 man months/year

14. facilities required:

i) Land	: NO	v) Fish ponds	: NO
ii) Labour	: NO	vi) Foreign exchange	: NO
iii) Special equipment	: NO	vii) Other items	: NO
iv) Animal sheds	: NO	viii) Total estimated cost	: NO
Institute's Budget			

15. If financed by an organisation other than the Institute: No.

16. Approximate cost:

- | | |
|---|--------------------|
| a) salary of scientific staff | g) Total cost: |
| b) salary of Technical staff | Institute's budget |
| c) salary of supporting staff, if any | |
| d) Casual Labour cost, if any | |
| e) cost of equipment, facility etc. | |
| f) contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc. | |

17. signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute code No. FSS/FRA/ST.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute: G.M.F.R. Institute, Cochin
4. Title of Project Assessment of Marine Fishery Resources of the Exclusive Economic Zone.
5. Title of Sub-project. National Marine Living Resources Centre.
6. Name and designation of Project Leader. T.Jacob, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin.	T.Jacob	S-3	35	As per colm
	K.Alagaraja	S-2	25	10
	G.Venkataraman	S-3	40	
	S.K.Pharmaraja	S-2	25	
	M.srinath	S-1	35	
	K.Narayana Kurup	S-1	20	
	K.Balan	S-1	35	
	K.S.Scariah	S-1	35	
	K.Vijayalakshmi	S	20	

Technical Assistance: C.R.Shanmughavelu, G.Balakrishnan, U.K.Satyavan, Varughese Philipose, Varughese Jacob, G.Krishnan kutty Nair, P.Sivaraman, V.Rajendran, V.P.Annam, P.K.Mahadevan Pillai, A.Kanakkan, S.Haja Najeemudeen, C.J.Prasad, P.L.Ammi, K.C.Yohannan, Joseph Andrews, Abha Kant, M.B.Seynudeen, K.P.George, P.P.Pavithran, M.R.Beena, P.T.Mani, M.Ramachandran, K.Anandan & Lata Thote.

8. Location of the research project. Cochin

- 9 a) objectives: Maintenance of computerised information system relating to marine living resources.
- b) practical utility: The system will help in the rapid acquisition of information on potential and exploited stocks, in E.E.Z. and dissemination of the same to the various National and International agencies and fishing industry for research and development.

Information also on ancillary resources and endangered species will be retrieved and disseminated.

10. Technical Programme:

1. To standardise the data entry format
2. To develop suitable programme package
3. Maintenance of data on
 - i. catch and effort
 - ii. biological aspects such as age, sex, maturity and fecundity;
 - iii. environmental data such as physico-chemical characteristics of the coastal and offshore waters and meteorological conditions and
 - iv. economic aspects such as socio-economic impact, cost of production and market mechanism.
 - v. culture experiments bearing on aspects such as nutrition, genetics and physiology.
4. Maintenance of linkage with other organisations for retrieval of data on marine fisheries.
5. Processing the data and dissemination of information to the various end users.

Work done:

Restructured schedules accommodating codes were introduced in the states of West Bengal, Orissa, Karnataka, Goa, Maharashtra and Gujarat. Proceedings of the National Workshop on "Acquisition and dissemination of data on Marine Living Resources of Indian Seas" were prepared and published. Steps for acquiring a computer for National Marine Living Resources Data Centre have been taken.

Work envisaged in the current year

- i. steps for installation of a computer.
- ii. Processing of data for stock assessment of important species.
- iii. dissemination of available information to the user sectors, both national and international.

11. date of start: April 1980 12. likely date of completion; March 1985.

13. Estimated man-months; 26 man months/year

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. special equipment	: No	vii. other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's budget.

15. IF financed by an organisation other than the Institute: No.

16. Approximate cost

- | | |
|--|------------------------------------|
| a) Salary of Scientific staff | g) Total cost: Institute's budget. |
| b) Salary of Technical staff | |
| c) Salary of Supporting staff, if any | |
| d) Casual labour cost, if any | |
| e) Cost of equipment, facility etc. | |
| f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc. | |

 1. Institute code No.FSS/FRA/1.5 2. I.C.A.R. Code No.

3. Name and address of
 Research Institute: C.M.F.R.Institute, Cochin.

4. Title of Project: Assessment of Marine Fishery Resources
 of Exclusive Economic Zone.

5. Title of Sub-project: Survey of Estuarine Fisheries

6. Name and designation of
 Project Leader: K.Narayana Kurup, S-1

7. Name(s) and designation(s) of project Leader and project
 Associates together with time proposed to be spent and
 work to be done.

centre	Name	designa- tion	Time to be spent (%)	Work to be done
Cochin	K.Narayana Kurup	S-1	45	As per colm 10

Technical Assistance: G.Balakrishnan, U.K.Satyavan, Varughese
 Philipose, K.C.Yohannan.

8. Location of the research
 project. Cochin

9. (a) objectives:

At present there is no comprehensive account of fishery
 resources from estuarine regions. The project aims at
 evolving a suitable sampling design to estimate fishery
 resources from this region.

(b) practical utility:

Some important marine fishes and prawns spend some part
 of their lifetime in estuaries. For proper assessment
 of seed resources required for mariculture and assess-
 ment to the fishery, data on resources from estuaries
 are required.

 / of recruitment

10. Technical Programme: pilot surveys are taken up to study the problem in detail in order to arrive at a suitable sampling design.

work done: Investigations were continued in the area of Vembanad lake enclosed between Mulavkad and Thevara. Modalities have been worked out to carry out a pilot sample survey in the Vembanad lake.

Work envisaged in current year: Field work will be intensified in the zone between Mulavkad to Thevara.

11. Date of start: April 1981 12. Likely date of completion: March 1985.

13. Estimated man-months: 6 man months/year

14. Facilities required:

i. Land	: NO	v. Fish ponds:	NO
ii. Labour	: NO	vi. Foreign exchange	: NO
iii. Special equipment	: NO	vii. Other items:	NO
iv. Animal sheds	: NO	viii. Total estimated cost:	Institute's budget.

15. If financed by an organisation other than the Institute: NO

16. Approximate cost:

- | | | |
|--|----------------|---------------------|
| a) Salary of scientific staff | g) Total cost: | Institute's budget. |
| b) Salary of technical staff | | |
| c) Salary of supporting staff, if any | | |
| d) Casual Labour cost, if any | | |
| e) Cost of equipment, facility etc. | | |
| f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds sprayers etc. | | |

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

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9. a) objectives: In the past, due to introduction of mechanised fishing, changes in the composition of the fish catch both quantitatively and qualitatively have taken place. This aspect is to be studied under this project.
- b) practical utility: The relative pressures exerted on commercially important species by both mechanised and non-mechanised units could be evaluated which would be useful in formulating better management policies.

10. Technical Programme:

data obtained from mechanised and non-mechanised units in Tamil Nadu during the last one decade will be critically studied.

Work done: Catch and effort data from mechanised and non-mechanised crafts for the year 1981 and 1982 in Tamil Nadu were analysed.

Work envisaged in current year;

Analysis of data for the three years (1978-80) in respect of catch and effort from mechanised and non-mechanised fishing crafts will be taken up.

11. date of start: April 1983. 12. Likely date of completion; March 1985.

13. Estimated man-months; 6 man months/year

14. Facilities required:

i. Land	: NO	v. Fish ponds	: NO
ii. Labour	: NO	vi. Foreign exchange	: NO
iii. Special equipment	: NO	vii. Other items	: NO
iv. Animal sheds	: NO	viii. Total estimated cost: Institute's budget.	

15. If financed by an organisation other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	g) Total cost: Institute's budget.
b) Salary of Technical staff	
c) Salary of supporting staff, if any	
d) Casual Labour cost, if any.	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.	

17. signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

9

-
1. Institute Code No: FE & E/1 2. I.C.A.R.Code No.
-
3. Name and address of Research Institute : CMFR Institute,
Cochin-18.
-
4. Title of Project : Socio-economic investigation
in marine fishery sector.
-
5. Title of sub-project : Surveys of small scale fisheries in southern region of India to study the socio-economics of coastal rural sector.
-

6. Name and designation of Project Leader : R. Sathiadhas, S-1
-

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	R. Sathiadhas	S-1	40	As per item No. 10
	K. K. P. Panikkar	S-1	15	

Technical Assistance: Syed Basheeruddin, Field Officer,
(Field staff to be recruited)

8. Location of the research: Cochin project
-

9. a) Objectives: To carry out a comprehensive survey of small-scale fisheries of selected fishing villages in southern states to understand the present status and impact of introduction of new technologies and practices on traditional fishery sector.
- b) Practical utility: The information gathered by this survey would help/identify the difficulties/bottlenecks encountered in the small-scale fishery sector and suggest necessary remedial measures in view of formulating further developmental programmes.
-

10. Technical Programme: Data pertaining to cost benefit factors of traditional fishing practices, socio-economic status of the fishermen families and the impact of introduction of new fishing technologies will be collected from selected fishing villages and studied.

Work done: The first phase of the socio-economic survey in Thiruvattiyurkuppam and Pudumanikuppam have been carried out. All the fishermen households of these two villages were covered under the survey and the work of tabulation and analysis of data have been taken up.

Work envisaged in current year: The IIInd stage of the socio-economic survey in Thiruvattiyurkuppam and Pudumanikuppam will be taken up. Similar survey on the socio-economic aspects of fishermen will be taken up in Calicut area.

11. Date of start: April 1978 12. Likely date of completion:
(Actually started in 1980) March 1985.

13. Estimated man-months: 5 man months/year

14. Facilities required:

- | | | | |
|------------------------|------|-----------------------------|--------------------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : No | vi. Foreign exchange | : No |
| iii. Special equipment | : No | vii. Other items | : No |
| iv. Animal sheds | : No | viii. Total estimated cost: | Institute's budget |

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

1. Institute Code No. FE & E/3 2. I.C.A.R. Code No.
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin-18.
4. Title of Project : Studies on market structure,
transportation, storage and
pricing
5. Title of sub-project : Price spread at selected fish
markets.
6. Name and designation of Project Leader : K.K.P. Panikkar, S-1.
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and
work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.K.P. Panikkar	S-1	30	As per item 10
	R. Sathiadhas	S-1	20	

Technical Assistance: Syed Basheeruddin, Field Officer,
(field staff to be recruited)

8. Location of the research : Cochin
Project
9. a) Objectives: 1) To carry out a comprehensive study of price spread for all major varieties of fish to estimate the components of marketing margin and the share of producer in consumer's one rupee.
2) To study the various problems relating fish marketing system.
- b) Practical utility: The study would help to identify various bottlenecks in fish marketing system, the constraints which prevent the producers in getting the reasonable price for their produce and the role of middlemen in the marketing process.

10. Technical Programme: Collection and study of data on market structure, distribution system and price behaviour at selected centres by following the marketing channel of fish from producer to consumer.

Work done: The data on fish price were collected from Cochin Fisheries Harbour and the surrounding consumer markets such as at Ernakulam, Mundakayam, Perumbavoor, Pala and Ettumanoor. The data are being analysed.

Data relating to marketing of prawn at Sakthikulangara were collected and are being analysed.

Work envisaged: Data on fish marketing will be collected from Mangalore and Madras areas and will be analysed.

11. Date of start: April 1981 12. Likely date of completion: March 1985.

13. Estimated man-months: 5 man months/year

14. Facilities required:

- | | | | |
|------------------------|------|-----------------------------|------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : No | vi. Foreign exchange | : No |
| iii. Special equipment | : No | vii. Other items | : No |
| iv. Animal sheds | : No | viii. Total estimated cost: | |
| | | Institute's budget. | |

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

RESEARCH PROJECT -1984-85

13

-
1. Institute Code No. FE & E/4. 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin-18.
-
4. Title of Project : Studies on cost of production,
Profitability and optimum resource
allocation in marine fisheries
sector.
-
5. Title of sub-project : Economics of mechanised fishing
units.
-
6. Name and designation of Project Leader : K.K.P. Panikkar, S-1.
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and
work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	K.K.P. Panikkar	S-1	30	As per item 10.
	T. Jacob	S-3	25	
	R. Sathiadhas	S-1	20	

(Field staff to be recruited)

-
8. Location of the research : Cochin
Project.
-
9. a) Objectives: 1) To study the economics of different types
of mechanised fishing units and their comparative economic
efficiency. 2) To study the input-out relationship in
mechanised crafts and gears. 3) To assess the quantum of
energy utilisation in various fishing units.
- b) Practical utility: The study will help the industry to
take entrepreneurial decisions and credit agencies to
formulate appropriate lending policies. The study will
also help in estimating the demand for fuel and the
proper channelisation of its supply.
-

10. Technical Programme: Sample units of different types of mechanised units will be selected and detailed information on inputs and output will be collected for a period of one year. The work will be taken up at selected centres.

Work done: Cost and earning data for different types of mechanised fishing units based at Cochin Fisheries Harbour were collected and are being analysed.

Work envisaged: Cost and earning data for different types of mechanised units will be collected from Mangalore and Sakthikulangara areas.

11. Date of start: April 1981 12. Likely date of completion: March 1985

13. Estimated man-months: 7 man months/year

14. Facilities required:

- | | | | |
|------------------------|------|-----------------------------|---------------------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : No | vi. Foreign exchange | : No |
| iii. Special equipment | : No | vii. Other items | : No |
| iv. Animal sheds | : No | viii. Total estimated cost: | Institute's Budget. |

15. If financed by an organisation other than the Institute: No.

16. Approximate cost:

- Salary of Scientific staff
- Salary of Technical staff
- Salary of Supporting staff, if any
- Casual Labour cost, if any
- Cost of equipment, facility etc.
- Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

RESEARCH PROJECT - 1984-85

15

-
1. Institute Code No. FE & E/9 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin-18.
-
4. Title of Project : Socio-economic Investigation in
marine fishery sector.
-
5. Title of sub-project : Study on income, consumption,
employment pattern and credit
facilities available to fisher-
men in N.W. coast.
-
6. Name and designation of Project Leader : D.B.S. Sehara, S-2.
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and
work to be done

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	D.B.S. Sehara	S-2	50	As per item 10
	R. Sathiadhas	S-1	20	

Technical Assistance: J.P. Karbhari T-7.

8. Location of the research : Cochin
Project
-

9. a) Objectives: 1) To carry out comprehensive study of the
income of fishermen from main and subsidiary occupations,
their consumption pattern, savings and employment status
2) To examine the extent of credit facilities available
specially from cooperative societies and Government
agencies.
- b) Practical utility: The data collected will enable the
study of income status of fishermen as well as credit
facility available to them through different agencies.
The information gathered regarding employment will be
of vital importance for future developmental plans.
-

10. Technical programme: Sample households will be selected. Data pertaining to income from different sources, investment, saving, family employment and credit facilities available will be gathered through primary survey, suitable econometric techniques will be used for analysis of data.

Work done: Detailed household-wise data from 7 selected villages in Maharashtra & Gujarat for three quarters were collected. The analysis of the data are being completed.

Work envisaged: Collection of data for the fourth quarter from the 7 villages will be completed. The data will be analysed and report finalised.

11. Date of start: April 1982 12. Likely date of completion: March 1985.

13. Estimated man-months: 12 man-months/year

14. Facilities required:

- | | | | |
|------------------------|-------|-----------------------------|------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : No | vi. Foreign exchange | : No |
| iii. Special equipment | : No | vii. Other items | |
| iv. Animal sheds | : No. | viii. Total estimated cost: | |
| | | Institute's budget | |

15. If financed by an organisation other than the Institute :

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

1. Institute Code No: FEE/10 2. I.C.A.R. Code No.
3. Name and address of Research Institute: C.M.F.R. Institute, Cochin-18
4. Title of Project: Economics studies in relation to structural changes, production, market research and resources management in fisheries sector.
5. Title of sub-project: Comparative economics of artisanal and mechanised fishing units in the West Bengal coast.

6. Name and designation of Project Leader: Kamal Kumar Datta, S-1.

7. Name(s) and Designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent %	Work to be done
Cochin	Kamal Kumar Datta	S-1	75	As per column 10

Technical Assistance: S.S. Dan

8. Location of the Research Project: Cochin

9. (a) Objectives: Conduct a comprehensive study (1) to understand the economic viability of mechanised and artisanal fishing units. (2) To analyse the resource utilisation and factor product relationship in both the sector.

(b) Practical Utility: To study the variation in the profitability of mechanised and non-mechanised fishing units and the extent of resource allocation and factor in these sectors.

10. Technical Programme: The study will be carried out in Bengal coast. Sample units of different types of mechanised boats and country crafts will be selected through a suitable sampling design. (ii) Preparation of suitable performae for collection of data. (iii) Collection and analysis of all relevant data.

Work done during 1983-84: During March-April '83 a Pilot Enquiry has been conducted in order to identify the predominant crafts and gears used in West Bengal. All the five landing centres - Jaldah and Digha in Midnapore district and Bakkhali, Frazergunj, Jumbu island in 24 parganas were selected for the study.

During July-August '83, work was started and cost-and earning data from 30 selected units for 36 days completed.

During October-December '83, collected sample informations from the same units for 36 days. The collected data are being analysed.

¹⁸
Work envisaged: Similar studies will be taken in Orissa
in 1984-85.

11. Date of start: April 1983 12. Likely date of completion:
March 1985.

13. Estimated man-months: 7 man months/year.

14. Facilities required:

i) Land	: No	v) Fish ponds	: No
ii) Labour	: No	vi) Foreign exchange:	No
iii) Special equipment	: No	vii) Other items	: No
iv) Animal sheds	: No.	viii) Total estimated	
		cost Institute	
		Budget.	

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff	
d) Casual labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	Institute Budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

RESEARCH PROJECT PROPOSAL

19

-
1. Institute Code No. FE & E/11. 2. I.C.A.R. Code No.
-
3. Name and Address of Research Instt./Centre. C.M.F.R. Institute,
Cochin-18.
-
4. Title of Project (Specify the problem) Studies on attitude to: new technologies and design and evaluation of extension aids.
-
5. Title of Sub-projects and experiments (where appropriate) Design and evaluation of teaching aids for mariculture extension.
-
6. Name & Designation of project Leader: Krishna Srinath, S-1.
-
7. Name(s) and Designation(s) of project Leader and project Associates together with time proposed to be spent and work to be done.
-

Sl. No.	Name	Centre	Designation	Time to be spent %	work to be done
	Krishna Srinath	Cochin	S-1	35	As per item 10

Technical Assistance: Field staff (to be recruited)

-
8. Location of the research project with complete address (Division/Section/sub-Station): Cochin
-
9. (a) Objectives: (Specify briefly the aims & goals of the project in not more than 150 words): To develop and evaluate teaching aids to be used in different extension and training programmes taken up by CMFRI
- (b) Practical Utility: (It should include background information and justification of the project in not more than 150 words): Teaching aids which includes audiovisual aids render the process of teaching and learning easy, lively and effective. Teaching aids attract attention of the learner, holds up interest for a longer time, help to reinforce the idea quickly and retain the same for a long time on the part of the learner.
-
10. Technical Programme: Projected and non-projected aids suitable for different training and extension situation will be developed and evaluated.
- (a) List of sub-projects and experiments (Indicate briefly plan of procedure techniques, instruments and special materials, environments etc)
- (b) Observations proposed to be undertaken.
-

11. Work done:

and Photographs were taken and set of slides describing the
 exhi- operational details of prawn culture technology was prepared,
 bited organised, maintained and evaluated the ICAR pavilion at the
 at Cochin '84 All India Exhibition.

12. Work envisaged

Preparation and evaluation of slides as mussel and oyster culture techniques and activities and achievements of the Institute. A Video cassette recorder is proposed to be procured and short films for educating the fishermen will be shot. Booklets and folders on the findings of the Institute will be prepared and evaluated.

13. Date of start:

14. Likely date of completion:
 April 1985

15. Estimated man-months: (Scientific personal only)
 3 man-months/year.

16. Facilities required:

- | | |
|------------------------|----------------------------|
| i. Land | v. Fish ponds |
| ii. Labour | vi. Foreign exchange |
| iii. Special equipment | vii. Other items |
| iv. Animal sheds | viii. Total estimated cost |

17. If financed by an organisation other than the Institute, then give the following information:

- (a) Name of Financing Organisation:
- (b) Title of the Project (If the project forms a part of a larger project)

18. Approximate Cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff (Calculate on the basis of the percentage of time devoted in the project)
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- g) Total cost.

19. Signatures of Project
 Leader and Associates

20. Signature of Head of
 Division/Section/Station

21. Signature of Director.

RESEARCH PROJECT PROPOSAL

21

-
1. Institute Code No. FE & E/12 2. I.C.A.R. Code No. _____
3. Name and Address of Research Instt./Centre. C.M.F.R. Institute,
Cochin-18.
4. Title of Project (Specify experiments where appropriate the problem) : Studies on attitude to new technologies and design and evaluation of extension side.
5. Title of Sub-projects and experiments (where appropriate) A study on the adoption of mariculture practices.
6. Name & Designation of project Leader : Krishna Srinath, S-1
-

7. Name(s) and Designation(s) of project Leader and project Associates together with time proposed to be spent and work to be done:

Sl. No.	Name	Centre	Designation	time to be spent %	work to be done
	Krishna Srinath	Cochin	S-1	35	As per item 10

Technical Assistance: Field staff (to be recruited)

-
8. Location of the research project with complete address (Division/Section/sub-Station): Cochin
9. (a) Objectives: (Specify briefly the aims & goals of the project in not more than 150 words): To study the awareness, source of communication, attitude, credit utilisation and constraints involved in the adoption of mariculture practices by fishermen/fish farmers.
- (b) Practical Utility: (It should include background information and justification of the project in not more than 150 words): Awareness and attitude of end users have direct bearing on their adoption behaviour. The information collected will serve as a feedback to the technology development and transfer system of the Institute.
-
10. Technical Programme: Suitable samples of fishermen/fish farmers will be selected from
- (a) List of sub-projects and experiments (Indicate briefly plan of procedure, techniques, instruments and special materials, environments etc.) selected centres and relevant data will be collected through personal interviews.
- (b) Observations proposed to be undertaken
-

11. Work done:

Data from 50 fish farmers from Parur, Varapuzha and Mulavakad area were collected. List of persons who brought prawn seed from the Gost Hatchery, Azhikode and Narakkal Prawn Culture Laboratory were obtained and data collected from 20 of them.

12. Work envisaged:

Data will be collected to study the adoption of mussel, oyster and Seaweed culture practices.

13. Data of start: April 1983 Likely date of completion: April 1985.

14. Estimated man-months: (Scientific personnel only)
3 man-months/year

15. Facilities required:

- | | |
|------------------------|----------------------------|
| i. Land | v. Fish ponds |
| ii. Labour | vi. Foreign exchange |
| iii. Special equipment | vii. Other items |
| iv. Animal sheds | viii. Total estimated cost |

16. If financed by an organisation other than the Institute, then give the following information:
(a) Name of Financing Organisation
(b) Title of the Project (if the project forms a part of a larger project)

17. Approximate Cost:

- Salary of Scientific staff
- Salary of Technical staff
- Salary of supporting staff, if any Calculate on the basis of the percentage of time devoted in the project)
- Casual labour cost, if any
- Cost of equipment, facility etc.
- Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- Total cost.

18. Signatures of Project Leader and Associates

19. Signature of Head of Division/Section/Station:

20. Signature of Director.

RESEARCH PROJECT - 1984-85

23

1. Institute Code No. FE & E 13 2. I.C.A.R.Code No.

3. Name and address of : C.M.F.R.INSTITUTE,
Research Institute Cochin-18.

4. Title of Project : Socio-economic Investigation
in marine fishery sector.

5. Title of sub-project : Costs and returns of Dol net
fishery in North West coast.

6. Name and designation of : D.B.S.Sehara, S-2.
Project Leader

7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and
work to be done.

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	D.B.S.Sehara	S-2	80	As per item 10
	K.K. Datta	S-1	30	

Technical Assistance: J.P. Karbhari, T-7.

8. Location of the research : Cochin
Project

9. a) Objectives: 1) To estimate returns on investment and
residual income to owners;

2) To compare levels of income of owners
and wage earners.

b) Practical utility: Data collected will enable the
study of income status of owners and wage-earners
engaged in dol net fishing. It will also provide
vital information on returns to capital of dol net
units in North-West coast.

10. Technical programme: Sample dol net operating units will be selected. Data regarding fixed and variable costs, catch, price, employment and earnings will be collected through primary survey. Suitable econometric techniques will be used for analysis of data.

Work done: Nil

Work envisaged: Two representative villages each from Maharashtra and Gujarat will be selected after preliminary survey out of Dol net operating villages and data will be collected from selected units in each village periodically.

11. Date of start: April '84 12. Likely date of completion: March '86.

13. Estimated man-months: 12 man-months/year

14. Facilities required:

- | | |
|----------------------------|--|
| i. Land : No | v. Fish ponds : No |
| ii. Labour : No | vi. Foreign exchange: No |
| iii. Special equipment: No | vii. Other items |
| iv. Animal sheds : No. | viii. Total estimated cost: Institute's budget |

15. If financed by an organisation other than the Institute :

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost:

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director.

1. Institute Code No. FB/PR/3.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
-
4. Title of Project : Investigations on the resources of tunas and related fishes.
-
5. Title of Sub-project : Resources of tunas and billfishes
-
6. Name and designation of Project Leader : E. G. SILAS
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Minicoy	G.Gopakumar	S-1		1-7
Goa	G.M.Kulkarni	S		1-5
Mangalore	C. Muthiah	S-1		1-5
Calicut	T.M.Yohannan	S-2		1-5
Cochin	E.G.Silas			1
	P.P.Pillai	S-2 (APL)		1-6
	M.Srinath	S-1		1-4
	A.A.Jayaprakash	S-2		1-6
Tuticorin	Pon. Siraimeetan	S-1		1-5
Madras	S. Sreenivasa Rangan	S		1-5

Technical Assistance: K.K.Kunhikoya (Minicoy), H. Ramachandra (Mangalore), M. Ayyappan Pillai (Cochin), P. Sadasiva Sarma (Vizhinjam), C. Manimaran (Tuticorin), M.V.Someraju (Waltair).

8. Location of the research project : Minicoy, Goa, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Madras and Waltair.
-
9. a) Objectives: (1) To estimate the resources of tunas and billfishes in the shelf waters, EEZ and contiguous areas; and to study the state of exploitation of these resources. (2) To study the biological parameters such as the age, growth, reproduction and behaviour patterns of tunas and to investigate the role of environment in tuna fisheries. (3) To develop fuel saving and efficient fishing methods for tunas and allied fishes by experimenting with FAD'S. (4) To investigate the baitfish resources in the Minicoy Island and baitfish culture. (5) Use of deep water gillnets to estimate resource availability.

10. Technical Programme:- (1) Investigations and fishery surveys on board research and exploratory vessels and aerial surveys will be undertaken to chart the pattern of distribution and abundance of these resources in the EEZ and contiguous seas around Indian in space and time (2) On board participation and collection of information on tuna fisheries by utilizing vessel facilities of other organisations, for longline operations and purse seining. (3) Collection of species-wise data on catch, effort and biological characteristics of tunas and billfishes. (4) Close observations on the purse seine and drift net landings of tunas and billfishes at Mangalore, Calicut, Cochin and other selected centres. (5) Investigations on the behaviour pattern of tunas and on environmental parameters. (6) Experiments to be conducted to install fish aggregating devices (FAD) along the shelf edge of the SW coast of India and Minicoy Island to test their effect on tuna fishery. (7) Observations on the distribution and abundance of baitfish resources in the Lakshadweep Is. and Andaman & Nicobar Is. Feasibility studies on the culture of selected species of baitfishes.

Work done:- During 1983 data on the catch, effort, species composition and biological characteristics of tunas and billfishes were collected and studied from 9 centres. Population parameters like asymptotic length, growth coefficient and exploitation rate for the species E. affinis, A. thazard, X. pelamis and T. albacares were estimated. The effect of different levels exploitation rate on the yield of E. affinis and A. thazard was studied.

Work envisaged:- In 1984 it is envisaged to give emphasis to the study the population dynamics of different species of tuna including their standing stock, exploitation rate and potential resources in the EEZ of India. Exploratory fishing with pelagic trawl, purse seine and drift net will be conducted. Efforts will be made to establish FAD's along the shelf edge and off Minicoy. Availability and abundance of baitfishes at Minicoy will be studied.

11. Date of start : 1976	12. Likely date of completion: 1984-85
13. Estimated man-months :	
14. <u>Facilities required:</u>	
i. Land : no	v. Fish ponds : No
ii. Labour : no	vi. Foreign exchange : Yes
iii. Special equipment : Yes	vii. Other items : -
iv. Animal sheds : no	viii. Total estimated cost : Institute's Budget.
15. If financed by an organisation other than the Institute : No	
16. <u>Approximate cost:</u>	
a) Salary of Scientific staff	f) Contingencies, such of chemicals, fertilizers, seed, animals, feed sprayers etc.
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	g) Total cost: Institute's Budget.
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
17. <u>Signatures of:</u>	

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FD/PR/5.4 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
-
4. Title of Project : Investigations on other pelagic resources
-
5. Title of Sub-project : Resource characteristics of Pomfrets
-
6. Name and designation of Project Leader : M.H. Dhulkhed, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Puri	K.R.M.Nair	S-1		1-3
Cochin	T.Jacob	S-3		3
	K.Balan	S-1		3
	A.A.Jayaprakash	S-2		1-3
	M.Kumaran	S-2		1-3
Calicut	Madan Mohan	S-1		1-3
Mangalore	M.H. Dhulkhed	S-3		1-3
Karwar	V.M.Deshmukh	S-2		1-3
Bombay	M.Zaffar Khan	S-1		1-3
Veraval				

Technical Assistance: K.V.Rao (Puri), V.A.Narayanankutty (Cochin), V.K.Janaki (Calicut), Uma. S. Bhat (Mangalore) & Hanumantharaya (Karwar), S.V. Chavan (Bombay) and H.K.Dhokia (Veraval).

8. Location of the research project : Puri, Cochin, Calicut, Mangalore, Karwar, Bombay and Veraval.
-

9. a) Objectives:

- 1) To study the fishery, biology and resource characteristics of commercially important Pomfrets.
- 2) To evaluate changes in stocks of Pomfrets in relation to fishery

b) Practical utility:

The pomfrets are among the best quality table fish with export potential. There are considerable lacunae in our knowledge of their resource characteristics.

10. Technical programme: (1) Data on the catch and effort to be collected at the landing places and on board the exploratory vessels. Species composition to be studied; (2) Studies on age, growth, maturity, spawning

food and feeding of commercially important species. (3) Studies on growth of the predominant species to obtain age structure and mortality rates.

Work done: Valuable data on the fishery and biological characteristics of Pomfrets encompassing gear-wise catch and effort, species composition and size composition were collected and studied from Veraval, Karwar, Mangalore, Calicut, Cochin and Puri. Except at Calicut and Puri, no biological information could be collected at other centres due to prohibitive cost of the samples.

Work envisaged: Preliminary processing of the resource data, collected earlier will be compiled for detailed study of the stock assessment during 1984.

-
11. Date of start : 1976 12. Likely date of completion: 1985
-
13. Estimated man-months :
-
14. Facilities required:
- | | | | |
|------------------------|------|----------------------------|-----------------------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : No | vi. Foreign exchange | : No |
| iii. Special equipment | : No | vii. Other items | : No |
| iv. Animal sheds | : No | viii. Total estimated cost | : Institute's Budget. |
-
15. If financed by an organisation other than the Institute : No
-
16. Approximate cost:
- Salary of Scientific staff
 - Salary of Technical staff
 - Salary of Supporting staff, if any
 - Casual Labour cost, if any
 - Cost of equipment, facility etc.
 - Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - Total cost : Institute's Budget.
-
17. Signatures of:

Sd/
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/FR/9.1 2. I. C. A. R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
4. Title of Project : Survey of Pelagic Fish Resources of the Exclusive Economic Zone.
5. Title of Sub-project : Estimation of the Fishery and Resources of oil sardine.
6. Name and designation of Project Leader : V. Balan, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Vizhinjam Cochin	P.N.Radhakrishnan Nair	S-1		1-4
	V. Balan	S-2		1-4
	K.Narayana Kurup	S-1		4
	T. Jacob	S-3		4
Calicut	M. Kumaran	S-2		1-4
Mangalore	Madan Mohan	S-1		1-4
Karwar	G.G.Annigeri	S-2		1-4
Goa	G.M.Kulkarni	S		1-2

Technical Assistance: M. Abdul Nizar (Cochin), V. Janaki (Calicut), Uma S. Bhat (Mangalore), N. Chinnappa Gowda (Karwar) and S.G.Vincent (Vizhinjam).

8. Location of the Research Project. : Vizhinjam, Cochin, Calicut, Mangalore, Karwar and Goa.
9. a) Objectives: 1. To monitor the fishery and biological characteristics of the resource. 2. To assess the magnitude of the exploitable resource. 3. Assess the impact of purse seine fishery on the artisanal fishery.
- b) Practical utility: The characteristics of oil sardine resource have to be determined continuously and its catch trends watched. The areas from where production could be increased have to be determined. Continuous monitoring of the resource is of importance to the fishing industry. Studies have to be continued to see that the fishing does not affect adversely the production potential of this valuable resource.

10. Technical Programme: 1. Collection of data on catch and effort of purse seiners and indigenous units. 2. Observations on length, weight, sex and maturity of the fish. 3. Rate of growth, age, composition, mortality and spawning will be investigated. 4. Analysis of data of last ten years of Cochin, Calicut, Mangalore and Karwar to assess the stock abundance.

Work done: Valuable data on the catch and fishing effort trends by various gear in the fishery, size and age structure and maturity cycle of oil sardine at six centres on the west coast were collected and studied. The impact of the purse seine fishery on the artisanal fishery and on the stock was monitored.

Work envisaged: It is envisaged that the work on the resources will be continued and strengthened on the above lines and stock assessment of the resources based on the previous data will be taken up during 1984-85.

11. Date of start : 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months:

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal shed	: No	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff	f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprays etc.
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	g) Total cost: Institute's Budget.

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

- | | |
|---|--|
| 1. Institute Code No. FB/PR/9.2 | 2. I.C.A.R. Code No. |
| 3. Name and address of Research Institute | : CMFR INSTITUTE, COCHIN. |
| 4. Title of Project | : Survey of Pelagic fish resources of the Exclusive Economic Zone. |
| 5. Title of Sub-project | : Evaluation of the fishery and resources of Lesser sardines. |
| 6. Name and designation of Project Leader | : P. Sam Bennet, S-2 |
| 7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done. | |

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	G. Luther	S-3		1-3
Madras	P.T.Meenakshisundaram	S-2		1-3
	S. Srinivasa Rangan	S-1		1-3
Mandapam	R. Thiagarajan	S-1		1-3
Tuticorin	P. Sam Bennet	S-2		1-3
Vizhinjam	P.N.Radhakrishnan Nair	S-1		1-3
Cochin	K.Narayana Kurup	S-1		1-2
	K.S.Scaria	S-1		1-2
Mangalore	Madan Mohan	S-1		1-3
Karwar	G.G.Annigeri (APL)	S-2		1-3

Technical Assistance: M. Samuel Sumithrudu (Waltair), R. Mohan (Madras), G. Arumugham (Tuticorin), T.A.Omana (Vizhinjam), Uma S. Bhat (Mangalore) and N. Chinnappa Cowda (Karwar).

- | | |
|--------------------------------------|--|
| 8. Location of the Research Project. | : Waltair, Madras, Mandapam, Tuticorin, Vizhinjam, Cochin, Mangalore and Karwar. |
|--------------------------------------|--|
9. a) Objectives: Detailed species-wise evaluation of the lesser sardine stocks in the areas of their distribution. 2. Study of fishery important biological features of major species at all centres.
- b) Practical utility: It is important to study the nature and abundance of the lesser sardine, stocks fishery and biological characters of constituent species so that the fishery could be rationally exploited to give optimum yield.

10. Technical Programme: 1. Gear-wise and species-wise catch data be taken all centres of observation. 2. Gear-wise biological observations such as size and age composition, mortality sex and maturity be made for commercially important species. 3. Exploratory fishing will be conducted using standard gear at various centres.

Work done: During 1983, the exploited resources of lesser sardines were studied. Data on the catch, effort, species composition, size and age composition and on biology of predominant species were collected and studied from 8 centres. Preliminary processing of resources data was completed for stock estimate.

Work envisaged: The work envisaged during 1984 will be on similar lines as in the previous year with emphases on stock assessment studies based on resources data.

11. Date of start : 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's Budget.

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost : Institute's Budget.
-

- 17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No.	FB/PR/9.3	2. I.C.A.R. Code No.	
3. Name and address of Research Institute		: CIMER INSTITUTE, COCHIN.	
4. Title of Project		: Survey of Pelagic Fish resources of the Exclusive Economic Zone	
5. Title of Sub-project		: The fishery and resources characteristics of anchovies.	
6. Name and designation of Project Leader		: G. Luther, S-3	
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.			

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	G. Luther	S-3	-	1-4
Madras	P. Devadoss	S-2	-	1-3
Vizhinjam	P.N.Radhakrishnan Nair	S-1	-	1-3
Cochin	K. Alagaraja	S-2	-	3-4
	K. Balan	S-1	-	3-4
Mangalore	G. Syda Rao	S-2	-	1-3

Technical Assistance: M. Samuel Sumithrudu (Waltair), S. Chandrasekhar (Madras), A.K.Velayudhan (Vizhinjam), H. Ramachandra (Mangalore), R. Reghu (Cochin).

- | | |
|-------------------------------------|---|
| 8. Location of the research Project | : Waltair, Madras, Vizhinjam, Cochin and Mangalore. |
|-------------------------------------|---|
9. a) Objectives: 1. To assess the magnitude of the exploited fishery and the stock of anchovy resources and to study their relative composition and species-wise abundance in space and time. 2. To monitor the important biological and fishery characteristics of the commercially important species.
- b) Practical utility: Information on the distribution and abundance of anchovies together with biological aspects is necessary for an appraisal of their commercial exploitation prospects and to develop a prediction system.
10. Technical Programme: (1) Collection of catch and effort data from the different types of gear separately for the genera Stolephorus, Thryssa, Coilia, Setipinna and Thrissina. (2) Species composition of the different genera of anchovies in the different types of gear. (3) Collection of catch and catch rate data on Stolephorus devisi/S.heterolobus

and S. bataviensis, length and age distribution, maturity stages, sex ratio, intensity of feeding, length-weight, growth and mortality.
 (4) Assessment of stock position of Stolephorus resources based on past 5-10 years data (to be continued).

Work done: Regular data on the exploited resources and on the biology of the predominant anchovy species have been collected as per the work programme, processed and studied for the fishery trends, species composition, growth and age and maturity cycle. Past data on the anchovy resources (Stolephorus) was processed and studied for growth, asymptotic length and exploitation rates.

Work envisaged: Work on the similar lines will be continued during 1984 with emphasis on the stock assessment based on the resources data collected during the earlier years.

11. Date of start : 1981-'82 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific Staff
 - b) Salary of Technical Staff
 - c) Salary of Supporting Staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost : Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. FB/PR/9.4 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
4. Title of Project : Survey of pelagic fish resources of the Exclusive Economic Zone.
5. Title of Sub-project : Evaluation of the fishery and resources of mackerel
6. Name and designation of Project Leader : A. Noble, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	S. Reuben	S-2	-	1,2,7
Madras	N.S.Radhakrishnan	S-1	-	1,2,7
Mandapam	M.Sivadas	S-1	-	1,2,7
Vizhinjam	N.Gopalakrishna Pillai	S-1	-	1,2,3,7
Cochin	M.V.Pai	S-3 (APL)	-	1,2,5,6,7
	M.Srinath	S-1	-	7
Calicut	T.M.Yohannan	S-2	-	1,2,4,7
Mangalore	A. Noble	S-3	-	1,2,5,6,7
Karwar	M.H.Ishukhed	S-3	-	1,2,5,6,7
Goa	G.M.Kulkarni	S	-	1

Technical Assistance: M.V. Somaraju (Waltair), T.A.Omana (Vizhinjam), V.A.Narayanan Kutty, M.N.Kesavan Elayathu (Cochin), Alli C. Gupta (Mangalore) S. Hanumantharaya (Karwar).

8. Location of the research Project : Waltair, Madras, Mandapam, Vizhinjam, Cochin, Calicut, Mangalore Karwar and Goa.
9. a) Objectives: (1) To study the relative abundance of the mackerel in space and time. (2) To understand the resource characteristics and to have estimates on the stock.
- b) Practical utility: Monitoring resource and biological data on continuous basis is essential to understand, predict changes in its population structure and to evolve effective management policies on the exploitation of this resource.

10. Technical Programme: (1) Collection of data on catch and effort; size and age composition, sex and maturity condition. (2) Impact of mechanised fishing on the resource to be watched. (3) Fecundity studied to be done. (4) Studied on scales to be done. (5) Spawning and young fish survey to be undertaken subject to availability of facilities. (6) Recruitment studies with the aid of aerial and acoustic surveys and remote sensing to be taken up subject to availability of facilities. (7) Analysis of past 10 years data for resource characteristics and estimation of stocks.

Work done: Investigations on the fishery and biology of the resource from 5 centres were carried out. Data on the catch, effort and catch rate, gear-wise, seasonality, size and age composition and on maturation cycle of the exploited resource were collected and studied. Resource data collected during the previous year were analysed and tabulated for estimating the maximum sustainable yield. Past data from Cochin were analysed and mortality rates, $100, K$ and t_0 were estimated.

Work envisaged: Monitoring of resource characteristics as envisaged in Technical programme to be done. Assessment of stock based on past data will be undertaken.

11. Date of start : 1981-'82 12. Likely date of completion: 1984-'85

13. Estimated man-months : Man-months/year

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff	f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers, etc.
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	g) Total cost; Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. FB/PR/9.5 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
-
4. Title of Project : Survey of Pelagic fish resources of Exclusive Economic Zone.
-
5. Title of Sub-project : Evaluation of the fishery and resources of Seer fishes
-
6. Name and designation of Project Leader : M. Vasudev Pai, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	G. Luther	S-3 (APL)	-	1-3
Mandapam	R. Thiagarajan	S-1	-	1-3
Vizhinjam	P.N.Radhakrishnan Nair	S-1	-	1-3
Cochin	M.Vasudev Pai	S-3	-	1-3
	M. Srinath	S-1	-	2
Calicut	T.M.Yohannan	S-2	-	1-3
Mangalore	C.Muthiah	S-1	-	1-3
Tuticorin	H.Mohammed Kasim	S-1	-	1-3

Technical Assistance: S. Sumithrudu (Waltair), C. Manimaran (Tuticorin), S.G. Vincent (Vizhinjam), M.N.Kesavan Mayathu (Cochin) and H.Ramachandra (Mangalore).

8. Location of the research Project : Waltair, Tuticorin, Vizhinjam, Cochin, Calicut and Mangalore.
-
9. a) Objectives: (1) To study the relative abundance of seer fishes in space and time. (2) To evaluate the fishery and resources characteristics of seer fishes such as size and age composition and mortality.
- b) Practical utility: The importance of seer fishes in the internal and external trade is increasing. Detailed information on their distribution and relative abundance would help in increasing the catches and proper management of the resource.
-
10. Technical programme: (1) Collection of catch and effort data for estimating the relative abundance of the species on different grounds.

(2) Detailed study will be made of the size and age composition of the catches and recruitment and mortality based on exploited resource. (3) Experimental fishing to be conducted on board the research vessels of the Institute.

Work done: Good progress was maintained at all the observation centres on the West and east coasts. The scientists directed their studies mainly on assessing regional and seasonal fluctuations in the fisheries of the constituent species as well as their size and age composition and mortality.

Work envisaged: In 1984 it is envisaged to give emphasis to the study the population dynamics of different species of seerfish including their standing stock exploitation rate and potential resources.

11. Date of start : 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: No
ii.	Labour	: No	vi.	Foreign exchange	: No
iii.	Special equipment	: No	vii.	Other items	: No
iv.	Animal sheds	: No	viii.	Total estimated cost	: Institute's Budget.

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost : Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No : FB/PR/9.6 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
-
4. Title of Project : Survey of pelagic fishery resources of the Exclusive Economic Zone.
-
5. Title of Sub-project : Evaluation of the fishery and resources of Bombay duck.
-
6. Name and designation of Project Leader : V.M.Deshmukh, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Bombay	V.M.Deshmukh	S-2	-	1-3
	Alexander Kurian	S-1 (APL)	-	1-3
Veraval	M. Zaffar Khan	S-1	-	1-3
Cochin	K. Alagaraja	S-2	-	2-3
	S.K.Tharmaraja	S-2	-	2-3

Technical Assistance: S.V.Chavan (Bombay), J.D.Sarang (Bombay), H.K.Dhokia (Veraval).

8. Location of the research Project : Bombay and Veraval
-
9. a) Objectives: (1) To assess the relative abundance of Bombay duck in space and time; (2) To monitor the characteristics of the resources such as size and age composition, spawning cycle, growth rate and mortality; (3) To study the effect of fishery on the population in relation to stock size.
- b) Practical utility: Bombay duck forms an important fishery in India. As there are indications of the resources being subjected to heavy fishing a detailed monitoring and assessment of the stocks is necessary for the proper management of the fishery.
-
10. Technical Programme: (1) Accurate resources data especially on catch and effort will be collected from landing centres. (2) Biological aspects such as size distribution, age and growth, food and feeding habits, maturity, sex ratio spawning and mortality will be studied. (3) Study of the resource data for stock assessment.

Work done: Seasonal trends of the fishery, size and age composition of the exploited resource and the biological characteristics of Bombay duck were studied at Bombay and Veraval. Preliminary processing of the resources data of the past years was completed.

Work envisaged in current year: Besides monitoring the exploited resource on the above aspect, stock assessment of Bombay duck will be undertaken based on the past data.

11. Date of start : 1981-82 12. Likely date of completion: 1984-85.

13. Estimated man-months : Man months/year

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation :
other than the Institute

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost : Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No: FB/PR/9.7 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
4. Title of project : Survey of the Pelagic fish resources of the EEZ.
5. Title of Sub-project : Evaluation of the fishery and resources of Carangids
6. Name and designation of Project Leader : S. Reuben, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	S. Reuben	S-2	-	1-2
Madras	N.S.Radhakrishnan	S-1	-	1-2
Mandapam	M.Sivadas	S-1	-	1-2
Tuticorin	H. Mohammed Kasim	S-1	-	1-2
Vizhinjam	P.Radhakrishnan Nair	S-1	-	1-2
Cochin	K.V.Somasekharan Nair	S-1	-	1-2
Mangalore	A. Noble	S-3 (APL)	-	1-2
Veraval	S.G.Raje	S-1	-	1-2

Technical Assistance: Waltair (M.V.Somaraju), Madras (K.Muthiah), Vizhinjam, (P.Sadasiva Sarma), Cochin (V.A.Narayanan Kutty), Mangalore (Ali C. Gupta) and Veraval (H.K. Thokla).

8. Location of the research project : Waltair, Madras, Mandapam, Vizhinjam, Cochin, Mangalore and Veraval.
9. a) Objectives: (1) To evaluate the relative abundance of the resource of Carangids along the east and west coasts of India. (2) To monitor the important fishery and biological characteristics of the commercially important species.
- b) Practical utility: Since this is an under exploited resource with great potential detailed studies on the resource characteristics of dominant species will be of great help in the appraisal of their commercial exploitation prospects.

10. Technical Programme: (1) Collection of catch and effort data and species composition from different types of gear from selected centres. (2) Collection of data on size, growth, age structure, sex and maturity and food of commercially important species.

Work done: During 1983 catch and effort data, species composition of Carangids; size composition, sex and maturity and food of Decapterus dayi, Megalaspis cordyla, Caranx carangus and Alopes kalla were collected and studied.

Work envisaged in current year: Studies on the above aspects of the resource will be continued with emphasis on the growth, mortality and stock assessment of the predominant species.

11. Date of start : 1981-82 12. Likely date of completion : 1984-'85

13. Estimated man-months :

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's Budget.

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost : Institute's Budget.
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No: FB/PR/9.9 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN.
-
4. Title of Project : Survey of the pelagic fish resources of Exclusive Economic Zone
-
5. Title of Sub-project : Assessment of the major pelagic fish resources.
-
6. Name and designation of Project Leader : K.V.Narayana Rao, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.
-

Centre	Name *	Designation	Time to be spent (%)	Work to be done
Waltair	S.Reuben	S-2 (APL)	-	1-5
Madras	P.T.Meenakshisundaram	S-2 (APL)	-	1-5
M.Camp	R. Thiagarajan	S-1	-	1-5
Tuticorin	P.Sam Bennet	S-2	-	1-5
Vizhinjam	P.N.Radhakrishnan Nair	S-1	-	1-5
Cochin	K.V.N. Rao	S-3	-	1-5
Calicut	M. Kumaran	S-2 (APL)	-	1-5
Mangalore	A. Noble	S-3	-	1-5
Karwar	M.H.Dhulkhed	S-3	-	1-5
Bombay	V.M. Deshmukh	S-2 (APL)	-	1-5
Veraval	H. Zaffar Khan	S-1	-	1-5

* Only core staff are indicated. Other scientists stationed at the centres will also participate in the vessel based surveys.

Technical Assistance: All Technical Assistants stationed at Research Centres.

-
8. Location of the research project : Waltair, Madras, M. Camp, Tuticorin, Vizhinjam, Cochin, Calicut, Mangalore, Karwar, Bombay and Veraval.
-
9. a) Objectives: To study the distribution and abundance of major pelagic fish resources in space and time and to estimate the magnitude of the stocks in the Exclusive Economic Zone.

- b) **Practical utility:** With the availability of vast unexploited areas under the EEZ, adequate knowledge of the nature of these grounds, their relative richness and the magnitude of the resources is necessary for a judicious exploitation. The Project seeks to provide such a survey and charting of the productive areas.

10. **Technical Programme:** (1) Detailed coverage of the coastal resources by Co-ordinated surveys by the Institute's Research Vessel and analysis of the data. (2) Analysis of the data from the Exploratory vessels using pelagic gears. (3) Charting of the productive areas wherever possible based on such data. (4) Assessment of seasonal trends and abundance of resources in the areas surveyed. (5) Sonar survey of the important pelagic species in space and time will be undertaken.

Work done: Data on the seasonal trends in abundance of the dominant pelagic resources exploited by the artisanal, drift net and purse seine fisheries from nine centres were collected, analysed and studied. During September/October 1983, fish resources and fishery environmental survey was conducted off West Bengal coast. Preliminary analysis of the data indicated that dense fish concentrations (dominated by demersal component) were found between 20 and 50 M bottom depth. In January 1984, the shelf waters between 20 M to 100 M and from Alleppey to Goa were surveyed acoustically for pelagic fish schools. Fish school concentrations dominated by Horse mackerel, young tuna and mackerel were generally dense in the area North of 13° N than in the South and especially in depths between 40 to 75 M.

Work envisaged: During 1984 the exploited and potential pelagic resources will be monitored with emphasis on sea borne acoustic and fishing surveys to delimit the distribution and abundance of the stocks and to study the recruitment of young fish.

11. Date of start : 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. **Facilities required:**

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Research vessel	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost	: Institute's Budget.

15. If financed by an organisation other than the Institute : No.

16. **Approximate cost:**

a) Salary of Scientific staff	f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	g) Total cost : Institute's Budget.
e) Cost of equipment, facility etc.	

17. **Signatures of:**

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/PR/10 2. I.C.A.R. Code No.
3. Name and address of
Research Institute : CMFR INSTITUTE, COCHIN
4. Title of Project : Survey of the pelagic fish resources
of Exclusive Economic Zone.
5. Title of Sub-Project : Studies on the fishery and resource
characteristics of the Indian Shad,
Hilsa ilisha off West Bengal-Orissa
coast.
6. Name and designation of
Project Leader : S. Rauben, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done.

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Contai	S.S. Dan	Field Officer(T-7)	25	1-6
Waltair	S. Rauben	S-2	25	1-6
Madras	P.T.Meenakshisundaram	S-2	25	1-6
Cochin	S.K. Dharmaraja	S-2 (APL)	25	1-6

Technical Assistance: Contai (Sapan Kumar Ghosh, Pulin Bahari Day),
Gopalpur (K. Dhanaraju, K. Ramasomayajulu), Puri (Sukhadev Bar),
Waltair (M.V. Somaraju), Madras (S. Chandrasekhar) and Cochin
(Varghese Philipose).

8. Location of the Research Project : Contai, Gopalpur, Puri, Waltair,
Madras and Cochin
9. a) Objectives: 1) To evaluate the fishery and resource character-
istics of the Indian shad, Hilsa ilisha from the Marine environ-
ment; 2) To estimate the stock size; 3) To study the effect of
marine fishery on the stock.
- b) Practical Utility: The Indian shad forms an important resource
in the northern part of Bay of Bengal shared by India, Bangladesh
and Burma. It is an anadromus migratory species, ascending to
estuarine and riverine systems in the region for breeding. The
fishery yields annually about 10,580 mt in West Bengal and
Orissa coast of which 69.8% is taken from the marine and 30.2%
from the estuarine and riverine environment. The Indian shad
occupies an important position in the economic and social life
of the people living in the above two States. Earlier studies

made in India on the riverine and estuarine phases of life history of the species have indicated a drastic-decline of its stock entering the Hooghly estuarine and fresh water systems which is ascribed to the construction of dams, weirs and barages. Besides, the size of the breeding stock that enters the estuarine and riverine systems in the region, year after year may also be dependent on the magnitude of the stock in the marine environment where significant catches are taken. The knowledge gained on the aspects as detailed under (a) has immediate application in the understanding the strength of the stock in the marine environment, besides helping in the formulation of management and conservation policies for a rational exploitation of the resources in the region.

-
10. Technical Programme: 1) Collection of gear-wise data on catch, fishing effort and catch-per unit effort of the fishery of Hilsa ilisha from major landing centres (Diamond Harbour, Fraser Gunj, Jamhoo Island, Janput, Contai, Diga, Balasore, Puri and Gopalpur) as per random sampling survey programmes. 2) Length composition of the species in the landings (A sample of 50 fish to be measured and sample wt. recorded) on all observation days and for all gears and centres; 3) Detailed study of the peak fishery by Scientist/Tech. Asst. team by camping at the major landing centres during October-December; 4) Racial studies of the species to be undertaken from selected centres; 5) Exploratory survey and experimental fishing (by Drift gillnet/Trawl) to be conducted on board R.V. Skipjack during October-December; 6) Studies on the length-weight relationship, rate of growth, age structure, rate of exploitation and mortality to be undertaken to assess the stock size and maximum sustainable yield.

Work done: Detailed studies on the biological and fishery aspects, migration, breeding and nursery areas of the species, from the estuarine and fresh water environments, in the region were made. Practically no information is available on the marine stocks of the species.

Work envisaged: The project programmes will be initiated at all the observation centres. The work on the aspects as detailed in 1, 2, 3 and 5 under the Technical programme will be taken during 1984-85.

11. Date of start : 1984-85 12. Likely date of completion: 1988-89

13. Estimated man-months : 12 man-months/year

14. Facilities required: i) Land - No; ii) Labour - No; iii) Special equipment - No; iv) Animal shed - No; v) Fish ponds - No; vi) Foreign exchange - No; vii) Other items - No; viii) Total estimated cost - Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost: a) Salary of scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.; g) Total cost : Institute's Budget

17. Signatures of :

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No. FB/DR/1.8.1 2. ICAR Code No.
3. Name and address of Research Institute : CMFR Institute, Cochin.
4. Title of Project : Survey of Catfish resources
5. Title of Sub-project : Estimation of the stocks of cat-fishes.
6. Name and designation of Project Leader : V.N. Bande, Scientist S2.

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	V.N. Bande & K. Alagaraja	S2	25	1-4
Waltair	Y. Appanna Sastry	S1	25	"
Calicut	N. Gopinatha Menon	S1	50	"
Mangalore	C. Muthiah	S1	25	"
Veraval	S.G. Raje	S1	50	"

Technical Assistance:

K. Narayana Rao (Waltair), K. Balakrishnan (Madras), K. Balachandran (Cochin), H. Ramachandra (Mangalore), R.G. Kavithkar (Bombay), H.K. Dokia (Veraval).

8. Location of the research project : Veraval, Bombay, Mangalore, Calicut, Cochin and Waltair.

9. a) Objectives: 1. To evaluate the relative abundance and resource characteristics of cat-fishes. 2. To study growth, feeding, reproductive biology of important species.
- b) Practical Utility: The knowledge resulting from the study has immediate application in the exploitation of this resource in both inner shelf and outer shelf regions of the Exclusive Economic Zone, and in assessing the stock of the important species and in formulating management policies for a rational exploitation of these commercially important stocks.

-
10. Technical programme: 1. Collection of data on gear-wise catch, effort and species composition. 2. Collection of data on length, weight, food, sex ratio and maturity. 3. Application of models for stock assessment. 4. Participation in exploratory/experimental fishing voyages.

Work done: The catch data, species composition of the catfishes and the size and age composition, feeding and maturity conditions of the important species landed at the different centres chosen were studied and the attempt begun to assess the stock of the main important species.

Work envisaged in current year: Stress will be laid on the observations on sex ratio and distinguishing characteristics of the sexes especially during non-breeding time. Stock assessment work will be completed.

-
11. Date of start : 1981-82 12. Likely date of completion: 1984-85

-
13. Estimated man months :

-
14. Facilities required: i) Land : Nil ii) Labour : Nil iii) Special equipment : Research Vessel iv) Animal sheds: Nil v) Fish ponds : Nil vi) Foreign exchange : Nil vii) Other items : Nil viii) Total estimated cost: Institute's Budget

-
15. If financed by an organization : No
other than the Institute

-
16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seeds, animals feeds, sprayers etc.
- g) Total cost : Institute's Budget

-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.8.2 2. ICAR Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of Project : Survey of the demersal resources of Exclusive Economic Zone
-
5. Title of Sub-project : Resource characteristics of perches
-
6. Name and designation of the Project Leader : P. Sam Bennet, Scientist S-2.
-
7. Name(s) and designation(s) of Project Leader and Project Associate together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	P. Sam Bennet	S2	30	1-3
Mandapam	K.M.S. Ameer Hamsa	S1	30	1-3
Vizhinjam	P.A. Thomas	S2	50	1-3
Bombay	S.K. Chakraborty	S1	30	1-3
Cochin	J.C. Gnanamuthu	S1	30	1-3

Technical Assistance: G.Arumugam (Tuticorin), S.G. Vincent (Vizhinjam), Chandran (Cochin), B.B. Chavan (Bombay)

8. Location of the research project : Tuticorin, Vizhinjam, Cochin and Bombay
-
9. a) Objectives: 1. To evaluate the relative abundance of perches in space and time. 2. To study growth, feeding and reproductive biology of commercially important species
- b) Practical Utility: The knowledge of these aspects has immediate application in the exploitation of the resources and also in formulation of management policies for a rational exploitation of the resources.
-
10. Technical Programme: 1. Collection of data on catch, effort, species composition from all gears. 2. Collection of data on length, weight, food, sex ratio and maturity of the commercially important species. 3. Participation in exploration/experimental fishing cruises.

Work done: The catch data, species composition of the perches at the different centres and age composition, food and feeding and maturity of the important species were studied during the past year.

13. Estimated man-months :

i)	Land	: No	v)	Fish ponds	: No
ii)	Labour	: No	vi)	Foreign exchange	: No
iii)	Special equipments	: No	vii)	Other items	: No
iv)	Animal sheds	: No	viii)	Total estimated cost	:
				Institute's Budget	

16. Approximate cost: a) Salary of Scientific staff; b) Salary of technical staff; c) Salary of supporting staff, if any d) Contingencies, such of chemicals, fertilisers, seed, animal, feeds sprayers etc. g) Total cost: Institute's Budget

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.8.3 2. ICAR Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of project : Survey of the demersal resources of the Exclusive Economic Zone
-
5. Title of sub-project : Resource characteristics of thread-fin breams.
-
6. Name and designation of the Project Leader : V. Sriramachandra Murty Scientist-S2
-
7. Name and designation(s) of project leader and project associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Kakinada	V. Sriramachandra Murty	S2	40	1-4
Madras	E. Vivekanandan	S2	30	"
Cochin	K.V. Somasekharan Nair	S1	30	"
Calicut	Gracy Mathew	S1	30	"
Bombay	S.K. Chakraborty	S1	30	"
Veraval	S.G. Raje	S1	50	"

Technical Assistance:

K. Narayana Rao (Waltair), P. Ramalingam (Kakinada), P. Ramadoss (Madras), M.N. Kesavan Eleyathu (Cochin)

8. Location of the Research Project : Waltair, Kakinada, Madras, Cochin, Calicut, Bombay, Veraval
-
9. a) Objectives: 1) To study the distribution and abundance of threadfin breams at these centres. 2) To study the population characteristics, such as length distribution, growth, age composition, sex ratio, maturation, spawning and fecundity and mortality rate of commercially important species.
- b) Practical Utility: Knowledge of the above aspects is essential for a proper exploitation of the resource and the formation of the management policies required for this.
-

-
10. Technical Programme: 1) Collection of data on effort, catch and species composition of commercial landings and from catches of departmental vessels. 2) Collection of data on length, weight, food, age, growth maturity and fecundity of N.japonicus. 3) Estimation of stock of N.japonicus resources 4) Participation in exploratory experimental fishing cruises.

Work done: Data on effort, catch, species composition of threadfin breams landed by commercial trawlers, and data on the biology of the dominant species, N.japonicus, were collected from the different centres. Growth, mortality rates and stock size of N.japonicus at Kakinada were estimated.

Work envisaged in current year: Study and comparison of biometric data on N.japonicus based on a sample of 200 fishes from each centre. Consolidation of the accumulated data and analysis for stock assessment of N.japonicus.

-
11. Date of start: 1981-82 12. Likely date of completion: 1984-85

-
13. Estimated man-months :

-
14. Facilities required: i) Land : No ii) Labour : No iii) Special equipment : No iv) Animal sheds : No v) Fish ponds : No vi) Foreign exchange : No vii) Other items : No viii) Total estimated cost : Institute's Budget

-
15. If financed by an organisation : Nil
other than the Institute

-
16. Approximate cost: a) Salary of Scientific staff; b) Salary of technical staff c) Salary of supporting staff; d) Casual labourer cost, if any; e) Cost of equipment, facility etc., f) Contingencies such as chemicals, fertilisers seed, animals, feeds, etc. g) Total cost : Institute's Budget

-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.8.4 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of Project : Survey of demersal resources of the Exclusive Economic Zone.
-
5. Title of sub-project : Assessment of sciaenid resources
-
6. Name and designation of the project leader : T. Appa Rao, Scientist S2.
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Veraval	T. Appa Rao	S2		1-4
Kakinada	V. Sreeramachandra Murty	S2	30	"
Madras	P. Devadoss	S2	30	"
	E. Vivekanandan	S2		"
Cochin	K. V. Somasekharan Nair	S1		"
Calicut	Gracy Mathew	S1	30	"
Bombay	S. K. Chakraborty	S1		"

Technical Assistance: K. Narayana Rao (Waltair), P. Ramalingam (Kakinada), P. Ramadas (Madras), B. B. Chandran (Cochin).

8. Location of research project : Waltair, Kakinada, Madras, Calicut, Bombay, Veraval.
-

9. a) Objectives: 1) To study the distribution and abundance of the different species of sciaenids at the different observation centres. 2) To study the population characteristics such as length, weight, growth and age, maturation, spawning and fecundity, mortality rates of commercially important species.

b) Practical Utility: From the knowledge gained from the above, it will be possible to form suitable management policies for a rational exploitation of the resource in the area concerned.

-
10. Technical Programme: 1. Collection of data on catch, effort and species composition from the commercial catch and from departmental vessel operations. 2. Collection of data on length, weight, food, gonadal condition of important species. 3. Studies on age, growth and mortality rates. 4. Participation in exploratory/fishing cruises.

Work done: Seasonal trends of the fishery, species composition and studies on biological aspects, viz., size and age distribution, maturity condition, growth and food of dominant species at the different centres were carried out.

Work envisaged in current year: The accumulated data would be consolidated and analysed for an assessment of the resources with particular reference to estimation of population parameters of the species of Johnius & Otolithus

-
11. Date of start: 1981-82 12. Likely date of completion: 1984-85

-
13. Estimated man-months :

-
14. Facilities required: i) Land: No ii) Labour : No iii) Special equipment : No iv) Animal sheds : No v) Fish ponds : No vi) Foreign exchange : No vii) Other items : No viii) Total estimate cost: Institute's Budget

-
15. If financed by an organisation : No other than the Institute

-
16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any d) Casual labour cost, if any; e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost:

-
17. Signatures of :

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.8.5 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute,
Cochin.
-
4. Title of Project : Survey of the demersal resources
of the Exclusive Economic Zone.
-
5. Title of Sub-project : Resource characteristics of
silver bellies.
-
6. Name and designation of the Project Leader : V. Sriramachandra Murty,
Scientist S2.
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work
to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Kakinada	V. Sriramachandra Murty	S2	50	1-2
Madras	S. Srinivasarangan	S1	30	1-2
Mandapam	P. Livingston	S1	30	1-2

Technical Assistance: P. Ramalingam (Kakinada), S. K. Balakumar
(Madras), M. Badruddin (Mandapam)

-
8. Location of the research project : Kakinada, Mandapam, Madras.
-
9. a) Objectives: To assess the magnitude of the resource of
silver bellies and to study their species composition and
species-wise abundance in space and time. 2) To study
the biology and estimate population parameters of the
important species.
- b) Practical Utility: The information on the above aspects
is essential for the effective management and rational
exploitation of the resources.
-
10. Technical Programme: 1. Data on catch, effort and species
composition to be collected at fish landing centres and on
board research/fishing vessels. 2) Population characteris-
tics such as age, size composition, weight, food, sex ratio,
maturity etc. to be studied of the dominant species. 3.
Estimation of age, growth and mortality rates. 4. Partici-
pation in exploratory/experimental fishing cruises.

- b) Practical Utility: The study would provide the information necessary for the rational exploitation and management of the resource.

Work done: Data on effort, catch and species composition of silver bellies landed by commercial gear, and on the various aspects of the biology of dominant species were collected from the different observation centres.

Work envisaged in current year: Detailed analyses of the data collected so far will be undertaken for an assessment of these resources along the east coast and for estimates of age, growth and maturity of the dominant species studied.

- 11. Date of start: 1981-82 12. Likely date of completion: 1984-85

 13. Estimated man-months :

 14. Facilities required: i) Land : No ii) Labour : No iii) Special equipment: No iv) Animal sheds: No v) Fish ponds : No vi) Foreign exchange: No vii) Other items: No viii) Total estimated cost: Institute's Budget

 15. If financed by an organisation :
 other than the Institute

 16. Approximate cost: a) Salary of Scientific staff b) Salary of Technical staff c) Salary of Supporting staff, if any d) Casual labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds, sprayers etc. g) Total Cost:

 17. Signatures of:

Sd/-

Project Leader

Sd/-

Head of Division

Sd/-

Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.9.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of Project : Survey of the demersal resources of Exclusive Economic Zone.
-
5. Title of Sub-project : Estimation of major demersal fish resources.
-
6. Name and designation of the Project Leader : C. Mukundan Scientist S2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	Y. Appanna Sastry	S1	30	1-4
Kakinada	V. Sriramachandra Murty	S2	25	"
Madras	P. T. Meenakshisundaram	S2	25	"
	E. Vivekanandan	S2	25	"
Mandapam	P. Livingston	S1	25	"
Vizhinjam	C. Mukundan	S2	25	"
Cochin	K. V. Somasekharan Nair	S1	30	"
Veraval	S. G. Raje	S1		"

Technical Assistance: W. Venugopalan (Kakinada), S. Chandrasekharan (Madras), M. Badruddin (Mandapam), C. Manimaran (Tuticorin), Abdul Nizar (Cochin), R. G. Kavithkar (Bombay).

8. Location of the Research Project : Bombay, Cochin, Vizhinjam, Tuticorin, Mandapam, Madras, Kakinada, Waltair, Veraval.
-
9. a. Objectives: Study of the demersal fishery resources and also the major component species/groups, available for exploitation by the mechanised vessels at the different centres.
- b. Practical Utility: With growing mechanization the exploitation of ground fisheries off the mainland has increased many-fold. For a judicious exploitation of the additional areas an adequate knowledge of the nature of these grounds, the relative richness of the different fishing areas, and the magnitude of the resources is necessary. The Project seeks to provide such a survey and charting of the more productive areas.
-

-
10. Technical Programme: 1. Detailed coverages of the coastal resources from co-ordinated operation of the Institute vessels wherever available. 2. Analysis of data from commercial/exploratory fishing by private mechanised craft/ Government of India Vessels. 3. Assessment of the resources available in the areas concerned. 4. Participation in exploratory/cope, fishing vessels.

Work done: Fishery data from the above sources were collected during the past year.

Work envisaged in current year: Along with collection of such data, the accumulated data over the period of the project would be consolidated and analysed for an assessment of the demersal resources in the different regions covered.

-
11. Date of start: 1981-82 12. Likely date of completion: 1984-85

-
13. Estimated man-months :

-
14. Facilities required: i. Land : - ii) Labour : -
iii) Special equipment : - iv) Animal sheds : - v) Fish ponds : - vi) Foreign exchange : - vii) Other items : -
viii) Total estimated cost : Institute's Budget

-
15. If financed by an organisation : No
other than the Institute

-
16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any
d) Casual labour cost, if any e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost :
Institute's Budget

-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/IR/1.9.2 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of Project : Survey of demersal resources of the Exclusive Economic Zone
-
5. Title of Sub-project : Bathypelagic resources of the EEZ
-
6. Name and designation of the Project Leader : Dr. M.J. George, Scientist S3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	M.J. George	S3	10	1-4
	C. Suseelan	S2	20	"
	M.M. Meiyappan	S1	20	"
	K. Rengarajan	S2	20	"
	I. David Raj	S1	20	"

Technical Assistance: K.K. Balasubramanian and K.N. Gopalakrishnan (Cochin)

8. Location of the research project : Cochin
-
9. a) Objectives: 1) To undertake exploratory/research survey of bathypelagic resources, particularly of economic value, beyond the areas at present exploited with a view to find new resources and fishing grounds. 2) To evaluate the resource potential of the under exploited areas and to assess the magnitude of the resources available for exploitation.
- b) Practical Utility: Bathypelagic resources comprising fishes, prawns, lobsters, crabs and other organisms constitute a fishery of considerable economic significance. Preliminary surveys carried out in the continental shelf and slope of certain regions of our coasts have shown the availability of exploitable deep sea crustacean and other bathypelagic resources. Detailed information on the distribution pattern, seasonal abundance and biology of constituent species of the resources in the areas beyond the conventional fishing grounds in the Exclusive Economic Zone of our country forms a pre-requisite for rational exploitation and accelerated development of these resources.
-

10. Technical Programmes: 1) Participation in the exploratory/experimental fishing cruises of Research Vessels and other larger vessels. 2) Collection of data on bathypelagic resources in the prescribed proforma. 3) Analysis of data for distribution pattern, seasonal abundance and biological and fishing parameters relating to fishes. 4) Assessment of exploitable bathypelagic resources in the extended economic zone on the basis of the data analysed.

Work envisaged in current year: Work on this project will commence as and when the larger research vessels are available for cruises.

11. Date of start: 1984-85 12. Likely date of completion : 1986-87

13. Estimated man-months : 80 man months/year

14. Facilities required: i) Land : No ii) Labour : No
iii) Special equipment : No iv) Animal sheds : No
v) Fish ponds : No vi) Foreign exchange : No
vii) Other items : viii) Total estimated cost: Institute's Budget

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of Scientific staff
b) Salary of Technical staff c) Salary of Supporting staff, if any d) Casual Labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FB/DR/1.10 2. I.C.A.R. Code No.
-
3. Name and address of : CMFR Institute,
Research Institute Cochin.
-
4. Title of Project : Survey of the demersal resources
of the Exclusive Economic Zone
-
5. Title of Sub-project : Preparation of fishery atlases
-
6. Name and designation of : C. Mukundan,
Project Leader Scientist S-2.
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work
to be done.

Centre	Name	Desig- nation	Time to be spent (%)	Work to be done
Vizhinjam	C. Mukundan	S-2	25	1-2

Technical Assistance: Mahadevan Pillai (Cochin)

8. Location of the research : Cochin, Vizhinjam
project

9. a) Objectives: To chart the area-wise and season-wise dis-
tribution and abundance of pomfrets, catfishes and
sciaenids (with relate parameters).
- b) Practical Utility: Information on these three groups,
which are commercially significant, is to be compiled
and presented in a consolidated form, which would be
useful to the industry.

10. Technical programme:

- Catch and effort data for these three groups would be analysed on an all-India basis.
- Related biological and environmental information on the constituent species, available so far, would also be consolidated.

Work done: The analysis of the earlier year's catch was carried out category-wise, area-wise and season-wise.

Work envisaged in current year: Analysis on the above lines would be continued.

11. Date of start : 1981-82 12. Likely date of completion :
1984-85

13. Estimated man-months :

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: No
ii.	Labour	: No	vi.	Foreign exchange	: No
iii.	Special equipment	: No	vii.	Other items	: No
iv.	Animal sheds	: No	viii.	Total estimated cost :	
				Institute's Budget	

15. If financed by an organisation : No
other than the Institute

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Cost of equipment, facility, etc.
- f) Contingencies, such as chemicals, fertilisers, seed, animals, feeds, sprayers etc.
- g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	V.S.Rangaswami	S1	100	
	V.Gandhi	S1	100	
	A.Raju	S1	100	
Tuticorin	R.Marichamy	S2	25	
Madras	P.Nammalwar	S2	100	
	G.Mohanraj	S2	100	

8. Location of the research project : Mandapam Camp, Tuticorin, Madras.

9. a) Objectives: 1. To assess the production potential of different groups of marine fishes in mono and polyculture systems in ponds. 2. To develop the seed collection and hatchery techniques necessary for such culture.

b) Practical Utility: The development of culture technique on the above lines would facilitate the production of seed and large-scale culture of compatible species.

10. Technical Programme: 1. Studies on seed availability in the wild and collection of seed from selected centres for stocking. 2. Culturing of marine fish in ponds at different stocking densities, different levels of application of fertilizers to ponds and feeding of the species selected. 3. Monitoring of the environmental parameters, such as temperature, salinity.

dissolved oxygen, water depth, soil condition, presence of blooms, presence of toxic substances etc. as also the growth of fishes in terms of length and weight in the ponds. 4. Harvesting and estimation of production under different systems. 5. Experiments on compatible species for polyculture. 6. Development of hatchery technique for the required supply of seed, wherever needed.

Work done: Availability of seed in the wild and changes in the pattern of availability have been studied in all centres. Fish culture experiments with milkfish and mullets at different stocking densities and in fertilized and unfertilized ponds have been carried out. Success was also achieved in breeding of some of the species selected.

Work envisaged in current year: Variation in seed availability in relation to lunar phases and other changes would be studied. Possibilities of culturing new species, particularly in polyculture systems, would be investigated.

11. Date of start : 1984-85 12. Likely date of completion :
1986-87

13. Estimated man-months :

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds:	No	viii. Total estimated cost :	
		Institute's Budget	

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of Scientific staff b) Salary of Technical staff c) Salary of Supporting staff, if any d) Casual labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc. g) Total cost :

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

- | Centre | Name | Designation | Time to be spent (%) | Work to be done |
|----------|-----------------------|-------------|----------------------|-----------------|
| Mandapam | K.M.S. Ameer Hamsa | S1 | | |
| | P.E. Sampson Manickam | S1 | | |

8. Location of the research project : Mandapam Camp.

9. a) Objectives: 1) To utilise coastal areas for culture of suitable marine fish by different techniques. 2) To assess the production potential of different marine fishes by culture in cages.
- b) Practical utility: The Project aims at developing suitable technologies for culture of compatible species on a large scale to increase the fish production.
-
10. Technical programme: 1) To develop suitable culture system for the utilisation of inshore areas for marine fish culture. 2) To assess the availability of seed of cultivable marine species of fishes for stocking. 3) To culture selected marine species in suitably devised cages by stocking at different densities, application of suitable natural and artificial feed. 4) To monitor the growth rate, environmental parameters and assess production. 5) To study the possibility of culturing new species, particularly groupers, in cages. 6) To develop a suitable hatchery technique wherever necessary.

Work done: Studies on culture of Epinephelus and Lutjanus species in cages in the inshore water were carried out.

Work envisaged in current year: More detailed work on these and other species of fishes would be taken up.

11. Date of start : 1984 12. Likely date of completion : 1986-87

13. Estimated man months :

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: No	vi. Foreign exchange	: No
iii. Special equipments	: No	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of Scientific staff b) Salary of Technical staff c) Salary of Supporting staff, if any d) Casual labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds, sprayers etc. g) Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No.DF/CUL/1.5 2. I.C.A.R. Code No.
-
3. Name and designation of : C.M.F.R.Institute,
Research Institute Cochin-18.
-
4. Title of Project : Mariculture - Culture of
fin-fishes
-
5. Title of Sub-project : Culture of marine fish in
polythene - lined ponds
-
6. Name and designation of : S. Lazarus,
Project Leader Scientist S2
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work
to be done.
-

Centre	Name	Desig- nation	Time to be spent (%)	Work to be done
Calicut	S.Lazarus	S2		

Technical Assistance: K.Nandakumaran (Calicut)

8. Location of the research : Calicut
project
-
9. a) Objectives: To develop suitable culture systems for
utilisation of unused coastal areas for marine fish
culture. 2) To assess the production potential of
different groups of marine fish by culturing them in
polythene-lined ponds.
- b) Practical utility: The technology developed by the
Project would enable culture of compatible species in
unused areas of the coast.
-
10. Technical programme: 1) Studies on availability in the
wild of seed of the selected marine fish and collection
of seed for stocking. 2) Culture of marine fish in poly-
thene-lined ponds under different conditions of stocking,
maturing and feeding. 3) Monitoring environmental para-
meters, as also growth of fish. 4) Harvesting and
estimation of production under different conditions 5)
Studies on different compatible species for polyculture.

Work done: Marine species like Chanos, Mugil and Megalops were cultured in such ponds and their production rates were studied.

Work envisaged in current year: Similar work would be continued at different rates of stocking, manuring and feeding, as also on new species that could be used for such culture.

11. Date of start : 1984 -12. Likely date of completion :
85 1986-87

13. Estimated man-months :

14. Facilities required: i) Land : No ii) Labour : No
iii) Special equipment : iv) Animal sheds : No v) Fish
ponds : No vi) Foreign exchange : vii) Other items : No
viii) Total estimated cost : Institute's Budget

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of scientific staff b) Salary
of Technical staff c) Salary of Supporting staff, if any
d) Casual labour cost, if any e) Cost of equipment,
facility etc. f) Contingencies, such of chemicals,
fertilisers, seed, animal feeds, sprayers etc. g) Total
cost :

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No.DF/CUL/1.6 2. I.C.A.R. Code No.
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin-18.
4. Title of Project : Culture of marine fishes (Revised)
5. Title of Sub-project : Culture of marine fish in pens
6. Name and designation of the Project Leader : R.S. Lal Mohan,
Scientist S2.
7. Names and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	R.S.Lal Mohan	S2		

Technical Assistance: Joseph Rodrigo, M.R. Arputharaj (Mandapam)

8. Location of the Research : Mandapam Project

9. a) Objectives: To develop suitable culture systems for the utilization of seasonally inundated coastal areas and derelict waters.
- b) Practical utility: The project aims at developing suitable technologies for culture of compatible species on a large scale in order to increase the fish production.

10. Technical Programme:

1. Assessment of the availability of the seed of cultivable fishes and the collection of seed for stocking. 2) Culture of selected species of marine fish in pens and lagoon areas at different levels of stocking and of natural and artificial feeding. 3) Monitoring of all relevant environmental factors and the growth of the fish in the pens. 4) Estimation of production in the pen culture system under different conditions.

Work done: Culture of milkfish and mullets was carried out in pens.

Work envisaged in current year: Similar work will be continued with different levels of feeding and stocking, and attempts to culture other species of marine fish will also be made.

14. Facilities required:

- | | | | | | |
|------|-------------------|-------|---------------|------------------------|----|
| i. | Land : | No | v. | Fish ponds : | No |
| ii. | Labour : | No | vi. | Foreign exchange : | No |
| iii. | Special equipment | :vii. | Other items : | No | |
| iv. | Animal sheds : | No | viii. | Total estimated cost : | |

Institute's Budget

16. Approximate cost:

- a. Salary of the Scientific staff
- b. Salary of Technical staff
- c. Salary of Supporting staff, if any
- d. Casual labour cost, if any
- e. Cost of equipment, facility etc.
- f. Contingencies, such of chemicals, fertilisers, seed, animals feeds, sprayers etc.
- g. Total cost :

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-'85

1. Institute Code No. CF/RE/1.1.1. 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR Institute, Cochin
4. Title of Project : Crustacean resources of E.E.Z.
5. Title of Sub-project : Assessment of penaeid prawn resources
6. Name and designation of Project Leader : M.J. George, Scientist S3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent(%)	Work to be done
Cochin	M.J. George	S3	25	1-3
	K. Alagaraja	S2	25	2
	C. Suseelan	S2	25	1-3
Puri	Manmadan Nair	S1	50	1-3
Waltair	G. Sudhakara Rao	S2	75	1-3
Kakinada	S. Lalitha Devi	S1	25	1-3
Madras	D.B. James	S2	25	1-3
Tuticorin	S. Shanmugam	S1	25	1-3
Cochin	K.N. Rajan	S1	75	1-3
Mangalore	K.K. Sukumaran	S1	25	1-3
	K.Y. Telang	S1	50	1-3
Karwar	G. Nandakumar	S2	25	1-3
Bombay	S. Ramamurthy	S3	25	1-3
	M. Aravindakshan	S	50	1-3
Veraval	V.D. Deshmukh	S1	40	1-3
Calicut	N.S. Kurup	S1	75	1-3

Technical Assistance: P.V.K. Rao(Puri), C.Nalini, K.K.Balasubramanian, K.Chellappan(Cochin), C.Tippaisamy(Mangalore), V. Suresh, S.Lakshmi(Calicut), Manickaraja(Tuticorin), J.B.Varma (Kakinada), B.P.Tumber(Veraval), A.Y.Mestri(Bombay), P. Thirumilu(Madras), C.Z.Dinesh(Karwar).

8. Location of the research project: Puri, Waltair, Kakinada, Madras, Tuticorin, Calicut, Mangalore, Karwar, Bombay, Veraval, Cochin.
9. a) Objectives: 1. To assess the magnitude of exploited resources of the various species of penaeid prawns and to study their relative abundance in space and time along the Indian coast. 2. To monitor the population characteristics of all the important species at different places. (3) To study the biological characteristics of the commercial species and to maintain the relevant data on a continuing basis. 4). To

undertake spawning surveys of important species of the inshore and offshore waters. (5) To evaluate the resources potential of the under exploited areas and to find new resources beyond the conventional fishing grounds.

b) Practical utility: Penaeid prawns contribute to more than half of the marine prawn production of the country and are in great demand in export trade. The exploitation of this resources has increased considerably in recent years. Some new fishing grounds have also be discovered and commercial exploitation has extended there also. The effect of the increased fishing pressure on the prawn stock has to be closely watched and the biological as well as population characteristics of stock are studied to provide scientific data for framing suitable management policies to obtain maximum sustainable yield.

-
10. Technical Programme: (1) Data on catch and effort for the penaeid prawns fished from the sea will be collected at the centres mentioned above based on random sampling. 2) Species composition and their seasonal abundance in the catch, size and sex composition, maturity, food and other biological aspects of the individual species will be analysed. 3) Detailed studies on population characteristics will be undertaken. 4) Spawning and resources surveys will be carried out at selected centres. 5) Record the variations in prices of the different grades of prawns.

Work done: Data on catch, effort, biological aspects and prices at the different species of penaeid prawns in the fishery at the different centres have been collected and studied.

Work envisaged in current year: A detailed analysis of the data collected so far from each centre on catch, effort, length frequency and other biological data would be undertaken this year with a view to make a proper assessment of the stocks and a detailed review paper on the stock assessment got ready for publication.

11. Date of start: 1981-82. 12. Likely date of completion: 1987-88

13. Estimated man-months: (for scientific personnel only)
70 man months

14. Facilities required:

i. Land : Nil; ii. Labour: Nil; iii. Special equipment: Nil;
iv. Animal sheds: Nil; v. Fish ponds: Nil; vi. Foreign Exchange: Nil; vii. Other items: Nil; viii. Total estimated cost:
Institute's budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost : Institute's Budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-'85

1. Institute Code No. CF/RE/1.1.2. 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin

4. Title of Project : Crustacean Resources of the E.E.Z.

5. Title of sub-project : Assessment of non-penaeid prawn resources

6. Name and designation of Project Leader : S. Ramamurthy, Scientist S-3

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Bombay	S. Ramamurthy	S3	25	1-4
	M. Aravindakshan	S	50	"
Kakinada	S. Lalitha Devi	S1	25	"
Veraval	V.D. Deshmukh	S1	40	"

Technical Assistance: J.B. Varma (Kakinada), A.D. Sawant (Bombay), B.P. Thumber (Veraval)

8. Location of the research project: Kakinada, Bombay, Veraval

9. a) Objectives:

1. To assess the magnitude of the exploited resources of the various species of nonpenaeid prawns and to study their relative abundance in space and time along the Indian coast.
2. To monitor the population characteristics of the commercial species and to maintain the relevant data on a continuing basis.
3. To study the biological and population aspects of constituent species.
4. To evaluate the resources potential beyond the presently exploited fishing zones.

b) Practical utility: Nonpenaeid prawns are the second major category of the prawn resources and support around the year fishery of high magnitude in certain regions. A proper assessment of the resources through collection of data on catch, effort and population characteristics and biology of constituent species is essential for the rational exploitation of the resources.

10. Technical Programme: 1) Data on catch and effort for non-penaeid prawns will be collected at the above mentioned centres based on random sampling. 2) Data on species composition, size and sex distribution, maturation, fecundity, spawning, larval distribution, growth, food and feeding and their biological aspects of important species will be collected. 3) Detailed studies on population characteristics will be undertaken.

4) At centres where research vessels are available trawling surveys will be conducted to discover new resources of deep sea non-penaeid prawns.

Work done: Data on catch, effort, biological aspects and prices of different species of nonpenaeids of different observation centres have been collected and studied. The fishery decreased at Veraval, Bombay and Kakinada. The resources data from 1961-80 in Maharashtra were analysed to study the catch trends.

Work envisaged in current year: A detailed analysis of the data collected so far from each centre on catch, effort, length frequency and other biological data would be undertaken this year with a view to make a proper assessment of the stocks and a detailed review paper on the stock assessment got ready for publication.

11. Date of start: 1981-82. 12. Likely date of completion: 1987-88

13. Estimated man-months: (Scientific personnel only)
22.2 man months/year

14. Facilities required:

i. Land: Nil; ii. Labour: Nil; iii. Special equipment: Nil; iv. Animal sheds: Nil; v. Fish ponds: Nil; vi. Foreign Exchange: Nil; vii. Other items: Nil; viii. Total estimated cost: Institutes Budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost: a) Salary of scientific staff.; (b) Salary of Technical staff.; c) Salary of Supporting staff, if any; d) Casual labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such as chemicals, fertilizers, seeds, animals, feeds sprayers etc.; g) Total cost: Institute Budget.

17. Signature of:

Sd/-

Project Leader

Sd/-

Head of Division

Sd/-

Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. CF/RE/1.1.3. 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin

4. Title of Project : Crustacean Resources Investigations

5. Title of Sub-project: Assessment of prawn resources in the nursery grounds

6. Name and designation of Project Leader : C. Suseelan, Scientist S2

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Puri	Mannadhan Nair	S1	50	1-3 at Puri
Kakinada	S.Lalitha Devi	S1	25	1-3 at Kakinada
Madras	D.B. James	S2	25	1-3 at Madras
Cochin	V.S. Kakati	S1	50	Stake net fishery of Cochin BW.
	C. Suseelan	S2	50	Stake net fishery of Ashtamudi BW & 1-3 at Cochin.
Calicut	N.S. Kurup	S1	25	1-3 of Korapuzha
Mangalore	K.K. Sukumaran	S1	25	1-3 of Nethravathi
Karwar	G. Nandakumar	S2	25	1-3 at Karwar

Technical Assistance: P.V.K. Rao (Puri), K.N. Gopalakrishnan, K.Chellappan (Cochin, Quilon), Dinesh (Karwar), K.Koumudi Menon (Calicut), P.Thirumulu (Madras).

8. Location of the research project: Puri, Kakinada, Madras, Cochin, Calicut, Mangalore, Karwar

9. a) Objectives: 1) To study the rate of recruitment of post-larvae and juvenile penaeid prawns with the nursery areas and to use their abundance as an index for forecasting the magnitude of the fishery of the succeeding period. (2) To study the distribution, growth rates, migration, mortality etc. of various species in important estuarine systems. 3) To assess

the catch rates of juvenile prawns in order to indicate the trend of abundance of juvenile population inside the nursery areas.

b) Practical utility: The success or failure of the prawn fishery could be predicted in advance using the index of post larval and juvenile abundance in the estuarines and backwaters. As the exploitation of juvenile prawns from the nursery areas is fast increasing everywhere, data on catch, effort and biological characteristics of the constituent species will provide scientific backing to frame management policies for judicious exploitation and conservation of resources.

10. Technical programme:

1) The rate of recruitment of post-larvae and juvenile prawns into the nursery grounds will be studied at selected centres by using quantitative sampling methods. 2) Data on catch and effort for juvenile penaeid prawns will be collected for major fisheries. 3) Data on species composition, sex ratio and biological aspects such as growth, movements etc. of important species will be studied.

Work done: The recruitment pattern, biological characteristics and exploitation of juvenile penaeid prawns in the nursery areas were studied from selected centres.

Work envisaged in current year: The qualitative and quantitative data on postlarval and juvenile prawns so far recorded at each of the project centres will be analysed in detail and a comprehensive report of the results prepared for publication. The monitoring studies will be continued only for the major fisheries.

11. Date of start: 1981-82. 12. Likely date of completion: 1987-88

13. Estimated man-months: 33 man months (Scientific personnel only)

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost:	Institute's budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.

17. Signatures of :

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-'85

1. Institute Code No. CF/RE/1.3 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin

4. Title of Project : Crustacean resources of E.E.Z.

5. Title of Sub-project : Assessment of lobster and crab resources

6. Name and designation of Project Leader : P.V. Kagwade

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent(%)	Work to be done
Madras	E.V. Radhakrishnan	S2	15	1-3
Bombay	P.V. Kagwade	S2	75	"
Veraval	V.D. Deshmukh	S1	20	"
Mangalore	K.Y. Telang	S1	50	"

- Technical Assistance: A Mohan (Madras), W. Venugopalan (Kakinada), M. Manickaraja (Tuticorin), V. Suresh, K.K. Balasubramanian (Cochin), A.Y. Mestry (Bombay), B.P. Tumber (Veraval), O. Tipaisamy (Mangalore).

8. Location of the research : Kakinada, Madras, Cochin, Tuticorin, Project Calicut, Mangalore, Bombay, Veraval

9. a) Objectives: 1) To collect resources data on shallow water lobsters and commercially important crabs. 2. To elucidate the various biological aspects such as age and growth, food and feeding habits, maturation, spawning migration and behaviour of commercially important species of lobsters and crabs.
- b) Practical Utility: Lobsters and crabs form about 10-15% of the total crustacean catches in India and there is an export market for lobster tails and crab meat. The characteristics of these natural resources have to be fully determined and the rate of their exploitation closely watched to avoid overfishing.

10. Technical Programme:

1. Regular observations on species-wise abundance of different groups. 2. Studies on biological characteristics of concerned species. 3. Estimation of mortality and population parameters.

Work done: Resources data on lobster and crabs were collected. Decrease in the catches of both the groups were noticed in important fishing areas. Age, growth and maturity size of Panulirus polyphagus were determined.

Work envisaged in current year: A detailed analysis of the data collected so far from each centre on catch, effort, length frequency and other biological data would be undertaken this year with a view to make a proper assessment of the stocks and a detailed review paper on the stock assessment got ready for publication.

11. Date of start: 1981-82 12. Likely date of completion: 1987-88

13. Estimated man-months : 20 man-months

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

a) Salary of Scientific staff:	
b) Salary of Technical Staff :	
c) Salary of Supporting staff:	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.	
g) Total cost	: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-'85

1. Institute Code No.CF/RE/1.4. 2. I.C.A.R.Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin

4. Title of Project : Crustacean Resources Investigations

5. Title of Sub-project : Prawn Fishery Atlas

6. Name and designation of Project Leader : E.G. Silas

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	E.G. Silas	Director	10	1-2
-do-	K.Rengarajan	S2	25	"
-do-	S.K.Dharmaraja	S2	10	"
-do-	I. David Raj	S-1	25	"
- <u>Technical Assistance:</u>				

8. Location of the research project: Cochin

9. a) Objectives:

1) To present all information about prawn resources, their biology, ecology and utilisation in a pictorial form

b) Practical utility:

The fishing atlas will be of great use to the industry and the Government of the maritime states in planning future developments. It will also highlight the gaps in our knowledge regarding the prawn resources of the country which need further investigations.

10. Technical Programme: 1) Processing and summarising of all available data on the prawn resources of India.
2) Preparation of fishery maps and charts to show the magnitude of the prawn fishery in the various geographical regions, depth-wise distribution of the species, relative abundance of the prawns in space and time, size distribution of the species on the estuarine, inshore and offshore regions and the fishing methods employed for catching prawns in various areas.

Work done: Data on prawn landings by EFP vessels along the Indian coast for the year 1979-80 has been analysed for the preparation of the atlas.

Work envisaged in current year: Similar analysis for the year 1980-81 will be taken up.

11. Date of start: 1981-82. 12. Likely date of completion: 1987-88

13. Estimated man-months : (Scientific personnel only)
8.4 man months

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost:	
		Institute's Budget	

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- a) Salary of scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff, if any
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost : Institute's budget
-

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. CF/RE/1.7 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin
-
4. Title of Project : Crustacean Resources of EEZ
-
5. Title of Sub-project : Assessment of Stomatopod resources
-
6. Name and designation of Project Leader : M.M. Kunju, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Madras	D.B. James	S-2	25	1-3
Cochin	M.M. Kunju	S-2	25	"
Calicut	N.S. Kurup	S-1	15	"
Mangalore	K.K. Sukumaran (APL)	S-1	15	"
Karwar	G. Nandakumar	S-2	25	"
Waltair	G. Sudhakara Rao	S-2	25	"

Technical Assistance: Koumudi Menon (Calicut), C. Nalini (Cochin), Thippeswamy (Mangalore), Dinesh (Karwar), P. Thirumulu (Madras)

8. Location of the research project : Madras, Calicut, Cochin, Mangalore, Karwar
-

9. a) Objectives:

1. To assess the magnitude of the exploited stomatopod resources and to study their relative abundance in space and time along the Indian coasts.
2. To study the biology and population characteristics of stomatopods with a view to make an appraisal of the commercial exploitation prospects.

- b) Practical utility: Stomatopods form about 10-15% of the catch landed by trawlers. This resource is not fully utilised at present. They are good raw material for converting into fish meal poultry feed, manure and also for human consumption. An accurate assessment of their resources along with biological factors is an essential prerequisite for the exploitation.
-

10. Technical Programme: 1) Data on catch and effort, species composition etc. will be collected.
 2) Size composition, sex ratio, maturity and other biological aspects will be studied from the samples obtained from commercial and experimental trawling.
 3) Estimation of spatial and seasonal distribution of stomatopods will be made on the basis of data collected from experimental and other trawler catches together with biological studies.

Work done: Catch and effort data on stomatopod landing at various centres were analysed. Maximum landings are recorded at Mangalore, while there is general increase in all other centres except Karwar. December to April is the peak season.

Work envisaged in current year:

A detailed analysis of the data collected so far from each centre on catch, effort, length frequency and other biological data would be undertaken this year with a view to make a proper assessment of the stocks and a detailed review paper on the stock assessment got ready for publication.

11. Date of start: 1981-82 12. Likely date of completion: 1987-88

13. Estimated man-months: (Scientific personnel only)
 15 man months

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost	: Institute's Budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- Salary of Scientific staff
- Salary of Technical Staff
- Salary of Supporting staff, if any
- Casual labour cost, if any
- Cost of equipment, facility etc.
- Contingencies, such of chemicals, fertilizers, seeds, animals, feeds, sprayers etc.
- Total cost : Institute's Budget

17. Signatures of:

Sd/-
 Project Leader

Sd/-
 Head of Division

Sd/-
 Director

RESEARCH PROJECT - 1984-85

 1. Institute Code No. CF/RE/1.1.7 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute,
 Cochin

4. Title of Project : Crustacean Resources Investigations

5. Title of Sub-project : A study on standardisation of prawn
 fishing effort of different types
 of traps

6. Name and designation of Project Leader : K.R. Manmadhan Nair,
 Scientist S1

7. Name(s) and designation(s) of Project Leader and Project
 Associates together with time proposed to be spent and work
 to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
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Puri	K.R. Manmadhan Nair	S-1		
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Technical Assistance: P.V. Krishna Rao, T-1, Puri

8. Location of the research project: Puri

9. a) Objectives:

To standardise the fishery effort of "Dhaudi" and "Baja" -
 the two important types of traps employed in the commercial
 fishery of Chilka - for proper assessment of the prawn stock.

b) Practical utility

Traps are the most important gears employed in capturing
 juvenile marine prawns from Chilka lake. The heterogeneity
 in commercial traps renders estimation of stock and rate
 of exploitation of the prawns difficult. Therefore,
 standardisation of the efforts put in by the different
 types of traps would enable to make realistic estimates
 of the prawn stock and study the population characteristics
 of important species.

10. Technical Programme:

- i) An adequate number of "Dhaudi" and "Baja" will be hired
 and experimental fishing conducted with the help of
 fishermen during the fullmoon and newmoon nights. A total
 number of 24 such operations will be conducted.
 - ii) Hydrographic parameters will be recorded simultaneously.
 - iii) The catch, effort and biological data will be statistically
 analysed.
-

11. Date of start: April 1984 12. Likely date of completion : March 1985

13. Estimated man-months : 3

14. Facilities required:

i) Land	: Nil	v. Fish ponds	: Nil
ii) Labour	: Nil	vi. Foreign exchange	: Nil
iii) Special equipment	: Nil	vii. Other items	: Rs 3000/-
iv. Animal sheds	: Nil	viii. Total estimated cost:	
		Institute's Budget	

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical Staff
- c) Salary of Supporting staff, if any
- d) Casual labour cost, if any
- e) Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- f) Cost of equipment, facility etc.
- g) Total cost : Institute's Budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. CF/CUL/1.1.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR Institute, Cochin.
-
4. Title of Project : Culture of Crustaceans
-
5. Title of Sub-project : Field Culture of marine prawns
-
6. Name and designation of Project Leader : M. Kathirvel, Scientist S1
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Madras	M. Kathirvel	S1	35	1-3
	K. Devarajan	S2	35	1-3
	M. Rajagopalan	S1	25	1-3
Calicut	S. Lazarus	S2	50	1-2
Tuticorin	M. Rajamani	S1	25	1-3
Narakkal	Syed Ahamed Ali	S1	15	4

Technical Assistance: M. Manickaraja (Tuticorin), Shahul Hameed (Madras), K. Nandakumaran (Calicut)

8. Location of the research project : Madras, Tuticorin, Calicut and Narakkal
-

9. a) Objectives:

1) To develop methods of culturing marine prawns in different types of coastal ecosystems for increasing production of prawns through aquaculture (2) To test the economic viability of such prawn culture methods.

b) Practical utility:

The establishment of marine prawn culture in the coastal areas would help augment prawn production in the country. Better utilization of derelict coastal waters, would provide employment opportunities for the rural population in coastal areas and improve their economy.

10. Technical Programme: 1) Field culture experiments by selective stocking of fast growing species of marine prawns will be carried out and the techniques of culture under different conditions and systems evaluated. 2) Data on growth and production under various culture conditions will be collected. 3) Culture of marine prawns in salt pan areas in Madras and Tuticorin will be taken up. 4) Compounded feeds prepared from locally available raw materials will be tested in the laboratory as well as in the field to select the most suitable feed for accelerated growth.

Work done: Experiments have been done on the culture of P.indicus and P.monodon in coastal ponds, salt pans and in coconut groves. The suitability of these ecosystems for prawn culture has been demonstrated. Yield of 600 kg/ha have been achieved in 50 day growing periods.

Work envisaged in current year: Field experiments on the effect of stocking density, duration of crop and salinity on growth and production of cultured prawns in salt pans and other coastal ecosystems will be taken up at Madras, Tuticorin and Calicut.

11. Date of start : 1984-85 12. Likely date of completion : 1987-88

13. Estimated man-months : 22.2 man-months

14. Facilities required:

i) Land : Nil ii) Labour : 4 men/ha/day iii) Special equipment : Nil iv) Animal sheds : Nil v) Fish ponds: Nil vi) Foreign exchange : Nil vii) Other items : Nil viii) Total estimated cost : Institute's Budget

15. If financed by an organisation : Nil other than the Institute

16. Approximate cost: a) Salary of Scientific staff b) Salary of technical staff c) Salary of supporting staff, if any d) Casual Labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc. g) Total cost : Institute's Budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

 1. Institute Code No. CF/CUL/1.1.2 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute,
 Cochin.

4. Title of Project : Culture of Crustaceans

5. Title of Sub-project : Mass production of marine
 prawn seed

6. Name and designation of Project Leader : M. S. Muthu,
 Scientist-S3

7. Name(s) and designation(s) of Project Leader and Project
 Associates together with time proposed to be spent and work
 to be done

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Narakkal	M.S. Muthu	S3	50	1, 2, 3, 4
	N.N. Pillai	S2	75	2, 3, 4
	S.K. Pandian	S2	75	2, 3, 4
	A. Laxminarayana	S2	50	1, 2
	Mary K. Manisseri	S2	75	2, 4
	Syed Ahamed Ali	S1	35	4
	A.R. Thirunavukkarasu	S2	75	2, 3, 4
Madras	K. Devarajan	S2	50	1, 2, 3
	M. Kathirvel	S1	50	1, 2, 3
Tuticorin	M. Rajamani	S1	50	1, 2, 3

Technical Assistance: K.K. Surendran, C.S. Sasidharan, Sivadas
 (Narakkal), M. Manickaraja (Tuticorin), A. Ramakrishnan, Shahul
 Hameed (Madras)

8. Location of the Research project : Narakkal (Cochin), Kovalam
 (Madras) and Tuticorin

9. a) Objectives:

1. To develop methods for inducing the marine prawns to mature and spawn in captivity and for maintaining a broodstock of prawns in maturation facilities so that hatchery operation could proceed without interruption.
2. To simplify hatchery techniques for large scale production of marine prawn seed.
3. To improve methods of large scale production of live food organisms for rearing prawn larvae.
4. To develop microparticulate compounded feeds for the various larval stages in order to reduce dependance on live food organisms.

RESEARCH PROJECT - 1984-85

 1. Institute Code No. CF/CUL/1.1.3 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin.

4. Title of Project : Culture of commercially important crabs

5. Title of Sub-project : Artificial propagation of green crabs

6. Name and designation of Project Leader : R. Marichamy, Scientist S2.

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	R. Marichamy	S-2	35	1-3

Technical Assistance: S. Rajapackiam T-1

8. Location of the research project : Tuticorin

9. a) Objectives: To develop suitable techniques for the culture of commercially important portunid crab and to study the feasibility of green crab culture on a large scale.

b) Practical utility: The commercially important crabs occurring in our coastal waters are suitable for culture. The results of this research programme would enable to develop and establish crab culture practices and to augment crab production.

10. Technical Programme:

- 1) Berried green crabs will be collected from the natural habitat and the eggs hatched in captivity will be reared to stocking size.
- 2) Maturation of crabs in captivity through eye-stalk ablation will be studied.
- 3) Techniques of field culturing of crabs in coastal waters will be developed and the feasibility of large scale culture will be studied.

Work done: Some experiments on cage culture and pond culture of Scylla serrata have been done. Ovigerous female collected from the wild were reared during incubation period and the larval stock reared upto zoea stage.

Work envisaged in current year: Work on induced maturation of crabs in captivity will be undertaken and methods of rearing the larvae to stocking size under controlled condition will be developed in addition to work on field culture of crabs in ponds etc.

11. Date of start : 1978 12. Likely date of completion :
1987-88

13. Estimated man-months : Scientific personnel only
4.2 man months

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: 2 nos
ii. Labour	: 2 man/day	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost:	
		Institute's Budget	

15. If financed by an organisation : Nil
other than the Institute

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. CF/CUL/1.1.5 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute, Cochin.

4. Title of Project : Culture of Crustaceans

5. Title of Sub-project : Artificial insemination and breeding of prawns

6. Name and designation of Project Leader : M.S. Muthu Scientist S3

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Narakkal	M.S. Muthu	S3	25	1-4
(Cochin)	A. Laxminarayana	S2	25	1-4

Technical Assistance: C.S. Sasidharan

8. Location of the research project : Narakkal (Cochin)

9. a) Objectives:

1. To develop methods of artificial insemination of prawns.
2. To selectively breed the artificially inseminated prawns in captivity and to develop hybrids.

b) Practical utility: Development of a technique for artificial insemination in prawns will open up a new field in the selective breeding and evolution of improved strains of prawns for culture purposes. It will also enable hybridization of closely related species and genetic improvement of cultivable prawns.

10. Technical Programme:

1. Suitable methods of extracting the intact spermatophore from male prawns will be developed.
2. Techniques of artificially transferring the extracted spermatophores into the thelycum of the female prawns will be devised.
3. The artificially impregnated females will be induced to mature and spawn in captivity.
4. The eggs spawned will be reared under controlled conditions to study the viability and characteristics of the animals produced.

Work done: A method of extracting the intact spermatophores by electrostimulation has been developed and the detailed structure of the spermatophore and the sperms studied. A method of implanting the spermatophore into the thelycum of the female has also been evolved.

Work envisaged in current year: Work on items 3 and 4 of the technical programme will be carried out.

11. Date of start : 1982-83 12. Likely date of : 1987-88
completion

13. Estimated man-months : 6 man-months/year

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Nil
ii. Labour	: Nil	vi. Foreign exchange	: Nil
iii. Special equipment	: Nil	vii. Other items	: Nil
iv. Animal sheds	: Nil	viii. Total estimated cost:	
		Institute's Budget	

15. If financed by an organisation : Nil
other than the Institute

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

 1. Institute Code No. CF/CUL/1.5 2. I.C.A.R. Code No.

3. Name and address of Research Institute : CMFR Institute,
 Cochin.

4. Title of Project : Culture of Crustaceans

5. Title of Sub-project : Culture of Spiny Lobsters
 (Panulirus sp.)

6. Name and designation of Project Leader : E.V. Radhakrishnan,
 Scientist S2

7. Name(s) and designation(s) of Project Leader and Project
 associates together with time proposed to be spent and
 work to be done

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Madras	E.V. Radhakrishnan	S2	100	1-4
	M. Vijayakumaran	S2	50	3-4

Technical Assistance: Shahul Hameed

8. Location of the research project : Madras

9. a) Objectives:

To develop suitable indigenous techniques for the
 culture of commercially important spiny lobsters

b) Practical utility: Large scale culture of lobsters
 will augment production and export of this highly
 priced crustacean.

10. Technical Programme: 1) Berried females collected from the
 sea will be kept in the laboratory to hatch the eggs and
 the phyllosoma will be reared to the puerulus stage using
 suitable live and artificial feeds. Induced maturation of
 lobsters in captivity will be tried through hormonal control
 2) Puerulii will be collected from the sea using different
 types of collectors and reared under controlled conditions
 3) Development of artificial feed for the lobsters 4)
 Experiments will be conducted to accelerate growth rate
 in juvenile lobsters. 5) Neuro-endocrine studies on
 growth and moulting of lobsters.

Work done: Growth rate of spiny lobsters have been accelerated by three to seven times by eyestalk ablation in captivity, reducing the rearing period from eighteen to six months. Lobsters have been made to spawn in the laboratory and the phyllosoma reared upto the sixth stage.

Work envisaged in current year: Studies on effect of quality of food on conversion, growth, tail weight and quality of flesh of ablated spiny lobsters will be taken up. Mass culture of lobsters to evaluate the techno-economic feasibility also will be carried out.

11. Date of start : 1981-82 12. Likely date of : 1987-88
completion

13. Estimated man-months : Scientific personnel only
36 man-months/year

14. Facilities required:

i) Land	: Nil	v) Fish ponds	: Nil
ii) Labour	: Nil	vi) Foreign exchange	: Nil
iii) Special equipment	: Nil	vii) Other items	: Nil
iv) Animal sheds	: Nil	viii) Total estimated cost	:
		Institute's Budget	:

15. If financed by an organisation : Nil
other than the Institute

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff, if any
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.
- g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. CF/CUL/1.1.7 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin.
-
4. Title of Project : Culture of Crustaceans
-
5. Title of Sub-project : Sea Ranching of marine prawns
-
6. Project Leader : N.N. Pillai, Scientist-S2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin/ Narakkal	N.N. Pillai	S2	20	i
	M.S. Muthu	S3	15	i
	K.V. George	T7	20	i
	A. Laxminarayana	S2	15	i
	S.K. Pandian	S2	15	i
	Mary K. Manisseri	S2	15	i
	A.R. Thirunavukkarasu	S2	15	i
Mandapam	D. Sivalingam	S1	100	i-iv
Tuticorin	M. Rajamani	S1	25	i, ii & iv
Madras	M. Kathirvel	S1	15	i, ii & iv
	K. Devarajan	S2	15	i, ii & iv
<u>Technical Assistance:</u> K.K. Surendran, C.S. Sasidharan, Sivadas (Narakkal), M. Manickaraja (Tuticorin), A. Ramakrishnan, Shahul Hameed (Madras)				

-
8. Location of the research project : Mandapam Camp, Tuticorin,
Narakkal, Madras
-

9. a) Objectives:

To release the hatchery reared seed of marine penaeid prawns into the sea in order to enhance the population of prawns in the sea and thus increase the magnitude of the prawn catch from the marine prawn fishery.

b) Practical utility:

The marine prawn catch in the country has not increased in recent years in spite of increased fishing effort. By introducing hatchery reared prawn seed in the advanced post larval stages, when they have a better chance of

survival under natural conditions, the recruitment of prawns to the capture fishery could be improved. This is especially possible in the burrowing species of prawns such as Penaeus semisulcatus, P. japonicus and Metapenaeus affinis which do not penetrate into the estuaries during their juvenile phase and which also do not seem to migrate far from their place of origin.

-
10. a) Technical Programme: i) Initially hatchery reared prawn seed from Narakkal, Madras and Tuticorin will be transported to Mandapam in oxygen filled containers and released into the 500 acre lagoon on the Palk Bay side. ii) Growth and survival will be monitored by periodic sampling. iii) Later, a hatchery for P. semisulcatus will be established at Mandapam Camp. iv) Methods of reducing mortality of the introduced prawn seed will be developed.

b) Work done: This is a new project.

c) Work envisaged in the current year: Item No.i, ii and iv shown in the Technical Programme will be taken up during the year.

11. Date of start : 1984-85 12. Date of completion: 1987-88

13. Estimated man-months : 32.4 man-months
(Scientific personnel only)

14. Facilities required: i) Land : ii) Labour :
iii) Special equipment : iv) Animal sheds: v) Fish ponds :
vi) Foreign exchange : vii) Other items:
viii) Total estimated cost : Institute's Budget

15. If financed by an organisation :
other than the Institute

16. Approximate cost: a) Salary of Scientific staff b) Salary of Technical staff c) Salary of Supporting staff, if any
d) Casual Labour cost, if any e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc. g) Total cost: Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/RE/1.2.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Molluscan Fishery Resources
5. Title of Sub-project : Survey of cephalopod resources in
the Exclusive Economic Zone
6. Name and designation of Project Leader : E.G. Silas, Director
7. Name (s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Veraval	-	-	-	Tech.Prog. 1-5
Bombay	Kuber Vidyasagar	S-2	40	"
Mangalore	G. Syda Rao	S-2	20	"
Cochin	K. Alagarswami (A.P.L.)	S-3	5	"
	M.M. Meiyappan	S-1	30	"
Vizhinjam	K. Prabhakaran Nair	S-1	30	"
Tuticorin	K. Satyanarayana Rao	S-3	25	"
Madras	R. Sarvesan	S-2	40	"
Waltair	G. Radhakrishnan	S-1	40	"

Technical Assistance:

8. Location of the research Project : Veraval, Bombay, Mangalore, Cochin, Vizhinjam, Tuticorin, Madras and Waltair

9. a) Objectives: To conduct exploratory surveys in the Exclusive Economic Zone using modern methods of fishing to identify, chart and assess the oceanic squid resources which form one of the major potential resources of the EEZ for commercial exploitation.
- b) Practical Utility: The Government have given high priority to the exploitation of the Exclusive Economic Zone for increasing marine fish production. The oceanic squids form one of the major resources of the zone and the survey will provide data on the identity, distribution and abundance of the resources for use in commercial exploitation.

10. Technical Programme:

1. Exploratory surveys of the Exclusive Economic Zone for oceanic squids using modern methods of fishing including squid jigging.
2. Acoustic aerial and remote sensing surveys for squid resources.
3. Participation in the Institute's Research Vessel programmes and in collaborative programmes with Govt. of India Ocean Development and Fisheries Organisations for survey of squid resources.
4. To study the biology of the component species, pattern of distribution, abundance, spawning congregations and migration.
5. Assessment of the potential stocks of oceanic squid resources of the Exclusive Economic Zone.

Work done: Catch and effort data of cephalopod caught by EFP vessels operated in different areas have been analysed.

Work envisaged in current year: Squid and cuttlefish resources survey will be carried out using Institute's Research Vessel SKIPJACK, and the catch data provided by the EFP vessels will be analysed.

11. Date of start: 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: -	v. Fish ponds	: -
ii. Labour	: -	vi. Foreign exchange	: Yes
iii. Special equipment	: Yes	vii. Other items	: -
iv. Animal sheds	: -	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation: -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical Staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any; e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/RE/1.2.2 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
-
4. Title of Project : Molluscan Fishery Resources
-
5. Title of Sub-project : Stock assessment of cephalopod
resources of the inshore waters
-
6. Name and designation of Project Leader : K. Alagarwami, S-3
-
7. Name (s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work to
be done.

Centre	Name	Designation	Time to be spent (%)	Work to be done
Veraval	-	-	-	
Bombay	Kuber Vidyasagar	S-2	60	
"	K.S. Sundaram	S-1	100	
Mangalore	G. Syda Rao	S-2	20	Tech.Prog.
Cochin	K. Alagarwami	S-3	5	
	M.M. Meiyappan	S-1	50	
	M. Srinath	S-1	-	
Vizhinjam	K. Prabhakaran Nair	S-1	50	1-6
Tuticorin	K. Satyanarayana Rao (APL)	S-3	25	
Mandapam	P. Natarajan	S-1	100	
"	K. Ramadoss	S-1	20	(2,5 only)
Madras	R. Sarvesan	S-2	60	
Waltair	G. Redhakrishnan	S-1	60	

Technical Assistance: M. Prasada Rao (Waltair), P. Thillairajan
(Mandapam), G. Sreenivasan (Tuticorin), T.A. Omana (Vizhinjam)

8. Location of the research project : Veraval, Bombay, Mangalore,
Cochin, Vizhinjam, Tuticorin,
Mandapam, Madras and Waltair
-
9. a) Objectives: In the past, data on the cephalopod (cuttlefish,
squid and octopus) resources of the inshore waters have been
collected and their distribution has been studied. In view
of their importance in the export trade, detailed investigations
on the assessment of stocks of the component species will be
taken up to estimate the potential in order to guide the
inshore fishing industry for increasing production.

- b) Practical Utility: Information on the stocks of cephalopod resources in the inshore waters will help in planning development programmes for increasing production through intensification of effort in identified areas and on specific stocks and introduction of modern methods of fishing.

10. Technical Programme:

1. Monitoring of the exploited cephalopod stocks in the inshore waters.
2. Experimental fishing with different gears including squid jigging and dip-nets with light attraction and trawl nets with Cadalmin class vessels in the inshore waters.
3. Stock assessment of cuttlefish and squid resources.
4. Preparation of fishery atlas for cephalopod resources.
5. Reappraisal of the Palk Bay squid resources.
6. Racial studies of selected species.

Work done: Exploitation of cephalopod resources of inshore waters has been monitored and biological parameters of certain species have been collected for stock assessment studies.

Work envisaged in current year: Continuation of monitoring the exploited resources, and collecting more data on biological characteristics and races to aid stock assessment

11. Date of start: 1981-82 12. Likely date of completions: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: -	v. Fish ponds	: -
ii. Labour	: -	vi. Foreign exchange	: Yes
iii. Special equipment	: Yes	vii. Other items	: -
iv. Animal sheds	: -	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation : -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc; g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No.	MCL/RE/1.7	2. I.C.A.R. Code No.	
3. Name and address of Research Institute	CMFR INSTITUTE, COCHIN		
4. Title of Project	Molluscan Fishery Resources		
5. Title of Sub-project	Experiments in transport of molluscan seed.		
6. Name and designation of Project Leader	S. Mahadevan, S-3		
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done			
8. Centre	Name	Designation	Time to be spent (%) Work to be done
Tuticorin	P. Muthiah	S-2	10 1-3
Vizhinjam	K.K. Appukuttan	S-2	10 1-3
Calicut	P.S. Kuriakose	S-2	10 1-3

Technical Assistance: N. Vaithyanathan (Tuticorin), T. Prabhakaran Nair (Vizhinjam), V.G. Surendranathan and M.P. Sivadasan (Calicut)

8. Location of the research projects: Tuticorin, Vizhinjam, Calicut

9. a) Objectives: To devise effective methods of transportation of seeds of oysters and mussels from areas of collection to regions of poor spat-fall for transplantation and for farming.
- b) Practical Utility: The seed transport experiments will enable proper utilisation of available seed resources for farming purposes as well as for propagation to new areas.

10. Technical Programme: (Revised)

1. Laboratory experiments on conditioning and different methods of packing and studying survival rate.
2. Experimental/trial transport of live seed over long distances employing different techniques and studying survival rate.
3. Supporting seed requirements of State agencies seasonally.

Work done: Seed conditioning experiments were carried out on edible oyster at Tuticorin and brown mussel at Vizhinjam.

Work envisaged in current year: To intensify experiments on conditioning and packing and to attempt long-distance transport of seed.

11. Date of start: 1981-82 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i.	Land	:	-	v.	Fish ponds	:	-
ii.	Labour	:	-	vi.	Foreign exchange:	-	
iii.	Special equipment	:	-	vii.	Other items	:	Yes
iv.	Animal sheds:	-		viii.	Total estimated cost	:	Institute's budget

15. If financed by an organisation : -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any; e) Cost of equipment, facility etc; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc; g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOI/RE/1.8 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Molluscan Fishery Resources
5. Title of Sub-project : Recruitment studies in clam population
6. Name and designation of Project Leader : K.A. Narasimham, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Kakinada	K.A. Narasimham	S-2	20	Tech. Prog. 1-3
Karwar	N. Ramachandran	S-1	20	1-3

Technical Assistance: H.S. Shivanna (Karwar)

8. Location of the research project : Kakinada and Karwar
9. a) Objectives: It is well known that under favourable conditions the clam spat settle in high densities and in a few months, before the exploitation phase, the abundance is much reduced usually due to natural mortality. This project aims to elucidate the pattern of recruitment of clam populations in natural beds and determine conditions favourable for successful recruitment.
- b) Practical Utility: Information on changes in the abundance of clam population from seed stage to the time they reach the recruitment age for commercial exploitation will help to evolve suitable strategy for better utilisation of the seed resource in clam culture.

10. Technical Programme:

1. To determine environmental conditions conducive to successful spatfall.
2. To monitor the changes in population from settlement to exploitation in terms of abundance and size/age in relation to environmental conditions and
3. To estimate mortality rates.

Work done: Data have been collected on the changes in population density in relation to environmental conditions and length composition of Anadara granosa at Kakinada and Meretrix sp. at Karwar.

Work envisaged in current year: To continue monitoring the changes in the population structure of clams and complete item 3 of Technical Programme.

11. Date of start : 1982-83 12. Likely date of completion: -----
1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: No	v. Fish ponds	: No
ii. Labour	: Yes	vi. Foreign exchange	: No
iii. Special equipment	: No	vii. Other items	: No
iv. Animal sheds	: No.	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.,

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/RE/1.9 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Molluscan Fishery Resources
5. Title of Sub-project : Atlas of clam resources of Kerala and Karnataka
6. Name and designation of Project Leader : G.P. Kumaraswamy Achary, S-1
7. Name(s) and designation (s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Vizhinjam	K.K. Appukuttan	S-2	20	1-5
"	K. Prabhakaran Nair	S-1	20	1-5
Cochin	G.P. Kumaraswamy Achary	S-1	20	1-5
Mangalore	C. Syda Rao	S-2	20	1-5
Karwar	M. Ramachandram	S-1	20	1-5
Calicut	P.S. Kuriakose	S-2	10	1-5

Technical Assistance:

8. Location of the research project : Vizhinjam, Cochin, Mangalore, Karwar, Calicut
9. a) Objectives: Mapping the areas of clam resources in Kerala and Karnataka collecting information on species composition, distribution pattern, environmental parameters, present exploitation rate, exploitable resources and utilisation of this resource with a view to provide a comprehensive picture about the important clam resources for use of the fishermen, industry and planners.
- b) Practical Utility: At present there is no precise information on the available resource potential of clams of the Kerala and Karnataka region for planning rational exploitation programme of this resource which has gained importance in the exports recently and for indigenous consumption and industrial purposes. This project would provide the necessary information on the resources for use by the fishermen, industry and planners.

10. Technical Programme:

1. To identify gaps in current knowledge and fill up such gaps through: a) investigations on the clam resources in inshore areas, estuary, bays, backwaters, and tidal creeks of the Kerala and Karnataka zone; b) estimation of the resources; c) study the environmental parameters to know the optimum conditions of bed areas; d) estimation of species-wise landings at places where there is regular exploitation and study of the fishery; e) study on utilisation.
2. Preparation of clam resources atlas for the two States.

Work done: A detailed plan of work has been drawn up. Survey of estuaries in North Canara and Southern Kerala has been completed.

Work envisaged in current years: Survey of the remaining areas will be completed. Analysis of data will be done and atlas prepared.

11. Date of start: 1983-84 12. Likely date of completion: 1984-85

13. Estimated man-months: -

14. Facilities required:

i.	Land	: -	v.	Fish ponds	: -
ii.	Labour	: Yes	vi.	Foreign exchange	: -
iii.	Special equipment	: -	vii.	Other items	: -
iv.	Animal sheds	: -	viii.	Total estimated cost	: Institute's budget

15. If financed by an organisation other than the Institute: -

16. Approximate costs: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprays etc.; g) Total cost: Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/RE/1.9 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Molluscan Fishery Resources
5. Title of Sub-project : Atlas of clam resources of Kerala and Karnataka
6. Name and designation of Project Leader : G.P. Kumaraswamy Achary, S-1
7. Name(s) and designation (s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Vizhinjam	K.K. Appukuttan	S-2	20	1-5
"	K. Prabhakaran Nair	S-1	20	1-5
Cochin	G.P. Kumaraswamy Achary	S-1	20	1-5
Mangalore	C. Syda Rao	S-2	20	1-5
Karwar	M. Ramachandram	S-1	20	1-5
Calicut	P.S. Kuriakose	S-2	10	1-5

Technical Assistance:

8. Location of the research project : Vizhinjam, Cochin, Mangalore, Karwar, Calicut
9. a) Objectives: Mapping the areas of clam resources in Kerala and Karnataka collecting information on species composition, distribution pattern, environmental parameters, present exploitation rate, exploitable resources and utilisation of this resource with a view to provide a comprehensive picture about the important clam resources for use of the fishermen, industry and planners.
- b) Practical Utility: At present there is no precise information on the available resource potential of clams of the Kerala and Karnataka region for planning rational exploitation programme of this resource which has gained importance in the exports recently and for indigenous consumption and industrial purposes. This project would provide the necessary information on the resources for use by the fishermen, industry and planners.

10. Technical Programme:

1. To identify gaps in current knowledge and fill up such gaps through: a) investigations on the clam resources in inshore areas, estuary, bays, backwaters, and tidal creeks of the Kerala and Karnataka zone; b) estimation of the resources; c) study the environmental parameters to know the optimum conditions of bed areas; d) estimation of species-wise landings at places where there is regular exploitation and study of the fishery; e) study on utilisation.
2. Preparation of clam resources atlas for the two States.

Work done: A detailed plan of work has been drawn up. Survey of estuaries in North Canara and Southern Kerala has been completed.

Work envisaged in current years: Survey of the remaining areas will be completed. Analysis of data will be done and atlas prepared.

11. Date of start: 1983-84 12. Likely date of completion: 1984-85

13. Estimated man-months: -

14. Facilities required:

i.	Land	: -	v.	Fish ponds	: -
ii.	Labour	: Yes	vi.	Foreign exchange	: -
iii.	Special equipment	: -	vii.	Other items	: -
iv.	Animal sheds	: -	viii.	Total estimated cost	: Institute's budget

15. If financed by an organisation : -
other: than the Institute

16. Approximate costs: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprays etc.; g) Total cost: Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of Molluscs
5. Title of Sub-project : Culture of edible oyster
6. Name and designation of Project Leader : K. Nagappan Nayar, S-3
7. Name (s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	K. Nagappan Nayar	S-3	10	1-11
	K. Satyanarayana Rao	S-3	25	1-11
	P. Mithiah	S-2	80	1-11
	M.E. Rajapandian	S-1	50	1-11
Karwar	N. Pamachandran	S-1		

Technical Assistance: C.T. Rajan, D. Sunderarajan, N. Valdevanathan,
G. Sreenivasan, (Tuticorin); H.S. Shivanna (Karwar)
A.D. Gandhi

8. Location of the research project : Tuticorin, Karwar

9. a) **Objectives:** This project aims at evolving suitable farming techniques for growing and production of oysters and in the collection of spat by employing different techniques and standardising them. Studies on the biology of oysters will enable us to find out the growth rate, spawning period and the size at which harvesting can be done. The project also envisages studies on environmental factors which will help in the proper farm management. Purification techniques for the harvested stocks are also to be developed.

b) **Practical Utility:** Oyster is a highly nutritious food, but the natural production as well as consumption is very low. Basic techniques for the culture of oysters have been developed and the high production potential has been demonstrated. However, several intrinsic problems remain to be investigated, answers to which are essential for large scale production of oyster through culture. The project will work on some of the priority areas to improve the techniques of oyster culture and to reduce cost of production.

10. Technical Programme:

1. Developing suitable oyster farming system in addition to rack-tray method.
2. Stocking, growing and harvesting oysters.
3. Spat collection experiments and intensification of spat collection areas.
4. Determination of optimum size at harvest.
5. Determination of condition factor and percentage edibility in different months.
6. To investigate the nutritional value of the oyster flesh at different sizes.
7. Studies on gonadal maturity and reproductive cycle.
8. Control of predators.
9. Fattening of oysters.
10. Evolving suitable method of purification of harvested oysters.
11. Histopathological studies to elucidate the changes taking place in the host tissue on account of trematode infection.

Work done: One tonne of oyster meat was produced in the experimental farm. Growth, breeding, condition factor, fattening, salinity tolerance and occurrence of parasites in the cultured oysters have been studied.

Work envisaged in current year: Techniques of hanging culture and on-bottom culture will be developed. Fattening of oysters will be done. Studies on the biochemical composition of oyster meat will be undertaken.

11. Date of start: 1978 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: -	v. Fish ponds	: Farm
ii. Labour	: yes	vi. Foreign exchange	: -
iii. Special equipment	: -	vii. Other items	: -
iv. Animal sheds	: -	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation :
other than the Institute

16. Approximate costs: a) Salary of scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual labour cost, if any, e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.-
g) Total cost: Institute's budget.

17. Signatures of:

Sd/-
Project Inader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.3 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture-Culture of molluscs
5. Title of Sub-project : Culture of clams and windowpane oyster
6. Name and designation of Project Leader : K.A. Narasimham, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Kakinada	K.A. Narasimham	S-2	20	2-4
Mangalore	G. Syda Rao	S-2	20	1-3
Karwar	N. Ramachandran	S-1	20	1-3

Technical Assistance: Ch. Ellithatayya (Kakinada), D. Nagaraja (Mangalore) and H.S. Shivanna (Karwar)

8. Location of the research project : Kakinada, Mangalore and Karwar
9. a) Objectives: The main thrust will be to evolve suitable farming methods for clams and windowpane oyster. Transplantation of seed clams from thickly populated beds to suitable places.
- b) Practical Utility: Being a very important source of sustenance fishery along the Indian coast clam farming needs a major thrust. The results obtained will enable us to take up large scale farming at selected centres along the coast and thereby increase the production of this low cost protein food.

10. Technical Programmes:

1. To evolve suitable culture techniques for clam farming at different centres.
2. To study the soil and water conditions of the clam beds
3. To study and compare the growth, maturity, spawning and index of condition of natural bed clams with those of cultured clams.
4. To develop culture techniques for the windowpane oysters at Kakinada.

Work done: Blood clam culture by transplantation of seeds without pen enclosure met with success. Experiments have been carried out on M. casta in Mangalore.

Work envisaged in current year: Farming of clams using different stocking densities and methods of growing will be attempted at Mangalore and Karwar. Windowpane oyster culture to be taken up at Kakinada.

11. Date of start: 1978 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: No	v. Fish ponds	: Clam farms
ii. Labour	: Yes	vi. Foreign	: No
iii. Special	: No.	exchange	
equipment		vii. Other items	: No
iv. Animal sheds	: No.	viii. Total	
		estimated cost:	Institute's budget

15. If financed by an organisation: -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc., g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No. MOL/CUL/1.3.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of molluscs
5. Title of Sub-project : Replenishment and monitoring of
Villorita spp. production in
estuarine system
6. Name and Designation of Project Leader : G.P. Kumaraswamy Achary, S-1
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	G.P. Kumaraswamy Achary	S-1	75%	Tech.Prog. 1-6

Technical Assistance: to be posted.

8. Location of the Research Project : Cochin
9. a) Objectives: To evolve suitable methods by culture and replenishment of stock, regulatory measures to economise the production and standardisation of yield to support a regular industry for clams. This will enable enhancement of production of clam in the estuary. At present the exploitation is at a higher rate than the nature of replenishment of the stock. Based on this study, to evolve a package programme for socio economic improvement of the fishermen and development of the industry.
- b) Practical Utility: Exploitation from Vembanad lake alone is about 1,35,000 tonnes and 4/5 of the exploitation is from sub soil deposit. There is immediate danger of shortage of raw-material as soon as the sub soil deposit is exhausted. This project will help to support the enhancement of production of clam for helping the industry as well as the fishermen.

10. Technical Programme:

1. Attempt on finding the suitable species for large scale production of clams and species yielding higher rates of meat.

2. Possibility of breeding and replenishment in the farm area and in the estuary.
3. Evolve methods for control of the exploitation of the under-sized clam.
4. Transplantation of suitable species to other areas and enhancement of production.
5. Monitoring of lime shell industry and also the potentiality of the resource, exploitation, marketing etc.
6. Study the socio-economic impact on the industry.

Work done: Item 1,2,3,5 and 6 of the technical programme covered. Villorita is successfully spawned by artificial method for the first time and reared to spat settlement stage as base for hatchery technology.

Work envisaged in current year: Follow up work on item 1-6 technical programme.

11. Date of start : 1980 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. Facilities required:

i. Land :	v. Fish ponds :
ii. Labour :	vi. Foreign :
iii. Special equipment :	exchange
iv. Animal shed :	vii. Other items :
	viii. Total estimated cost :
	Institute's budget

15. If financed by an organisation :
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any, e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost; Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1982-85

1. Institute Code No. MOL/CUL/1.4 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of Molluscs
5. Title of Sub-project : Pearl culture
6. Name and designation of Project Leader : K. Alagarwami, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
- | Centre | Name | Designation | Time to be spent (%) | Work to be done |
|-----------|--------------------------|-------------|----------------------|----------------------------|
| Tuticorin | K. Alagarwami | S-3 | 15 | 1-2 |
| | A. Chellam (APL) | S-2 | 40 | Tech. Prog.
1, 2, 3 & 4 |
| | S. Dharmaraj | S-1 | 40 | Tech. Prog.
8 & 9 |
| | T.S. Velayudhan | S-1 | 40 | Tech. Prog.
5, 6 & 7 |
| | A.C.C. Victor (on leave) | S-2 | - | " |
| Mandapam | D. Sivalingam | S-1 | 40 | Tech. Prog. 10 |
| | K. Srinivasagani | | | |
- Technical Assistants: (4, 5, 8) J. Antony Pitchai
(1, 2, 3, 9) A. Dasman Fernando (1, 2, 3, 7, 9) Soosai V. Rayan (1, 2, 3, 6, 9)
8. Location of the research project : Tuticorin, Mandapam
9. a) Objectives: To carry out further researches on pearl culture to improve upon all aspects and update the technology for higher rates of pearl production and improvement of quality of cultured pearls.
- b) Practical Utility: The breakthrough in pearl culture technology was achieved at this Institute and the maritime States, Union Territories have been assisted to take up development work in pearl culture. Being the nerve centre for pearl culture researches in the country, the present project at the Institute will help in updating the technology and assist the development efforts towards establishment of pearl culture industry by providing R & D support.
10. Technical Programmes:
1. Pearl oyster collection and rearing;
 2. Development of techniques for large-scale collection of spat from natural beds;

3. Standardisation of farming technology;
4. Monitoring of growth and reproduction of farm oysters;
5. Studies on pearl-sac formation; (completed in part)
6. Influence of environmental parameters in pearl culture;
7. Control of biofouling and boring;
8. Improvements in pearl oyster surgical techniques for enhancing production rate and quality;
9. Economics of model pearl culture farm.
10. Experimental pearl culture at Mandapam.

Work done: All the items of above programme have made substantial progress.

Work envisaged in current year: A major thrust on the items to improve and standardise pearl culture technology.

11. Date of start: 1978 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land : yes	v. Fish ponds : Pearl culture farm
ii. Labour : yes	vi. Foreign : yes
iii. Special : yes	exchange
equipment	vii. Other items : Nil
iv. Animal : No	viii. Total
sheds	Estimated cost: Institute's Budget

15. If financed by an organisation : No
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; Salary of Technical staff, c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.5 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of Molluscs
5. Title of Sub-project : Development of hatchery system...
for edible oyster seed production
6. Name and designation of Project Leader : K. Nagappan Nayar, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	K. Nagappan Nayar	S-3	10	1-4
	K. Satyanarayana Rao	S-3	20	1
	M. E. Rajapandian	S-1	50	2-4
	P. Muthiah	S-2	30	4

Technical Assistance: A.D. Gandhi, N. Vaidyanathan

8. Location of the research project : Tuticorin
9. a) Objectives: To develop suitable methods of inducing maturation of gonads of oyster and hatchery technique for the production of oyster seed so as to provide a constant supply of spat for the purpose of culture.
- b) Practical Utility: It would help in providing oyster spat throughout the year and pave way in taking up further studies towards improving the genetic quality of the edible oyster.

10. Technical Programme:

Establishment of a well-equipped flow through system of filtered sea water to facilitate investigations on

1. Induced maturation of gonads
2. Artificial spawning of oyster
3. Rearing of larvae
4. Setting and rearing of spat under controlled conditions.

Work done: Initial success has been achieved in induced maturation, artificial spawning and rearing of larvae to spat stage.

Work envisaged in current year: Further investigations will be carried out to standardise methods of induced maturation, artificial spawning and mass production of oyster spat by hatchery techniques.

FINANCIAL AND ADMINISTRATIVE REGISTRATION VOUCHER

-
11. Date of start : 1978 12. Likely date of completion: 1984-85
-
13. Estimated man-months : -
-
14. Facilities required:
- | | |
|--------------------------|---|
| i. Land : | v. Fish ponds : |
| ii. Labour : | vi. Foreign exchange : |
| iii. Special equipment : | vii. Other items : |
| iv. Animal sheds : | viii. Total estimated cost : Institute's budget |
-
15. If financed by an organisation : -
other than the Institute
-
16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost: Institute's budget
-
17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No.	MOL/CUL/1.6	2. I.C.A.R. Code No.	
3. Name and Address of Research Institute	CMFR INSTITUTE, COCHIN		
4. Title of Project	: Mariculture - Culture of Molluscs		
5. Title of Sub-project	: Development of hatchery systems for mussel seed production		
6. Name and designation of Project Leader	: K. Rangarajan, S-3		
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done			
Centre	Name	Designation	Time to be spent (%) Work to be done
Madras	K. Rangarajan	S-3	30 1-4
Vizhinjam	K.K. Appukuttan	S-1	30 1-4

Technical Assistants: R. Thangavelu, P. Poovannan (Madras), T. Prathakaran Nair, Mathew Joseph (on study leave) K.T. Thomas (Vizhinjam)

8. Location of the research project : Madras, Vizhinjam
9. a) Objectives: To develop suitable hatchery techniques for seed production of mussels, so as to get a constant supply of seed throughout the year without having to depend on nature for seed requirements.
- b) Practical Utility: As availability of natural seed cannot be relied upon suitable hatchery methods evolved will be of immense help in providing an uninterrupted supply of hatchery seed to culturists.

10. Technical Programmes:

1. To try different methods of conditioning the adults and inducing them to spawn by suitable physical or chemical treatment.
2. Mass culture of algae and flagellates to be used as food for the larvae and spat.
3. Suitable techniques to be evolved for the collection of spat at the setting time of the larvae in the tank.
4. To develop a proper nursery system.

Work done: Success has been achieved in experimental spat production in the laboratory for both green mussel and brown mussel.

Work envisaged in current year: Achieving large-scale settlement of spat under laboratory conditions by intensifying the work. Standardisation of techniques.

11. Date of start: 1978 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land :	v. Fish ponds :
ii. Labour :	vi. Foreign exchanges :
iii. Special : equipment	vii. Other items :
iv. Animal : sheds	viii. Total estimated : Institute's cost budget

15. If financed by an organisation: -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.7.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of Molluscs
5. Title of Sub-project : Experimental pearl oyster hatchery
for mass production of spat
6. Name and designation of Project Leader : K. Alagarwami, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	K. Alagarwami	S-3	15%	1-4
	S. Dharmaraj (A.P.L.)	S-1	40	2
	A. Chellam	S-2	40	3,4
	T.S. Velayudhan	S-1	40	1
	A.C.C. Victor (on leave)	S-2	-	-

K. Srinivasagani

Technical Assistants: / (2), J. Antony Pitchai (3), Dasman Fernando (1), Soosai V. Rayen (4)

8. Location of the research project : Tuticorin
9. a) Objectives: An indigenous technology for artificial breeding and spat production of pearl oyster has already been developed on a laboratory scale. The present project aims at mass production of pearl oyster spat in an experimental hatchery and standardisation of design and procedures for a pilot-scale hatchery.
- b) Practical Utility: The design and procedures standardised under the project would help in establishing viable commercial hatcheries for pearl oyster to enable uninterrupted supply of the biological raw material to pearl culture industry.

10. Technical Programme:

1. Application of controlled maturation and spawning techniques for large-scale spawning.
2. Introduction of new designs in larval rearing system for stream-lining and maximising larval production.
3. Large-scale spat settlement, transplantation and juvenile rearing in farm.
4. Mass culture of algae in out-door tanks for juvenile feeding.

Work done: Under an earlier project (MDL/CUL/1.7) a breakthrough was achieved in developing techniques for artificial production of pearl oyster seed.

Work envisaged in current year: Scaling up of operations and introduction of new designs in experimental hatchery.

11. Date of start: 1984-84 12. Likely date of completion: 1984-85

13. Estimated man-months :

14. Facilities required:

i. Land	: No	vi. Fish ponds	: Farm
ii. Labour	: No	vi. Foreign	: Yes
iii. Special	: Yes	exchange	
equipment		vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated	
		cost	: Institute's budget

15. If financed by an organisations -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any; e) Cost of equipment, facility, etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.9 2. I.C.A.R. Code No. -----
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN -----
4. Title of Project : Mariculture - Culture of Molluscs -----
5. Title of Sub-project : Development of hatchery system for clam seed production -----
6. Name and designation of Project Leader : K.A. Narasimham, S-2 -----
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done -----

Centre	Name	Designation	Time to be spent(%)	Work to be done
Kakinada	K.A. Narasimham	S-2	20	Tech. Prog. 2 and 3

Technical Assistance: To be posted.

8. Location of the research project : Kakinada -----
9. a) Objectives: To develop appropriate hatchery technology for controlled production of clam seed.
- b) Practical Utility: The availability of clam seed in natural beds for culture operations is unpredictable. While theoretically 2 clam harvests each of 5-6 months duration can be obtained in a year seed availability is limiting the operations to a single crop. This project would help to provide clam seed throughout the year and pave the way to take up studies on larval ecology and improvement of genetic quality of different clam species.

10. Technical Programme:

1. To establish a full fledged laboratory with controlled conditions.
2. To maintain and condition adult clams in the laboratory and try various physical and chemical methods to induce them to spawn.
3. Culture of suitable phytoplankters to be used as food for larvae and spat.
4. To develop proper nursery system for raising the spat.

Work done: Fertilisation was achieved in stripped gametes of Anadara granosa.

Work envisaged in current year: Development of techniques for induced spawning and larval rearing to settlement stage.

11. Date of start: 1982-83 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: No	v. Fish ponds	: yes
ii. Labour	: Yes	vi. Foreign exchange	: No
iii. Special equipment	: Yes	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation other than the Institute No

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.10 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of Molluscs
5. Title of Sub-project : Breeding and experimental sea-ranching of commercially important gastropods
6. Name and designation of Project Leader : S. Mahadevan, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	S. Mahadevan	S-3	25	1-4
	K. Ramadoss	S-1	70	1-4
Vizhinjam	K.K. Appukuttan	S-2	10	1

(This sp.)

Technical Assistance: P. Thillairajan (Mandapam)

8. Location of the research project : Mandapam, Vizhinjam
9. a) Objectives:
1. To develop suitable techniques for the breeding of commercially important gastropods and rearing the young ones to sizes appropriate for transplantation to natural beds.
 2. To plan and carry out experimental sea-ranching of important selected gastropod species and monitor the effect on improvement/replenishment of natural populations.
- b) Practical Utility: For several years, species such as Xancus ~~lividus~~ on the mainland waters and Trochus niloticus and Turbo marmoratus in the Andaman and Nicobar waters have been subject to heavy exploitation. Their breeding potential and recruitment to exploited fishery have not been understood. The present project aims at developing controlled breeding techniques for gastropods in order to be able to use such systems for production of juveniles on large scale and replenishment of stocks through sea-ranching in future.

10. Technical Programme:

1. To study the breeding habits of adults, larval development and juvenile growth of selected gastropods representing different reproductive strategies (gastropods under consideration are species of Xancus, Turbo, Trochus, Heliotis, Thais, Cypraea and Comus).
2. Controlled breeding and seed production of local gastropod species at the project centres.
3. Development of controlled breeding techniques for Trochus niloticus and Turbo marmoratus after success under item 2.
4. Experimental sea-ranching and monitoring of survival, and improvement/replenishment of natural populations.

Work done: Preliminary investigations have been completed.

Work envisaged in the current year: Technical programmes items 1 and 2 will be carried out.

11. Date of start: 1983-84 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i. Land	: No	v. Fish ponds	: Marine Aquarium
ii. Labour	: Yes		
iii. Special equipment	: Yes	vi. Foreign exchange	: Yes
		vii. Other items	: Nil
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation: -
other than the Institute

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any, e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.2.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of molluscs
5. Title of Sub-project : Culture of green mussel in salt-water lagoon
6. Name and designation of Project Leader : K. Rangarajan, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Madras	K. Rangarajan	S-3	50%	Tech. Prog. 1-4

Technical Assistance: R. Thangavelu, P. Poornan

8. Location of the research Project : Madras
9. a) Objectives: To experiment and evolve suitable techniques for the farming of mussels in the coastal lagoon ecosystem.
- b) Practical Utility: Vast areas of lagoons along the east coast are practically lying unutilised at present. Most of the areas could be utilized to culture mussels. The development of proper culture system plays an important role in increased production and bring the farming of mussels within the reach of coastal rural population.

10. Technical Programme

1. To evolve suitable techniques for farming the green mussel in Muttukadu lagoon near Madras.
2. To study the environmental and biological factors influencing reproduction in the population of mussels.
3. To study the growth potential of mussels in lagoon ecosystem.
4. To estimate production rates under different culture methods

Work done: Preliminary experimental work has been carried out in an earlier project of mussel culture in 1983-84 and some encouraging results have been obtained.

Work envisaged in current year: As per technical programme.

11. Date of start : 1984-85 12. Likely date of completion: 1985-86

13. Estimated man-months: : -

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: Mussel farm
ii.	Labour	: Yes	vi.	Foreign	: No
iii.	Special	: Yes		exchange	
	equipment		vii.	Other items	: No
iv.	Animal	: No	viii.	Total estimated	
	sheds			cost	: Institute's budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual Labour cost, if any; e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed animals, feeds sprayers etc.; g) Total cost: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No.	MOL/CUL/1.2.2	2. I.C.A.R. Code No.		
3. Name and address of Research Institute	: CMFR INSTITUTE, COCHIN.			
4. Title of Project	: Mariculture - Culture of molluscs			
5. Title of Sub-project	: Investigations on mussel spat settlement and seed slipping on transplantation			
6. Name and designation of Project Leader	: K.K. Appukuttan, S-2			
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done				
8. Centre	Name	Designation	Time to be spent (%)	Work to be done
Vizhinjam	K.K. Appukuttan	S-2	30%	Tech. Prog. 1-4

Technical Assistance: T. Prabhakaran Nair, K.T. Thomas, Mathew Joseph (on study leave)

8. Location of the research : Vizhinjam Project
9. a) Objectives: To study the mussel spat attachment and seed settlement in nature and in farm and to investigate the causes of large-scale slipping of seed when transplanted to culture ropes. The candidate species is the brown mussel Perna indica.
- b) Practical Utility: Recently large scale slipping of seed mussel was identified as one of the constraints in mussel culture and very little information is available on this aspect. The present investigation would help in enhancing production in mussel culture farm through appropriate measures to prevent slipping of transplanted seed.

10. Technical Programme:

1. Observations on primary and secondary settlement of mussel spat in natural bed at Vizhinjam.
2. Collection and transplantation of mussel seed from various ecological condition.
3. To study the rate of slipping under various conditions.
4. To study the environmental parameters to know the optimum conditions for proper settlement of seed.

Work done: Some observations have been made in the earlier project on mussel culture.

Work envisaged in current year: As per technical programme.

11. Date of start : 1984-85 12. Likely date of completion: 1984-85

13. Estimated man-months: : -

14. Facilities required:

i. Land :	v. Fish ponds :
ii. Labour :	vi. Foreign exchange:
iii. Special : equipment	vii. Other items :
iv. Animal : sheds	viii. Total estimated : cost

15. If financed by an organisation other than the Institute : No

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of supporting staff, if any; d) Casual Labour cost, if any, e) Cost of equipment, facility etc.; Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget.

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No.	MDL/CUL/1.2.3	2. I.C.A.R. Code No.		
3. Name and address of Research Institute	: CMFR INSTITUTE, COCHIN			
4. Title of Project	: Mariculture - Culture of molluscs			
5. Title of Sub-project	: Pilot project in mussel culture			
6. Name and designation of Project Leader	: P.S. Kuriakose S-2			
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done				
Centre	Name	Designation	Time to be spent (%)	Work to be done
Calicut	P.S. Kuriakose	S-2	100%	1-7

Technical Assistance: V.G. Surendranathan, M.P. Sivadasan

8. Location of the research Project : Calicut

9. a) Objectives: To work out the techno-economic feasibility of open-sea mussel culture and identify problems in large-scale culture through appropriate feed-back. The candidate species is the green mussel Perna viridis.
- b) Practical Utility: The project will demonstrate the high production potential and economic viability of mussel farming along the coastal waters. The techno-economic data will be provided to organisations interested in commercial mussel farming.

10. Technical Programme:

1. Open-sea raft culture of mussels adopting standard norms.
2. Standardisation of spat collection, transportation, conditioning, selection and seeding operations for large-scale farming.
3. Economics of mussel culture-
4. Demonstration of technical know-how and commercial viability of mussel farming.

-
5. Purification of mussels.
 6. Development of strategy with cooperation of State Fisheries Development Corporations, Integrated Fisheries Project and Marine Products Development Authority for marketing of farm mussel production.
 7. Investigations on technological and biological problems based on feed-back.

Work done: The techniques of open-sea mussel culture have been developed at the Institute on experimental basis and the high production potential has been ascertained.

Work envisaged in current year: To implement items 1-7 of the technical programme.

11. Date of start : 1984-85	12. Likely date of completion: 1986-87
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13. Estimated man-months:	: 40
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14. Facilities required:

i. Land : -	v. Fish ponds	: Open sea-
ii. Labour : Yes		mussel farm
iii. Special : -	vi. Foreign exchange	: -
equipment	vii. Other items	: boat puri-
iv. Animal : -		fication
sheds		plant
	viii. Total estimated cost	: Institute's budget

15. If financed by an organisation other than the Institute	: -
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16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual Labour cost, if any, e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MOL/CUL/1.8 2. J.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Mariculture - Culture of molluscs
5. Title of Sub-project : Culture of cephalopods
6. Name and designation of Project Leader : D. Sivalingam, S-1
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	D. Sivalingam	S-1	60%	Tech.Prog. 1-4

Technical Assistance: P. Thillairajan

8. Location of the research Project : Mandapam
9. a) Objectives: To develop techniques for breeding and culture of cephalopods.
- b) Practical Utility: Culture techniques for rearing cephalopods when developed successfully, have good scope for adoption on commercial lines for enhancing production. The cephalopods have a high demand in the export market.

10. Technical Programme:

1. Maintenance of adults of cuttlefish (*Sepia* spp.) in marine aquaria for observations on reproductive behaviour.
2. Collection of egg clusters of cuttlefish (*Sepia* spp.) and investigations on optimum hatching conditions.
3. Investigations on nutritional and other physiological requirements for growth during juvenile phase.
4. Development of appropriate techniques for the grow-out phase of culture.

Work done: In the project during 1979-1980 occurrence of egg capsules were hatched in the laboratory and the young ones had survived for a few weeks.

Work envisaged: Detailed investigations will be carried out as per Tech. Programme.

-
11. Date of start: 1984-85 12. Date of completion: 1986-87
-
13. Estimated man-months : -
-
14. Facilities required:
- | | | | | | | | |
|------|-----------|---|---------|-------|-------------|---|-------------|
| i. | Land | : | - | v. | Fish ponds | : | - |
| ii. | Labour | : | - | vi. | Foreign | : | - |
| iii. | Special | : | Yes | | exchange | | |
| | equipment | | | vii. | Other items | : | Cages |
| iv. | Animal | : | Marine | viii. | Total esti- | : | Institute's |
| | sheds | | aquaria | | mated cost | | Budget |
-
15. If financed by an organisation other than the Institute : -
-
16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual Labour cost, if any, e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc., g) Total cost: Institute's budget
-
17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT 1984-85

1. Institute Code No. MBO/ES/1.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute: C.M.F.R. Institute, Cochin
4. Title of Project: Fishery Oceanography Investigations
5. Title of Sub-project: Physical and chemical aspects of the waters of the Exclusive Economic Zone

6. Name and designation of Project Leader: A.V.S. Murty, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	A.V.S. Murty	S-3		1-3
	C.P. Ramamirtham	S-2		"
Madras	D.S. Rao	S-2		"
	K.G. Girijavallabhan	S-1		"
Mandapam	S. Krishna Pillai	S-1		"
Tuticorin	R. Marichamy	S-2		"
Karwar	S. Mathuswamy	S-1		"
Calicut	C.V. Mathew	S		"

Technical Assistance: K.P. Viswanathan (Calicut), T. Dandapani (Madras), M. Selvaraj (Mandapam), R. Vasanthakumar (Vizhinjam), N.P. Kunhikrishnan (Cochin), G.S. Bhat (Mangalore), Ch. Ellithathayya (Kakinada), S.P. Dahyalal, S. Rajapackiam (Tuticorin).

8. Location of the Research Project: Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Tuticorin, Mandapam, Madras, Kakinada and Waltair

9. (a) Objectives: To determine the seawater characteristics of the Exclusive Economic Zone and their influence on biological productivity and fisheries.
- (b) Practical Utility: A continuous monitoring programme of the seawater characteristics is of great value in assessing the fertility, biological productivity and fisheries of the Economic Zone.

10. Technical Programme: 1. Hydrographical and meteorological data to be collected, processed and analysed for physical and chemical parameters. 2. Nutrient contents of the sea water to be analysed and

134. The fishery resources of the coastal waters of India have been processed for the seasonal variations in relation to the rate of primary organic production. 3. To identify the environmental factors which influence the fisheries.

Work done: Physico-chemical aspects of waters of inshore regions were regularly monitored at Cochin, Madras, Mandapam, Tuticorin, Mangalore, Calicut and other Centres.

Work envisaged in current year: Greater coverage of the fishery environmental aspects of the EEZ making use of the departmental research vessels as well as vessels of other organisations (whenever available) will be undertaken.

11. Date of start: 1978 12. Likely date of completion: continuing

13. Estimated man-months: man months/year

14. Facilities required:

i. Land	- No	v. Fish ponds	- No
ii. Labour	- No	vi. Foreign exchange	- Yes
iii. Special equipment	- Yes	vii. Other items	- No
iv. Animal sheds	- No	viii. Total estimated cost	- Institute's Budget

15. If financed by an organisation other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost:	Institute's Budget

17. Signatures of:

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MBO/PP/1.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project: Phytoplankton and primary productivity
-
5. Title of Sub-project: Phytoplankton and primary productivity
of the EEZ
-
6. Name and designation of Project Leader: K. Radhakrishna, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Waltair	K. Radhakrishna	S-3		1-4
Kakinada	G.S. Daniel Selvaraj	S-1		"
Madras	K.C. Girijavallabhan	S-1		"
Tuticorin	C.P. Copinathan	S-2		"
Calicut	C.V. Mathew	S		"
Vizhinjam	Rani Mary Jacob	S-2		"
Cochin	P.V. Ramachandran Nair	S-3		"
Karwar	G.M. Kulkarni	S		"

Technical Assistance:

B. Narayana Rao (Waltair), T. Dhandapani (Madras), V.K. Balachandran (Cochin) and P. Swarnalatha (Calicut)

8. Location of the research project: Waltair, Kakinada, Madras, Tuticorin,
Vizhinjam, Cochin, Calicut and Karwar
-
9. (a) Objectives: 1. Assessment of productivity potential of the EEZ.
2. Determination of temporal and spatial variability in productivity. 3. Study of the influence of hydrobiological parameters on primary productivity.
- (b) Practical Utility: Phytoplankton productivity being the primary base of the marine food pyramid, its estimation would help assess the ultimate fishery potential of our EEZ.
-
10. Technical Programme: 1. Measurement of primary productivity by oxygen and/or radiocarbon methods. 2. Estimation of phytoplankton standing crop in terms of pigments and total counts. 3. Measurement of related physico-chemical parameters in the Euphotic Zone and correlation with productivity. 4. Taxonomical and ecological studies on phytoplankton.

Work done: Productivity measurements by the oxygen method/radio carbon method have been carried out at different Centres. Phytoplankton biomass (cell counts) was also estimated. Temperature, salinity insolation, micronutrients have been measured. Correlation studies are in progress.

Work envisaged in current year: The Project work to be continued at the existing 8 Centres. In addition additional coverage will be made in the EEZ on board R.V. Skipjack.

11. Date of start: 1976 12. Likely date of completion: continuing

13. Estimated man-months : man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - Yes
iii) Special equipment - Yes	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost -
	Institute's Budget

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical Staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost : Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/PL/1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Secondary Production
-
5. Title of Sub-project : Zooplankton in relation to producti-
vity, recruitment and fisheries
-
6. Name and designation of Project Leader: K.J. Mathew, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Karwar	T.S. Naomi	S		1-6
Calicut	C.V. Mathew	S		"
Cochin	K.J. Mathew	S-2		"
"	K. Rengarajan	S-2		"
Vizhinjam	P.A. Thomas	S-2		"
	Rani Mary Jacob	S-2		"
Tuticorin	Pon Siraimetan	S-1		"
Mandapam	S. Krishna Pillai	S-1		"
Madras	K.G. Girijavallabhan	S-1		"

Technical Assistance: P.M. Aboobaker (Cochin), G. Subramanya Bhat (Mangalore), K. Ramachandran Nair (Vizhinjam) and T. Dhandapani (Madras)

8. Location of the Research Project : Karwar, Mangalore, Calicut, Cochin,
Vizhinjam, Tuticorin, Mandapam and Madras
-
9. (a) Objectives: 1) Estimation of zooplankton biomass and correlation with primary production and related hydrographic parameters.
2) Quantitative and qualitative analysis of zooplankton and correlation with food components of major pelagic fishes.
- (b) Practical Utility: Zooplankton being the important link in the marine food chain, its study is essential for establishing a meaningful correlation between primary production and fish resources and also to predict fluctuations in our pelagic fisheries.
-
10. Technical Programme: (a) Regular collection of samples for zooplankton from selected stations over a geographic area following standard methods. (b) Quantitative and qualitative analysis of zooplankton. (c) Taxonomy and biology of important zooplankton groups. (d) Study of the importance of zooplankters as indicators of water masses. (e) Study the seasonal distribution and abundance

of zooplankton in relation to hydrographic parameters. (f) Working out indices of productivity at the various levels employing statistical methods, for determining the role of zooplankton in the trophic chain. (g) Estimation on the monthly standing crop of zooplankton of the EEZ at selected centres and the preparation of monthly charts.

Work done: Secondary production is regularly monitored from 9 Research Centres. In addition to total biomass estimations, the zooplankton are analysed for their composition and seasonal abundance.

Work envisaged in current year: Investigations will be intensified with emphasis on deriving entire picture for the EEZ and also the role of zooplankton analysis to the recruitment.

-
11. Date of start : 1981 12. Likely date of completion: 1985
-
13. Estimated man-months : man-months/year
-
14. Facilities required:
- | | |
|--------------------------------------|--|
| i) Land - No | v) Fish ponds - No |
| ii) Labour - No | vi) Foreign exchange - No |
| iii) Special equipment - No | vii) Other items - No |
| iv) Animal sheds - No | viii) Total estimated cost - |
| | Institute's Budget |
-
15. If financed by an organisation
other than the Institute: No
-
16. Approximate cost:
- | | |
|--|--------------------|
| a) Salary of Scientific staff | |
| b) Salary of Technical staff | |
| c) Salary of Supporting staff, if any | |
| d) Casual Labour cost, if any | |
| e) Cost of equipment, facility etc. | |
| f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc. | |
| g) Total cost : | Institute's Budget |
-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/FEL/1.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Fish eggs and larvae
-
5. Title of Sub-Project : Eggs and larvae of commercially
important fishes from the shelf and
adjacent waters (EEZ)
-

6. Name and designation of Project Leader : K.C. George, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	K.C. George	S-3		1-3
Vizhinjam	Rani Mary Jacob	S-2		"
Mandapam	S. Krishna Pillai	S-1		"
Tuticorin	Pon Siraimetan	S-1		"

Technical Assistance:

Geetha Antony (Cochin)

8. Location of the Research Project : Cochin, Vizhinjam, Mandapam and
Tuticorin
-

9. (a) Objectives: Monitoring of abundance of fish eggs and larvae in the coastal waters with special reference to commercial species - Survey of Ichthyoplankton, of the shelf and adjacent waters to identify spawning areas and seasons of commercial species - Qualitative studies for identification of fish eggs and larvae by hatching and rearing in the laboratory.

(b) Practical Utility: Knowledge of seasonal and spatial distribution of eggs and larvae help in determining the spawning areas, seasons and intensity of spawning of fishes, which in turn is useful in the assessment of recruitment to the stocks.

10. Technical Programme: 1. Regular collection of Ichthyoplankton from inshore waters at the selected centres and their quantitative and qualitative studies. 2. Collections by R.V. Skipjack from the shelf and adjacent waters. 3. Hatching and rearing of live ichthyoplankton at selected centres namely Cochin and Vizhinjam using rearing containers connected to a water circulating system.

Work done: Work on item 1 of the Technical Programme is done on a continuing basis. Rearing live ichthyoplankton has been started at Cochin and Vizhinjam. In addition to the on-going programmes, rearing experiments will be given more emphasis.

Work envisaged in current year: Work to be intensified by undertaking hatching and rearing of fish eggs and larvae in laboratory conditions.

-
11. Date of start : 1976 12. Likely date of completion :
continuing
-
13. Estimated man-months : man months/year
-
14. Facilities required:
- | | | | |
|------------------------|-------|----------------------------|--------------------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - Yes | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost | - |
| | | | Institute's Budget |
-
15. If financed by an organisation
other than the Institute : No
-
16. Approximate cost:
- | | |
|--|--------------------|
| a) Salary of Scientific staff | |
| b) Salary of Technical staff | |
| c) Salary of Supporting staff, if any | |
| d) Casual Labour cost, if any | |
| e) Cost of equipment, facility, etc. | |
| f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc. | |
| g) Total cost : | Institute's Budget |
-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/SW/1.2 2. I.C.A.R. Code No. -----
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin -----
4. Title of Project : Seaweed Resources Investigations -----
5. Title of Sub-project : Culture of economically important
seaweeds -----
6. Name and designation of Project Leader : N. Kaliaperumal, S-2 -----
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done -----

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Mandapam	N. Kaliaperumal	S-2	50	1-3
Madras	Geetha Bharathan	S-1		"

Technical Assistance: S. Kalimuthu, J.R. Ramalingam, M. Selvaraj and
M. Najmuddin (Mandapam)

-
8. Location of the Research Project : Mandapam and Madras -----

9. (a) Objectives:

To carry out culture experiments on commercially important seaweeds in order to develop suitable techniques for seaweed farming.

(b) Practical Utility:

This will provide additional raw materials in off seasons and also production could be increased according to the demand.

10. Technical Programme:

1. Farming and culturing of economically important seaweeds by means of vegetative propagation and spores.
2. Enhancement of seaweed production by management of solar radiation.
3. Study of genetic variation in Gracilaria corticata.

Work done: Farming technology of economically important seaweeds have been developed.

Work envisaged in current year: Further investigations on sporulation and environmental manipulation to increase production will be attempted.

11. Date of start: 1981 12. Likely date of completion: 1984

13. Estimated man-months : man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute : No

16. Approximate cost :

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual Labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds. sprayers etc.
g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. MBO/EE/1.4 2. I.C.A.R. Code No.
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
4. Title of Project: Environmental monitoring in the
industrial and adjacent area of the
Cochin Backwater system
5. Title of Sub-project:
6. Name and designation of Project Leader: C.P. Ramamirtham, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	C.P. Ramamirtham	S-2	25%	As per Col. 10
	I. David Raj	S-1	25%	"

Technical Assistance: L.R. Kambhodkar (Cochin, M. Enose)

8. Location of the Research Project : Cochin
9. (a) Objectives: 1. To assess the productivity of the backwaters and study of the effect of factory effluents on the environmental characteristics. 2. To study the effect of large scale oceanic phenomena on the estuarine system. 3. To study the fishery of the estuarine system in relation to hydrography.
- (b) Practical Utility: The investigations undertaken would give a comprehensive idea of the changes occurring in the fishery and hydrographic conditions in the backwater system, as also the effect of factory effluents and may suggest measures for the proper conservations and utilisation of these extensive areas for fishery development.
10. Technical Programme: Fortnightly sampling for salinity, dissolved oxygen, temperature, pH and nutrients at 5 stations each along two channels in the Cochin backwater system namely Cochin-FACT area and Cochin-Azhikode area, are to be made. Plankton observations, productivity measurements (oxygen technique) and trynet fishing are to be carried out at these stations.

Work done: The monsoon effect of the estuarine system between Cochin and FACT and also the area between Cochin and Azhikode were investigated to study the effect of effluent discharge on the biota of the estuarine. Emphasis was specially laid on the reduction of pH consequent on the discharge of acidic effluents from the industries into the river and the spread of low pH water into the adjoining prawn fields were studied.

Work envisaged: Investigations to be carried out during different seasons to find out the overall effect of bunding on the ecosystem as a whole and the adjacent seasonal and perennial prawn fields.

-
11. Date of start: 1983 12. Likely date of completion: 1985
-
13. Estimated man-months: man months/year
-
14. Facilities required:
- | | | | |
|------------------------|------|----------------------------|--------------------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - No | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost | - |
| | | | Institute's Budget |
-
15. If financed by an organisation
other than the Institute: No
-
16. Approximate cost:
- | | |
|--|--------------------|
| a) Salary of Scientific staff | |
| b) Salary of Technical staff | |
| c) Salary of Supporting staff, if any | |
| d) Casual Labour cost, if any | |
| e) Cost of equipment, facility etc. | |
| f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc. | |
| g) Total cost : | Institute's Budget |
-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/MP/1.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Marine Pollution
-
5. Title of Sub-project : Marine Pollution in relation to
protection of living resources
-
6. Name and designation of Project Leader : P.V. Ramachandran Nair, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	P.V. Ramachandran Nair	S-3		1-4
	V. Kunjukrishna Pillai	S-2		"
	A. Geethanand Ponniah	S-1		"
Karwar	S. Mithuswamy	S-1		1-2
Tuticorin	R. Marichamy	S-2		1-3
Cochin	I. David Raj	S-1		1-4

Technical Assistance: D. Vincent, K.K. Valsala (Cochin), R.V. Singh

8. Location of the Research Project : Cochin, Karwar and Tuticorin
-

9. (a) Objectives:

To identify sources of marine pollution, assess their effect on living organisms and to suggest tolerable levels for protecting the living resources of inshore areas, specially fisheries.

(b) Practical Utility:

In recent years there has been a world-wide awareness of the problems of marine pollution because of the immense growth of human population and industries, large scale application of pesticides and several other forms of human interferences with the natural environments. Apart from these, certain biological phenomena like phytoplankton blooms create conditions which lead to pollution and ultimately deoxygenation of water and mortality of fish and other marine life. Hence, studies on marine environmental damage by different sources become an obvious necessity.

10. Technical Programme: 1. Instances of mass mortality due to pollution will be investigated with regard to source and level of pollution in water. 2. In areas where instances of aquatic pollution are prevalent, suitable surveys will be conducted to identify type of pollution and their effect on the biota. 3. The levels of mercury in water in nearshore areas of Tuticorin will be monitored. 4. The levels and selected heavy metals in the environment will be monitored in selected areas.

Work done: Potential areas where pollution can occur from industries were extensively surveyed. The areas were Cochin backwater, Tuticorin coast & Malabar coast.

Work envisaged in current year: Regular surveys hotspots of pollution identified as per programme above.

11. Date of start: 1982 12. Likely date of completion: 1985

13. Estimated man-months : man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - Yes
iii) Special equipment - Yes	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost - Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/MP/1.2 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Marine Pollution
-
5. Title of Sub-project : Environmental monitoring of
aquaculture systems
-
6. Name and designation of Project Leader V. Kunjukrishna Pillai, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	V. Kunjukrishna Pillai	S-2		1-3
	V. Chandrika	S-1		"
Madras	Geetha Bherathan	S-1		"
	M. Rajagopalan	S-1		1-4
	K.G. Girijavallabhan	S-1		1-3
Cochin	I. David Raj	S-1		"
Technical Assistance: D. Vincent, K.K. Valsala (Cochin), T. Dhandapani (Madras), J.X. Rodrigo (Mandapam)				

-
8. Location of the Research Project : Cochin, Madras
-
9. (a) Objectives: 1. To collect baseline information on salinity, O_2 , nutrients and organic carbon content in the water and substratum and to link with production from the respective fields for a comparative evaluation. 2. To monitor variations in environmental parameters which cause stress on culture animals and also to explore remedial measures. 3. To estimate parameters than can be used as indices of the productivity of culture systems.
- (b) Practical Utility: The programme envisages monitoring of water quality and nature of substratum and also abundance and variations of benthic biota. Knowledge gathered on these lines may considerably help in foreseeing the problems affecting the growth and survival of culture organisms. Information on the chemical composition of the substratum and rate of oxygen reduction potential (Eh) will certainly help in controlling unfavourable situations. The abundance and variations of the benthic biota along with estimates of organic carbon in water and mud will give a true picture of the productivity of the ecosystem. There is scope to use these parameters as an index of overall productivity of prawn culture ecosystems.
-

10. Technical Programme: 1. Collection and analysis of physico-chemical data including water temperature, pH, Eh, salinity, dissolved oxygen and nutrients from selected prawn culture systems where commercial culture is practised. 2. Determine the organic carbon contents of sediment. 3. Determine the interstitial salinity in culture fields. 4. Record growth rate regularly and keep surveillance on mortality.

Work done: Environmental monitoring as outlined in Technical Programme 1 & 2 was carried out in the culture system in three Centres. At Cochin very high values of nutrients and mud organic matter was noticed after the monsoon. But there were no instance of fish mortality of cultured organisms.

Work envisaged in current year: Technical Programme 1-4

11. Date of start : 1982 12. Likely date of completion: 1985

13. Estimated man-months : man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - Yes
iii) Special equipment - Yes	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost - Institute's Budget

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/MP/1.3 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Marine Pollution
-
5. Title of Sub-project : Investigations on the pesticide
residues and heavy metals in the
environment and living resources of
the estuarine and inshore waters
-

6. Name and designation of Project Leader : V. Kunjukrishna Pillai, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	V. Kunjukrishna Pillai	S-2		1-3

Technical Assistance: D. Vincent, K.K. Valsala (Cochin)

8. Location of the Research Project : Cochin
-
9. (a) Objectives: Pollution from pesticides and heavy metals in the aquatic environment and their build up in the organisms is a major problem for investigation. This is of particular significance when the potential for large scale aquaculture in this region is taken into consideration. There are reports of mortality of fishes and crustaceans due to large scale application of pesticides in the agricultural lands lying adjacent to Cochin backwaters and hence requires regular monitoring.
- (b) Practical Utility: Information on the pesticide residue concentration in the environment as well as in the animals from this area is almost lacking. Data on the short-term as well as long-term effects of major pesticides on the ecosystem and the organisms will be highly useful in evaluating several biological effects on the population as well as in assessing the damage which can result due to biological magnification and food chain transport.
-
10. Technical Programme: 1. Baseline studies and survey to identify the level of pesticide residue in the aquatic environment and in commercially important organisms. 2. Detailed investigations on selected species to study the pesticide residues and heavy metal concentration and their effects. 3. Evolve a suitable programme for regular monitoring of pesticide residues in this region.

Work done: The necessary instrumentation for the work has been procured. The standards have been obtained and instrument calibration has been conducted.

Work envisaged in current year: Collection of fish and shell fish samples from brackish and marine areas and estimate the concentration levels different pesticide residues and heavy metals and also relate the same with their feeding habits.

11. Date of start : 1981 12. Likely date of completion: 1984-85

13. Estimated man-months : man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- Yes
iii) Special equipment	- Yes	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost -	
		Institute's Budget	

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
g) Total cost : Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No, MBO/MS/1.1 2. I.C.A.R. Code No.
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
4. Title of Project : Ecological studies of mangrove swamps
5. Title of Sub-Project : Ecology of the mangrove swamps and
their associated fauna and flora
6. Name and designation of Project Leader : M.S. Rajagopalan, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	M.S. Rajagopalan	S-3		1-3
	S. Banik	S-1		5
Kakinada	G.S. Daniel Selvaraj	S-1		1-3
Madras	D.S. Rao	S-2		4

Technical Assistance: Ch. Elli Thathayya (Kakinada), A. Kanagam (Cochin)

8. Location of the Research Project: Cochin, Madras and Kakinada
9. (a) Objectives: 1. To understand the various ecological aspects connected with mangrove areas. 2. To determine quantitatively and qualitatively the mangrove associated fauna, their inter-relationship and influence on fisheries. 3. To evaluate nutritional composition in terms carbohydrates of the halophytes (back mangroves).
- (b) Practical Utility: Mangrove areas have characteristic flora & fauna and have high productivity. Further, mangrove areas serve as nursery grounds for many species of fishes and prawns. Hence valuable information can be gained from the point of view of coastal aquaculture. To explore the possibility of utilizing halophytes as fodder.
10. Technical Programme: 1. Detailed survey of mangrove vegetation, resident and migratory fauna with special reference to succession of plant and animal communities. 2. Collect information on hydrographic conditions, primary productivity, soil etc. 3. Locate areas which serve as nursery grounds for fishes and shell fishes. 4. To determine the carbohydrate content of halophytes of the back mangrove region. 5. To study the physico-chemical properties and soil microbiology of mangrove soils at Cochin.

Work done: Mangrove areas at Cochin backwater, Killai estuary, Gulf of Kutch and Kakinada have been surveyed and the ecology and biology of mangroves have been studied.

Work envisaged in current year: Intensification of the ecological studies at Cochin and Kakinada as per technical programme and also at Madras.

11. Date of start: 1976 12. Likely date of completion: 1984-85

13. Estimated man-months : 24 man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - No
iii) Special equipment - No	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost -
	Institute's Budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	- Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. MBO/MM/1.1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project : CONSERVATION OF MARINE MAMMALS AND TURTLES
-
5. Title of Sub-Project : INVESTIGATIONS ON THE BIOLOGY OF MARINE TURTLES, CETACEANS AND THE DUGONG IN RELATION TO THEIR CONSERVATION AND MANAGEMENT
-

6. Name and designation of Project Leader : E.G. SILAS
-

7. Names and Designations of Project Leader and Project Associates together with the time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	E.G. Silas	Project Leader		MM-1,2,4,5
				MT-1,3,4,5
	V. Kunjukrishna Pillai	S-2		MM-6
Madras				MT-6
	M. Rajagopalan	S-1		MM-1-5
				MT-1-5

Technical Assistance: A. Bastian Fernando (Mandapam Camp)
Other Field Staff of Fishery Resources Assessment Division as well as other Divisions of the Institute

8. Location of the Research Project : Headquarters at Cochin, and Centres at Mandapam Camp, Madras, etc., along the coast
-

9. (a) Objectives: 1. Processing of data available on Cetaceans (dolphins, porpoises and whales) of the Indian Seas and to study the distribution, biology and behaviour of some species. 2. To examine the modalities of conservation measures necessary for the protection of lesser cetaceans. 3. Development of Cetacean Data Centre at the CMFRI. 4. To study the biology and resources of marine turtles, for developing proper conservation and management measures.

(b) Practical Utility: 1. There is hardly any information available on dolphins, porpoises and smaller whales except for records of strandings. Dolphins constitute an important link in the trophic chain in our shelf waters. No estimates are available about the population of different species of dolphins in our coastal waters, nor their role as predators of fish such as mackerel, sardines and carangids. Often damage to fishing gear is also caused by dolphins. A proper study of these animals, the species occurring in our waters, their

behaviour, biology and abundance will help considerably in evolving suitable management measures for proper conservation and utilization of this resource. 2. Survey of marine turtle nesting grounds along the coast, the hatchery programme of incubating and releasing new hatchlings, mark recovery experiments and studies on the reproductive biology of turtles are badly needed to develop proper conservation and management measures.

10. Technical Programme: (For marine mammals)

1. Processing and writing up of data already collected by the Project Leader on marine mammals from the Indian Ocean. 2. Observations on the behaviour, ecology and biology of marine mammals, particularly of dolphins and porpoises along the south west coast of India. 3. Monitoring of incidental catch of lesser cetaceans in fishing operations (gillnets/purse seine/impounding nets such as rampan). 4. Special emphasis to be given to study their reproduction, growth, food and feeding habits and behaviour and role in the trophic chain. 5. Development of the Cetacean Data Centre at the National Marine Living Resources Data Centre (NMLRDC) at the CMFRI, Cochin. 6. Study the deleterious effects of pollution on marine mammals.

Technical Programme: (For marine turtles)

1. Location of nesting grounds and breeding seasons. 2. Collection of data on turtle fishing including incidental catch in fishing gear. 3. Biological studies and turtle hatching and releasing programmes. 4. Development of conservation and management plans. 5. Development of Data Centre for marine turtles and the NMIRD at the CMFRI, Cochin.

Work done: Some ecological and biological observations on marine mammals have been carried out and this will be a continuing study. Data on turtle landings and locations of nesting grounds have been collected for selected areas along the coast and the Bay Islands. Based on recovery programme, published information has been brought out on sea turtle research and conservation (CMFRI Bull. 35) and on management and conservation (MFIS-50). A National Workshop on Sea Turtle Conservation was held at Madras in February '84 and the recommendations have been printed and sent to concerned authorities for implementation.

Work envisaged during the current year: Work to be continued with stress on dolphins, lesser whales and marine turtles. 1. Monitor and study of incidental catch of dolphins and stranding of whales along the coast to be investigated and data centre to be developed for Cetaceans and marine turtles. 2. Conservation and management of dugong, lesser cetaceans and marine turtles to be developed. 3. Survey of nesting grounds and release programme of turtles to be intensified with elucidation of biological aspects.

11. Date of start: 1981

12. Likely date of completion: 1984-85

13. Estimated man-months :

25 man months/year

14. Facilities required:

- | | |
|---|---|
| i) Land - No | v) Fish ponds - No |
| ii) Labour - Contingent | vi) Foreign exchange - For tags |
| iii) Special equipment - Shipboard facilities | vii) Other items - nil |
| iv) Animal sheds - No | viii) Total estimated cost - Institute's Budget |

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

- a. Salary of scientific staff
- b. Salary of technical staff
- c. Salary of supporting staff, if any
- d. Casual labour cost, if any
- e. Cost of equipment, facility etc.
- f. Contingencies such as chemicals, feeds, etc.
- g. Total cost - from Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. FED/Misc/3		2. I.C.A.R. Code No.		
3. Name and address of Research Institute:		C.M.F.R. Institute, Cochin		
4. Title of Project :		Application of underwater acoustic technology in fishery research		
5. Title of Sub-project:		Attraction of fishes by acoustic methods		
6. Name and designation of Project Leader:		S. Natarajan, Field Officer		
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done				
Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	S. Natarajan	Field Officer		Execution of work as in Col. 10

Technical Assistance: To be provided

8. Location of the Research Project : Cochin
9. (a) Objectives: 1. To establish the spectral characteristics of sounds produced by various fishes, marine reptiles and mammals of different sizes. 2. To establish the luring sound of the fish and marine mammals and to control them within the large area of water. 3. To study the response of fish and marine mammals to their own noise when reproduced as also to that of other species. 4. To develop a set-up for studying the noise produced by a particular species and their response to the acoustic transmission in detail.
- (b) Practical Utility: From the recorded noise spectrum of fish the size and species can be delineated. 2. By reproducing the recorded noise of particular fish it is possible to attract them and drive them into the fishing gear and increase the catch. 3. To keep dolphins out of purse-seine nets, using under-water sound to drive away dolphins and marine mammals. 4. It is possible to lure the fish at feeding time in a pond or tank by producing appropriate sound into the water. 5. It is useful for identification and location of the soniferous marine organisms from the sound at the sea.

10. Technical Programme: 1. To select and design the appropriate equipments; 2. to procure the main and test equipments; 3. to set up a field laboratory and to carry out effective test; 4. to tape-record the noise produced by different fishes and marine mammals in ponds, tanks and sea; 5. to record the bait eating and swimming sounds of different fishes; 6. to make spectrum analysis of the recorded noise; 7. to conduct the experiment repeatedly on different species and at different places; 8. to develop required techniques and technology; 9. to prepare detailed reports and take up transfer of technology through education and training.

Work done: Procured Hydrophone and precision amplifier. Recorded the noise produced by Eel and lobster using domestic tape recorder.

Work envisaged in current year: To procure strip chart recorder and scientific tape recorder and to record and analysis the noise spectrum for different species of fishes.

11. Date of start: 1981 12. Likely date of completion: 1985

13. Estimated man-months: man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- Yes
iii) Special equipment	- Yes	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	- Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/Misc/4 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Assessment of the mesopelagic fish
resources of the E.E.Z.
-
5. Title of Sub-Project:
-
6. Name and designation of Project Leader: K. Rengarajan, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	K. Rengarajan	S-2		1-3
	K.J. Mathew	S-2		"
	I. David Raj	S-1		"

Technical Assistance:

-
8. Location of the Research Project : Cochin
-
9. (a) Objectives: Systematic exploratory surveys undertaken during the
cruises of R.V. VARUNA and other vessels in the southeastern
Arabian sea have brought to light the existence of large
quantities of mesopelagic fish resource mainly constituted by
myctophids, gonostomatids and hatchet fishes which could be
commercially exploited. These fishes also form forage for several
species of oceanic fishes.
- (b) Practical Utility: The quantitative assessment of the mesopelagic
fishes along with a study on their biology would help in planning
a judicious exploitation of this hitherto unexploited resources.
In addition, the study would throw light on the influence of
these organisms on the exploited pelagic resources of the Indian
seas.
-
10. Technical Programme: 1. Carrying out exploratory fishing surveys
employing different gears in conjunction with echo surveys from
R.V. Skipjack for obtaining samples for quantitative assessment and
biological studies of the mesopelagic fishes. 2. Studies on the
feeding habits and spawning behaviour of these fishes. 3. Study of
other mesopelagic organisms such as euphausiids, cephalopods,
siphonophores found in association with the Deep Scattering Layer
and mesopelagic fishes.

Work done: As the vessel was laid up for long periods progress has not been made.

Work envisaged in current year: As per Technical Programme

-
11. Date of start: 1982 12. Likely date of completion: 1987
-
13. Estimated man-months : man months/year
-
14. Facilities required:
- | | |
|--------------------------------------|--|
| i) Land - No | v) Fish ponds - No |
| ii) Labour - No | vi) Foreign exchange - No |
| iii) Special equipment - No | vii) Other items - No |
| iv) Animal sheds - No | viii) Total estimated cost - |
| | Institute's Budget |
-
15. If financed by an organisation
other than the Institute: No
-
16. Approximate cost:
- Salary of Scientific staff
 - Salary of Technical staff
 - Salary of Supporting staff, if any
 - Casual Labour cost, if any
 - Cost of equipment, facility etc.
 - Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - Total cost - Institute's Budget
-
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. FED/Misc/5 2. I.C.A.R. Code No. _____
3. Name and address of Research Institute: C.M.F.R. Institute, Cochin
4. Title of Project : Mariculture - culture of polychaetes
5. Title of Sub-Project : Culture of *Marphysa gravenyi*
6. Name and designation of Project Leader: K. Rangarajan, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Madras	K. Rangarajan	S-3		1-4
	M. Rajagopalan	S-1		"

Technical Assistance: Poovannan (Kovalam)

8. Location of the research project : Muttukadu (Madras)
9. (a) Objectives: To evolve suitable farming techniques for *Marphysa* (polychaete) culture in the backwater area in order to increase the total production per unit area.
- (b) Practical Utility: *Marphysa gravenyi* is distributed in the backwaters at Adyar, Kovalam etc. The adult worm which measures about 20-30 cm in length lives in the soft mud. The worms are dug up by fishermen with a triangular wooden plank and used as a bait in the backwater to catch fishes like *Sillago*, *Tilapia*, Mulletts etc. The worm is in great demand and fishermen spend many hours to collect them from the backwater. The method of collection is laborious and time consuming. Culture of these worms will help to meet the demands of the fishermen and enable them to spend more time in actual fishing and earn more.
10. Technical Programme: 1. Survey the backwaters and map out the occurrence of the worm, their density of distribution, substratum preference etc. 2. To study the ecological factors influencing their distribution. 3. Study of environmental parameters which have an influence over spawning, development of larvae and settlement in different substrata. 4. Assessment of the food and feeding habits of the larvae, rate of growth, time of harvest and production per unit area.

Work done: During the year 1983-84 items Nos. 1 & 2 of the technical programme were taken up and data have been collected on the density of distribution of the worm and the ecological factors which influence the spawning and distribution of their egg mass.

Work envisaged: The rest of the technical programme dealing with the development of larvae, settlement in different strata, assessment of the food and feeding habits of the larvae, rate of growth and production per unit area etc. will be taken up for detailed study.

11. Date of start: 1982 12. Likely date of completion: 1986

13. Estimated man-months: man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	- Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/IT/1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project: Introductions of low cost instrument
technology in fishery research
-
5. Title of Sub-Project: Designing, developing and fabri-
cating electronic instruments - Mile
marker circuit in Acoustic system,
flowmeters and power supply system
for larval counter.
-

6. Name and designation of Project Leader: S. Natarajan, Field Officer
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	S. Natarajan	T-6		1-7

Technical Assistance:

-
8. Location of the research project : Cochin
-
9. (a) Objectives: To develop need based low cost modern instrument-
ation in the research investigation in capture and culture fisheries

(b) Practical Utility: 1. With the help of larvae counter the fish larvae can be counted speedily and accurately while delivering the seeds to the cultivators/farmers, while stocking in the pond and at laboratory unit. 2. Flowmeter used for plankton collection (for estimating the volumes of water samples). 3. Mile marker circuit gives a mark on the echogram & sonogram after every one nautical mile which helps in analysing and mapping the fish distribution through acoustic survey for fish biomass.

10. Technical Programme: 1. To establish the theory and principle of working; 2. To design and develop the electrical/electronic circuits; 3. To procure the electrical/electronic components; 4. To assemble the units electrical/electronic/mechanical; 5. To fabricate the mounting for the different units; 6. To do the test in laboratory and the field and perfecting the system; 7. To prepare the detailed

report and obtain trademark patent wherever required.

Work done: 1. Developed Rudder indicator; 2. Developed Electronic Larval Counter which counts larvae less than 1 mm dia; 3. Fabrication of flowmeter under progress. 4. AC/DC Automatic switch over transportable aerator system.

Work envisaged in current year: Developing mile marker circuit for acoustic system in R/V Skipjack and power supply system for larval counter.

11. Date of start: 1981 12. Likely date of completion: 1984-85

13. Estimated man-months : 20 man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- Yes
iii) Special equipment	- Yes	vii) Other items - Electrical/ Electronic components	
iv) Animal sheds	- No		Rs. 5000/-
		viii) Total estimated cost - Institute's Budget	

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual Labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/BT/1 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Single Cell Protein (SCP) production
from micro-algae
-
5. Title of Sub-Project:
-
6. Name and designation of Project Leader: P.V. Ramachandran Nair, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	P.V. Ramachandran Nair	S-3		1-7

Technical Assistance: V.K. Balachandran, K.K. Valsala (Cochin)

8. Location of the research project : Cochin
-
9. (a) Objectives: To develop mass cultures of micro-algae rich in quality protein, with a view to use them in aquaculture practices, including feed formulation on a substitute for the conventional protein source.
- (b) Practical Utility: In view of the aquaculture developments and current awareness of quality protein enriched feed formulation, the scientists are trying to switch over from the conventional protein sources to SCP. Quite a lot of information is already available in this field, by the actual inclusion of SCP in fish feed formulation and is yet to get popularised among the aquaculturist. So a scheme for developing SCP from micro-algae to use as a protein source in aquaculture/mariculture is proposed.
-
10. Technical Programme: 1. Isolation and identification of protein rich species of micro-algae from the backwater and coastal areas of west coast. 2. Studies on their growth pattern and identifying the ECP in experimental cultures. 3. Qualitative and quantitative study of the proteins. 4. Mass culture of the isolated species after identification and study of growth pattern. 5. Identification of suitable inorganic nutrients for the quality SCP production. 6. Utilization of the sewage effluents for the culture of the organism and comparing their suitability again in the nutrient enriched media. 7. Development of harvesting technique and storage of SCP.

Work done: Four species of microalgae were isolated locally from the estuarine and inshore regions of Cochin and grown in the laboratory under axenic conditions and the total protein content was estimated.

Work envisaged: Further work on isolation and analysis of protein together with field trials will be done.

11. Date of start: 1982 12. Likely date of completion: 1985

13. Estimated man-months : man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - No
iii) Special equipment - Yes	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost - Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual Labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/BT/2 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Bio-Gas Production
-
5. Title of Sub-Project : Development of suitable digester for
coastal villages
-
6. Name and designation of project Leader : V. Chandrika, S-1
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	V. Chandrika	S-1	50%	1-6

Technical Assistance: To be posted

8. Location of the Research Project: Cochin
-
9. (a) Objectives: The world today is passing through an energy crisis. So the trend is to conserve the non-renewable sources. In developing countries especially in the tropics bio-gas technology gives a ray of hope in tackling rural-energy problems. In rural, brackish water shore areas where there is non-availability of fresh water it is aimed to produce Bio-gas using desalinated sea water for mixing purposes. Hence, it is envisaged to conduct investigations on bio-gas production using desalinated sea water to study the mechanism of bio-gas production in different salinities and to isolate a potential methane producing bacteria for mass-culturing from the mangrove sediments.
- (b) Practical Utility: Water hyacinth can be anaerobically digested in the bio-gas digesters to yield bio-gas and fertilizer and the sludge can be used as a nutrient for fish culture.
-
10. Technical Programme: 1. Experimental set up for a lab-scale bio-gas digester. 2. Production of Bio-gas using artificial sea water without sulphate radical with different substrates like cow-dung and water hyacinth. 3. Enlistment of the whole range of halophilic (salt-loving bacteria which are anaerobic in behaviour and at the same time methanogenic in function from mangrove sediments. 4. Isolation of cellulolytic bacteria from estuarine sediments. 5. Bio-conversion of water hyacinth waste into fuel gas. Methanogenesis,

Ecology, Physiology, Bio-chemistry and Taxonomy of common methylotrophs.
6. Determination of chemical factors by analytical methods.

Work done: Isolation of bacteria from mangrove areas is in progress.

Work envisaged in current year: As per technical programme.

11. Date of start: 1982 12. Likely date of completion: 1985

13. Estimated man-months: man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- Yes	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	- Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

1. Institute Code No. FED/SW/1.4	2. I.C.A.R. Code No.			
3. Name and Address of Research Institute:	C.M.F.R. Institute, Cochin			
4. Title of Project:	Seaweed Resources Investigations			
5. Title of Sub-Project:	Selection and Genetic Improvement of Seaweeds			
6. Name and Designation of Project Leader :	Geetha Bharathan, S-1			
7. Name(s) and Designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done				
Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	N. Kaliaperumal	S-2		1-8
Madras	Geetha Bharathan	S-1		"

Technical Assistance: S. Kalimuthu (Mandapam)

8. Location of the Research Project : Mandapam, Madras
9. (a) Objectives: 1. Screening, evaluation and genetic characterisation of different natural populations. 2. Generation of genetic variability by mutagenesis, polyploidy, hybridisation. 3. Selection of desirable characters based on the above, for use in further genetic manipulation and improvement.
- (b) Practical Utility: The commercial exploitation of seaweeds is hampered by factors like over-exploitation and the variable and uncertain quality of the raw material. Cultivation of seaweeds of economic importance is already commercially viable in many countries and is being introduced in India also. The availability of high-yielding, fast growing strains of uniform quality would be a great asset to this enterprise, benefitting the cultivator as well as the industrialist who uses the raw material.

Planned genetic selection and improvement of desirable seaweeds can yield accelerated results. This project will undertake a preliminary screening of available material for identifying potentially useful varieties. Attempts will be made to generate new variability in order to widen the base of variation, especially in some vegetatively propagated material. This will be done by adopting different strategies depending upon the species involved. The aim will also be the establishment of a knowledge base which would help in future scientific breeding programmes.

10. Technical Programme: 1. Collection of material from different populations. 2. Study of variation in yield, quality, biomass and characters of genetic significance like chromosomes and patterns of protein banding by electrophoresis. 3. Evaluation of growth characteristics of these populations under cultivation. 4. Induction of mutations by use of chemical mutagens like EMS. 5. Induction of polyploidy by use of chemicals like colchicine and cytochalasin B. 6. Attempts at interspecific and intergeneric hybridisation between different taxa. 7. Evaluation of results of 4, 5, 6 in terms of 2 and 3. 8. Identification and selection of desirable characters and individuals/strains bearing them.

Work envisaged: Technical Programme 1 to 8

11. Date of start: 1984 12. Likely date of completion: 1989

13. Estimated man-months : man-months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.	
g) Total cost	- Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/PL/2 2. I.C.A.R. Code No. _____
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Secondary Production
-
5. Title of Sub-project : Investigations on 'Krill' resources
of the Antarctic waters
-
6. Name and designation of Project Leader : K.J. Mathew, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	K.J. Mathew	S-2	50%	

Technical Assistance: To be posted

8. Location of Research Project: Cochin
-
9. (a) Objectives: 1. To estimate the biomass of Euphausia superlea (Krill) in the epipelagic zone in the Antarctic Ocean. 2. To investigate qualitative and quantitative aspects of euphausiids of the Antarctic and temperate zones in the southern ocean. 3. To study the vertical distribution and migration of krill and other euphausiids in the Antarctic waters. 4. Studies on vertical profiles of temperature, oxygen and density and their probable relation to distribution and abundance of krill resources. 5. To estimate the krill biomass and abundance by the application of sonars. 6. Identification of surface aggregations and swarming of krill using satellite imageries.
- (b) Practical Utility: 1. The krill being the most abundant single species animal resource in the Antarctic which has a high nutritive value, a knowledge about their distribution and abundance in space and time would help in planning future strategies for India for a rational exploitation of this resource. 2. The distribution and abundance of euphausiids and other zooplankters in general are less investigated in the southern ocean. The study envisaged at present would throw more light on the above aspects.
-

10. Technical Programme: 1. Collection of krill and other euphausiid samples using different types of nets from the Antarctic, sub-Antarctic and subtropical waters during the Indian - Antarctic Research Expeditions. 2. Qualitative and quantitative analysis of krill, other euphausiids and zooplankters in general. 3. Collection and analysis of environmental parameters and the correlation of the same with the krill and other euphausiids. 4. Obtaining satellite imageries for the study of swarming and aggregation of krill in the Antarctic waters.

 11. Date of start: 1984 12. Likely date of completion: 1988

13. Estimated man-months: man months/year

14. Facilities required:

i) Land - No	v) Fish ponds - No
ii) Labour - No	vi) Foreign exchange - No
iii) Special equipment - No	vii) Other items - No
iv) Animal sheds - No	viii) Total estimated cost -
	Institute's Budget

15. If financed by an organisation
 other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
 b) Salary of Technical staff
 c) Salary of Supporting staff, if any
 d) Casual Labour cost, if any
 e) Cost of equipment, facility etc.
 f) Contingencies, such of chemicals, fertilizers, seed,
 animals, feeds, sprayers etc.
 g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
 Project Leader

Sd/-
 Head of Division

Sd/-
 Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. FED/Miso/7 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Investigation on sediment
fertility
-
5. Title of Sub-project : Evaluation of Macro and Micro
nutrients in the sediment and
fertility of culture systems
-
6. Name and designation of Project Leader : P.V. Ramachandran Nair, S-3
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	P.V. Ramachandran Nair	S-3		
	C.P. Ramamirtham	S-2 (APL)		
	V. Kunjukrishna Pillai	S-2		
	A.G. Ponniah	S-1		
	R.V. Singh	T-6		
	I. David Raj	S-1		

Technical Assistance: V.K. Balachandran, K.K. Valsala (Cochin)

8. Location of the research project : Cochin
-
9. (a) Objectives: 1. To provide general and quantitative information on the mineralogical and chemical composition of Marine sediment. 2. To evaluate the nutrients availability in sediment samples in relation to fertility of selected aquatic regions. 3. To estimate the amounts of trace elements and to assess their role in productivity of the regions concerned. 4. To establish baseline levels of biologically toxic heavy metals in the sediment and define areas of heavy metal pollution.
- (b) Practical Utility: 1. The essential nutrients and trace elements in water are usually taken from the sediment and thus the sediments in aquatic regions are generally a good store house of nutrients and trace elements. As such, the analysis of sediment becomes significant while studying the productivity of the ecosystems. 2. A knowledge of macro and micro gradients in sediment will greatly help in understanding of the geochemical mass balance of elements in the marine ecosystem.
-

10. Technical Programme:

1. Collection of sediment samples from selected regions once in a season.
2. Analysis of collected samples for macro nutrients i.e. Ca, Mg, Na, K, SO_4 , PO_4 , NO_3 , NO_2 , SiO_2 and organic carbon.
3. Analysis for micro elements i.e. Co, Cu, Li, Ni, Pb, Zn, Cd, Hg, Ba, Cr, Sr, Mo, Al, Mn, Fe.

11. Date of start : 1984-85 12. Likely date of completion: 1987-88

13. Estimated man-months : man months/year

14. Facilities required:

- | | | | |
|------------------------|------|----------------------------|--------------------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - No | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost | - |
| | | | Institute's Budget |
-

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost : Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. Fed/Miso/8 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : C.M.F.R. Institute,
Cochin
-
4. Title of Project : Bio-Active agents from marine
organisms
-
5. Title of Sub-Project :
-
6. Name & designation of Project Leader : D. Sadananda Rao, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Madras	D. Sadananda Rao	S-2		as per
	D.B. James	S-2		Technical
	K.G. Girijavellabhan	S-1		Programme
Vizhinjam	C.S. Gopinadha Pillai	S-2		
	P.A. Thomas	S-2		
	K.K. Appukuttan	S-1		
Tuticorin	C.P. Gopinathan	S-2		
Cochin	S. Muthusamy	S-1		

Technical Assistance: S. Kalimuthu (Mandapam), N.P. Kunhilkrishnan (Cochin)

8. Location of the Research Project : Madras, Vizhinjam, Mandapam,
Tuticorin and Cochin
-

9. (a) Objectives: To make a critical study of the bioactive agents from marine organism, to undertake a resource survey on such agents and also to conduct mariculture trials on such organisms.
- (b) Practical Utility: The knowledge obtained from these studies will have the following application:
- (1) in assaying the marine food organisms for toxins.
 - (2) in understanding the effects of blooms of toxic organisms.
 - (3) in the culture of certain economically important bioactive organisms
-

10. Technical Programme: 1. Ecological survey of important corals, alcyonarians, echinoderms, unicellular and higher algae which are prone to be toxic. 2. Collection, preservation, storage and screening for bio-activity. 3. Determination of the chemical and physiological nature of the bio-active substances and toxins. Quantification and identification of the compounds by HPLC and MS in the organisms. 4. Animal assay to determine tolerance levels. 5. Mariculture of the economically important toxic organisms.

Work envisaged: Technical Programme 1 to 5

11. Date of start : 1984 12. Likely date of completion: 1987

13. Estimated man-months : man-months/year

14. Facilities required:

- | | | | |
|---|------|---|------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour - for collection of specimen | | vi) Foreign exchange - for HPLC & Mass Spectra | |
| iii) Special equipment - HPLC & Mass Spectra | | vii) Other items | - No |
| iv Animal sheds - for keeping test animals, like mouse rabbits etc. | | viii) Total estimated cost - Institute's Budget | |

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

- | | |
|---|----------------------|
| a) Salary of Scientific staff | |
| b) Salary of Technical staff | |
| c) Salary of Supporting staff | |
| d) Casual Labour cost, if any | |
| e) Cost of equipment, facility etc. | |
| f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc. | |
| g) Total cost | - Institute's Budget |

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

175

1. Institute Code No. PNP/3 2. ICAR Code No.

3. Name and address of Research Institute: C.M.F.R. Institute, Cochin

4. Title of Project Reproductive physiology of fishes and shellfishes

5. Title of sub-project Controlled breeding of grey mullets and Siganus spp.

6. Name and designation of Project Leader L. Krishnan S-2

7. Name(s) and Designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Narakkal	L. Krishnan	S-2	25	Tech. Prog. 1-3 on Mulletts
"	M.K. George	S-1	25	
Mandapam	G. Mohan Raj	S-2	25	1-3 on <u>Siganus</u> spp.

Technical Assistance : To be posted

8. Location of the Research Project : Narakkal, Mandapam

9. a) Objectives: To develop controlled breeding techniques for induced maturation and spawning of grey mullets and Siganus spp.

b) Practical Utility: The project aims at development of techniques, using controlled environmental conditions such as photoperiodicity, temperature, salinity and pH, for maturation and spawning of cultivable salt-water species which will enable management of seed production for coastal aquaculture.

10- Technical Programme

1. Development of broodstock by manipulation of environmental parameters for production of viable eggs.
2. Induced breeding and standardisation of techniques.
3. Critical examination of development of gonads of fish under experimental control and to study the details of endocrine mechanism on gonad development through histological and histochemical methods.

Work done:

Natural spawning as well as induced breeding were achieved in Siganus canaliculatus. The larvae were successfully reared for 3 days. In Mugil cephalus induced breeding experiments and maintenance of brood stock with water quality management were carried-out.

Work envisaged:

Experiments will be carried out on induced breeding of Mugil cephalus. Studies on reproductive physiology of the fish will be intensified at Narakkal. At Mandapam Camp techniques of breeding of S. canaliculatus developed during the last year will be perfected by carrying out planned experiments.

11. Date of start: 1982-83 12. Likely date of completion : 1984-85

13. Estimated man-months : 60 man-months/year

14. Facilities required:

i.	Land	- No	v.	Fish ponds	- Yes
ii.	Labour	- No	vi.	Foreign exch.	- No
iii.	Special eqpt.	- Yes		Other items	- No
iv.	Animal sheds	- No		Total estimated cost- Institute's budget	

15. If financed by an organisation other than the Institute- Nil

16. Approximate cost:

- a) Salary of Scientific staff:
- b) Salary of Technical staff:
- c) Salary of supporting staff:
- d) Casual labour cost, if any:
- e) Cost of equipment, facility etc.
- f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers, etc.
- g) Total cost : Institute's Budget

17. Signatures of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

177

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. PNP/4 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute C.M.F.R. Institute,
Cochin
-
4. Title of Project : Reproductive Physiology of
fishes and shellfishes
-
5. Title of Sub-project : Correlation between the
structure of pituitary and
changes in the gonad of
the pearl spot, Etroplus.
-

6. Name and designation of Project Leader A.D. Diwan, S-2
-

7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	A.D. Diwan	S-2	25	Tech. Prog. 1- 2
Narakkal	L. Krishnan	S-2	25	1- 2

Technical Assistance : To be posted

8. Location of the research project: Cochin
-

9. a) Objectives: The main objective of the present study is to know the architecture of neurosecretory cells of pituitary gland and their structural changes in relation to gonadal cycle.
- b) Practical utility: Investigations of the pituitary, gonad relationship by histological means will give a clear understanding of the seasonal behaviour of neurosecretory cells which are responsible for the production of gonadotropins which in turn control the activities of the gonads. These studies will further help in manipulating the methodology in induced breeding.
-

10. Technical Programme:

1. Anatomical and histological study of the pituitary and gland will be carried out to know the types of neurosecretory cells and their architecture.

2. Morpho-histology of the reproductive system will be investigated. Histochemical studies of the gonads will be undertaken following the standard methods.

Work done: The maturation process in female Etroplus suratensis indicated that the species shows two periods of maturation in an year. In the histological picture of the pituitary gland six different cell types were observed. Gonadotrophs were identified by differential staining.

Work envisaged: The correlation of gonadotrophs with different phases of maturation and detailed studies on the histo-chemical aspects will be made.

11. Date of start: 1982-83 12. Likely date of completion
1984-85

13. Estimated man-months : Five

14. Facilities required

- | | | | |
|------------------------|-------|----------------------------|----------------------|
| i. Land | : No | v. Fish ponds | : No |
| ii. Labour | : Yes | vi. Foreign exchange | : No |
| iii. Special equipment | : Yes | vii. Other items | : No |
| iv. Animal sheds | : No | viii. Total estimated cost | : Institute's budget |

15. If financed by an organisation other than the Institute : Nil

16. Approximate cost:

- Salary of scientific staff
- Salary of Technical staff
- Salary of supporting staff, if any
- Casual labour cost, if any
- Cost of equipment, facility etc.
- Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.

17.

Signature of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

 1. Institute Code No. PNP/6 2. ICAR. Code No.

 3. Name and address of C.M.F.R. Institute, Cochin
 Research Institute

4. Title of Project Finfish nutrition

5. Title of Sub-project Nutritional requirements of
 fry and fingerlings of the
 milkfish Chanos chanos and
 mullets

6. Name and designation of
 Project Leader R. Paul Raj, S-2

7. Name(s) and designation(s) of Project Leader and Project
 Associates together with time proposed to be spent and
 work to be done

Centre	Name	Designa- tion	time to be spent(%)	Work to be done
Cochin	R. Paul Raj	S-2	20	1. Planning of experiment 2. conduct of Tech.Prog. 1-8
"	D.C.V. Easterson	S-2	20	1-8
Tuticorin	D. Kandasami	S-1	20	1-8
Technical Assistance: To be posted				

 8. Location of the research project : Cochin, Tuticorin

9. a) Objectives:

1. To study the protein, lipids, carbohydrate, energy, vitamins and mineral requirements of the fry and fingerlings of mullets and the milkfish, Chanos chanos.
2. Formulation and preparation of artificial diets including microparticulate diets for mullet hatchlings.

b) Practical Utility:

Increasing interest is evinced on the culture of milkfish and mullets in the coastal waters of our coast. In the brackishwater fish farming carried out at present supplementary feeds are provided in certain cases based on emperical knowledge. However, considerable amount of wastage of certain nutrients as well as absence of essential nutrients in the desired levels required for the optimum growth has been noticed. It is imperative, therefore, to understand the total nutritional requirements for evolving suitable feed particularly for the fry and fingerlings of these species.

10. Technical Programme:

1. Statistically designed experiments will be conducted using standard test diets prepared from purified nutritional biochemicals to define the optimum requirements.
2. Isocaloric diets with graded levels of proteins will be prepared to study the protein requirements.
3. Isonitrogenous diets with graded levels of lipids and carbohydrates will be prepared to determine the optimum energy requirements.
4. Isocaloric and isonitrogenous diets will be prepared to define the essential amino acids, vitamins and minerals based on the deletion technique and also for determining their optimum requirements.
5. Digestibility of nutrients will be studied using total faeces collection method or chromic oxide indicator method.
6. Standard chemical procedures will be adopted for chemical analysis

7. Regular monitoring of environmental parameters will be undertaken during the experiment.
8. The data collected will be analysed statistically to interpret the results.

Work done

Feeding experiments to define optimum protein requirement of Liza macrolepis fry was terminated at Tuticorin. Results of the experiment showed that 40% protein to be the optimum for growth, survival and protein retention for L. macrolepis fry under experimental condition. To define the lipid requirements of Chanos chanos fry, six isonitrogenous diets with graded levels of lipids were prepared using purified ingredients.

Work envisaged

Feeding experiments on the fry and fingerlings of milkfish and mullets using compounded diets would be conducted for developing suitable feed.

11. Date of start: 1982-83 13. Likely date of
completion : 1985-86

13. Estimated man-months : 20 manmonths/year

14. Facilities required:

- | | | | | |
|-------|----------------------|---|--------------------|--|
| i) | Land | - | No | |
| ii) | Labour | - | Yes | |
| iii) | Special equipments | - | Yes | |
| iv) | Animal sheds | - | No | |
| v) | Fish ponds | - | No | |
| vi) | Foreign exchange | - | Yes | |
| vii) | Other items | - | No | |
| viii) | Total Estimated cost | - | Institute's budget | |
-

15. If financed by an organisation
other than the Institute : Nil
-

16. Approximate cost:

- a) Salary of scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost : Institute's budget
-

17. Signature of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

183

1. Institute Code No. PNP/8 2. I.C.A.R. Code No.

3. Name and address of : C.M.F.R. Institute, Cochin
Research Institute

4. Title of Project : Finfish nutrition

5. Title of Sub-project : Cataloguing of chemical and
biological data on conventional and
non-conventional feed ingredients
suitable for cultivable marine
organisms

6. Name and designation of
Project Leader : R. Paul Raj, S-2

7. Name (s) and designation(s) of Project Leader and
Project Associates together with time proposed to be
spent and work to be done

Centre	Name	Designa- tion	Time to be spent (%)	work to be done
Cochin	R. Paul Raj	S-2	10	Planning of project; source form for reporting data and guidelines for analysis; digestibility trials, chemical analysis of feed.
-do-	M.S. Rajagopalan	S-3	10	Data on utiliza- tion of mangrove vegetation as feed.
Narakkal	S. Ahamed Ali	S-1	10	Chemical analysis of feeds, digesti- bility trials

Technical Assistance : to be posted

8. Location of the research project : Cochin and Narakkal

9. a) Objectives:

1. To prepare composition tables on both conventional and non-conventional feed stuffs of both plant and animal origin. (Proximate composition, amino acid profile, fatty acids, profiles, mineral composition, vitamin composition etc.)
2. To collect information on the biological value of the feedstuffs (Digestibility data, essential amino acid index etc.)
3. Preparation of a catalogue of feed ingredient resource based on the above, its availability and cost.

b) Practical utility:

Information on the chemical composition of the feed ingredients and their biological value is a pre-requisite for formulation of diets. The proposed study is undertaken with a view to collect all relevant information on the above aspects based on laboratory studies and published reports. The data thus obtained will be catalogued and disseminated to the endusers as and when required.

10. Technical programme

1. Suitable proforma and guidelines for entering data will be prepared on the lines developed by the international Network of feed information Centres modified to our requirements.
2. Existing information on chemical and biological aspects of feed ingredients will be collected both from published literature and also by corresponding with the different laboratories working feed analysis and biological evaluation of feeds in marine organisms.
3. Composition analysis of new ingredients will be undertaken at Cochin.
4. Digestibility trials will be conducted at Narakkal and Cochin.

Work done

Data on the proximate amino acid profile, fatty acid profile, vitamin contents and mineral contents of feed ingredients were collected. Amino acid profile and fatty acid profile of live food organisms, Artemia, Moina, Brachionus were also collected. Proximate composition of oil cakes, fish meal, clam meal, wheat and rice bran were determined. Digestibility of Liza parsia conducted.

Work envisaged

Collection of data on the chemical and biochemical composition of the feed ingredients and their cataloguing would be continued. Feeding experiments will be carried out to study the digestibility of selected feed in prawns and fishes using chromium sesquioxide indicator method.

 11. Date of start: 1982-83 12. Likely date of completion : 1984-85

13. Estimated man-months : 6 man-months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- Yes	vi) Foreign exchange	- Yes
iii) Special equipment	- Yes	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost-	Institute's budget

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- a) Salary of scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost : Institute's budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

187

-
1. Institute Code No. PNP/9 2. I.C.A.R. Code No. _____
3. Name and address of Research Institute : C.M.F.R. Institute, Cochin
-
4. Title of Project : Crustacean Nutrition
-
5. Title of Sub-project : Nutritional requirements of penaeid prawn larvae and juveniles
-

6. Name and designation of Project Leader : Syed Ahamed Ali S-1
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designation	Time to be spent (%)	Work to be done
Narakkal (Cochin)	Syed Ahamed Ali	S-1	50	Tech, Prog. 1 - 6
Madras (Kovalam)	M. Vijayakumaran	S-2	25	"

Technical Assistance : To be posted

8. Location of the Research Project : Cochin and Madras
-

9. a) Objectives:

To obtain data on the dietary requirement of protein, lipids, carbohydrates, minerals and vitamins of the larvae and juveniles of the cultivable species of penaeid prawns, with a view to evolve suitable artificial diets for hatchery production and nursery rearing of the species.

b) Practical utility:

There is only fragmentary data available on the total nutritional requirements of larvae and juveniles of penaeid prawns such as P. indicus and P. monodon in the hatchery culture at present. The results of the project would help to understand the basic aspects of nutritional requirements of the younger stages and formulate suitable artificial feed for large scale production in the hatchery and nursery management.

10. Technical Programme:

1. Formulation and preparation of appropriate test diets with different nutrient levels for studying the nutritional requirements of larvae and juveniles.
2. Feeding experiments with prepared diets and collection of data on maximum and optimum nutrient requirement level for different larval and juveniles stages.
3. Evaluation of protein efficiency ratio (PER), digestibility net protein utilization (NPU) and biological value of protein (BV) and other related factors.

Work done: Purified diet using egg albumen protein source prepared and offered to Penaeus indicus larvae. The larvae were found to develop up to P-II stage. Thereafter it was found that the feed was not available to larvae as the particles settled down on the container.

Work envisaged:

Feeding experiments on micro-particulate feed compounded with different composition will be carried out.

11. Date of start: 1982-83 12. Likely date of completion : 1984-85

13. Estimated man-months : 36 manmonths/year

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: No
ii.	Labour	: Yes	vi.	Foreign	
iii.	Special equipment:	Yes		exchange	: No
iv.	Animal sheds	: No	vii.	Other items	: No
			viii.	Total estimated cost:	Institute's budget

15. If financed by an organisation other than the Institute : Nil

16. Approximate cost:

- a) Salary of scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost:
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

189

-
1. Institute Code No. PNP/10 2. I.C.A.R. Code No.
-
3. Name and address of
Research Institute : C.M.F.R. Institute, Cochin
-
4. Title of Project : Crustacean nutrition
-
5. Title of sub-project : Nutritional requirements of
spiny lobsters (Panulirus spp)
-
6. Name and designation of
Project Leader : M. Vijayakumaran S-2
-
7. Name (s) designation(s) of Project Leader and Project
Associates together with time proposed to be spent and
work to be done
-

Centre	Name	designa- tion	Time to be spent	work to (%) be done
Madras	M. Vijayakumaran	S-2	25	1- 3
Madras	E.V. Radhakrishnan	S-2	20	3

Technical Assistance :

M. Shahul Hameed T-1

8. Location of the research project : Kovalam and Madras
-

9. a) Objectives:

Study of dietary protein, lipid, carbohydrate,
mineral and vitamin requirements of spiny lobsters.

b) Practical Utility:

Preliminary investigations on the rearing of
phyllosoma larvae and culture of early juveniles
of palinurids, to marketable size under controlled
conditions have provided encouraging results. However,
one of the constraints encountered is on the selection
of suitable feed in the perfection of the technology.
The present project would greatly help to overcome
this by providing data for the development of
nutritionally balanced compounded diet for different
stages of spiny lobsters.

10. Technical Programme:

1. Formulation and preparation of test diets with different combinations of nutrients.
2. Biochemical evaluation of test diets.
3. Biological evaluation of test diets through feeding experiments

Work done:

Experiments were carried out with diets having protein ranging from 0 to 60%. Initial trials indicated that the diets with 45-60% protein gave better growth rates.

Work envisaged

Feeding experiments with semi synthetic test diets to increase stability as well as acceptability of the diets will be planned and conducted.

-
11. Date of start: 1982-83 12. Likely date of completion : 1985-86
-

13. Estimated man-months : 4 man-months
-

14. Facilities required:

- | | | | | |
|------|---------------|-------|-----------------------------|--------------------|
| i. | Land | : No | v. Fish ponds | : no |
| ii. | Labour | : Yes | vi. Foreign exchange | : No |
| iii. | Special eqpt. | : Yes | vii. Other items | : No |
| iv. | Animal sheds | : No | viii. Total estimated cost: | Institute's budget |
-

15. If financed by an organisation other than the Institute : Nil
-

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff, if any
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost: Institute's budget
-

17. Signatures of

sd/-
Project Leader

sd/-
Head of Division

sd/-
Director

1. Institute Code No. PNP/11 2. I.C.A.R. Code No.
3. Name and address of Research Institute : C.M.F.R. Institute, Cochin
4. Title of Project : Molluscan Nutrition
5. Title of sub-project : Development of artificial and processed natural diet for rearing of bivalve larvae
6. Name and designation of Project Leader : D. Kandasami, S-1
7. Name(s) and designation(s) of Project Leader and Project Associates together with the proposed time to be spent and work to be done

Centre	Name	Designa- tion	Time to be spent (%)	work to be done
Tuticorin	D. Kandasami	S-1	25	Tech. Prog. 1 - 5
-do-	P. Muthiah	S-1	25	"
-do-	S. Dharmaraj	S-1	25	"
-do-	A. Chellam	S-1	25	"

Technical Assistance : To be posted

8. Location of the research project : Tuticorin

9. a. Objectives:

To develop artificial feed and processed natural feed for bivalve larvae and evaluate their nutritional efficiency.

b. Practical Utility:

In the hatchery production of seed of oyster, mussel and pearl oyster, success depends on providing appropriate feed to the different stages of larvae until spat settling. Feeding with live microalgal requires maintenance of an elaborate and continuous live algal culture system. Development of suitable artificial feed to appropriate particle size acceptable to larvae would not only ensure supply of feed as and when required, but also help in hatchery production

of seed. Chellam S-1 25

10. Technical Programme:

1. Formulation of artificial diet for bivalve larvae.
2. Microbinding of artificial diet.
3. Development of techniques for processing and storage of natural diet such as microalgae and diatoms.
4. Study on growth and survival rate of larvae fed with such prepared diets.
5. Evaluation of nutritional value of prepared diets.

Work done:

Micro particulate diet less than 20 μ ~~micron~~ using casein, soybean, lecithene, yeast extract, minerals, oyster extract in different combination was prepared and experimented. On the basis of the results of these experiments, another diet with particulate size of 2-3 micron was prepared and experiments conducted.

Work envisaged:

Experiments with micro particulate diets will be continued to evolve suitable artificial diets and their evaluation in mass rearing of bivalve larvae.

11. Date of start: 1982-83 12. Likely date of completion : 1984-85

13. Estimated man-months : 24 man-months

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: No
ii.	Labour	: Yes	vi.	Foreign	
iii.	Special equipment	: Yes		exchange	: Yes
iv.	Animal sheds	: No	vii.	Other items	: No
			viii.	Total estimated cost: Institute's budget	

15. If financed by an organisation other than the Institute - Nil

16. Approximate cost:

- a) Salary of scientific staff
- b) Salary of technical staff
- c) Salary of supporting staff
- d) Casual labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- g) Total cost: Institute's budget

17. Signatures of:

Sd/-

Project Leader

Sd/-

Head of Division

Sd/-

Director

Centre	Name	Designation	Time to be spent (%)	work to be done
Cochin	D.C.V. Easterson	S-2	25	1 - 4
Tuticorin	D. Kandasami	S-1	25	"

8. Location of the research project : Cochin and Tuticorin

To study the morphology, histology and histochemistry of the hepatopancreas alongwith the biochemical composition, carotenoids and the change with feeding and physiological conditions. Investigations will also be carried out on the physiology and metabolism of hepatopancreas.

Hepatopancreas is a very important organ involved in various metabolic activities of the decapods especially in the synthesis and secretion of enzymes and uptake of nutrients. The state of hepatopancreas can ~~be~~ indicate the physiological well being of the animal. To understand the nutritional physiology of crustaceans understanding of hepatopancreas is vital.

10. Technical Programme

1. Study of gross morphology
2. Histology of hepatopancreas in normal and under various physiological conditions.
3. Isolation and identification of carotenoids
4. Study of various biochemical constituents

Work done:

Observations on the colouration, weight of hepatopancreas of Penaeus indicus and P. semisulcatus were made. The carotenoid content was found to vary from 0.347 - 0.407% in wet weight to hepatopancreas.

Work envisaged

1. Thinlayer chromatograph separation of carotenoids.
2. Standardisation of methods for extraction of the enzymes.

11. Date of start: 1983-84 12. Likely date of completion : 1985-86

13. Estimated man-months : four manmonths

14. Facilities required

i.	Land	: No	v.	Fish ponds	: No
ii.	Labour	: Yes	vi.	Foreign exchange	: Yes
iii.	Special eqpt	: Yes	vii.	Other items	: No
iv.	Animal sheds	: No	viii.	Total estimated cost- Institute's budget	

15. If financed by an organisation other than the Institute: Nil

16. Approximate cost:

- a) Salary of scientific staff
- b) Salary of technical staff
- c) Salary of supporting staff if any
- d) Casual labour cost, if any
- e) Cost of equipment, faculty etc.
- f) Contingencies, such as chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- g) Total cost:

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. PNP/19 2. I.C.A.R. Code No.
-
2. Name and address of : C.M.F.R. Institute, Cochin
Research Institute
-
4. Title of Project : Crustacean Nutrition
-
5. Title of Sub-project : Nutritional requirements of
the mud crab (Scylla serrata)
larvae and juveniles
-
6. Name and designation
of the project leader : D. Kandasami, S-1
-
7. Name(s) and Designation(s) of Project Leader and
Project Associates together with time proposed to be
spent and work to be done
-

Centre	Name	Designa- tion	time to be spent (%)	Work to be done
Tuticorin	D. Kandasami	S-1	25	1 - 3
	R. Marichami	S-2	25	1 - 3

Technical Assistance : To be posted

8. Location of the Research Project : Tuticorin
-

9. a) Objectives: To obtain data on the total nutritional requirements of the larvae and juveniles of the mud crab Scylla serrata to evolve suitable artificial diet for the hatchery production of seed and nursery rearing of the species.
- b) Practical Utility: The mud crab Scylla serrata, is one of the important culturable crustaceans. Preliminary experiments carried out on the culture of the species have indicated feasibility of culture of the species in large scale. There is only negligible data available on the rearing of the larvae and juveniles of the species with artificial diet. The project would help to understand the basic aspects of nutritional requirements of the younger stages and formulate suitable artificial diet for large scale production of seed in the hatchery and nursery management.
-

10. Technical Programme:

1. Formulation and preparation of test diets with different nutrient levels.
2. Feeding experiments with the test diets and collection of data on the optimum nutrients requirement, levels for the different larvae and juvenile stage.
3. Evaluation of protein efficiency ratio (PER), digestibility, Net Protein Utilisation (NPU), Net Protein Requirement (NPR), feeding efficiency and growth rates.

Work done : New project

Work envisaged: Test diet formulation and conducting feeding experiments

11. Date of start: 1984-85 12. Likely date of completion : 1986-87
-

13. Estimated man-months : six man-months
-

14. Facilities required:

- | | | | |
|-------------------------|-------|----------------------------|----------------------|
| i. Land | : No | v. Fish ponds | : Yes |
| ii. Labour | : Yes | vi. Foreign exchange: | Yes |
| iii. Special equipment: | Yes | vii. Other items | : Nil |
| iv. Animal shed | : No | viii. Total estimated cost | : Institute's budget |
-

15. If financed by any organisation other than the Institute : Nil
-

16. Approximate cost

- a) Salary of scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff
 - d) Casual labour cost, if any
 - e) Cost equipment, facility etc.
 - f) Contingencies such as chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost
-

17. Signatures of

Sd/-	Sd/-	Sd/-
Project Leader	Head of Division	Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. PNP/20 2. I.C.A.R. Code No.
-
3. Name and address of : C.M.F.R. Institute, Cochin
Research Institute
-
4. Title of project : Reproductive physiology of
fishes and shellfishes
-
5. Title of sub-project : Controlled breeding of
milk fish
-
6. Name and designation of
the Project Leader : M.K. George, S-1
-
7. Name(s) and designation(s) of Project Leader and
Project Associates together with time proposed to be
spent and work to be done
-
- | centre | Name | Designa-
tion | Time to be
spent(%) | work to
be done |
|----------|----------------------------|------------------|------------------------|---------------------|
| Narakkal | M.K. George | S-1 | 50 | Tech. Prog.
1- 5 |
| " | A.R. Thirunavu-
kkarasu | S-2 | 25 | 1 - 5 |
-
- Technical Assistance : To be posted
-
8. Location of the Research Project : Narakkal
-
9. a) Objectives: Maturation and spawning of pond reared
milkfish under controlled conditions
- b) Practical utility: The scientific data on the
maturation and spawning of milk fish are essential
prerequisites for developing suitable technology for
seed production on large scale. The project envisages
to obtain information on these aspects with a view
to develop viable seed production technology and
culture of this most important cultivable fish.
-
10. Technical Programme:
1. The milk fish specimens collected from the pond
would be maintained under laboratory conditions.
 2. They will be fed with diets containing above 40%
protein and vitamin E.

3. Gonadotropin/pituitary extract HCG will be administered alone or in combination to induce gonadial maturation and spawning.
4. Selected environmental parameters such as temperature, salinity and pH will be maintained, and if required, manipulated to facilitate maturation and spawning.
5. Certain physiological parameters such as serum protein during maturation process will be studied.

Work done: New project

Work envisaged: Technical programme 1 to 5

 11. Date of start: 1984-85 12. Likely date of completion : 1985-86

13. Estimated man-months : 6 man-months

14. Facilities required:

i. Land	: No	v. Fish Ponds	: No
ii. Labour	: Yes	vi. Foreign exchange:	Yes
iii. Special equipment:	yes	vii. Other items	: No
iv. Animal sheds	; No	viii. Total estimated cost:	Institute's budget

15. If financed by any organisation other than the Institute : Nil

16. Approximate cost

- a) Salary of Scientific staff
 - b) Salary of technical staff
 - c) Salary of supporting staff
 - d) Casual labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies such as chemicals, fertilizers, seed, animals, feeds sprayers etc.
 - g) Total cost.
-

17. Signatures of

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. LD/D1/1.1 2. I.C.A.R Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Documentation & Information Services
5. Title of Sub-Project : Management of Fisheries Information Services
6. Name and designation of Project Leader : K.N.Krishna Kartha
Scientist S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	K.N.Krishna Kartha	S-2		2 (LJF)
"	M.J. George	S-3		2 (MFIS)
"	S.K.Dharmaraja	S-2		2 (MFIS)
"	G.Subba Raju	S-2		2 (MFIS)
"	M.S.Rajagopalan	S-3	2 (Annual Report)	
"	Krishna Sreenath	S-1	2 (Newsletter)	

Technical Assistance: L.V.Kanakasabhapathi; E.Johnson; S.Girija Kumari; A. Rajeswari Menon; A.Kanagam; L.R.Kambadkar; (Cochin) Edwin Joseph (Mandapam) Lalitha Sekharan (Calicut)

8. Location of the research Project : Cochin, Mandapam, Calicut

9. a) Objectives: Collection, collation and dissemination of scientific literature on marine fisheries, mariculture and allied topics and assessing and evaluating the information sources.
- 2) Selection dissemination of information on current developments in capture and culture fisheries among those involved in the respective fields.
- 3) Collection of complete literature on priority subjects.
- b) Practical utility: Documentation and information dissemination keep the research personnel abreast of developments in their respective fields. The publications issued extend information on technologies developed and research findings to the concerned people.

10. Technical programme:

1. Monthly current awareness service to circulate the list of latest additions to the library.
2. Publication of Indian Journal of Fisheries, Marine Fisheries Information Service, Bulletins, Special Publications, Newsletter, Fish trend and Annual reports.
3. Selective dissemination of information, by preparing and distributing brief accounts based on current periodicals technical reports etc.
4. Collection of complete literature, original, photocopies, or microfilms of important subjects.
5. Preparation of complete holdings of the library.
6. Publication of Monthly Fisheries Trends

Work envisaged in current year:

As per technical programme above and also strengthening the programmes of Acquisition, Technical Processing, circulation and documentation and Reprographic sections; To develop the dissemination of information system towards mass communication; to strengthen the printing unit

11. Date of start: 1962 12. Likely date of completion: Continuing

13. Estimated man months: 40 man months/year

14. Facilities required:

i. Land	!No	V. Fish Ponds	No
ii. Labour	!No	vi. Foreign exchange	No
iii. Special equipment	!Yes	vii. Other items	--
iv. Animal sheds	!No	viii. Total estimated cost	
		Institute's Budget	

15. If financed by an organisation other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff	g) Total cost: Institute's Budget
b) Salary of Technical staff	
c) Salary of supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.	

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. IDP/13 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Fisheries Forecast
5. Title of Sub-Project : Upwelling and fisheries : Model studies on distribution of upwelling and the structure of the biological communities along the west coast of India.

6. Name and designation of Project Leader : G. Subbaraju, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	G. Subbaraju	S-2		1-2
	R. Padmini	S-1		"
	K.J. Mathew	S-2		"
Calicut	N. Gopinatha Menon	S-1		"
Mangalore	P. Devadoss	S-2		"
	A. Noble	S-3		"

Technical Assistance: V.K. Balachandran and N.P. Kunhikrishnan (Cochin)

8. Location of the research project : Mangalore, Calicut, Cochin

9. (a) Objectives:

To identify the relation between wind and upwelling, between upwelling and the rate of production, between algal stock and zooplankton and pelagic fisheries to enable forecasting the fishery.

(b) Practical Utility:

This will enable forecasting of fishery for more efficient management of the stocks.

10. Technical Programme:

- The data available at C.M.F.R. Institute and other organisations for the region will be utilised for the model studies.
- Monitoring of wind, temperature, salinity, dissolved oxygen, nutrients, currents, plankton and fish will be made at stations in the region. Part of the work will be inter-organizational.

Work done: Consolidation of data available at C.M.F.R.I.

Work envisaged in current year: Acquisition of data from other organisations. Monitoring of meteorological, oceanographical and biological parameters at different stations.

11. Date of start : 1981 12. Likely date of completion: Continuing

13. Estimated man-months : man-months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost -	
		Institute's Budget	

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff
d) Casual Labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. C.M.F.R.I./IDP/16 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : National Programme of tagging
commercial prawns and fishes
5. Title of Sub-Project : Population studies by mark release
experiments on commercially important
fishes and prawns
6. Name and designation of Project Leader : P. Vijayaraghavan, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done

Centre	Name	Designation	Work to be done
Cochin	P. Vijayaraghavan	S-2	Organise and execute the programme
Technical staff	K.N. Rajan	S-1	Assist in tagging at all centres along the east and west coasts
	K.N. Gopalakrishnan		
	K. Chellappan		
	M.W. Kesavan Elayath		
	V.A. Narayanankutty		
	M. Abdul Nizar		Assist in drift bottle experiment.
	K.K. Valsala		
Tuticorin	M. Rajamani	S-1	Assist in tagging at Tuticorin
Madras	E.P. Sampson Manickam	S-1	Assist in tagging at
	D.B. James	S-2	Pulicat
	D.S. Rao	S-2	Assist in drift bottle
	K.G. Girijavallabhan	S-1	experiment
Chilka	K.R. Manmadhan Nair	S-1	Assist in tagging at Chilka

8. Location of the research project : Cochin

9. (a) Objectives: 1. Make quantitative assessment of the magnitude of the migration of Penaeus indicus along the west and south east coast. 2. To study the part played by the coastal currents in the migration of P. indicus.
- (b) Practical Utility: The results will reveal the extent to which the important prawn fisheries of the west coast are supported by recruitments from outside areas.

10. Technical Programme:

1. 5000 prawns to be marked and released off Calicut during April '84.
2. 5000 prawns to be marked and released at Manappad during June '84.
3. 5000 prawns to be marked and released at Chilka estuary in July '84.
4. 5000 prawns to be marked and released off Mandapam in August '84.
5. 5000 prawns to be marked and released off Kakinada in September '84.
6. 5000 prawns to be marked and released in the Pulicat estuary in September-October '84.
7. Drift bottles to be released every alternate month off Karwar and Madras for one year and at Quilon in April-June, at Vizhinjam in May, at Kanyakumari from July to November and off Chilka, Pulicat and Tuticorin during the tagging operations

11. Date of start : 1982 12. Likely date of completion: Continuing

13. Estimated man-months : man-months/year

14. Facilities required:

- | | | | |
|------------------------|------|------------------------------|------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - No | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost - | |
| | | Institute's Budget | |
-

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost - Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. IDP/17 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Remote Sensing and Fisheries
-
5. Title of Sub-Project: Application of Remote Sensing
Technology in Marine Fisheries
-
6. Name and designation of Project Leader : G. Subbaraju, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	G. Subbaraju	S-2		1-4
	P.V.R. Nair	S-3		"
	V.K. Pillai	S-2		"
	A.G. Ponniah	S-1		"

More scientists will be drafted at the time of operation of the project from different Divisions.

Technical Assistance: N.P. Kunhikrishnan & V.K. Balachandran

-
8. Location of the Research Project : Cochin
-
9. (a) Objectives:
1. To locate fish schools by aerial photography.
 2. To delineate areas of high productivity by scanning chlorophyll patterns.
 3. To develop the infrastructural facilities for interpretation of satellite imageries and Aerial photos of fish schools.
- (b) Practical Utility:

To identify the areas of high productivity from ocean colour scanning from Remote Sensing Satellites and also to assess the size and distribution of schools and thereby the biomass of pelagic fishes. 2. To monitor pollution prone areas and studies of circulation and upwelling.

10. Technical Programme: 1. Acquisition of landsat and similar imageries for the coastal zones. 2. Establishment of photo interpretation facilities. 3. Acquisition of CCT's for specific areas suitable for aquaculture and also pollution prone areas. 4. Study the distribution of suspended matters and chlorophyll in the coastal zone from satellite picture of suitable wave length. 5. Chlorophyll scanning by Air borne OCR. 6. Super-impose the fish distribution data on the distribution patterns of TSS and chlorophyll. 7. Measurement of sea truth data and computer analysis of the parameters to derive the possible relationship.

Work done: Experiments were conducted for the west coast of India in collaboration with SAC to collect sea truth data to synchronize with the Soviet Satellite Salyut-7 overpass. Chlorophyll, particulate carbon, temperature, upwelling and downwelling irradiance were measured. OCR measurements by aircraft along with visual scouting for fish schools were also made by the scientists of the Institute. Synchronizing with the overpass, samplings were made at Madras and Vizag. Data are to be compared with multi spectral photographs obtained from Salyut-7.

Work envisaged: Analysis of the data collected during the JEP and comparative study with multi spectral photographs. Development of a remote sensing cell which can be used for the interpretation of imageries from satellites and also collection of further sea truth data from protected environments such as marine national parks.

-
11. Date of start: 1981 12. Likely date of completion: 1985
-

13. Estimated man-months: man months/year
-

14. Facilities required:

- | | | | |
|------------------------|------|------------------------------|--------------------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - No | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost - | Institute's Budget |
-

15. If financed by an organisation
other than the Institute: No
-

16. Approximate cost:

- a) Salary of Scientific staff
 - b) Salary of Technical staff
 - c) Salary of Supporting staff, if any
 - d) Casual Labour cost, if any
 - e) Cost of equipment, facility etc.
 - f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 - g) Total cost - Institute's Budget
-

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/IDP/20 2. ICAR Code No.
-
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin
-
4. Title of Project : Mariculture - Culture of molluscs
-
5. Title of Sub-Project : Identification and isolation of
suitable planktonic micro-organisms
as mass culture
-
6. Name and designation of Project Leader : C.P. Gopinathan, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Tuticorin	C.P. Gopinathan	S-2		as per
	A. Chellam	S-2		column 10
	P. Muthiah	S-2		
	S. Dharmaraj	S-1		
Vizhinjam	K. Ramachandran Nair	T-4		

Technical Assistance:

8. Location of the research project : Tuticorin, Vizhinjam
-

9. a) Objectives:

1. To isolate micro-organisms found in the plankton off Tuticorin area.
2. To study the suitability and acceptability of these micro-organisms as larval feed.
3. Mass culture of such organisms

b) Practical Utility:

The above investigations will help the institute in assuring large scale production of seeds of cultivable molluscs for commercial operation.

10. Technical Programmes:

To develop a continuous mass culture system for feeding the larvae of mussels, edible oysters and pearl oyster with the micro-organisms and their combinations and to evaluate the suitability and the growth rate of the larvae.

Work done: Five species of microalgae namely Isochrysis galbana (Original and Cochin strain), Tetraselmis chuii, T. gracilis, Chlorella salina and Synechocystis salina were maintained in good condition adjacent to the hatchery at Karapad. Altogether 30500 litres of the pure culture of Isochrysis galbana has been supplied to the hatchery for the rearing operations of oysters.

Work envisaged in current year: The isolation of new forms of microalgae from the nearby environment of the hatchery and the mass culture of the same for the purpose of feeding the bivalve larvae will be undertaken.

11. Date of start: 1982 12. Likely date of completion: 1984-85

13. Estimated man-months: man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff	
b) Salary of Technical staff	
c) Salary of Supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seeds, animals, feeds, sprayers etc.	
g) Total cost:	Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/IDP/21 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE
COCHIN
-
4. Title of Project : Influence of mesh sizes on prawn
and fish catches
-
5. Title of Sub-Project : Retention and escapement of young
fishes and prawns in trawling gear
-
6. Name and designation of Project Leader : V.N. Bande, S-2
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	V.N. Bande	S-2	25%	1-2 & 4
	M.K. George	S-1	25%	"
	C. Suseelan (APL)	S-2	25%	1, 3 & 4
	V.S. Kakati	S-1	25%	1-3 & 4

Technical Assistance:

-
8. Location of the research project : Cochin
-
9. (a) Objectives: 1. To determine relationships between mesh size of
trawl and fish and prawns captured in trawling gear. 2. To
determine the rate of escapement and to study its effect on
resources.
- (b) Practical Utility: Considerable quantities of undersized fish and
prawns are being caught in the commercial trawling operations. An
estimate of such destructive fishing would help in determining
the appropriate mesh size of trawling gear and framing management
policies.
-
10. Technical Programme:
1. Conduct experimental fishing with suitably designed trawl nets with
different cod end mesh size using two Cadalmis simultaneously in
the commercial fishing grounds.
 2. Data obtained to be analysed for determining escapement at
different levels of mesh size.

3. Estimate retention and escapement sizes of important species of prawns in various mesh sizes of the gear.
4. Conduct sample survey of the cod-end mesh sizes of commercial fish/shrimp trawls operating from Cochin.

Work done: This is a project formed by merging the Crustacean Division Project No. CF/RE/1.1.6

Work envisaged in current year: Operations of Cadalmis or similar identical vessels as detailed in columns 9(a) & 10.

11. Date of start : 1983-84 12. Likely date of completion: 1984-85
(one season)

13. Estimated man-months : 12 man months/year

14. Facilities required:

- | | | | |
|------------------------|------|----------------------------|--------------------|
| i) Land | - No | v) Fish ponds | - No |
| ii) Labour | - No | vi) Foreign exchange | - No |
| iii) Special equipment | - No | vii) Other items | - No |
| iv) Animal sheds | - No | viii) Total estimated cost | - |
| | | | Institute's Budget |

15. If financed by an organisation
other than the Institute : No

16. Approximate cost:

- a) Salary of Scientific staff
- b) Salary of Technical staff
- c) Salary of Supporting staff
- d) Casual Labour cost, if any
- e) Cost of equipment, facility etc.
- f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
- g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. IIP/6	2. I.C.A.R. Code No.		
3. Name and address of Research Institute	: CMFR INSTITUTE, COCHIN Vikram Sarabhai Space Centre, Trivandrum (VSSC)		
4. Title of project	: Development of FRP/Synthetic floatation units for open-sea mariculture.		
5. Title of Sub-project	:		
6. Name and designation(s) of Project Leader	: CMFRI: K. Nagappan Nayar, S-3 VSSC : C.R. Sathaya, Head, Composites group		
7. Name and designation (s) of project Leader & Associates together with time proposed to be spent and work to be done			
Centre	Name and Designation	Time to be spent (%)	Work to be done
Trivandrum (VSSC)			
Tuticorin	M. Nagappan Nayar, S-3	10	Tech. Prog. 1-3
8. Location of Research Project: Trivandrum, Tuticorin			
9. a) <u>Objectives</u> : To design and develop suitable floatation units for open-sea mariculture.			
b) <u>Practical Utility</u> : Raft culture has been developed as a standard technique for the culture of pearl oysters and mussels. At present materials such as drums are used as floatation units to provide buoyancy to rafts. These are not long lasting and also create maintenance problems. The FRP/synthetic floatation units aimed to be developed under this project will serve the long-felt need for providing suitable structures to withstand all-weather conditions of the sea.			
10. <u>Technical Programme</u> :			
1. Designing and development of fibreglass reinforced plastic or other synthetic floatation units suitable for mariculture under open-sea conditions of the Indian coasts.			
2. Testing of the units under field conditions			
3. Standardisation of floatation units for different purposes of mariculture.			

Work done: Six numbers of FFP floatation units have been fabricated by VSSC and these are under test by CMFRI.

Work envisaged: Further intensive testing of the units for use in open-sea mariculture.

11. Date of start: April 1981 12. Likely date of completion: 1984-85

13. Estimated man-months: Man months/year

14. Facilities required:

i. Land	: Nil	v. Fish ponds	: Open sea farm
ii. Labour	: Yes	vi. Foreign exchange	: No
iii. Special equipment	: Yes	vii. Other items	: No
iv. Animal sheds	: No	viii. Total estimated cost	: Institute's budget

15. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual labour cost, if any, e) Cost of equipment, facility etc. f) Contingencies, such as chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost: Institute's Budget

16. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TE/2 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFRI INSTITUTE,
COCHIN
4. Title of Project : Training programmes in marine fisheries research
5. Title of Sub-project : Training in pearl culture
6. Name and Designation of Project Leader : K. Alagaraswami, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
	K. Alagaraswami	S-3	5	As in col. 10
Tuticorin	A. Chellam (APL)	S-2	10	
	S. Dharmaraj	S-1	10	
	T.S. Velayudhan	S-1	10	

Technical Assistance: A.D. Gamiel, J. Antony Pitchai, Dasman Fernando, Soosai V. Rayen.

8. Location of the Research Project : Tuticorin
9. a) Objectives: The Institute has the technical knowhow on pearl culture and many maritime States/private firms have shown keen interest in acquiring the know-how. The Institute has conducted training courses for the benefit of the fisheries departments of the States and Agricultural Universities. The present project aims at continuing the training programme. There is demand for vocational training from the universities and this need will also be met.
- b) Practical Utility: The transfer of technology to the end users through this project would help the States/Research organisation/private enterprise to take up pearl culture in their areas either on commercial lines or for development purposes. This is the only centre which offers such organised training in pearl culture in India.

10. Technical Programme: The curriculum of different types of training courses namely long term, short-term and vocational courses differ in content to meet the expected levels of attainments of managerial and technical personnel. Training is imparted on the development of pearl oyster resource, farm maintenance, pearl production through surgery and post-operative culture, harvesting techniques and management. The course will be organised based on specific requirements of States etc. and on their sponsoring candidates.

Work done: One long-term and two short-term training courses already conducted. Refresher training was given.

Work envisaged in current year: Short-term training programme will be organised.

11. Date of start: 1978 12. Likely date of completion: 1984-85
13. Estimated man-months : -
14. Facilities required:
- | | |
|----------------------------|---|
| i. Land : - | vi. Fish ponds : Pearl farm |
| ii. Labour : - | vii. Foreign exchange : - |
| iii. Special equipment : - | viii. Other items : Surgery laboratory |
| iv. Animal sheds : - | ix. Total estimated cost : Institute's budget |
15. If financed by an organisation other than the Institute -
16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any, e) Cost of equipment, facility etc. f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget
17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TR/3 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE, COCHIN
4. Title of Project : Training programme in Marine Fisheries Resources
5. Title of Sub-project : Training in Edible oyster culture
6. Name and designation of Project Leader : K. Nagappan Nayar, S-3
7. Name(s) and Designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name and Designation	Time to be spent (%)	Work to be done
Tuticorin	K. Nagappan Nayar	S-3	10
	K. Satyanarayana Rao	S-3	10
	P. Muthiah	S-2	10
	M.E. Rajapandian	S-1	10
			Tech. Prog. 1-7

Technical Assistance:

8. Location of the Research Project : Tuticorin

9. a) Objectives: The system of edible oyster culture has been developed at the Institute. It is proposed to organise short-term training courses in edible oyster culture to demonstrate and give practical training to the interested culturists and technical personnel.
- b) Practical Utility: The technical know-how of oyster culture will be transferred to the end-user through training programmes. Based on the training, farmers will be able to take up oyster culture on a commercial scale.

10. Technical Programmes: Training in:-

1. Selection of farm sites
2. Various methods of farming
3. Construction of racks for culture purposes
4. Collection methods of oyster spat
5. Growing oyster spat
6. Farm management
7. Purification and harvesting techniques.

Work done: One batch of personnel from maritime States have been given training in oyster culture in a four-week training courses in January-February, 1983.

Work envisaged: Training of technical people in farming will be done.

11. Date of start: 1978 12. Likely date of completion: 1984-85

13. Estimated man-months : man months/year

14. Facilities required:

i.	Land	: No	v.	Fish ponds	: Oyster farm
ii.	Labour	: Yes	vi.	Foreign exchange	: No
iii.	Special equipment	: Yes	vii.	Other items	: No
iv.	Animal sheds	: No	viii.	Total estimated cost	: Institute's budget

15. If financed by an organisation: No other than the Institute

16. Approximate cost:- a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual labour cost, if any; e) Cost of equipment, facility etc. f) Contingencies, such as chemicals, fertilisers, seed, animals, feeds, sprayers etc. g) Total cost: Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TR/4 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFRI INSTITUTE,
COCHIN
4. Title of Project : Training Programme in marine fisheries research
5. Title of Sub-project : Training in underwater investigations by SCUBA-diving
6. Name and designation of Project Leader : S. Mahadevan, S-3
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Tuticorin	K. Nagappan Nayar	S-3	10	
Mandapam	S. Mahadevan	S-3	10	
	K. Ramadoss	S-1	10	

Technical Assistance: J. Antony Pitchai, D. Fernando, S.V. Rayen.
(Tuticorin).

8. Location of the research project : Tuticorin, Mandapam Camp
9. a) Objectives: Training in SCUBA-diving will be imparted to scientific and technical personnel who desire to carry out underwater scientific investigations.
- b) Practical Utility: This will meet the growing need of research and development agencies for expertise for carrying out direct underwater observations on populations, behaviour, ecology of sea bed, sea farming etc.

10. Technical Programmes:

1. Suitable scientific and technical personnel from various research centres or sponsored candidates will be given training in SCUBA-diving.
2. Candidates for short-term sessions will be trained for a period of 8 weeks.
3. Training includes practical lessons in various methods of swimming in open sea, snorkelling, use of masks while swimming with fins, class room lessons on principles of aqualung diving, precautions to be followed while engaged in under-water work. The training imparted in sea trips and aqualung diving will be to the level of achieving proficiency in SCUBA-diving.

Work done: Two training courses have been conducted.

Work envisaged in current year: Need based programme will be taken up.

11. Date of start: 1978 12. Likely date of completions
1984-85

13. Estimated man-months : -

14. Facilities required:

i.	Land	: -	v.	Fish ponds	: -
ii.	Labour	: -	vi.	Foreign exchange	: -
iii.	Special equipment	: yes	vii.	Other items	: -
iv.	Animal sheds	: -	viii.	Total estimated cost	: Institute's budget

15. If financed by an organisation : -
other than the Institute

16. Approximate costs: a) Salary of Scientific staff, b) Salary of Technical staff; c) Salary of Supporting staff, if any; d) Casual Labour cost, if any; e) Cost of equipment, facility etc., f) Contingencies, such of chemicals, fertilisers, seed, animals, feeds sprayers etc. g) Total cost: Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TR/5 2. I.C.A.R. Code No.
3. Name and address of Research Institute: C.M.F.R. Institute, Cochin
4. Title of Project : Training Programme in marine fisheries research
5. Title of Sub-Project : Training in seaweed culture and utilization
6. Name and designation of Project Leader: N. Kaliaperumal, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Mandapam	N. Kaliaperumal	S-2	25%	1-4

Technical Assistance: J.R. Ramalingam, M. Selvaraj, M. Najmuddin and S. Kalimuthu (Mandapam)

8. Location of the Research Project : Mandapam

9. (a) Objectives: To train technical/research personnel and interested individuals in the methods of seaweed resources survey, culture and utilization.

(b) Practical Utility: The Institute has already worked out the techno-economic feasibility of seaweed culture and utilization. There are frequent enquiries from interested individuals and organizations regarding the seaweed resources, methods of culture and utilization. The proposed training course will meet this demand

10. Technical Programme:

To impart training on the following aspects.

1. Identification of various species of economically important seaweeds.
2. Methods of resources survey
3. Methods of seaweed culture
4. Methods of seaweed utilization

Work done: Training for interested individuals and local farmers was imparted.

Work envisaged in current year: Training to be continued as per Technical Programme

11. Date of start: 1978 12. Likely date of completion: continuing

13. Estimated man-months : 6 man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
 b) Salary of Technical staff
 c) Salary of Supporting staff, if any
 d) Casual labour cost, if any
 e) Cost of equipment, facility etc.
 f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. TR/6 2. I.C.A.R. Code No.
-
3. Name and address of
Research Institute: C.M.F.R. Institute, Cochin
-
4. Title of Project Training Programme in Marine
Fishery Research.
-
5. Title of sub-project: Training in Fisheries Resources
Assessment including Population
Dynamics.
-
6. Name and designation of
Project Leader K. Alagaraja, S-2
-
7. Name(s) and designation(s) of Project Leader and Project
Associates together with time proposed to be spent and work
to be done.

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin.	K. Alagaraja	S-2	50	organising
	T. Jacob	S-3	35	Training
	G. Venkataraman	S-3	20	programme,
	S. K. Dharmaraja	S-2	25	delivering
	K. Narayana Kurup	S-1	15	lectures and
	K. Balan	S-2	15	assessment of
	M. Srinath	S-1	15	response.
	K. S. Scariah	S-1	30	
	K. Vijayalakshmi	S	10	

Technical Assistance: C. R. Shanmughavelu, U. K. Satyavan,
G. Balakrishnan, Varughese Philipose, G. Krishnankutty Nair,
Varughese Jacob, P. Sivaraman, V. Rajendran, V. P. Annam, A. Kanakkan,
S. Haja Najeemudeen, C. J. Prasad, P. L. Ammini, K. C. Yohannan,
Abha Kant, Joseph Andrews, P. K. Mahadevan Pillai.

-
8. Location of the research
project. Cochin
-
9. (a) Objectives: To impart the above training to research,
technical and field staff of various Research Institutes,
state Fisheries Departments and Corporations, Universities,
Fishing Industry and other interested organisations.
- (b) Practical Utility: To enable i. research/technical staff
to plan their experiments/research programmes well in advance
so as to obtain data amenable for statistical analysis and
ii. field staff to collect data on fish landings and other
related aspects more efficiently to increase the quality
of data and reduce non sampling errors to the minimum.
-

10. Technical programme:

1. For research/technical staff: Training in theory and practicals covering i) basic statistics including probability, distributions and inference ii) Univariate, bivariate and multivariate analysis iii) growth curves iv) population models and v) sample survey designs for arriving at estimates of marine fish landings etc. six weeks duration including field trips.

2. For field staff: Training in selection of units of observations, identification of species, gears and crafts, collection of species-wise, gear-wise catch and effort data, simple sampling techniques and their utility - Three weeks duration including field trips.

Work done: Five weeks FAO/DANIDA/ICAR National Training Course on Fish Stock Assessment was held during 7th Nov. to 9th Dec. 1983 at CMFRI, Cochin. 25 participants representing ICAR Fisheries Research Institutes, Government of India, Agricultural and other Universities took part in the training. Case studies on fish stock assessment was the main aspect of this course.

Work envisaged in the current year: Training will be given to maritime states Departmental personnel on the sampling programmes for estimation of marine fish production.

11. Date of start: April 1980 12. Likely date of completion: March 1985

13. Estimated man-months: 18 man months/year

14. Facilities required:

i.	Land	:	No	v.	Fish ponds	:No
ii.	Labour	:	No	vi.	Foreign	
iii.	Special equipment.	:	No		exchange:	No
iv.	Animal sheds	:	No	vii.	Other items:	No
				viii.	Total estimated	
					cost: Institute's	
					Budget	

15. If financed by an organisation other than the Institute: NO

16. Approximate cost:

a) salary of Scientific staff	g) Total cost: Institute's budget.
b) salary of Technical staff	
c) salary of supporting staff, if any	
d) Casual Labour cost, if any	
e) Cost of equipment, facility etc.	
f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds sprayers etc.	

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of division

Sd/-
Director

-
1. Institute Code No. CMFRI/TR/7 2. I.C.A.R. Code No. -----
3. Name and address of Research Institute: C.M.F.R. Institute,
Cochin -----
4. Title of Project: Training Programme in Bacteriology -----
5. Title of Sub-Project: Training Programme in Bacteriology -----
6. Name and designation of Project Leader: V. Chandrika, S-1 -----
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done -----

Centre	Name	Designation	Time to be spent (%)	Work to be done
Cochin	V. Chandrika	S-1	25%	As per Col. 10

Technical Assistance:

-
8. Location of the Research Project : Cochin -----

9. (a) Objectives:

To train the Scientists and Technical staff of CMFRI in principles of Bacteriological work.

- (b) Practical Utility: The monitoring of bacterial load in culture products can be undertaken at the respective centres.

10. Technical Programme:

Training in the preparation of Media, inoculation, incubation, identification and quantification.

Work done: Training was given to CMFRI personal engaged in mariculture projects.

Work envisaged in current year: Training to be continued as per technical programme.

-
11. Date of start: 1981 12. Likely date of completion: 1984-85 -----

13. Estimated man-months : man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost -	
		Institute's Budget	

15. If financed by an organisation
other than the Institute: No

16. Approximate cost:

a) Salary of Scientific staff
b) Salary of Technical staff
c) Salary of Supporting staff, if any
d) Casual Labour cost, if any
e) Cost of equipment, facility etc.
f) Contingencies, such of chemicals, fertilizers, seed,
animals, feeds, sprayers etc.
g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TR/8 2. I.C.A.R. Code No.
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
4. Title of Project : Training Programme in Marine Fisheries Resources
5. Title of Sub-project : Training in mussel culture
6. Name and designation of Project Leader : P.S. Kuriakose, S-2
7. Name(s) and designation(s) of Project Leader and Project Associates together with time proposed to be spent and work to be done

Centre	Name	Designation	Time to be spent (%)	Work to be done
Calicut	P.S. Kuriakose	S-2	-	1-9

Technical Assistance: V.G. Surendranathan, M.P. Sivadasan.

8. Location of the research project : Calicut

9. a) Objectives: The Institute has developed suitable techniques for farming of mussels. It is proposed to organise short-term training course for a period of 6 weeks in mussel farming for the benefit of the Fisheries Departments of the States, interested culturists and technical personnel.
- b) Practical Utility: The technical know-how of mussel farming will be transferred to the end users through this project. This would help the states/ Research Organisations/private enterprise to take up mussel farming in their areas on commercial scale.

10. Technical Programme: Training in:-

1. Selection of farm site
2. Methods of farming
3. Construction of rafts buoying and mooring
4. Seed collection and transportation
5. Seeding technique
6. Thinning of mussels
7. Growing mussel in the farm
8. Farm management
9. Harvesting and post harvest technology.

Work done: Training was given to a batch of candidates from the Departments of Fisheries of Gujarat, Andhra Pradesh and Karnataka.

Work envisaged in current year: Short-term training will be conducted as and when required.

11. Date of start: 1982-83 12. Likely date of completion: 1984-85

13. Estimated man-months : -

14. Facilities required:

i.	Land	: -	v.	Fish ponds	: Mussel farm
ii.	Labour	: yes	vi.	Foreign exchange	: -
iii.	Special equipment	: -	vii.	Other items	: -
iv.	Animal sheds	: -	viii.	Total estimated cost	: Institute's budget

15. If financed by an organisation other than the Institute : -

16. Approximate cost: a) Salary of Scientific staff; b) Salary of Technical staff; c) Salary of Supporting staff; d) Casual Labour cost, if any; e) Cost of equipment, facility etc.; f) Contingencies, such as chemicals, fertilisers, seed, animals, feeds sprayers etc.; g) Total cost: Institute's budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1984-85

-
1. Institute Code No. CMFRI/TR/9 2. I.C.A.R. Code No.
-
3. Name and address of Research Institute : CMFR INSTITUTE,
COCHIN
-
4. Title of Project : Training in application and operation
of underwater Acoustic equipment in
fisheries
-
5. Title of Sub-Project : Short-term course (2 weeks) in
principles, application and operation
of underwater acoustic equipment for
fishing operators and fishery
scientists
-
6. Name and designation of Project Leader : S. Natarajan, Field Officer
-
7. Name(s) and designation(s) of Project Leader and Project Associates
together with time proposed to be spent and work to be done
-

Centre	Name	Designa- tion	Time to be spent (%)	Work to be done
Cochin	S. Natarajan	T-6		As in Col. 10

Technical Assistance:

-
8. Location of the Research Project : Cochin
-
9. (a) Objectives: For enabling the fishing operators (skipper, mate etc.)
to use the modern fish finding equipments most efficiently in
conducting fishing operations and the scientists to gain knowledge in
using acoustic technique for biomass estimation and interpretation of
echogram etc and to educate about modern technology, changes and their
advantages.
- (b) Practical Utility: 1. For enabling the fishing operators to
use the modern equipments effectively and increasing the fish catch.
2. To gain basic knowledge of handling the equipment and first line
maintenance by operators to avoid breakdown. 3. To help the scientist
in interpreting the echogram for identification of species distri-
bution, migration study and biomass estimation.
-

10. Technical Programme:

1. Preparing syllabus and course material
2. Identifying and selecting the right persons for training
3. Conducting theoretical and practical classes
4. Participation of trainee in fishing cruises.

Work envisaged: The preparations have been made to conduct the training course during 1984-85

11. Date of start : 1984-85 12. Likely date of completion: 1985

13. Estimated man-months : 6 man months/year

14. Facilities required:

i) Land	- No	v) Fish ponds	- No
ii) Labour	- No	vi) Foreign exchange	- No
iii) Special equipment	- No	vii) Other items	- No
iv) Animal sheds	- No	viii) Total estimated cost	-
			Institute's Budget

15. If financed by an organisation other than the Institute : No

16. Approximate cost :

a) Salary of Scientific staff
 b) Salary of Technical staff
 c) Salary of Supporting staff, if any
 d) Casual Labour cost, if any
 e) Cost of equipment, facility etc.
 f) Contingencies, such of chemicals, fertilizers, seed, animals, feeds, sprayers etc.
 g) Total cost - Institute's Budget

17. Signatures of:

Sd/-
Project Leader

Sd/-
Head of Division

Sd/-
Director