

RESEARCH PROJECTS 1978



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN-18

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

RESEARCH PROJECTS FOR 1978

INTRODUCTION

While formulating the Research projects of the Central Marine Fisheries Research Institute for the year 1978, the Institute has taken into consideration the priority areas proposed for the Sixth Plan and the various specific needs and problems of the Maritime States, Union territories and the fishing industry for their development plans. The Research Projects are basic, adaptive and applied in nature wherever necessary and lays stress on the proper exploration and monitoring of the fishery resources of the economic zone.

Mariculture investigations will be intensified and based on the technologies already developed by the Institute, demonstration projects have been taken up on fishes, prawns, other crustaceans, molluscs and also seaweeds. Suitable training programmes have been introduced for imparting training at various levels on mariculture, underwater investigations and on fishery resources assessment. The Institute will also be taking up Inter-Institutional projects and sponsored projects on specific areas. An Operational Research Project on an integrated approach to blending sea farming with traditional small-scale capture fisheries for rural development is also being taken up by the Institute.

The projects on the status of the major fisheries will provide the balance sheet for both demersal and pelagic fisheries resources in understanding the assets and liabilities of the resources. The projects on the stock assessment of commercially important species are intended to evolve suitable marine resources management policies. National demonstrations in mariculture will also receive priority attention.

Since recruitment to the Scientific and Technical cadres as well as the five yearly assessment for promotions are in progress, changes in deployment of personnel may be necessary. The designations of Scientific and Technical staff are indicated as on 1st January 1978.

Cochin,
January '78.



(E.G.SILAS)
DIRECTOR

ABBREVIATIONS USED

APL	-	Associate Project Leader
S-3	-	Scientist S3
S-2	-	Scientist S2
S-1	-	Scientist S1
S	-	Scientist S
SRS	-	Senior Research Scholar
RS	-	Research Scholar
T-6	-	Field Officer
T-4	-	Senior Technical Assistant
T II 3	-	Technical Assistant/Computer
T I 3	-	Technical Assistant
T-2	-	Junior Technical Assistant/Computer
T-1	-	Field Assistant

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN

RESEARCH PROJECTS FOR 1978

 Code No. Title of Project/Problem Page No.

FISHERIES RESOURCES ASSESSMENT DIVISION

Assessment of marine fisheries resources

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*CF/RE/1.7	36. Assessment of Stomatopod resources	..	73
@CF/RE/1.2	.. Estimation of population parameters of prawns off Cochin (merged with CF/RE/1.1 in 1977)		
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I.C.A.R. SCHEMES IN PROGRESS

1. Scheme on pearl culture (at Tuticorin)
2. Scheme on Marine prawn culture and propagation (at Narakkal, Cochin)
3. Operational Research Project on an integrated approach to blending sea-farming with traditional small scale capture fisheries for rural development. (at Madras).

RESEARCH PROJECT - 1978

-
1. Institute Code No. FSS/FRA/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FSS/FRA/1 Assessment of Marine Fishery Resources.
- Title of Problem: FSS/FRA/1.1. Sample survey for estimating marine fish production and fishing effort expended to get the production from mechanised boats and non-mechanised boats.
-
5. Name and designation of Principal Investigator: ✓ K. Alagaraja, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time
- | | |
|------------------------------|-----------------------------|
| ✓ S.K. Dharmaraja, S-1 | ✓ U.K. Sathyavan, TII-3 |
| ✓ A.S. Kaikini, T6 | ✓ Varughese Jacob, TII-3 |
| ✓ C.R. Shanmughavelu, T6 | G.Kfishnankutty Nair, TII-3 |
| ✓ M.G. Dayanandan, T6 | P. Sivaraman, TII-3 |
| Syed Basheeruddin, T6 | V. Rajendran, TII-3 |
| S.S. Dan, T6 | V.P. Annam, TII-3 |
| ✓ K.Narayana Kurup, S | A.Kanakkan, T-2 |
| ✓ K. Balan, S | S.Haja Nejeemudeen, T-2 |
| ✓ B.Prasanna Kumari, S | K. Santha Kumary, T-2 |
| ✓ K. Vijayalekshmi, S | P.L. Ammini, T-2 |
| G. Balakrishnan, T4 | C.J.Prasad, T-2 |
| ✓ Varughese Philipose, TII-3 | T.A. Sankarankutty, T-2 |
- Technical staff (T1, T2 and (TII-3) at 40 Centres)
-
7. Location of the Research Project: Cochin
-
- 8.(a) Objectives: Estimation of marine fish production and effort in terms of number of operations of unit gear of different types of (a) non-mechanised boats and (b) mechanised boats along with the detailed break-up of the yield according to variety, region and type of gear and variation in the price structure at the landing centres.
-
- (b) Practical Utility:
- The data on catch and effort from the basic requirements for the assessment of exploited stocks. The estimates arrived at as well as the price statistics are made use of by the Governmental agencies and the fishing industry for the fishery developmental programmes in the country.
-

9. Technical programme:

The design of Sample Survey involves space-time stratification. A number of geographically continuous landing centres form the stratum in space. A ten day period of a month is the time-stratum. The primary sampling unit is a centre-day/centre-group of two days. On the selected day non-mechanised/mechanised units are selected on a systematic basis. The data on night catches and also the cost of the different varieties of fishes landed are obtained by enquiry.

On the basis of estimates made for the primary sampling units, stratum wise estimates and their percentage error are arrived at. The period of estimation is a calendar month.

Size composition of some of the commercially important species of fishes will be studied under Sample Survey.

The work programmes of the field staff are prepared at the Headquarters at Cochin and posted to the field staff in advance for compliance. The field work of the staff is periodically inspected by the inspecting officers.

10. Date of start: Continuing project

11. Likely date of completion: Continuing project

12. Estimated man months: 720 man months/year

13. Facilities required:

i) Land	: Nil	iv) foreign exchange:	--
ii) labour	--	v) Estimated cost:	
iii) Special equipment:	--	T.A.	
		Contingency	--

14. If financed by an organisation other than the Institute

a) Name of the financing organisation --

b) Title of the project (if the project forms a part of a larger project) --

15. Approximate cost: --

16. Signatures of:

Sd.	Sd.	Sd.
Principal Investigator	Head of Division	Director

RESEARCH PROJECT - 1978

-
1. Institute Code No. FSS/FRA/1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: FSS/FRA/1 Assessment of marine fishery resources.
Title of Problem: FSS/FRA/1.2 Frame Survey
-
5. Name and designation of Principal Investigator: S.K. Dharma Raja, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
Part time
Varughese Jacob, TII-3 (APL)
B.Prasanna Kumari, S
K. Vijayalekshmi, S
G. Balakrishnan, T4
Varughese Philipose, TII-3
P. Sivaraman, TII-3
V. Rajendran, TII-3
K. Santha Kumari, T2
A. Kanakkan, T2
P.L. Ammini, T2
and other Technical field staff
-
7. Location of the Research Project: Cochin
-
- 8 (a) Objectives:
Village-wise data on fishermen population, fishing units of different types and information on fish landing centres will be collected under this project by this Institute. These will also bring out the nature of changing pattern of fishing industry and its consequent impact on fishermen.
-
- (b) Practical Utility:
For estimating total marine fish production based on the sample survey and for studying the socio-economic conditions of the fishermen populations as well as the changing pattern of the fishing industry, the information collected on the village-wise data on fishermen population, fishing units and other information concerning the infrastructure is of vital importance.
-

9. Technical programme:

The frame survey conducted upto 1977 is almost complete. The census data collected so far are being compiled. The existing survey is therefore wound up. During 1978, a fresh frame survey will be taken up and the same will be completed within one year. The investigators will collect data by visiting houses and fishing establishments in all the marine fishing villages in India.

10. Date of start: 1978

11. Likely date of completion: End of 1978

12. Estimated man months : 565 man months/year

13. Facilities required: Facilities available in project
No.FSS/FRA/1.1.

i) land : -	iv) foreign exchange: -
ii) labour: -	v) Estimated cost: -
iii) Special equipment: -	T.A -
	Contingency -

14. If financed by an organisation other than the Institute -

a) Name of the financing organisation -

b) Title of the project (if the project forms a part of a larger project) -

15. Approximate cost: -

16. Signatures of:

sd.	sd.	sd.
Principal Investigator	Head of Division	Director

RESEARCH PROJECT - 1978

1. Institute Code No. FSS/FRA/1.3

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: FSS/FRA/1. Assessment of marine fishery resources.

Title of Problem: FSS/FRA/1.3. Stock Assessment and estimation of potential yield of commercially important fishes.

5. Name and designation of Principal Investigator: B. Krishna Murty, S1 /

6. Name(s) and designation of Associate(s) and Establishments on which borne:
part time

Associate leader: M.G. Dayanandan, T6

Associates:

K. Alagaraja, S2
S.K. Dharma Raja, S1
C.R. Shanmughavelu, T6
K. Narayana Kurup, S
K. Balan, S

B. Prāsanna Kumari, S
K. Vijayalekshmi, S
U.K. Satyavan, TII-3
C.J. Prasad, T2
T.A. Sankarankutty, T2

7. Location of the Research project: Cochin

8. (a) Objectives:

Annual assessment of the stocks of commercially important fishes is essential for a rational exploitation of these stocks. The fifth meeting of the ICAR panel has indicated the importance of such stock assessments. The aim of this project is (i) to find out the effect of fishing on the stocks of commercially important fishes and thus determine the level of exploitation which will give the optimum sustained yields from the exploited stocks.

(ii) to evaluate area-wise, season-wise fishery potentialities of off-shore and deep sea regions.

(b) Practical Utility:

Data are essential for the rational exploitation of the commercially important fish stocks as well as for the proper implementation of fishery management policies and identifying potential fishing grounds in the off-shore and deep sea areas.

9. Technical programme:

1. Collection and analysis of monthly data on fish size. Estimation of age and growth. Expression of growth by suitable mathematical equation.
2. Conversion of available catch data (by weight) to size/age composition in number for every fishing season.
3. Estimation of relative abundance of various age/size groups for every fishing season/area.
4. Estimation of fishing and natural mortality rates.
5. Developing suitable mathematical models for estimating the yield by making use of other parameters (recruitment, growth and mortality rates) and estimating the maximum potential yield from each fishery along with the associated levels of exploitation.
6. Utilization of suitable biological informations for stock measurements and estimating the potential yield.

10. Date of start : Continuing

11. Likely date of completion: Continuing

12. Estimated man months: 65 man months

13. Facilities required:

- | | | | |
|-------------------------|---|-----------------------|---|
| i) land : | - | iv) foreign exchange: | - |
| ii) labour: | - | v) Estimated cost : | - |
| iii) Special equipment: | | | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation : -
- b) Title of the project (if the project forms a part of a larger project) : -

15. Approximate cost:

16. Signatures of:

Sd.	Sd.	Sd.
Principal Investigator	Head of Division	Director

RESEARCH PROJECT - 1978

1. Institute Code No. FSS/FRA/ST.1

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: Assessment of fishery Resources

Title of Problem: FSS/FRA/ Fishery Data Centre
ST.1

5. Name and designation of Principal Investigator: K. Alagaraja, S2

6. Name(s) and designation of Associate(s) and Establishments on which borne:

Part time

Associate leader: S.K. Dharma Raja, S1

Associates:

C.R. Shanmughavelu, T-6	G.Krishnankutty Nair, TII-3
M.G. Dayanandan, T-6	P.Sivaraman, TII-3
K. Narayana Kurup, S	V.Rajendran, TII-3
K. Balan, S	V.P.Annam, TII-3
B.Prasanna Kumari, S	A.Kanakkan, T-2
K. Vijayalekshmi, S	S.Haja Najeemudeen, T-2
G.Balakrishnan, T-4	K.Santhakumari, T-2
U.K. Satyavan, TII-3	P.L. Ammini, T-2
Varughese Jacob, TII-3	C.J.Prasad, T-2
Varughese Philipose, TII-3	T.A.Sankarankutty, T-2

7. Location of the Research Project: Cochin

8 (a) Objectives:

The National Fishery Data Centre is the store-house of all the data on exploratory and commercial fishing operations along with the environmental data. The relevant data from all exploratory vessels will be collected and their analysis will enable to draw up contour maps of various fisheries in relation to their abundance which will ultimately be of great value in the exploitation on untapped fishery resources.

(b) Practical Utility:

The monthly marine fish production reports in respect of maritime states of India as a whole and also the processed data of offshore vessels compiled at the National Fishery Data Centre are utilized by the various Governmental and International agencies and fishing industries.

-
9. Technical programme:
1. Preparation and distribution of standard forms for the collection of relevant data.
 2. Codifying and storing the data.
 3. Processing the data using the A.D.P. System
 4. Preparation of charts showing the abundance of fish of different types.
 5. Rapid dissemination of processed data to National and International agencies and Fishing industries.
-

10. Date of start: Continuing

11. Likely date of completion: Continuing

12. Estimated man months: 50 man months/year

13. Facilities required:

- | | |
|---------------------------|--------------------------|
| i) land: - | iv) foreign exchange : - |
| ii) labour: - | v) Estimated cost: - |
| iii) Special equipment: - | T.A: - |
| | Contingency: - |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation: -
 - b) Title of the project(if the project forms a part of a larger project) : -
-

15. Approximate cost:

16. Signatures of:

sd.	sd.	sd.
Principal Investigator	Head of Division	Director

RESEARCH PROJECT - 1978

- 1. Institute Code No: FSS/FRA/1.4

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FSS/FRA/1. Assessment of Marine Fishery Resources.

Title of Problem: FSS/FRA/1.4. Standardisation of fishing effort

- 5. Name and designation of Principal Investigator: S.K. Dharmaraja, S1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

part time

Associate Leader: K. Alagaraja, S2

Associates

K. Narayana Kurup, S
B. Prasanna Kumari, S
K. Balan, S
K. Vijayalekshmi, S
S. Haja Najamudeen, T-2

- 7. Location of the Research Project: Cochin

8. (a) Objectives:

At present fishing effort is evaluated in terms of man hours which does not have much significance in the fish population studies.

In multispecies fishery exploited by multigears
/of evaluation/fishing effort in terms of standard units is essential. This project is aimed at this.

- (b) Practical Utility:

For stock assessment studies the standardisation of effort will help to study the stock abundance.

9. Technical programme:

From the available analysed data standardisation of effort with reference to selected commercially important species the same using suitable statistical techniques.

10. Date of start: 1978

11. Likely date of completion: End of 1978

12. Estimated man months: 15 man months/year

13. Facilities required: Facilities available in Project
No. FSS/FRA/1.1

i) land: -	iv) foreign exchange: -
ii) labour: -	v) Estimated cost: -
iii) Special equipment: -	T.A: -
	Contingency: -

14. If financed by an organisation other than the Institute

a) Name of the financing organisation: -

b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

sd.
Principal Investigator

sd.
Head of Division

sd.
Director

RESEARCH PROJECT - 1978

1. Institute Code No. FSS/FRA/1.5

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FSS/FRA/1 Fishery Resources Assessment.

Title of Problem: FSS/FRA/1.5. Survey of Esuarine fisheries

5. Name and designation of Principal Investigator: K.Narayana Kurup, S

6. Name(s) and designation of Associate(s) and Establishments on which borne:

Part time:

K. Alagaraja, S2
S.K. Dharmaraja, S1
K. Balan, S
G. Balakrishnan, T-4
Varughese Philipose, TII-3

7. Location of the Research Project: Cochin

8. (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 the fishery resources from this region.

(b) Practical Utility:

Some important marine fishes and prawns spend part of their life time in estuarine areas. For proper assessment of stock recruited to the fishery data from estuaries are necessary.

∟ seed resources required for mariculture and assessment of

9. Technical programme:

Initially Pilot surveys would be taken up to study the problem in detail in order to arrive at a suitable sampling design for this purpose.

10. Date of start: 1978

11. Likely date of completion:

12. Estimated man months: 230 man months/year

13. Facilities required:

i) land, -	iv) foreign exchange: -
ii) labour: -	v) Estimated cost:
iii) Special equipment: -	T.A: -
	Contingency: -

14. If financed by an organisation other than the Institute

a) Name of the financing organisation: -

b) Title of the project (if the project forms a part of a larger project) -

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Sd.
Head of Division

Sd.
Director

RESEARCH PROJECT - 1978

- 1. Institute Code No. FSS/FRA/1.6

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: FSS/FRA/1. Assessment of marine fishery resources.

Title of Problem: FSS/FRA/1.6. Exploited marine fishery resources of maritime States

- 5. Name and designation of Principal Investigator: K. Narayana Kurup, S

6. Name(s) and designation of Associate(s) and Establishments on which borne:

Pondicherry: K. Santha Kumari, T-2
K. Vijayalekshmi, S

Kerala: K. Vijayalekshmi, S
G. Balakrishnan, T-4
V. Rajendran, TII-3

Part time

West Bengal & Orissa: Varughese Philipose, TII-3
Prasanna Kumari, S

Karnataka: G. Krishnankutty Nair, TII-3
C. J. Prasad, T-2

Andhra: K. Balan, S
C. J. Prasad, T-2

Goa: T. A. Sankarankutty, T-2

Tamil Nadu: B. Prasanna Kumari, S
V. P. Annam, TII-3
S. Haja Najeeemudeen, T-2

Maharashtra: Varughese Jacob, TII-3
A. Kanakkan, T-2

Gujarat: P. Sivaraman, TII-3
T. A. Sankarankutty, T-2

Laccadives & Andamans: V. P. Annam, TII-3
& S. Haja Najeeemudeen, T-2

7. Location of the Research Project: Cochin

8. (a) Objectives:

To prepare a comprehensive account on the fisheries in each maritime State on the basis of the available data in this division and make it a ready reference for planning and development.

(b) Practical Utility:

This will help each maritime State in planning the fishery management policies for development of fisheries in each State.

9. Technical programme:

The Statewise estimates done at present will be utilised for the project. The exploratory survey data collected by the E.F.P. and I.F.P. vessels will be also used for this purpose.

10. Date of start: 1978

11. Likely date of completion: End of 1978

12. Estimated man months: 45 man months

13. Facilities required: -

- | | |
|---------------------------|-------------------------|
| i) land: - | iv) foreign exchange: - |
| ii) labour: - | v) Estimated cost: - |
| iii) Special equipment: - | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation: -
- b) Title of the project (if the project forms a part of a larger project) : -

15. Approximate cost:

16. Signatures of:

sd.
Principal Investigator

sd.
Head of Division

sd.
Director

9. Technical programme:

1. To develop a suitable proforma for the collection of data on production, production means, marketing and distribution system, income and other socio-economic aspects of the fishermen of the selected fishing villages.
2. To collect the above data through house to house enumeration, discussions, and meetings.
3. To study the economics of operation and cost benefit factors of the existing fishing practices.
4. To introduce suitable culture fisheries operation along with the normal fishing activities of the centre to improve the economy of the fishermen.
5. To assess the impact of the introduced technology on the socio-economics of the area.
6. To report the findings of the survey to the agencies concerned with the development of the small scale fisheries.

10. Date of start: 1978

11. Likely date of completion: 1983

12. Estimated man months: 80 man months

13. Facilities required:

- | | |
|---------------------------|-------------------------|
| i) land: - | iv) foreign exchange: - |
| ii) labour: - | v) Estimated cost: - |
| iii) Special equipment: - | |

14. If financed by an organisation other than the Institute

a) Name of the financing organisation: -

b) Title of the project (if the project forms a part of a larger project). -

15. Approximate cost:

16. Signatures of:

sd.
Principal Investigator

sd.
Head of Division

sd.
Director

1. Institute Code No. FB/MF/1.1

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: FB/MF/1. Investigations on clupeoid fishery resources.
Title of Problem: FB/MF/1.1. Fishery and resource characteristics of the oil sardine.

5. Name and designation of Principal Investigator: Y. Balan, S-1.

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time

Nil

b) Part time

N. Gopinatha Menon	S	Calicut
M.H. Dhulkhed	S1	Mangalore
G.G. Annigeri	S1	Karwar
R. Reghu	T II 3	Cochin
		Goa *

7. Location of the Research Project: Calicut, Mangalore, Karwar, Cochin and Goa (New Centre)

8. a) Objectives:

1. To monitor the biological and fishery characteristics of the resource.
2. To assess the size of the exploitable resource.
3. To prepare the annual space/time fishery maps on the distribution pattern of the oil sardine.
4. To attempt the possibility of increasing the catches.
5. To develop a prediction system.

* staff not in position

 b) Practical Utility:

The oil sardine, Sardinella longiceps, is the most abundant fish resource of India and contributed 15% of the marine landings of 1970-74. The catches are composed mainly of the 10-15 cm. size group. The characteristics of this resource in space and time have to be determined continuously and catch trends watched. The areas from which production could be increased have to be determined. Continuous monitoring of the resource is of great importance to the fishing industry. It is also very important to undertake continuing studies to see that fishing does not affect adversely the production potential of this valuable natural resource.

9. Technical programme:

1. A regular record of catch and effort data of different gears will be maintained at the centres selected for biological sampling from which the resource characteristics will be studied.
 2. The relationship between the catch and the important environmental parameters will be examined, based on which fishery forecast could be made.
 3. The distribution patterns of the exploited stock will be analysed.
-

 10. Date of start: 1976

 11. Likely date of completion: Continuing

 12. Estimated man months: 40 man months/year

13. Facilities required:

- | | | |
|------------------------|----------------------|---|
| i) land | iv) foreign exchange | - |
| ii) labour | v) Estimated cost: | |
| iii) special equipment | | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost: -

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. FB/MF/1.2

2. I.C.A.R. Code No.

3. Name and address of Research Central Marine Fisheries Research
 Institute/Centre: Institute, Cochin

4. Title of Project: FB/MF/1 Investigations on the clupeoid
 fishery resources.

Title of Problem: FB/MF/1.2 Unit stocks of oil sardine.

5. Name and designation of M.H.Dhulkhed S-1
 Principal Investigator:

6. Name(s) and designation of Associate(s) and Establishments on
 which borne:

a) Whole time

Nil

b) Part time

G.G.Annigeri	S-1	Karwar
N.Gopinath Menon	S	Calicut
R.Reghu	III3	Cochin

7. Location of the Research Cochin, Calicut, Mangalore, and
 Project Karwar

8. a) Objectives:

1. To identify the natural units, if any in the population.
2. To see whether these units mix during the season in any
 of the fishing zones.

b) Practical Utility:

It is necessary to see if there are different unit stocks in
the fishery and if so, whether these are confined to particular
regions during the season. This information is essential to
understand the fluctuations in catches and to recommend measures
for proper exploitation of the resource.

 9. Technical programme:

1. Vertebral samples will be collected from different centres and statistical analysis of the samples made in order to test the significance of the differences in the vertebral counts.
2. Electrophoretic studies will be undertaken of blood serum and muscle and eye lens proteins.
3. Other serological and immunological studies will be undertaken.

 10. Date of start: 1976

 11. Likely date of completion: 1982

 12. Estimated man months: 16 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | - |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. FB/MF/1.3
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/MF/1 Investigations on clupeoid fishery resources.

Title of Problem: FB/MF/1.3 Evaluation of the resource of lesser sardines, anchovies and other clupeoids.

5. Name and designation of Principal Investigator: G. Luther S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time

Nil

b) Part timeA. Lesser Sardine Investigations

P. Sam Bennet	S-1	Tuticorin
J. C. Gnanamuthu	S-1	Madras
S. Lazarus	S	Vizhinjam
R. Thiagarajan	S	Mandapam Camp

B. Anchovies Investigations

P. Radhakrishnan Nair	S	Mandapam Camp
.....		Madras *
K. V. Narayana Rao	S-1	Cochin
.....	S	Calicut *

C. Other Clupeoid Investigations

C. Muthiah	S-1	Bombay
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7. Location of the Research Project: Vizhinjam, Bombay, Calicut, Cochin, Mandapam Camp, Madras.

8. a) Objectives:

- To evaluate the species-wise abundance of lesser sardines, anchovies and other important clupeoids.
- To elucidate the important biological and fishery features of the different species.
- To study the homogeneity or otherwise of the exploited stocks.

* New Centres staff not in position

 b) Practical Utility:

Lesser sardines, anchovies and other clupeoids account for about 15% of the total marine fish landings. They form important fisheries along the coasts of Andhra Pradesh, Tamil Nadu and Kerala. Information on their distribution and abundance, together with other biological aspects is necessary for developing their fisheries into more productive ones.

9. Technical programme:

1. Collection of resources data relating to catch and effort.
 2. Study of biological aspects such as age and size composition, sex ratio, maturity and spawning.
 3. Analysis of the distribution pattern of the resources along both the coasts.
 4. Examination of meristic and morphometric characters and internal and external parasites to identify the stocks.
-

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 50 man months/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| 1) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | |
| iii) special equipment | - | | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project)
-

15. Approximate cost: 7

16. Signatures of:

 Sd/-
Principal Investigator

Head of Division

 Sd/-
Director

-
1. Institute Code No. FB/MF/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: FB/MF/1 Investigation on Glupeoid Fishery Resources.
- Title of Problem: FB/MF/1.4 Oil sardine fishery atlas.
-
5. Name and designation of Principal Investigator: P. Vijayaraghavan, S-1
-
6. Name(s) and designations of Associate(s) and establishment(s) on which borne:
- | | | |
|-----------------------|---------------------|----------|
| a) <u>Whole time:</u> | b) <u>Part time</u> | |
| Nil | Varghese Philipose | T II 3 |
| | R. Reghu, TII-3 | } Cochin |
-
7. Location of the research Project: Cochin
-
8. a) Objectives:
1. To indicate the average monthly catch of oil sardine, in different zones during 1970-74.
 2. To prepare charts showing the commercial abundance of oil sardine in different grounds in relation to environmental factors.
 3. To demarcate the grounds commercially exploited at present.
 4. To indicate the potential grounds for expansion of the fishery.
-
- b) Practical Utility:
- Fishery Atlas would be of great help to the industry. The fifth meeting of the CAC for exploratory survey of marine fisheries strongly recommended the preparation of the Atlas.
-

 9. Technical programme:

1. The catch data of 1970-74 will be analysed and the average monthly catch in different zones will be computed.
2. The available information on the relative abundance of oil sardine in different grounds will be analysed.
3. The present information on the biological characteristics of the resource will be evaluated and summarised.

 10. Date of start: 1976

 11. Likely date of completion: 1978

 12. Estimated man months : 16 man months

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| 1) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | - | | |

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

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of larger project) -

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

 9. Technical programme:

1. The catch data upto 1977 will be analysed to estimate the monthly landings along the different sections of the coast.
2. The available information on the relative abundance and distributions of the fishes will be collated and analysed species-wise wherever possible.
3. The size and age-composition of the landings in different regions will be reviewed.
4. On the basis of this, review the status of the fishery.

 10. Date of start: 1976

 11. Likely date of completion: 1978

 12. Estimated man-months: 16 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost L | ; |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

RESEARCH PROJECT - 1978

-
1. Institute Code No. FB/MF.2.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: FB/MF/2 Investigations on mackerel fishery resources.
- Title of Problem: FB/MF/2.1 The fishery and resource characteristics of the mackerel.
-
5. Name and designation of Principal Investigator: G.Seshappa, S-2
-
6. Name(s) and designation of Associate(s) and establishments on which borne:
- | | | |
|---|------------------------|---------------|
| a) <u>Whole time:</u> | b) <u>part time:</u> | |
| K.Rajasekharan Nair, TII-3
Vizhinjam | A.Noble, S-1 | Cochin A.P.L. |
| * S-1 | M.V.Pai, S-1 | Karwar |
| Goa | N.S.Radhakrishnan, S-1 | Mangalore |
| | R.S.Lal Mohan, S-1 | Calicut |
| | T.M.Yohannan, S | Calicut |
| | P.Nammalvar, S | Mandapam Camp |
| | * | Madras |
| | * | Waltair |
| | D.B.James, S-1 | Port Blair |
-
7. Location of the Research project: Goa, Karwar, Mangalore, Calicut, Cochin, Vizhinjam, Mandapam Camp, Madras, Waltair, and Port Blair
-
8. a) Objectives:
1. To study the relative abundance of the mackerel in space and time.
 2. To analyse and maintain on continuing basis, data on resource characteristics, such as distribution, size and age composition, rate of growth, sex and maturity, recruitment and mortality.
 3. To assess the exploitable resource
-

* Staff not in position

 b) Practical Utility:

The mackerel, Rastrelliger kanagurta (Cuvier) is an important fishery forming 2 to 20% of our annual marine fish landings. Characteristics of this natural resources in space and time have to be continuously determined and the catch trends watched. Prospects of increasing the production by expanding the areas of exploitation, enhancing the input of effort both in season and more in off-season, have to be assessed. Continuous monitoring of the resource is of immense value to the fishing industry. It is also essential to see that the fishing does not adversely affect the production potential of the mackerel resource.

9. Technical programme:

1. Data on the catch and effort of both indigenous inshore and mechanised offshore fishing (purse seines) at all centres to be collected, based on random sampling method.
 2. Relative abundance of mackerel to be correlated with environmental parameters so as to evolve short-term as well as long-term prediction systems for the fishery.
 3. Size, rate of growth, age composition, sex and maturity, recruitment and mortality to be studied by sampling the catch at centres of observation.
 4. Migrations of the mackerel to be studied and races if any, to be identified and their effect on the fishery evaluated.
-

 10. Date of start: 1976

 11. Likely date of completion: Continuing

 12. Estimated man months: 68 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: Rs. 10,00,000 |
| iii) Special equipment | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director

RESEARCH PROJECT - 1978

 1. Institute Code No. FB/MF/2.2

2. I.C.A.R.Code No.

3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: FB/MF/2 Investigation on Mackerel fishery resources

Title of Problem: FB/MF/2.2 Unit stocks of mackerel

5. Name and designation of Principal Investigator: V.Balakrishnan S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time

b) Part time

M.V.Pai, S-1	Karwar
T.M.Yohaman, S	Calicut
A.A.Jayaprakash, S	Cochin

7. Location of the Research Project: Cochin, Karwar and Calicut

8. a) Objectives:

1. To identify the natural units, if any, of the population
2. To see whether these units mix during the season in any of the fishing zones.

b) Practical Utility:

It is necessary to see if there are different unit stocks in the fishery and if so these are confined to particular regions during the season. This information is essential to understand the nature of fluctuations in catches, and to recommend measures for proper exploitation of the resources.

 9. Technical programme:

1. Vertebral samples will be collected from different centres. The samples will be analysed by using Radiograph and statistical analysis of the samples made in order to test the significance of the differences among the samples.
2. A statistical analysis will be made of the important meristic and morphometric characters of the samples from different centres.
3. Examination of parasites will be made to identify stocks.

 10. Date of start: , 1976

 11. Likely date of completion: 1980

 12. Estimated man months:

 13. Facilities required:

- | | | |
|------------------------|---|----------------------|
| i) land | - | iv) foreign exchange |
| ii) labour | - | v) estimated cost: ? |
| iii) special equipment | - | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation --
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: Institute project

 16. Signatures of:

Sd/-
Principal Investigator.

Head of Division

Sd/-
Director

 9. Technical programme:

1. The catch data of past years will be analysed and the average monthly catch in different zones will be computed (10 years).
2. The available informations on the relative abundance of the mackerel in different grounds will be analysed.
3. The present informations on the biological characteristics of the resources will be evaluated and presented in pictures.
4. Informations from other agencies like IFP, PFP, MPEDA and IMD to be collected and incorporated.

 10. Date of start: 1976

 11. Likely date of completion: 1978

 12. Estimated man months: 16 man months

13. Facilities required:

- | | | |
|------------------------|---|----------------------|
| 1) land | - | iv) foreign exchange |
| ii) labour | - | v) Estimated cost: |
| iii) special equipment | - | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director

 1. Institute Code No. FB/MF/3.1

 2. I.C.A.R. Code No.

 3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

 4. Title of Project: FB/MF/3 Investigations on the resources of tunas and related fishes

Title of Problem: FB/MF/3.1 Resources of Tunas and bill fishes

 5. Name and designation of Principal Investigator. E.G.Silas, Director

 6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time

P.Livingston S, Minicoy

b) Part time

V.Balan,	S-1	Calicut
M.D.K.Kuthalingam		
	S-1	Vizhinjam
M.S.Rajagopalan		
	S-1	Cochin
Pon Siraimetan		
	S	Tuticorin

 7. Location of the Research Project: Calicut, Vizhinjam, Cochin and Minicoy

 8. a) Objectives.

To estimate the resources and study the biological parameters of tunas and related fishes and investigate the bait-fish resources in the Minicoy island.

 b) Practical Utility:

Although tunas form less than 0.5% of the annual marine catch of the country, the potential for the development of their fishery is great. The Indian Ocean stocks of tunas are now exploited by many foreign nations. More information on the biology and stock characteristics of these fishes as well as bill fishes will be of great help in expanding their fisheries.

 9. Technical programme:

1. Stock assessment of various species of tunas.
2. Sub-population studies based on blood group characteristics.
3. Migratory habits of different species based on tagging programme.
4. Productivity and food chain studies relating to tunas and related species.
5. Investigation on tunas associated species such as pelagic sharks, Alepisaurus and dolphin (Coryphaena) caught by long lines.
6. Investigations on the bait fish resources in the Lakshadweep
7. Environmental studies in relation to tuna fisheries.
8. Modern methods of detecting tuna resources, using sonar, etc.
9. Fishery and biology of tunas and other related fishes such as billfishes.
10. Investigation of sea birds associated with surface shoals of tunas which help in scouting for tunas.

 10. Date of start: 1976

 11. Likely date of completion: Continuing

 12. Estimated man months: 28 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director.

RESEARCH PROJECT - 1978

1. Institute Code No. FB/MF/3.3

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/MF/3 Investigations on the resources of tunas and related fishes

Title of Problem: FB/MF/3.3 Resources of seer fishes

5. Name and designation of Principal Investigator: M.V. Pai, S1

6. Name(s) and designation of Associate(s) and establishments on which borne:

a) Whole time :

Nil

b) Part time:

T.M. Yoharman, S
M. Devaraj, S

Calicut
Mangalore

7. Location of the Research Project: Karwar, Mangalore, Calicut

8. a) Objectives:

1. To study the relative abundance of seer fishes in space and time.
2. To evaluate the fishery and resource characteristics of seer fishes, such as size and age composition, sex-ratio, recruitment and mortality.

b) Practical Utility:

The importance of seer fishes in the internal and external trade is increasing. At present they form about 1.5% of the annual marine landings of the country. Detailed information on their distribution and relative abundance would help in increasing the catches and proper management of the resource.

 9. Technical programme:

1. A regular record of catch and effort at selected centres will be maintained for estimating the relative abundance of the species in different grounds.
2. Studies will be made of the biology of the important species.
3. Detailed study will be made of the size and age composition of the catches and recruitments and mortality of these fishes.

 10. Date of start: 1976

 11. Likely date of completion: 1980

 12. Estimated man months: 12 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost | - |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute.

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

 Sd/-
Principal Investigator

Head of Division

 Sd/-
Director

1. Institute Code No. FB/MF/3.4

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/MF/3 Investigation on the resources of tunas and related fishes

Title of Problem: FB/MF/3.4 Culture of anchovies as live-bait for tunas

5. Name and designation of Principal Investigator: G. Luther, S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time:

b) Part time:

M1

G. Copakumar
Madan Mohan

S1 | Vizhinjam
S1 |

7. Location of the Research Project: Vizhinjam

8. a) objectives:

1. To develop suitable methods of capture, transport and stocking in high densities.
2. Compound suitable feeds.
3. Investigate suitable environmental conditions for stocking.
4. Study the economics of culture of these fish for live bait purpose.

b) Practical Utility:

Anchovies form an important food item of tunas. So these fish could be used as live bait in the tuna fishery. Anchovies being slender and small fish occupy less space and thus afford as stocking of large number of them in a limited space in the bait tanks of the fishing vessel. A ready availability of live bait would save much time and fuel of the fishing vessel and tends to develop a successful life bait tuna fishery.

 9. Technical programme:

1. Anchovies will be collected in live condition using different methods of capture.
2. Suitable and effective methods will be evolved to minimise the initial mortality of captured fish.
3. Different feeds will be tried to provide suitable nutrition for the fish.
4. Fish will be stocked in different densities to find out the optimum density level.
5. Salinity, oxygen and temperature, siltation of the water in the cages will be monitored.
6. Experimental fishing for skipjack and other tunas with anchovies as livebaits will be done.

 10. Date of start: 1978

 11. Likely date of completion: 1980

 12. Estimated man months: 20 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: I

 16. Signatures of:

 Sd/-
Principal Investigator

Head of Division

 Sd/-
Director.

RESEARCH PROJECT - 1978

1. Institute Code No. FB/MF/4.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/
Centres: Central Marine Fisheries
Research Institute, Cochin
4. Title of Project: FB/MF/4 Investigations on Bombay duck
and Lizard fish resources.

Title of Problem: FB/MF/4.1 The fishery and resource characteri-
stics of Bombay duck and Lizard
fish.

5. Name and designation of
Principal Investigator: S.V. Bapat, Scientist S-2
6. Name(s) and designation of Associate(s) and Establishments on
which borne:

a) Whole time: b) Part time:

A.S. Kalkini	T-6	}	Bombay
A. Kurian,	S-1		
R.R. Nandedkar,	SRS		
V.S. Somvanshi	SRS		
- and other Technical staff.			
M.Z. Khan,	S	}	Veraval. Madras
M. Jayachandran,	T2		
S. Bashuruddin,	T.6		

7. Location of the Research Project: Bombay, Veraval and Madras.

8. a) Objectives:

1. To assess the relative abundance of the Bombay duck and lizard fish in space and time.
2. To monitor the characteristics of the resources such as size and age composition, sex ratio, recruitment and mortality.
3. To study the effect of fishing on the Bombay duck population with special reference to the changes in mean size and mean age of the landed fish.
4. To operate conventional and experimental 'Dol' nets from two centres viz. Bassein, and Nawabunder and study the catch composition.

 1) Practical Utility:

Bombay duck forms an important fishery in India yielding a catch of 60,000-70,000 tonnes per annum. As there are indications of the resource being subjected to heavy fishing pressure a careful watch on the catch trends and stock characteristics should be maintained. The study on the stock has to be intensified considerably, for the proper management of the fishery. The lizard fishes are the important constituents of the trawl catches especially in the region where the Bombay duck is scarce. Information on their biology and relative abundance would help in increasing the demersal fishery production.

 9. Technical programme:

Accurate resources data especially on catch and effort will be collected from landing centres and also by personal participation in the surveys conducted by the fishing vessels.

Biological aspects such as age and growth, food and feeding habits, maturity, sex ratio, spawning and migration will be studied along with stock assessment.

 10. Date of start: 1976

 11. Likely date of completion: Continuing

 12. Estimated man months: 40 man months/year

 13. Facilities required:

i) land	-	iv) foreign exchange	-
ii) labour	-	v) estimated cost:	-
iii) special equipment	-		

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation --
- b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director.

RESEARCH PROJECT - 1978

1. Institute Code No. FB/MF/4.2
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/MF/4 Investigations on the resources of Bombay duck and lizard fishes.
- Title of Problem: FB/MF/4.2 Unit stocks of Bombay duck.

5. Name and designation of Principal Investigator: S.V. Bapat, S-2

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time:

b) Part time:

M.V. Deshmukh, S 1

M.K. George, S

A. Kurian, S-1

Bombay

7. Location of the Research Project: Bombay

8. a) Objectives:

1. To identify the natural units, if any, of the population.
2. To see whether these units mix during the season in any of the fishing zones.

b) Practical Utility:

The Bombay duck fishery is confined to the Gujarat and Maharashtra coasts. The resource at present is subjected to heavy fishing pressure. It is necessary to know whether there are different natural stocks in the fishery and if all these are being exploited intensively. This information is essential for recommending measures for proper exploitation of the resource.

 9. Technical programme:

1. A statistical study of important morphometric and meristic characters of the fish () collected from representative fishing centres will be made in order to find out the probability of occurrence of different unit stocks.
2. Electrophoretic studies of the blood serum, muscle and other tissue proteins will be undertaken.

 10. Date of start: 1976

 11. Likely date of completion: 1980

 12. Estimated man months: 80 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) Foreign exchange | - |
| ii) labour | - | v) Estimated cost: | e |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

a) Name of the financing organisation -

b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: Institute project

 16. Signatures of:

Sd/-

Principal Investigator

Head of Division

Sd/-

Director.

-
1. Institute Code No. FB/DR/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: FB/DR/1 Investigations on major demersal fishery resources.
- Title of Problem: FB/DR/1.1 The resources of cat-fishes, perches and carangids.
-
5. Name and designation of Principal Investigator: B. Krishnamoorthi, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:
- Cat fish investigations:
- | | | | |
|-----------------|----|--|---------------|
| P. Mojunder | T6 | | Waltair |
| S.S. Dan | T6 | | |
| V.S. Rengaswami | S | | Mandapam Camp |
- Perches Investigations:
- | | | | |
|-------------------------|-----|--|-----------|
| V. Sriramachandra Murty | S1 | | Kakinada |
| P. Sam Bennet | S 1 | | Tuticorin |
| Gracy Mathew | S 1 | | |
- Carangid Investigations:
- | | | | |
|---------------------|-------|--|-----------|
| T. Prabhakaran Nair | S | | Vizhinjam |
| | T II3 | | |
-
7. Location of the Research Project: Waltair, Mandapam Camp, Kakinada, Tuticorin and Vizhinjam
-
8. a) Objectives:
1. To evaluate the relative abundance of the resources of the cat-fishes along the Andhra-Orissa coast and at Mandapam area; of the perches along the Kakinada and Tuticorin coasts; and the carangids along the Vizhinjam coast, in space and time.
 2. To delimit new and/or under-exploited fishing grounds.
 3. To study the growth, feeding and reproductive biology of the commercially important species in the groups mentioned.
-

b) Practical utility:

The knowledge gained as detailed in (a) has immediate application in the exploitation of the resources in the area concerned besides helping in the formulation of management policies for a rational exploitation. Since the groups mentioned are edible, a knowledge of their availability would help in increasing harvests of food from the seas.

9. Technical programme:

1. Observations on the inshore and offshore catches.
2. Collection of environmental data.
3. Collection of representative samples of fish for examination at the laboratory.
4. Collection of data on length, food and maturity cycles of the species concerned.
5. Application of growth models to understand the status of the fishery.
6. Introduction of trap fishery for perches.

10. Date of start: 1976

11. Likely date of completion: Continuing

12. Estimated man months: 20 man months/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | - | | |

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

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost: _____

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director.

-
1. Institute Code No. FB/DR/1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: FB/DR/1 Investigations on Major Demersal Fishery Resources.
- Title of Problem: FB/DR/1.2 Sciaenid and Polynemid resources of the east and west coast of India.
-
5. Name and designation of Principal Investigator: T. Tholasilingam, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:
- E. Vivekanandan, S-1 Madras
 V. Sriramachandra Murthy S-1 Kakinada
 K. V. Somasekharan Nair, S Calicut
 S. K. Chakravarty, S-1 Bombay
-
7. Location of the Research Project: Madras, Kakinada, Calicut & Bombay.
-
8. a) Objectives:
1. To study the fishery and biology of commercially important species of sciaenid/fishes. /and Polynemid
 2. To evaluate the changes in the stock characteristics.
-
- b) Practical Utility:
- The sciaenids form about 5.5% and the polynemids about 0.5% of the annual marine fish catch of the country. They form important constituents of the total catches. Our knowledge of the species composition and characteristics of important stocks is still inadequate. The project will help to elucidate these aspects and indicate possibilities of increasing the catches. The effect of fishing on the stocks will be a subject of continuous study.
-

 9. Technical programme:

1. Data on catch trend, relative abundance and biology of fish to be collected at the fish landing centres and on board exploratory fishing vessels.
2. Age, growth, food and feeding, maturation and spawning etc. of commercially important species to be studied.

 10. Date of start: 1969

 11. Likely date of completion: Continuing

 12. Estimated man months: 28 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: J | |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

 Sd/-
 Principal Investigator

Head of Division

 Sd/-
 Director

1. Institute Code No. FB/DR/1.3

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/DR/1 Investigations on major demersal fishery resources.

Title of Problem: FB/DR/1.3 The resources of silver bellies and ribbon fishes.

5. Name and designation of Principal Investigator: G. Venkataraman, S-2

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time:

Nil

b) Part time:

P.T. Meenakshisundaram	S-1	} Madras
J.C. Gnanamuthu	S-1	
Y. Appanna Sastry	S,	Kakinada
M. Badruddeen	T II-3	Mandapam
S.K. Chakraborty	S-1	Bombay

7. Location of the Research Project: Bombay, Tuticorin, Mandapam Camp, Madras and Kakinada.

8. a) Objectives:

1. To study the fishery and biology of silver bellies and commercially important ribbon fishes.
2. To keep a close watch on catch trends.
3. To study the effect of fishing on the stocks.

b) Practical Utility:

The introduction of trawl fishing has led to the development of a major fishery for silver bellies in the Mandapam area. Recently decline in the catch and catch per unit effort of this group have been noted. It is necessary to keep a close watch on the development of the fishery. The ribbon fishes form important fisheries along both the coasts and the work proposed relates to monitoring of stocks at a few representative centres.

 9. Technical programme:

1. Data on fisheries to be collected at the fish landing centres and on board exploratory fishing vessels.
2. Age, growth, reproduction and food of selected species under each group to be studied.
3. The relation between fishing pressure and the changes in the characteristics of the stocks to be investigated.

 10. Date of start: 1969

 11. Likely date of completion: Continuing

 12. Estimated man months: 32 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-

Principal Investigator

Head of Division

Sd/-

Director.

1. Institute Code No. FB/DR/1.4
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/DR/1 Investigations on major demersal fishery resources.

Title of Problem: FB/DR/1.4 Evaluation of the demersal resources (of some selected centres)

5. Name and designation of Principal Investigator: C. Mukundan S-1
6. Name(s) and designation of Associate(s) and establishments on which borne:

a) Whole time: Nil		b) Part time:	
b) Part time (Contd.)			
V.M. Deshmukh	S1	V.S. Rangaswamy	S Mandapam
S.K. Chakraborty	S1	P.N. Radhakrishnan Nair	S Mandapam
M.K. George,	S	M. Badruddin	T II-3 Mandapam
G.S. Daniel Selvaraj,	S	D. Kandaswami	T II-3
M.M. Meiyappan,	S	P.T. Meenakshisundaram	S1
A.A. Jayaprakash	S	E. Vivekanandan	S1
		R. Sarvesan,	S Madras
M.D.K. Kuthalingam	S1	M. Rajagopal	S
S.G. Vincent	T II-3	Y. Appanna Sastry	S Kakinada
P. Sam Bennet	S1	W. Venugopalan	T III-3
G. Venkataraman,	S2	B. Krishnamoorthi	S1
K. Dorairaj	S1	V. Somaraju	T II-3
P. Natarajan,	S	T. Appa Rao	S1
		S. Reuben	S1 Waltair
		S.S. Dan	T6
		P. Mojumdar	T6
		D.B. James	S1 Port Blair.

7. Location of the Research Project: Cochin, Bombay, Vizhinjam, Tuticorin, Madras, Mandapam, Kakinada, Waltair, Port Blair.

8. a) Objectives:
To evaluate the area-wise and season-wise abundance of the demersal resources (by detailed investigations at selected centres)

b) Practical Utility:

In any attempt to increase fish catch from the sea, the first need is to know the relative richness of the different fishing grounds so that any increased effort would be commercially justified. Such an assessment assumes increased importance in the context of vast area newly added under the Economic zone. The present project would thus form the basis for later more comprehensive investigations on the whole of the country's exploitable offshore demersal resources.

9. Technical programme:

1. To the extent the Institute's boats could be used, exploratory trawling would be carried out and the results analysed.
2. By arrangement with such bodies as the FFP/IFP the log sheets of their boats operating trawls and other gear would be analysed.
3. The data from the trawling operations by privately owned boats would also be covered to the extent feasible.
4. The catch and effort data would be analysed from the respective fishing grounds, demarcated into 10 mile squares, and the production evaluated in terms of month, type of vessel, fish species/category and area(unit square).
5. Observations would be made on the biology of the major constituent fish species of the trawl catches.
6. Environmental studies relating to the demersal fisheries would be made wherever possible.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man-months: 175 man months/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | - | | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator. Head of Division

Sd/-
Director.

1. Institute Code No. FB/DR/1.5

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/DR/1 Investigation on major demersal fishery resources.
Title of Problem: FB/DR/1.5 The resources of flat fishes and pomfrets.

5. Name and designation of Principal Investigator: G.Seshappa S-2

6. Name(s) and Designation of Associate(s) and Establishments on which borne:
a) Whole time:
b) Part time:

Nil

Flat fish investigation
G.Nandakumar S Mandapam Camp
Pomfret investigations
J.P.Karbhari T6 Veraval
K.V.Narayana Rao, S-1 Cochin APL.

7. Location of the Research Project: Mandapam Camp, Calicut, Veraval, Cochin

8. a) Objectives:

1. To study the fishery, biology and resource characteristics of commercially important flat fishes and pomfrets.
2. To evaluate the change in the stock of malabar sole in relation to fishing.

b) Practical Utility:

The malabar sole (flat fish) forms an important single species fishery off the Malabar and South Kanara Coast and is expanding with the introduction of mechanised boats. A careful watch on stock is necessary. The pomfrets are among the best quality table fish. There are considerable lacunae in our knowledge of their resource characteristics.

 9. Technical programme:

- i. Data on the catch and relative abundance of the fishes to be collected at the landing places and also on board exploratory fishing vessels.
 - ii. Studies on age, growth, maturity, spawning, food and feeding of commercially important species to be undertaken.
 - iii. The mortality rates of malabar sole to be estimated.
-

 10. Date of start: 1969

 11. Likely date of completion: Continuing

 12. Estimated man months: 24 man months/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | |
| iii) special equipment | - | | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost:

16. Signatures of:

 Sd/-
 Principal Investigator. Head of Division

 Sd/-
 Director

RESEARCH PROJECT - 1978

1. Institute Code No. FB/OF/1.1

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/OF/1 Investigation on other fishery resources.
 Title of Problem: FB/OF/1.1 Evaluation of the commercially important elasmobranch resources.

5. Name and designation of Principal Investigator : M.D.K.Kuthalingam S-1

6. Name(s) and designation of Associate(s) and establishments on which borne:

a) Whole time: b) Part time:

	S	}	
R.Soundararajan	S	}	Mandapam Camp
P.Natarajan	S	}	
D.Kandaswamy	T II-3	}	
M.E.Rajapandian	S		Tuticorin
S.G.Vincent	T II-3		Vizhinjam
P.Devadoss	S		Calicut

7. Location of the Research Project: Mandapam Camp, Tuticorin, Vizhinjam, Calicut (Madras and Waltair proposed centres)*

8. a) Objectives:

1. To find out the regional and species-wise abundance of sharks, rays and skates and their seasonal fluctuations.
2. To elucidate the various biological aspects such as food and feeding habits, age and growth, reproductive and embryonic development of commercially important species of sharks rays and skates.

* Staff not in position

 b) Practical Utility:

Although elasmobranchs form about 4% of the marine fish landings in India, the resource-oriented studies have not made much head way in the country. As a first step in this direction it is proposed to determine the relative abundance of sharks, rays and skates, species-wise and season-wise, at a few selected centres. The data so gathered will be of use in developing the fishery.

9. Technical programme:

- /at
1. Estimation of species-wise catch trends with respect to types of gears/selected centres.
 2. Determination of age and growth.
 3. Study of length-weight relationship.
 4. Analysis of the gut contents.
 5. Observation on the maturity of gonads.
 6. Investigation on fecundity, variation in the number of intra-Uterine embryos, duration and periodicity of gestation (in Viviparous forms) and other relevant aspects of study to determine the reproductive potentiality of the minor species.
 7. Investigation on nutritional aspect (protein, carbohydrate, fat contents etc) of sharks and rays.
-

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 20 man months/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|-------------------|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) estimated cost: | Institute Project |
| iii) special equipment | - | | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project)
-

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director.

1. Institute Code No. CF/RE/1.1a

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of project: CF/RE/1 Crustacean Resources Investigations.

Title of Problem: CF/RE/1.1a Assessment of Penaeid prawn Resources.

5. Name and designation of Principal Investigator: S. Ramamurthy Scientist S.1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

<u>a) Whole time</u>		<u>b) Part time</u>	
Mary K. Manissery, S1	Tuticorin	J. P. Karbhari T.6	Jamnagar
A.C. Sekhar, T.II.3	Madras.	M. Aravindakshan S	Veravel
		P. A. Thomas S.1	Bombay
		K. Y. Telang S	Goa
		K. K. Sukumaran S	Karwar
		M. M. Kunju S1	Mangalore
		M. M. Thomas S-I	Calicut
		N. S. Kurup S-I	0
		K. Chellappan T.1	0 Cochin.
		Jacob D. Eapen T.1	0
			*
		G. Nandakumar S	Neendakara
		K. Devarajan Sampson	Mandapam Camp
		Manickam	Madras
		G. Sudhakara Rao	S Waltair
		K. N. Rajan	S1 Kakinada
		P. V. K. Rao	S 0 Puri
			T.1 0
			* Janput

7. Location of the Research Project: Jamnagar, Veraval, Bombay, Goa, Karwar, Mangalore, Calicut, Cochin, Neendakara, Tuticorin, Mandapam Camp, Madras, Waltair, Kakinada, Puri and Janput.

* Staff not in position

8. a) Objectives:

- i. To assess the magnitude of the exploited resources of the various species of penaeid prawns and to study their relative abundance in space and time along the Indian coast.
- ii) To monitor the population characteristics of all the important species at different places.
- iii) To study the biological characteristics of the commercial species and to maintain the relevant data on a continuing basis.
- iv) To undertake spawning surveys of important species in the inshore and offshore waters.
- v) To evaluate the resource potential of the under exploited areas and to find out 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 resource has increased considerably in recent years. Some new fishing grounds have also been discovered and commercial exploitation has extended there too. The effect of increased fishing pressure on the prawn stock has to be closely watched and the biological as well as population characteristics of the stock are studied to provide scientific data for framing suitable management policies to obtain maximum sustainable yield.

9. Technical programme:

- i) 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.
- ii) 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 recorded.
- iii) Detailed studies on the population characteristics will be undertaken.
- iv) At centres where research vessel facilities are available spawning and resource survey will be carried out.

10. Date of start: 1969

11. Likely date of completion: Continuing

12. Estimated man months: 90 man months/year

13. Facilities required:

i) land

ii) labour

iii) special
equipment

iv) foreign exchange

v) Estimated cost:

14. If financed by an organisation other than the
Institute

a) Name of the financing organisation

b) Title of the project (if the
project forms a part of a
larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CF/RE/1.1b
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of project: CF/RE/1 Crustacean Resources Investigations
Title of Problem: CF/RE/1.1b Assessment of Non-penaeid prawn Resources
5. Name and designation of Principal Investigator: M. Mydeen Kunju, Scientist S.1
6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time

V.D.Deshmukh S1 Bombay

b) Part time

*	Jamnagar
J.P.Karbhari T6	Veraval
V.S.Kakati S1	Cochin
G.Sudhakara Rao S1	Kakinada
K.N.Rajan S	Puri
*	Janput

7. Location of the Research Project: Jamnagar, Veraval, Bombay, Calicut, Cochin, Kakinada, Puri and Janput.

8. (a) Objectives:

- i) To assess the magnitude of the exploited resources of the various species of non-penaeid prawns and to study their relative abundance in space and time along the Indian coasts.
- ii) To monitor the population characteristics of the commercial species and to maintain the relevant data on a continuing basis.
- iii) To study the biological and population aspects of the constituent species.
- iv) To evaluate the resource potential beyond the presently exploited fishing zone.

* Staff not in position.

 b) Practical Utility:

Non-penaeid prawns are the second major category of the prawn resources and support a round the year fishery of high magnitude in certain regions. A proper assessment of this resource through collection of data on catch, effort and population characteristics, and biology of the constituent species, are essential for rational exploitation of the resource.

9. Technical Programme:

- i) Data on catch and effort for the non-penaeid prawns will be collected at the above mentioned centres, based on random sampling.
 - ii) Data on species composition, size and sex distribution, maturation, fecundity, spawning, larval distribution, growth, food and feeding and other biological aspects of important species will be collected.
 - iii) Estimates of mortality will be made.
 - iv) At centres where research vessel facilities are available, trawling surveys will be conducted to discover new resources of deep-sea non-penaeid prawns.
-

10. Date of start:

1969

11. Likely date of completion:

Continuing

12. Estimated man months:

36 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-

15. Approximate cost:

16. Signatures of:

 Sd/-
Principal Investigator

 Sd/-
Head of Division

 Sd/-
Director

1. Institute Code No. CF/RE/1.1c
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: CF/RE/1 Crustacean Resources Investigations
Title of Problem: CF/RE/1.1c Assessment of prawn resources in the nursery grounds.
5. Name and designation of Principal Investigator: C. Suseelan, S.1:
6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Full time: M.V. Somaraju, T.II.3		b) Part time		
				Goa
	Waltair.	P.A. Thomas	S1	Karwar
*	b) Part time	K.Y. Telang	S	
	Madras	S. Ramamurthy	S1	Mangalore
P.E. Sampson	Manickom	K.K. Sukumaran	S	
	S			
G. Sudhakara Rao	S1	K. Koumudi Menon	T2	Calicut
	Waltair	V.S. Kakati	S1	
K.N. Rajan	S	M. Kathirvel	S	
P. Venkata		K.N. Gopalakrishnan	T-II.3	Cochin
Krishna Rao	T1	K. Chellappan	T1	
	Puri	Jacob D. Eapen	T1	

7. Location of the Research Project: Goa, Karwar, Mangalore, Calicut, Cochin, Madras, Waltair, Kakinada and Puri.

* Staff not in position

8. a) Objectives:

- i) To study the rate of recruitment of post-larval and juvenile penaeid prawns into the nursery areas and to use their abundance as an index for forecasting the magnitude of the marine fishery of the succeeding period.
- ii) To study the distribution, growth rates, migration, food and feeding habits, mortality etc. of the various species in the same as well as widely separated estuarine ecosystems.
- iii) To assess the magnitude and exploitation of the juvenile prawn resources from the nursery grounds and to study their impact on the marine fishery of the neighbouring areas.

- iv) To collect and maintain systematic data on the sizes of the prawns Vs the mesh sizes of the gears employed.

b) Practical Utility:

The success or failure of the prawn fishery could be predicted in advance using the index of postlarval and juvenile abundance in the estuaries and backwaters. As the exploitation of juvenile prawns from the nursery areas is fast increasing every where, a careful check on the rate of exploitation and collection of data on biological characters of the constituent species will provide scientific backing to frame management policies for judicious exploitation and conservation of the resource. The data on sizes of prawns Vs mesh sizes of the gears will be useful to examine the need for mesh size regulations and other conservation measures.

9. Technical programme:

- i) The rate of recruitment of postlarval and juvenile prawns in the nursery grounds will be studied at selected places.
- ii) A survey of the spatial and seasonal distribution of the seed prawns along the shores of important estuaries and backwaters will be undertaken in relation to the various environmental factors.
- iii) Data on catch and effort for the juvenile penaeid prawns will be collected separately for each type of gear in operation, using random sampling methods.
- iv) Data on species composition, sex ratio and biological aspects such as growth, food, movement etc. of important species will be collected.
- v) Details on the size distribution of prawns caught by nets of different meshes will be collected from heavily fished areas and the rates of mortality will be estimated.

10. Date of start: 1978
11. Likely date of completion: Continuing
12. Estimated man months: 50 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signature of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	CF/RE/1.3		
2. I.C.A.R. Office No.			
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.		
4. Title of Project:	CF/RE/1	Crustacean Resources Investigations	
Title of Problem:	CF/RE/1.3	Assessment of lobster and crab resources	
5. Name and designation of Principal Investigator:	Mrs. P.V. Kagwade, S-1.		
6. Name(s) and designation of Associate(s) and Establishments on which borne:			
a) <u>Full time</u>	b) <u>Part time</u>		
Nil	J.P. Karbhari	T6	Veraval
	*		Mangalore
	K.K. Balasubramanian	T.II.3	Calicut
	M. Kathirvel	S	Cochin
	S. Shanmugham	S	Tuticorin
	K.M.S. Ameer Hamsa	S	Mandapam Camp
	E.V. Radhakrishnan	S1	Madras
	W. Venugopalam	T-II-3	Kakinada
7. Location of the Research Project:	Veraval, Bombay, Mangalore, Cochin, Calicut, Tuticorin, Mandapam Camp, Madras and Kakinada.		
8. a) Objectives:			
	i) To collect resources data on shallow water lobsters, deep-water lobsters and commercially important crabs.		
	ii) 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 landings 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.		

 9. 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.
-

 10. Date of start: 1976

 11. Likely date of completion: Continuing

 12. Estimated/man months: 28 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost:

 16. Signatures of:

 Sd/-
Principal Investigator

 Sd/-
Head of Division

 Sd/-
Director

1. Institute Code No. CF/RE/1.4
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: CF/RE/1 Crustacean Resources Investigations
 Title of Problem: CF/RE/1.4 Prawn Fishery Atlas.
5. Name and designation of Principal Investigator: E.G. Silas
 Director
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | a) <u>Full time</u> | b) <u>Part time</u> | | |
|---------------------|---------------------|----|---------|
| Nil | S.K. Dharmaraja | S1 | Cochin. |
| | K. Rangarajan | S | |
| | I. David Raj | S | |
| | and others | | |
7. Location of the Research Project: Cochin
8. a) Objectives:
 To present all information about prawn resources, their biology, ecology and utilisation in a pictorial form
- b) Practical utility:
 The fishery 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 investigation.
9. 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 in the estuarine, inshore and offshore regions and the fishing methods employed for catching prawns in various areas.

-
10. Date of start: 1976
-
11. Likely date of completion: 1978
-
12. Estimated man months: 20 man months/year
-
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) estimated cost:
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CF/RE/1.6
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: CF/RE/1 Crustacean Resources Investigations
 Title of Problem: CF/RE/1.6 Genetic resources of commercially important prawns
-
5. Name and designation of Principal Investigator: M.M.Thomas, S.1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | a) <u>Full time</u> | b) <u>Part time</u> | | |
|---------------------|---------------------|----|---------|
| Nil | N.S.Kurup | S1 | Cochin. |
| | C.Suseelan | S1 | |
| | M.Kathirvel | S | |
-
7. Location of the Research Project: Cochin
-
8. a) Objectives:
- i) To evaluate the genetic resources of the commercially important prawns
 - ii) To identify the natural unit stocks, if any, in the population of the commercially important species.
 - iii) To determine whether there is any intermixing of these units in the fishery at different regions of the coast.
-
8. b) Practical Utility:
- The programme is of considerable utility in the conservation and genetic upgradation of the prawn stock. The results of investigation could throw light on the existence or otherwise of biologically independent stocks and their influence in the maintenance of the fishery.
-

9. Technical programme:

- i) Initially the study would be confined to Penaeus indicus and Metapenaeus dobsoni.
- ii) Statistically adequate samples of these species will be collected from different centres of the west and east coasts for detailed morphometric studies.
- iii) The genetic map of the species will be studied through cytological and allied procedures.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 16 man months/year

13. Facilities required:

- i) land
- ii) labour
- iii) special equipment
- iv) foreign exchange
- v) Estimated cost:

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CF/RE/1.7

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute/ Cochin.

4. Title of project: CF/RE/1 Crustacean Resources Investigations
 Title of problem: CF/RE/1.7 Assessment of stomatopod resources

5. Name and designation of Principal Investigator: P. Vedavyasa Rao, S.2.

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) <u>Full time</u>	b) <u>Part time</u>	
Nil	P.K. Martin Thompson, R.S.	} Cochin.
	M.Ayyappan Pillai, T.II.3	
	K.Koumudi Menon, T.2.	} Calicut

7. Location of the Research Project: Cochin and Calicut

8. a) Objectives:

- i. To assess the magnitude of the exploited stomatopod resources and to study their relative abundance in space and time along the Indian coasts.
- ii. 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 resource along with biological factors is an essential prerequisite for their exploitation.

 9. Technical programme:

- i) Data on catch and effort, species composition etc. will be collected.
- ii) Size composition, sex ratio, maturity and other biological aspects will be studied from the samples obtained from commercial and experimental trawling.
- iii) Estimation of spatial and seasonal distribution of stomatopods will be made on the basis of data collected from experimental fishing and other trawler landings together with biological studies.

 10. Date of start: 1978

 11. Likely date of completion: Continuing

 12. Estimated man months: 12 man months/year

 13. Facilities required:

- i) land
- ii) labour
- iii) special equipment
- iv) foreign exchange
- v) estimated cost:

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

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. FB/CUL/1.2

2. I.C.A.R. Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin

4. Title of Project: FB/CUL/1 [REDACTED] - Culture of fishes

Title of Problem: FB/CUL/1.2 Culture of eels

5. Name and designation of Principal Investigator: K. Dorairaj, S1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole time:

Nil

b) Part time:

R. Soundararajan S
D. Kandasami T II 3

Mandapam

7. Location of the Research Project: Mandapam Camp

8. a) Objectives:

- i) To culture eels in running water.
- ii) To compound suitable feeds for the fishes.
- iii) To estimate the growth rate and production potential of the fish under different conditions.
- iv) To survey the elver resources of the east and west coasts of India.

b) Practical Utility:

Elvers command a good market in Japan. Similarly in foreign countries, the freshwater eel is a favoured item among food fishes.

The elver resources of the country are practically unutilised at present.

The present project is expected to result in exploitation of the elver resources and the development of the eel culture technology suitable to this country.

 9. Technical programme:

1. Elver resources survey will be conducted in important centres in Tamil Nadu, Andhra Pradesh and Kerala.
2. Elvers and eels will be cultured in different densities in the laboratory tanks with running water.
3. Suitable feed will be compounded.
4. Production during different periods and with different types of feed will be estimated.
5. Induced breeding experiments in eels will be undertaken.
6. Bio-chemical analysis of cultured eels will be made.

 10. Date of start: 1976

 11. Likely date of completion: 1980

 12. Estimated man months: 24 man months/year

 13. Facilities required:

- | | | |
|------------------------|---|----------------------|
| 1) land | - | iv) foreign exchange |
| ii) labour | - | v) estimated cost: |
| iii) special equipment | - | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director.

RESEARCH PROJECT 1978

-
1. Institute Code No. MOL/RE/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MOL/RE/1 Molluscan fisheries investigations
 Title of Problem: MOL/RE/1.1 Resources survey of commercially important molluscs
-
5. Name and designation of Principal Investigator: K.Nagappan Nayar, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
 b) Part time:
- | | | | |
|---------------------------|-------------|-----------------------------|-------------|
| ✓ T.Appa Rao, S-1 | } Waltair | S.Mahadevan, S-1 | } Tuticorin |
| ✗ N.Narayana Rao, T-2 | | K.Ramadoss, S | |
| K.A.Narasimham, S-1 | } Kakinada | C.T.Rajan, T I-3 | } |
| Y.Appannasastri, S | | N.Sundaram, T-2 | |
| W.Venugopalam, TII-3 | | P.V.Srinivasan, S-1) P.Novo | |
| R.Sarvesan, S | } Madras | K.K.Appukuttan, S | } Vizhinjam |
| ✗ K.S.Sundaram, S | | T.Prabhakaran Nair, T-II-3 | |
| M.M.Meiyappan, S | } Cochin | P.Radhakrishnan T-2 | |
| A.A.Jayaprakash, S | | Mathew, T-2 | |
| Syda Rao, S-1 | } Mangalore | Joseph, T-2 | |
| K.Satyanarayana Rao, S-1) | } M.Camp | P.S.Kurikose, S | } Kozhikode |
| D.Sivalingam, S | | V.G.Surendra- T2 | |
| P.Natarajan, S | | | nathan |
| K.A.Unnithan, T-2 | | | |
-
7. Location of the Research Project: Waltair, Kakinada, Madras, Cochin, Mandapam Camp, Tuticorin, Porto Novo, Vizhinjam, Kozhikode, Mangalore
-
8. (a) Objectives: A survey of the commercially important molluscs other than cephalopods along the coasts of India is wanting and the project aims at undertaking a systematic survey which will enable the preparation of fishery atlases of our molluscan fishery resources. Statewise availability of molluscan resources will be assessed and informative publications to be brought out periodically.
-

b) Practical utility: Of the very long coastline with the numerous estuaries, backwaters and creeks, only a small fraction has so far been surveyed. The thrust will be to have a wider coverage of survey to estimate the exploited stocks and to explore potential resources. A total estimation of production of all molluscs in India will be based on statistical designs and thus the fisheries at different centres will be accounted for in molluscs. pearl oysters, mussels, clams and cockles, gastropods etc. will be assessed regionwise. The environment, particularly topography substratum and tidal conditions of exploited and potential areas will be studied for extending culture operations in future.

9. Technical programme:

- a) Survey of the molluscan resources of the coastal and inshore waters. Estimation of shell time resources.
- b) Survey of backwater areas, estuaries and intertidal zones for locating and demarcating clam, mussel and oyster beds for estimating the resources.
- c) to assess magnitude of the sustenance the molluscan fishery provide the fishermen community.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 60 man months/year

13. Facilities required:

- | | |
|---|--------------------------------|
| i) land | iv) foreign exchange Rs.100000 |
| ii) labour | v) Estimated cost: |
| iii) special SCUBA,
complete equipment
& accessories. | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost: Contingencies Rs.1,72,000
T.A. Rs. 19,000

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No.	MOL/RE/1.2
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre	Central Marine Fisheries Research Institute, Cochin
4. Title of Project: MOL/RE/1	Molluscan Fisheries resources investigations
Title of Problem: MOL/RE/1.2	Survey of Cephalopod resources in the economic zone
5. Name and designation of Principal Investigator	E.G.Silas, Director
6. Name(s) and designation of Associates and Establishments on which borne:	
a) Whole time: Nil	<u>Part time:</u>
	M.V. Yadav, R.S. Veraval
	B.Narayan Rao, T-2 Waltair
	Y.Appanna Sastry, S Kakinada
	R. Sarvesan, S Madras
	K.Prabhakaran Nair, S Vizhinjam
	P.V. Srinivasan, SI Porto Novo
	K.Satyanarayana Rao, SI M.Camp
	K.A.Unnithan, T-2 M.Camp
	M.M.Meiyappan, S Cochin
	Kuber Vidyasagar, S Bombay
7. Location of the Research Project:	Veraval, Waltair, Kakinada, Madras, Vizhinjam, Porto Novo, M.Camp, Cochin Bombay and Mangalore
8. a) Objectives:	The Cephalopod resources (cuttlefishes, squids and octopuses) of the seas bordering India are under exploited. Recent exploratory of surveys carried out have brought to light the availability of several species of squids and cuttlefishes which indicate the possibility for commercial exploitation. In order to exploit the cephalopod resources properly, a survey for cephalopods have to be carried out. The project aims at strengthening the survey in the coastal and offshore waters and exploration for oceanic species inclusive of development of suitable fishing methods. The pattern of distribution, abundance, spawning, congregations, migration and biology of the squids and cuttle fishes will be studied.

the fishery and biology of component species and overall resources

b) **Practical Utility:** The cephalopods are an important potential resource and besides the demand for local consumption there is a good export potential. Considering the present status of our knowledge there is urgent need to put a major thrust on this problem to get a comprehensive knowledge of the exploited and potential stocks in the economic zone so that the deepsea fishing industry which is gaining momentum could make use of the data.

9. Technical programme:

1. to study the fishery and biology of species of cephalopods (cuttlefish, squids and octopus) that are landed from mechanised vessels, exploratory and experimental fishing vessels, indigenous craft and other traditional methods.
2. collection of pelagic and oceanic squids in exploratory surveys for studying the extent of resources, spatial and vertical distribution, the life history studies, distribution and abundance of larval cephalopods in relation to hydrographic factors to
3. to suggest exploitation of suitable species of cuttlefishes and squids on a large commercial scale for the purpose of exporting to foreign markets.
4. conducting experimental fishing in selected centres
5. species-wise evaluation of sustenance fishing in Andaman islands with particular reference to Octopus sp. by undertaking planned visits to the islands

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 51/year

13. Facilities required:

- | | | | |
|------------------------|---|----------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | - |
| iii) special equipment | - | | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project) -

15. Approximate cost: -

16. Signatures of:

(Sd)
Principal Investigator

Head of Division

(Sd)
Director

-
1. Institute Code No. MOL/RE/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Central Marine Fisheries
Institute/Centre: Research Institute, Cochin
-
4. Title of Project: MOL/RE/1: Molluscan fisheries investigations
Title of Problem: MOL/RE/1.4 Pearl oyster Atlas
-
5. Name and designation of Principal Investigator: K.Nagappan Nayar, S-2
-
6. Names and designation of Associates and Establishments
on which borne:
- a) Whole time: Nil Part time:
- S.Mahadevan, S-I
A.Bastin Fernando, T II-3 } Tuticorin
-
7. Location of the Research Project: Tuticorin
-
- 8 a) Objectives:
The object of this work is to prepare an Atlas on pearl oysters which will be very useful for all pearl oyster workers and also for pearl culturists who would like to take up pearl oyster culture on a large scale.
-
- b) Practical utility:
- At present, there is no pearl oyster Atlas which contains a comprehensive account of all aspects such as systematics, biology, fishery, culture and techniques etc. Such an Atlas will be very useful for one who wants to start a pearl culture industry.
-
9. Technical programme:
To transfer all available data on pearl oysters such as distribution pattern, species composition, diagnostic character. of the different species of pearl oysters, biology of pearl oysters pearl oyster fisheries, culture operations and techniques followed in producing spherical pearls etc. in a pictorial form with suitable descriptions.
-
10. Date of start: 1976
-
- 11 Likely date of completion: 1978
-

1. Institute Code No. CF/CUL/1.1a
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: CF/CUL/1 Culture of crustaceans
Title of Problem: CF/CUL/1.1a Intensive culture of marine prawns
5. Name and designation of principal Investigator: P. Vedavyasa Rao, S.2
6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Full time : Nil

b) Part time

b) Part time:

S. Ramamurthy S1 } Mangalore
K.K.Sukumaran S }

G. Nandakumar S Mandapam
Camp
S. Shanmugam S Tuticorin

M.M.Kunju S1 }
K.K.Balasubramanian } Calicut
T.II.3 }

K.A.Narasimham S1 }
G.Sudhakara Rao S1 } Kakinada
V.Sriramachandra-
murthy S1 }

M.S.Muthu S1 }
N.M.Pillai S }
S.K.Pandian S1 } Cochin
M.Rajamani S1 } and
A.Lakshminarayana S1 } Narakkal.
C.M.James S }
M.Narayanan S.R.S. }

7. Location of the Research Project: Mangalore, Calicut, Cochin, Tuticorin, Mandapam Camp, Kakinada, Narakkal

8. a) Objectives:

- i) To obtain relevant data on topographical, and operational aspects for establishing intensive prawn culture on large scale in the coastal zone.
- ii) To test and demonstrate the economic viability of intensive prawn culture through pilot/operational research

8. b) Practical Utility:

It is estimated that about 2.6 million ha of brackish water areas suitable for prawn culture are available in the country besides the

coastal lagoons and bays. The establishment of intensive prawn culture in these regions could help to augment prawn production, better utilisation and conservation of vast areas of derelict water source, to provide employment to large number of rural population and to improve their economy.

9. Technical programme:

1. Survey of different ecosystems in the coastal zone to obtain information on the suitability of the area for marine prawn culture will be undertaken.
2. Carry out field experiments by selective stocking of fast growing and larger species of marine prawns and evaluate the techniques of intensive culture under different conditions and systems.
3. Reliable data on various aspects of intensive culture through (i) seeds produced from hatcheries and (ii) seeds obtained from natural source will be gathered to study the economic feasibility of large scale intensive culture.
4. Participate in the pilot/operational research to test and demonstrate the economic viability of intensive prawn culture.
5. To provide consultancy service to entrepreneurs for setting up of intensive prawn culture.

10. Date of start:

1977

11. Likely date of completion:

Continuing

12. Estimated man months:

36 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	CF/CUL/1.1b		
2. I.C.A.R. Code No.			
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.		
4. Title of Project:	CF/CUL/1	Culture of crustaceans	
Title of Problem:	CF/CUL/1.1b	Mass Production of prawn seeds	
5. Name and designation of Principal Investigator:	M.S. Muthu, S.1.		
6. Name(s) and designation of Associate(s) and Establishments on which borne:			
a) <u>Full time</u> :	Nil		
b) <u>Part time</u> :			
		N.Neelakanta Pillai, S	Cochin
M.M.Kunju S1	Calicut	S.K.Pandian, S1	Narakkal
K.K.Balasubramanyan T.II.3		M.Rajamani S1	
K. Devarajan S	Madras	A.Lakshminarayana, S1.	
V.Selvaraj T.II.3		C.Merylal James, S	
J.Sunny Nayagam, R.S.		M.Narayanan, S.R.S.	
7. Location of the Research Project:	Narakkal, Cochin, Calicut and Madras.		
8. a) Objectives:			
i)	To develop and perfect hatchery techniques for large scale production of the seed of culturable species of penaeid prawns.		
ii)	To develop methods for maintaining a captive stock of breeder prawns in the laboratory or in suitable enclosures in the natural environment so that hatchery operations could proceed without interruption throughout the year.		
iii)	To train personnel at various levels in hatchery methods for large scale production of prawn seed.		
8. b) Practical Utility:			
The spurt of interest in penaeid prawn culture has already created a great demand in all the maritime States for quality prawn seed, the most important input in prawn culture operations. The availability of prawn seeds from natural sources is highly fluctuating and cannot be depended upon for stocking at the appropriate time. An assured supply of prawn seed is a pre-requisite for successful commercial culture. Hatchery production on large scale as envisaged in this project is the only solution to this problem.			

 9. Technical programme:

- i) Spawners of selected species will be collected from the sea and bred under controlled conditions. Simultaneously, various methods such as unilateral eye-stalk ablation of adult prawns in captivity will be tried to induce maturation. Rematuration of spent females will also be attempted.
- ii) Hatchery techniques to improve the survival rate of the prawn larvae during the various stages of development will be evolved.
- iii) Mass culture of diatoms and zooplankters will be undertaken to feed the larval stages.
- iv) To reduce the cost of production, artificial larval diets will be tried to minimise the dependence on phytoplankton and Artemia eggs.
- v) In order to propagate the techniques of large scale production of prawn seed, the project will actively participate in training personnel at various levels.

 10. Date of start: 1978

 11. Likely date of completion: Continuing

 12. Estimated man months: 32 man months/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i. land | iv. foreign exchange |
| ii. labour | v. Estimated cost: |
| iii. special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

 Sd/-
Principal Investigator

 Sd/-
Head of Division

 Sd/-
Director

-
1. Institute Code No. CF/CUL/1.1c
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: CF/CUL/1 Culture of Crustaceans
 Title of Problem: CF/CUL/1.1c Culture of commercially important crabs.
-
5. Name and designation of Principal Investigator: R. Marichamy, S.
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|---------------------|----------------------------------|
| a) <u>Full time</u> | b) <u>Part time</u> |
| Nil | N. Neelakanta Pillai, S ◊ Cochin |
| | M.Kathirvel, S ◊ |
-
7. Location of the Research Project: Cochin and Tuticorin
-
8. a) Objectives:
- i. To develop suitable techniques for the culture of commercially important Portunid crabs and to study the feasibility of crab culture on large scale.
-
8. b) Practical Utility:
- i. Preliminary investigations have revealed that the commercially important crabs occurring in our waters are suitable for culture in the coastal waters.
 - ii. The results of this research programme would enable to develop and establish crab culture practice in the country and to augment crab production.
-
9. Technical programme:
- i. Berried crabs of economic importance will be collected from natural environments and kept in captivity to study the hatching of eggs and development of larvae.
 - ii. The crab seeds thus obtained and those collected from the wild source will be reared in the laboratory/farm to stocking size and suitable techniques of culture will be evolved.

iii. Feasibility of large scale culture of crabs will be studied.

 10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 12 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i. land | iv. foreign exchange |
| ii. labour | v. Estimated cost: |
| iii. special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
 b) Title of the project (if the project forms a part of a larger project)


 15. Approximate cost:

16. Signatures of:

Sd/-
 Principal Investigator

Sd/-
 Head of Division

Sd/-
 Director

1. Institute Code No. CF/CUL/1.5
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: CF/CUL/1 Culture of Crustaceans.
 Title of Problem: CF/CUL/1.5 Culture of spiny lobsters (Panulirus spp)
5. Name and designation of Principal Investigator: T. Tholasilingam, S2.
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | a) <u>Full time</u> | b) <u>Part time</u> | |
|---------------------|------------------------|--|
| Nil | S.J. Rajan, T6 |  |
| | K. Rangarajan, S1 | |
| | E.V. Radhakrishnan, S1 | |
| | V. Selvaraj, T.II.3 | |
| | J. Sunny Nayagam, R.S. | |
- Madras.
7. Location of the Research Project: Madras
8. a) Objectives:
- i. To develop techniques for successful hatching of eggs and rearing of larvae for large scale production of lobster seeds under controlled conditions.
 - ii. To collect pueruli from the natural sources and to maintain a capture stock of lobster seeds for culture purpose.
 - iii. To culture the lobsters in large numbers under controlled conditions and to work out the economics.
 - iv. To study the biology of cultivable species in captivity.
8. b) Practical Utility:
- Mass production of lobster seeds and large scale culture of lobsters to augment production and export of lobster tails.

 9. Technical programme:

- i. Berried spiny lobsters will be collected from the wild source and hatchery experiments will be carried out under controlled conditions.
- ii. Techniques of rearing of phyllosomae to stocking size will be developed.
- iii. Pueruli will be collected from natural source by using different types of collectors.
- iv. Culture experiments on pueruli will be undertaken with a view to raise them upto marketable size.
- v. Studies on the food and feeding requirements at different stages will be carried out to find out the suitable food for culture.
- vi. Stocking density and economics of lobster culture will be worked out.

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 20 man month/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i. land | iv. foreign exchange |
| ii. labour | v. Estimated cost: |
| iii. special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

 Sd/-
Principal Investigator

 Sd/-
Head of Division

 Sd/-
Director

-
1. Institute Code No. MOL/CUL/1.1
-
2. I.C.A.R. Code No:
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MOL/CUL/1: Mariculture- Culture of molluscs
 Title of Problem: MOL/CUL/1.1 Edible oysters
-
5. Name and designation of Principal Investigator: N.Nagappan Nayar, S-2
-
6. Names and designation of Associates and establishments on which borne:
- a) Whole time: Nil Part time:
- | | | |
|--------------------------|---|-----------|
| S.Mahadevan, S-I | } | Tuticorin |
| K.Ramadoss, S | | |
| M.E. Rajapandian, S | } | M.Camp |
| N.Sundaram, T2 | | |
| R.Thangavelu, T-2 | | |
| C.T.Rajan, T-I-3 | } | M.Camp |
| K.Satyanarayanan Rao, SI | | |
| D.Sivalingam, S | | |
| K.A. Unnithan, T-2 |) | |
-
7. Location of the Research Project: Tuticorin and M.Camp
-
8. a) Objectives:
- i) to evolve suitable farming techniques for oyster growing and spat collection
 - ii) to study the oyster samples both from natural beds and farm area and workout the rate of growth
 - iii) to study the meat-shell relationship and flesh values (protein content etc) of different sizes in different seasons
 - iv) investigations on farming techniques of oysters will be attempted towards developing a suitable method to raise edible oyster stock through culture methods
 - v) the basic aspects of biology and physiology of the oysters and the physioo-chemical and biological factors that influence the growth and survival of the oyster population will also be investigated.
 - vi) Investigations on lines of improvement in spat collection methods, greater yield of meat and control of pests and disease will be taken up in detail.
-

 8 b) Practical Utility:

Edible oysters from natural source are being collected by the fisherfolk throughout the year in very few places only. But the availability of oysters becomes scarce to the consumers when large scale mortality of oysters occur during heavy floods in the river and also on the closure of the river mouths by sand-bars. Suitable creeks, bays and lagoons could be selected and large scale oyster farming could be taken up to ensure a good supply of quality oysters from the oysters would be of considerable economic importance since it is aimed to produce low cost protein food. The shell which is a by-product in addition to utilising them as a cultch for the collection of spat could be used as a poultry grit as it is a rich source of calcium carbonate.

9. Technical programme:

- i) selection on suitable farm sites.
 - ii) designing suitable farm material for establishing farms
 - iii) stocking, growing and harvesting the oysters.
 - iv) biological hydrological and ecological observations to be carried out
 - v) Investigations on the settlement of fouling organisms on the oysters as well as on the infrastructures connected with the oyster culture work and to try different methods to minimise the settlement.
 - vi) to study the growth rate and the condition of the meat so as to fix the optimum size at which oysters could be harvested
 - vii) experiments on fattening the oysters.
 - viii) studies on oyster diseases and quality control
-

 10. Date of start: 1976

 11. Likely date of completion: 1982

 12. Estimated man months: 72 man months/year

13. Facilities required:

- | | |
|------------------------|--|
| i) land | iv) foreign exchange |
| ii) labour | v) estimated cost: Institute's project |
| iii) special equipment | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project)
-

 15. Approximate cost:

16. Signatures of:

 (Sd)
 Principal Investigator

Head of Division

 (Sd)
 Director

 9. Technical programme:

- i) the data collection on the biology of the green and brown mussels from the natural beds and the stake kept in the farm area in the open sea are to proceed simultaneously at specific intervals.
 - ii) Suitable farming techniques depending on the localities are to be developed for farming mussels.
 - iii) Spat collectors are to be set at different depths to achieve maximum settlement during the season
 - iv) Suitable periods for culturing the mussels, depending on the conditions of sea in that area, to be studied so that the farming of mussels on a large scale could be taken up in the open sea during the favourable period.
-

 10. Date of start: 1976

 11. Likely date of completion: 1980

 12. Estimated man months: 42 man months/year

13. Facilities required:

- | | | |
|------------------------|---|--|
| i) land | - | iv) foreign exchange |
| ii) labour | - | v) Estimated cost: Institute's project |
| iii) special equipment | - | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project) -
-

 15. Approximate cost:

16. Signatures of:

 (Sd)
 Principal Investigator

Head of Division

 (Sd)
 Director

-
1. Institute Code No. MOL/CUL/1.3
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MOL/ CUL/1: Mariculture-Culture of molluscs
Title of Problem: MOL/CUL/1.3: Culture of clams
-
5. Name and designation of Principal Investigator: K.A. Narasimham, S-I
-
6. Names and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- b) Part time:
P.V. Srinivasan, S-I Porto Novo
- S.Reuben, SI } Waltair
T.Appa Rao, SI }
P.E. Sampson Manickam, S }
-
7. Location of the Research Project: Kakinada, Waltair, Porto Novo, & Cochin
-
8. a) Objectives:
- i) to evolve suitable farming methods for clams-both in bottom and off bottom culture.
 - ii) to study the effectiveness of clam farming and also to compare and study the rate of growth, size at sexual maturity etc. of natural bed forms with that of the clams grown by off bottom culture method.
 - iii) transplant seed clams from thickly populated and dense beds to suitable places and create new beds.
 - iv) to investigate the advantages of clam farming along with fish farming in ponds.
-
- 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.
-
9. Technical programme:
- i) selection of suitable farm site
 - ii) condition of soil, its organic detritus etc. to be studied in relation to the depth of the occurrence of clams
 - iii) studies on gonadal maturity, growth rate, spawning

behaviour, development and spatting of clams in both natural and farm areas to be carried out.

- iv) Feasibility of monoculture and polyculture of different species of clams in the same area to be investigated
- v) farming of clams with fish in ponds to be carried out

10. Date of start: 1978

11. Likely date of completion 1982

12. Estimated man months; 24 man months/year

13. Facilities required:

- i) land -
- ii) labour -
- iii) special equipment
- iv) foreign exchange
- v) Estimated cost: -

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

()

16. Signatures of:

(Sd)
Principal Investigator

Head of Division

(Sd)
Director

-
1. Institute Code No. MOL/CUL/1.4
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MOL/CUL/1: Mariculture: Culture of Molluscs
Title of Problem: MOL/CUL/1.4 Pearl Culture
-
5. Name and designation of Principal Investigator: K. Alagarwami, S-2
-
6. Names and designation of Associates and Establishments on which borne:
- a) W hole time: Nil
- b) Part time:
- | | |
|--------------------------|-------------|
| A. Chellam, S 1 | } Tuticorin |
| A.C.C. Victor, S | |
| S. Dharmaraja, S | |
| T.S. Velayudhan, S | |
| A.D. Gandhi, T-2 | |
| A. Dasman Fernando, T-2 | |
| J. Antony Pitchai, T-2 | } Vizhinjam |
| F. Soosai, V. Rayen, T-2 | |
| K.K. Appukuttan, S | |
-
7. Location of the Research Project: Tuticorin, Vizhinjam
-
- 8 a) Objectives: Under the ad-hoc scheme on pearl culture some aspects of researches on pearl oyster farming and production of cultured pearls have been taken up. The ad-hoc scheme comes to a close by September, 1978. The objectives of the present project are to intensify selected aspects of research for obtaining more precise results and to carry out investigations on fresh problems relating to pearl culture in order to update and place the indigenous technology on a sound footing. The main thrust will be on improving the quality and achieving a higher ratio of top-class pearls in the gross yield
-
- b) Practical utility:
- The development of pearl culture technology at the Institute has created an active interest for establishing pearl culture industry in India. A pilot project for commercial production has been taken up by the Govt. of Kerala and the Govt of Tamil Nadu is considering a project at Tuticorin. The technical know-how is being supplied by this Institute to the States. The Institute itself is establishing a Demonstration Project. Being a new venture, constant R & D improvements would become necessary and the present project would meet the needs.
-

 9. Technical programme:

Establishing/intensifying experimental pearl oyster farms at the project centre: Raising of quality spat and collection of oysters; improvements in surgical procedures for improving the gross yield and achieving higher ratio of top-class pearls; studies on the biology of pearl oysters; evaluate the usefulness of the components of mixed-species Pinctada populations in pearl culture; investigations on the possibility of tank culture of oysters from spat through pearl production, control of fouling and boring organisms affecting the oysters; refinements in the techniques of shell bead production and trial on material other than conch shell; ~~studies~~ on the ecology of pearl culture grounds; ~~studie~~ on the physical structure and chemical composition of pearls. At Vizhinjam, monitoring of spatfall will be carried out.

10. Date of start: (Tuticorin from October 1978
on completion of ad hoc scheme)

11. Likely date of completion: 1982

12. Estimated man months: 40 man months/year

13. Facilities required:

- | | |
|------------------------|-----------------------|
| i) land | iv) foreign exchange- |
| ii)labour | v)Estimated cost:? |
| iii)special equipment | |
| SCUBA equipment | |
| and nucleus production | |
| machine | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
b) Title of the project(if the project forms a part of a larger project)
-

15. Approximate cost: ()

16. Signatures of:

(Sd)
Principal Investigator

Head of Division

(Sd)
Director

-
1. Institute Code No. MOL/CUL/1.5
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MOL/CUL/1 Mariculture - Culture of Molluscs
 Title of Problem: MOL/CUL/1.5 Development of hatchery system for edible oyster seed production
-
5. Names and designation of Principal Investigator: K.Nagappan Nayar, S-2
-
6. Names and designation of Associates and Establishments on which borne:
- a) Whole time: Nil
- b) Part time
- D.C.V.Easterson, S }
 K.Ramadoss, S } Tuticorin
 M.E.Rajapandian, S }
-
7. Location of the Research Project: Tuticorin
-
8. a) Objectives:
- To develop suitable hatchery technique for the seed production of edible oysters so as to get a constant supply of healthy seeds throughout the year without having to depend on nature
-
- b) Practical utility:
- As availability of natural seeds cannot be relied upon, suitable hatchery methods evolved, will be of immense help in providing an uninterrupted supply of healthy seeds to culturists to grow them to marketable size in their farms.
-
9. Technical programme:
- i) to establish a full fledged laboratory with temperature controlled rooms to spawn and grow the oyster larvae to settling stage
- ii) to try different methods of conditioning the adult forms and inducing them to spawn by suitable physical or chemical treatment.
- iii) Mass culture of algae and flagellate, to be used as food for the larvae and spat.
- iv) suitable techniques to be evolved for the collection of spat at the setting time of the larvae in the tank
- v) to develop a proper nursery system
- vi) to evolve suitable methods in the transport of seeds from the hatchery to the farming sites.
-

10. Date of start:	1978
11. Likely date of completion	1982
12. Estimated man months:	16 man months/year
13. Facilities required:	
i) land -	iv) foreign exchange -
ii) labour -	v) Estimated cost: -
iii) special equipment	
14. If financed by an organisation other than the Institute	
a) Name of the financing organisation	
b) Title of the project (if the project forms a part of a larger project)	
15. Approximate cost:	-
16. Signatures of:	

(Sd)
Principal Investigator

Head of Division

(Sd)
Director

1. Institute Code No.	MOL/Cul/1.6
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin
4. Title of Project:	MOL/CUL/1: Mariculture - Culture of Molluscs
Title of Problem:	MOL/CUL/1.6 Development of hatchery system for mussel seed production
5. Name and designation of Principal Investigator:	K.Rangarajan, S-I
6. Names and designation of Associates and Establishments on which borne:	
a) <u>Whole time</u> :	Nil
b) <u>Part time</u> :	
	N.Ramachandran S-I)
	P.Poovanan T) Madras
	Sreenivasagam T)
	k.K.Appukuttan, S)
	P.Radhakrishnan T-II) Vizhinjam
	T.Mathew, T)
7. Location of the Research Project:	Madras, Vizhinjam
8. a) <u>Objectives</u> :	
	To develop suitable hatchery techniques for the seed production of mussels so as to get a constant supply of healthy seeds throughout the year without having to depend on nature.
b) <u>Practical Utility</u> :	
	As availability of natural seeds cannot be relied upon, suitable hatchery methods evolved, will be of immense help in providing an uninterrupted supply of healthy seeds to culturists to grow them to marketable size in their farms.
9. <u>Technical programme</u> :	
i)	To establish a full fledged laboratory with temperature control rooms to spawn and grow the mussel larvae to settling stage
ii)	to try different methods of conditioning the adults forms and inducing them to spawn by suitable physical or chemical treatment.

-
- iii) Mass culture of algae and flagellates to be used as food for the larvae and spat
 - iv) suitable techniques to be evolved for the collection of spat at the settling time of the larvae in the tank
 - v) to develop a proper nursery system
 - vi) to evolve suitable methods in the transport of seed from the hatchery to the farming area.
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 32 man months

13. Facilities required:

- i) land -
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) Estimated cost: -
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
 - b) Title of the project(if the project forms a part of a larger project)
-

15. Approximate cost:

16. Signatures of:

(Sd)
Principal Investigator

Head of Division

(Sd)
Director

- 33
1. Institute Code No. MOL/CUL/1.7
2. I.C.A.R. Code No.
3. Name and address of Research Central Marine Fisheries Institute/Centre: Research Institute, Cochin
4. Title of Project: MOL/CUL/1: Mariculture - Culture of Molluscs
 Title of Problem: MOL/CUL/1.7 Development of hatchery system for production of pearl oyster seed.
5. Name and designation of Principal Investigator: K. Alagarwami, S-2
6. Names and designation of Associates and Establishments on which borne:
- | | | |
|--------------------|-----------------------|-------------|
| a) Whole time: Nil | b) <u>Part time</u> | |
| | A. Chellam, S-1 | } Tuticorin |
| | D. C. V. Easterson, S | |
| | S. Dharmaraja, S | |
| | T. S. Velayudhan, S | |
7. Location of the Research Project: Tuticorin
8. a) Objectives:
 To develop appropriate technology for controlled production of seed of pearl oysters
- b) Practical Utility:
 Production and collection of pearl oysters in the natural grounds is unpredictable. Genetically too, all the seed may not be of the required traits. Development of hatchery techniques would ensure uninterrupted supply of pearl oyster seed of desired species for pearl culture operations.

 9. Technical programme:

Building up proper laboratory facilities with controlled conditions; conditioning the pearl oyster to spawn at any time of the year; achieving high rate of fertilisation and viability of normal development; identification of food requirements for the different stages of larvae and spat; mass culture of such feed; investigations on the critical phase of setting and ideal collector materials; setting up of nursery tanks for the growth of spat.

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 20 man months/year

 13. Facilities required:

- | | | |
|------------------------|---|----------------------|
| i) land | - | iv) foreign exchange |
| ii) labour | - | v) Estimated cost: |
| iii) special equipment | | |

 14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

(Sd)
 Principal Investigator

Head of Division

(Sd)
 Director

-
1. Institute Code No. MBO/ES/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Fishery Oceanography Investigations
- Title of Problem: MBO/ES/1.1 Physical and Chemical aspects of the shelf and adjacent waters
-
5. Name and designation of Principal Investigator: Dr.A.V.S.Murty, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- B) Part time
- | | | | | |
|-------------------------|-----------|---------------------------|---|------------------|
| C.P.Ramamirtham, S-1) | Cochin | G.G.Annigeri, S-1 |) | Karwar |
| D.S.Rao, S-1 | | S.Krishna Pillai, S |) | Bombay |
| R.Vasanthakumar, T II.3 | | R.Marichamy, S | } | Tuticorin |
| | | Pon Siraimetan, S | | |
| N.P.Kunhikrishnan, T-2 | Calicut | M.Selvaraj, T-2 | } | Mandapam
Camp |
| D.Vincent, T-II-3 | | M.Najemuddin, T-2 | | |
| N.S.Radhakrishnan, S-1 | | K.G.Eerijavallabhan, S-1) |) | Madras |
| C.M.Allikunju, T-2 | Mangalore | S.Muthuswamy, S | | |
| | | P.Mojumder, S-1 |) | Waltair |
-
7. Location of the Research Project: *Veraval, Bombay, *Goa, Karwar, Mangalore, Calicut, Cochin, *Vizhinjan, Tuticorin, Mandapam Camp, Madras **Kakinada, Waltair, *Paradip, *Andaman, *Minicoy
-
8. (a) Objectives:
To determine the sea water characteristics of the shelf and adjacent waters and their influence on biological productivity and fisheries
-
- (b) Practical Utility:
A continuous monitoring programme of the sea water characteristics is of great value in assessing the fertility, biological productivity and fisheries of the economic zone
-

* Staff not in position

9. 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 processed for the seasonal variations in relation to the rate of primary organic production.
3. To identify the environmental factors which influence the fisheries

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 96 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the Project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

-
1. Institute Code No. MBO/ES/3
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Fishery Oceanographic Atlas
- Title of Problem: MBO/ES/3 Preparation of Atlas of inshore hydrographic conditions and areas of upwelling in relation to fisheries
-
5. Name and designation of Principal Investigator: G.Subbaraju, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time: Nil
- (b) Part time
- R.Padmini, S-1
R.Vasanth Kumar, TII.3
K.P.Viswanathan, T-2
P.M.Aboobaker, T II.3
- } Cochin
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
- Preparation of fishery oceanographic atlases to show the influence of the environmental factors on fisheries.
-
- (b) Practical Utility:
- The atlas when published will be useful for indicating the hydrological conditions and potential grounds and serve as a guide for commercial fisheries
-
9. Technical Programme:
1. Consolidation of the available information on inshore hydrography, upwelling and fisheries along the Indian coasts.
 2. Mapping of the inshore hydrographic conditions and the areas of upwelling in time and space.
 3. Pictorial representation of areas of upwelling and productivity together with fishery data
-

10. Date of start; 1978
11. Likely date of completion: 1980
12. Estimated man months: 32 man months
13. Facilities required:
- | | |
|------------------------|----------------------|
| i) land | iv) Foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) Special equipment | |
14. If financed by an organisation other than the Institute
- Name of the financing organisation
 - Title of the project (if the project forms a part of a larger project)
15. Approximate cost:
16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

-
1. Institute Code No. MBO/PP/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: CMFRI, Cochin
-
4. Title of Project: Phytoplankton and primary productivity
- Title of Problem: MBO/PP/1.1 Phytoplankton and primary productivity of the shelf and adjacent waters.
-
5. Name and designation of Principal Investigator: P.V.Ramachandran Nair, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time:
- C.P.Gopinathan, S-1) Cochin
 V.K.Balachandran, TII-3)
- K.G.Girijavallabhan, S-1 Madras
 P.Karuppaswamy S.) Calicut
 C.V.Mathew)
 Prasad, Res.Scholar Waltair
-
7. Location of the Research Project: Cochin, Calicut, Vizhinjam* Karwar* Tuticorin* Waltair and Madras
-
8. (a) Objectives:
1. Assess the potential productivity of the economic zone.
 2. Determine the spatial variability of organic production and factors governing it.
 3. Estimate the standing crop of phytoplankton organisms and to determine the relationship between phytoplankton with other parameters.
 4. Examine the influence of isolated environmental factors on algal growth
-
- (b) Practical Utility:
 Continuous study of the phytoplankton productivity of inshore waters is very essential as the major fisheries of the country are confined to coastal waters. This will enable an assessment of fluctuations in potential yield of demersal and pelagic fish stocks. Measurements of primary production is also essential in marine food chain studies.
-

 9. Technical Programme:

1. Measurement of primary productivity by C^{14} technique in the Indian Seas at selected stations.
2. Estimation of standing crop of phytoplankton by pigment analysis and by total cell counts.
3. Estimation of dissolved carbohydrate in the different ecosystems.
4. Taxonomical and ecological studies on phytoplankton
5. Measurement of contribution by nanoplankton in the total organic productivity.
6. Estimation of potential yields.

 10. Date of start: 1976

 11. Likely date of completion 1980

 12. Estimated man months: 23 man months/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) Special equipment | |

 14. If financed by organisation other than the Institute

- a) Name of the financing organisation --
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: Inst. Project

 16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

-
1. Institute Code No. MBO/PP/1.2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: C.M.F.R. Institute, Cochin
-
4. Title of Project: Phytoplankton and primary productivity
- Title of Problem: MBO/PP/1.2 Productivity and nutrient cycle in the prawn fields around Cochin
-
5. Name and designation of Principal Investigator C.P. Gopinathan, Scientist-S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time
- P.V. Ramachandran Nair, S-2
 M. Vijayakumaran, S-1
 V. Kunjickrishna Pillai, S
 V.K. Balachandran, T II-3
 K.K. Valsala, T-1
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
- To estimate the productivity and nutrient regeneration cycle, in the prawn fields in the Cochin backwater and adjoining areas
-
- (b) Practical Utility:
- The relative yields of prawn field vary considerably. The stocking capacity in the perennial fields will be dependent on the amount of natural food available. This information will provide a clue on the stocking capacity in the perennial fields. In the seasonal fields, it will be possible to obtain information on the rate of growth based on the productivity and regeneration of nutrients.
-
9. Technical programme: C 4
1. Measurement of basic productivity using oxygen and techniques and determination of the standing crop of phytoplankton in terms of chlorophyll and by total cell counts.

2. Study of the energy-flow in the prawn culture field. Analysis of the detritus and feeding experiment in the laboratory to study the conversion efficiency.
3. Determination of the hydrographic parameters including nutrients.
4. Determination of the rate of regeneration and consumption of the essential nutrients in the medium.
5. Estimation of the benthic fauna.

 10. Date of start: January 1978

11. Likely date of completion: December 1978
 (First phase will be completed in
 May 1978)

12. Estimated man months: 5

13. Facilities required:

- | | |
|-------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) Special equipment. | |

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

- | | |
|---|----------------|
| a) Name of the financing organisation | |
| b) Title of the project (if the
forms a part of a larger
project) | Not applicable |

 15. Approximate cost:

16. Signatures of:

Sd/+
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No.	MBO/PL/1
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre	Central Marine Fisheries Research Institute, Cochin
4. Title of project: MBO/PL/1	Secondary production
Title of problem: MBO/PL/1.1	Secondary production of the shelf and adjacent waters.
5. Name and designation of Principal Investigator:	K.J.Mathew, S
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
(a) <u>Whole time</u> : Nil	(b) <u>Part time</u> :
	K.Rengarajan, S Cochin
	C.V.Mathew, S Calicut
	K.G.Girijavallabhan, S-I) Madras
	Mrs. Naomi S)
	S.Krishna Pillai, S Bombay
	R.Marichamy, S) Tuticorin
	Pon.Siraimetan, S)
	C.M.Allikunju, T-II Mangalore
	*Waltair
	*Andaman
	*Minicoy
7. Location of the research project:	Cochin, Mandapam Camp, Bombay, Karwar, Mangalore, Calicut, Tuticorin and Madras, Waltair, Andaman and Minicoy.
8. (a) Objectives:	This project is to assess the role of zooplankton in the complete marine food chain and elucidate ecological aspects such as secondary production in relation to fisheries.
(b) Practical Utility:	In any fishery oriented investigation, the proper understanding of the relationship between the fishes that constitute the fishery and zooplankton which constitute their food is an essential pre-requisite. The most important factor that influence the fishery of a region is the plankton production.
	* Staff not in position

 Apart from primary production which gives the first important link in the food chain of the sea, it is essential to follow the cycle of events and transformation of material of different trophic levels so as to give valid predictions regarding the natural fluctuations in the abundance of fish stock.

9. Technical Programme:

1. Collection of zooplankton samples using standard methods.
2. Estimation of zooplankton biomass.
3. Taxonomy and biology of important zooplankton groups.
4. Study of importance of zooplankton as indicators of water masses.
5. Study the distribution and abundance of these groups with special reference to hydrographic conditions.
6. Assess the role of zooplankton in the marine food chain.
7. Study the importance of bioscattering and to identify the biological constituents of deep scattering layers.

 10. Date of start: 1976

11. Likely date of completion 1980

12. Estimated man months: 47 man months/year

13. Facilities required:

- | | | | |
|--------------------------|----|----------------------|-------------------|
| i) land | -- | iv) foreign exchange | -- |
| ii) labour | -- | v) estimated cost: | Institute project |
| iii) special equipment-- | | | |

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

- a) Name of the financing organisation: --
- b) Title of the project (if the project forms a part of a larger project) --

 15. Approximate cost: Institute project

16. Signatures of:

Sd.
 Principal Investigator

Head of Division

Sd.
 Director

-
1. Institute Code No. MBO/FEL/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre. Central Marine Fisheries Research Institute, Cochin.
-
4. Title of project: MBO/FEL/1 Fish eggs and larvae
 Title of problem: MBO/FEL/1.1 The eggs and larvae of commercially important fishes from the shelf and adjacent waters.
-
5. Name and designation of Principal Investigator: C.Mukundan, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time:
- K.Rengarajan, S }
 I.Davidraj, S } Cochin
- S.Krishnapillai, S Bombay
- K.G.Girijavallabhan, S Madras
- M.Rajagopalan, S
- Pon Siraimetan, S Tuticorin
-
7. Location of the Research Project: Cochin, , Bombay, Minicoy
 Tuticorin, Madras
-
8. (a) Objectives:
- 1) Quantitative assessment of fish eggs and larvae from study of plankton.
 - 2) Location of spawning grounds and study of spawning seasons and spawning intensities of important species.
 - 3) Estimation of recruitment to the stocks.
 - 4) Detailed life history studies on important species.
 - 5) Preparation of charts showing distribution of fish eggs and larvae in space and time.
 - 6) Studies on the influence of environmental factors on the abundance and distribution of fish eggs and larvae.

(b) Practical Utility:

Previous investigations on fish eggs and larvae from Indian seas were mainly on qualitative aspects (such as ~~at~~ descriptions of developmental stages) and very little information is available on quantitative and seasonal abundance of fish eggs and larvae. The scarcity of specific information on the identity of eggs and larvae continues to be serious drawback, and this is partly due to paucity of information on the ichthyofauna. This project will help in understanding the occurrence and distribution of fish eggs and larvae, the spawning areas and recruitment to stock of important species.

9. Technical Programme:

1. Estimation of total fish eggs and larvae in plankton samples and their relative abundance in space and time.
2. Preparation of synoptic charts.
3. Study of the distribution and abundance of eggs and larvae in relation to environmental factors.
4. Preparation of key for identification of fish eggs and larvae.
5. Study of the life history of important fishes.
6. Determination of the spawning periods and location of spawning grounds of important species.
7. Survey of eggs and larvae to study the survival and recruitment to fishable stocks.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months:

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. FB/CUL/1.1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: FB/CUL/1 Mariculture - Culture of fishes
Title of Problem: FB/CUL/1.1 Culture of marine fishes
5. Name and designation of Principal Investigator: G. Venkataraman, S-2
6. Name(s) and designation of Associate(s) and establishments on which borne:

a) Whole time:

Nil

b) Part time:

K.M. Ameer Hamsa	S	}	Mandapam
P. Nammalwar	S		
S. Shanmugham	S	}	Tuticorin
R. Marichamy	S		
T. Appa Rao	S1	}	Waltair
S. Reuben	S1		
M.H. Dhulkhed	S1	}	Margalore
R.S. Lal Mohan	S1		
P. Devadoss	S	}	Calicut
M. Rajamoni	S1		
S.K. Pandian	S1		
		}	Narakkal

Shankarath, T. →

7. Location of the Research Project: Waltair, Tuticorin, Mandapam
Calicut, Narakkal and Margalore
8. a) Objectives:

1. To investigate the possibility of culture of inshore and brackish water fishes.
2. To assess the production potential of different groups of fishes and other marine animals in commercial culture.

b) Practical Utility:

and West coasts

There are vast stretches of low lying areas along the East/ of the country which lie fallow at present but could be converted into fish farms. The project is expected to help in this direction. Culture and rearing experiments will be carried out in the pens and impoundments at different places along the coast.

 9. Technical programme:

1. Collection of fish seed from the inshore and brackish water areas for stocking and culture.
2. Poly culture of species.
3. To develop techniques for utilisation of seasonal inundated coastal areas, derelict waters for fish culture.
4. Use of salt pan reservoirs for culture of fishes and other organisms.
5. To evolve suitable techniques for the culture of fishes in pens, polythene lined ponds.
6. To develop suitable techniques for cage culture of fishes such as groupers and snappers.

 10. Date of start: 1976.

 11. Likely date of completion. 1980

 12. Estimated man months : 36 man months/year

 13. Facilities required:

- | | | | |
|------------------------|---|--------------------------------------|---|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: Institute project | |
| iii) special equipment | - | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation -
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: Institute project

 16. Signatures of:

Sd/-
 Principal Investigator

Head of Division

Sd/-
 Director.

1. Institute Code No.	MBO/SW/1.1
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre	Central Marine Fisheries Research Institute, Cochin
4. Title of Project: MBO/SW/1	Survey of Economically important seaweed Resources
Title of Problem: MBO/SW/1.1	Seaweed Resources Investigations
5. Name and designation of Principal Investigator	V.S.K.Chennubhotla, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
(a) <u>Whole time</u> : Nil	(b) <u>Part time</u> :
	S.Kalimuthu, TIII } Mandapam
	M.Selvaraj, T:2 } Camp
	M.Najundilay , T:II
	J.R.Ramalingam, T:II
	Radhakrishnan, T 2 Vizhinjam
	Panigrahi, R.S. M. Camp.
7. Location of the research project:	Mandapam Camp, and Vizhinjam
8. (a) <u>Objectives</u>	
	To study the Seaweed resources of the Kerala Coast for estimating the standing crop and for mapping productive areas in order to provide basic information to sea-weed processing industries.
(b) <u>Practical Utility</u> :	
	Seaweeds yield agar agar, algin, and other chemicals. Recently industries have been started in Tamil Nadu and other states and the demand for seaweeds for industry is increasing.

9. Technical Programme:
1. Survey of Seaweed resources to be undertaken along the remaining part of Tamil Nadu coast and in Kerala.
 2. Seaweed sample to be collected along the transects from different stations.
 3. Statistical analysis of the raw data.
-
10. Date of start: 1978
-
11. Likely date of completion: 1979
-
12. Estimated man months:
-
13. Facilities required:
- | | | | |
|------------------------|----|----------------------|-------------------|
| i) land | -- | iv) Foreign exchange | -- |
| ii) labour | -- | v) Estimated cost: | Institute project |
| iii) special equipment | -- | | |
-
14. If financed by an organisation other than the Institute,
- a) Name of the financing organisation.
 - b) title of the project (if the project forms a part of a larger project)
-
15. Approximate cost: Institute Project
-
16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

RESEARCH PROJECT-1978

1. Institute Code No.	MBO/SW/1.2
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: MBO/SW/1	Seaweed Resources Investigations
Title of Problem: MBO/SW/1.2	Culture of economically important seaweeds
5. Name and designation of Principal Investigator:	V.S.K.Chennubhotla, S-1
6. Name(s) and designations of Associate(s) and Establishments on which borne:	
(a) <u>Whole time</u> : Nil	(b) <u>Part time</u> :
	S.Kalimuthu, TII-3 Mandapam Camp.
	Radhakrishnan, T-2 Vizhinjam
	M.Selvaraj, T-2 Mandapam Camp
	and others.
7. Location of the research project:	Mandapam Camp, Tuticorin and Vizhinjam
8. (a) Objectives:	
	To carry out culture experiments on commercially important seaweeds to investigate the life history and 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.
9. Technical Programme:	
1. Laboratory culture of seaweeds to be maintained for studying the life history and physiological factors:	
2. Farming and culturing of economically important seaweeds by means of spores and vegetative propagation:	
10. Date of start:	1976

-
11. Likely date of completion: 1980
-
12. Estimated man months: 28 man months/year
-
13. Facilities required:
- | | | | |
|--------------------------|----|----------------------|----|
| i) land | -- | iv) foreign exchange | -- |
| ii) labour | -- | v) Estimated cost: | |
| iii) special equipment-- | | | |
-
14. If financed by an organisation other than the Institute.
- Name of the financing organisation
 - title of the project (if the project forms a part of a larger project)
-
15. Approximate cost: Institute Project
-
16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

RESEARCH PROJECT - 1978

1. Institute Code No.	MBO/EE/1.2
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: MBO/EE/1	Ecological Energetics
Title of Problem: MBO/EE/1.2	Ecological energetics in the fishing grounds off Cochin.
5. Name and designation of Principal Investigator:	C.P. Ramamirtham S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
a) <u>Whole time</u> : Nil	
b) <u>Part time</u>	
	V. Josanto, S.1
	P.P.Pillai, S
	V.K.Balachandran T.II.3
	I.David Raj, S
	R.Vasanthakumar, T.I.3
	Cochin
7. Location of the Research Project:	Cochin
8. a) Objectives:	
	To calculate the ratio of yield to production in a typical inshore fishing ground for making accurate assessment of potential yield.
b) Practical Utility:	
	Studies on the production and conversion of energy at different trophic levels form a basic pre-requisite for assessment of the potential catch available from the productive inshore waters of the upwelling area of the west coast of India.
9. Technical programme:	
	1. Study the rate of production at different trophic levels
	2. Estimate the conversion efficiency from primary to tertiary levels
	3. Integrated investigation on the food chain and utilisation of energy in a fishing ground from primary to tertiary level including the hydrographic parameters.

-
10. Date of start: 1975
-
11. Likely date of completion: 1978
-
12. Estimated man months: 40 man months/year
-
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) Estimated cost:
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	MBO/MB/1.1
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: MBO/MB/1.1. Title of Problem:	Mud banks and their influence on fisheries Investigations on the mud banks of the Kerala coast and their influence on fisheries.
5. Name and designation of Principal Investigator:	D.S.Rao, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
(a) <u>Whole time</u> Nil	(b) <u>Part time:</u> K.X.Mathew, S) C.P.Gopinathan, S-1) A.Regunathan, S) Cochin V.K.Balachandran, T II 3) C.Thankappan Pillai, T-2)
7. Location of the Research Project:	Cochin
8. a) Objectives:	Investigations, on the/banks for understanding their origin, /mud formation, dissipation and influence on fisheries
b) Practical utility:	Mud banks are special phenomenon occurring along the Kerala and Karnataka Coasts during Monsoon months. Their occurrence is also said to coincide with good fishing. In view of the importance of mud banks to fisheries, the Institute is expanding its programme of work to other areas.

 9. Technical Programme:

1. To extend the present investigations on the various mud bank regions of the south west coast upto Mangalore.
2. Seasonal echo-survey of the mud banks.
3. Assessing the fishery operations inside and outside the mud banks during different seasons.
4. Seasonal observations on currents and hydrographic parameters.
5. Geological studies of the mud of the mud banks (Sediments in suspension and at the bottom)
6. Pre and post mud bank period data to be included.

 10. Date of start: 1976

 11. Likely date of completion 1981

 12. Estimated man months: 30man months/year

 13. Facilities required:

- | | | |
|------------------------|----|----------------------|
| i) land | -- | iv) foreign exchange |
| ii) labour | -- | v) Estimated cost: |
| iii) special equipment | -- | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project(if the project forms a part of a larger project)

 15. Approximate cost: 3.21 lacs

 16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

RESEARCH PROJECT -1978

-
1. Institute Code No. MBO/BF/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Benthos of the fishing grounds
 Title of Problem: MBO/BF/1.1 Effect of Salvinia deposits on the fishing grounds off Cochin
-
5. Name and designation of Principal Investigator: V.Kunjakrishna Pillai, S.
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | | |
|-----------------------------------|--------------------------|----------|
| <u>Whole time:</u> Nil | <u>Part time</u> | |
| <u>Part time:</u> A.Regunathan, S | C.B.Gopinathan, S-1 | } Cochin |
| | V.Chandrika, S | |
| | M.Ayappan Pillai, T-II-3 | |
| | K.K.Valsala, T-1 | |
-
7. Location of the Research Project: Cochin
-
8. (a) Objectives:
 To investigate the effect of Salvinia weed deposits on the fishing grounds off Cochin.
-
- (b) Practical utility:
 During the tidal movements the weeds are transported to the inshore region and the inshore benthic community is affected to a great extent by the settlement of dead and decaying Salvinia. In the fishing grounds off Cochin considerable quantity of this weed is deposited every year during October-January and information on its short term and long-term effects on the fishery of the area will be of great interest.
-

-
9. Technical Programme:
1. Determine the extent of weed deposits (especially Salvinia) in the fishing grounds off Cochin.
 2. To estimate the benthic productivity.
 3. Investigate the break-down processes, recycling etc. of the weed by bacteriological analysis.
 4. Study the vertical stratification of the bottom layers by core sampling
-
10. Date of start: 1978
-
11. Dikely date of completion: 1980
-
12. Estimated man months
-
13. Facilities required:
- | | |
|------------------------|----------------------|
| 1) Land | iv) foreign exchange |
| ii) labour | v) Estimated cost |
| iii) Special equipment | |
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
-
15. Approximate cost:
-
16. Signature of

Sd.
Principal Investigator

Head of Division

Sd.
Director

1. Institute Code No. MBO/MCP/1
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
4. Title of Project: MBO/MCP/1 Mass culturing of plankters
- Title of Problem:
5. Name and designation of Principal Investigator: P.V. Ramachandran Nair, S-21
6. Name(s) and designations of Associate(s) and Establishments on which borne:
- (a) Whole time: Nil
- (b) Part time
- D.C.V. Easterson, S) Tuticorin
- V.K. Balachandran, T- II3 }
M. Ayappan Pilla, T- II3 } Cochin
P.K. Martin Thompson, RS }
C.M. James, S }
7. Location of the research project: Cochin and Tuticorin
8. (a) Objectives:
- To develop mass culture of various organisms at different trophic levels and to study their growth rate and conversion efficiency and for determining their utility as feed for the rearing of cultivable food fishes, crustaceans and molluscs.
- (b) Practical utility:
- Culture of phytoplankton organisms for use as feed for rearing of some important species of fishes and prawns has already been attempted in the laboratory. There is need for developing techniques for experimental investigations on the uptake of toxic substance at different trophic levels in the marine food chain. Large scale culturing of plankters is a new line of development which is now being attempted in other countries also with similar objectives in view. The techniques evolved for successful culturing organisms will have wide applications.

 9. Technical Programme:

1. Isolation and developing phytoplankters with lower generation time and higher growth constants. Determination of the point of maximum economically viable harvesting and their energy values.
2. Selection of suitable organisms from Zooplankton (micro and macro zooplankters) for culturing.
3. Evolving suitable techniques for mass culture of micro and macro zooplankters.
4. Determination of feeding, growth, reproduction rates and ecological efficiency of these organisms under optimum conditions.
5. Development of field cultures utilising solar energy on open-air conditions for feeding the larvae.

 10. Date of start: 1974

 11. Likely date of completion: 1978

 12. Estimated man months: 26 man months/year

 13. Facilities required:

i)	land	--	iv)	foreign exchange	--
ii)	labour	--	v)	estimated cost:	Institute
iii)	special equipment	--			project

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

a)	Name of the financing organisation:	--
b)	title of the project (if the project forms a part of a larger project)	--

 15. Approximate cost: Institute Project

 16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

-
1. Institute Code No. MBO/MP/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Marine Pollution
- Title of Problem: MBO/MP/1.1 Marine pollution in relation to protection of living resources
-
5. Name and designation of Principal Investigator: P.V.Ramachandran Nair, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- Part time:
- | | | |
|--------------------------|---|------------------|
| M.V.Pai, S-1 | } | Karwar |
| G.G.Annigeri, S-1 | | |
| M.S.Rajagopalan, S-1 | } | Cochin |
| C.P.Gopinathan, S-1 | | |
| V.Kunjukrishna Pillai, S | | |
| V.Chandrika, S | | |
| K.G.Girijavallabhan, S-1 | } | Madras |
| S.Muthuswamy, S | | |
| R.Marichamy, S | } | Tuticorin |
| M.Selvaraj, T-2 | | |
| | } | Mandapam
Camp |
| | | |
| P.Karuppaswamy, S | } | Calicut |
| D.Vincent, T-2 | | |
-
7. Location of the Research Project: Cochin, Karwar, Madras, Tuticorin and Mandapam Camp.
-
8. (a) Objectives:
To identify sources of marine pollution, assess their effect on living organisms, and to suggest preventive and remedial measures for protecting the living resources of the seas especially 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 interference with the natural environments. Apart from these, certain biological phenomena like phytoplankton blooms created 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.

9. Technical Programme:

1. The main sources of marine pollution are: domestic sewage discharge into the sea, direct effluents from industrial plants, pesticides such as DDT, oil spills from tankers and biological phenomena like blooming of phytoplankton. To begin with, investigations will be taken up on the deleterious effects on phytoplankton, zooplankton and fishes as a result of man-made changes in the environment.
2. In areas where other forms of pollution occur, suitable surveys will be conducted to identify the type of pollution and to suggest remedial measures.
3. Studies will be conducted on some organisms in the environment to measure the effects of pollution (bioassay) on their survival growth and reproduction.

10. Date of start: 1971

11. Likely date of completion: Continuing

12. Estimated man months: 58 man months/year

13. Facilities required:

- | | | |
|------------------------|----|----------------------|
| i) land | -- | iv) foreign exchange |
| ii) labour | -- | v) Estimated cost: |
| iii) Special equipment | -- | |

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

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

-
1. Institute Code No. MBO/CR/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: MBO/CR/1 Investigations on the coral reef resources
Title of Problem: MBO/CR/1.1 Ecology and resources of the fringing reefs and atolls.
-
5. Name and designation of Principal Investigator: C.S.Gopinatha Pillai, S-1
-
6. Name(s) and designations of associate(s) and Establishments on which borne:
(a) Whole time: Nil (b) Part time:
-
7. Location of the research project: Cochin
-
8. (a) Objectives:
A Study of the zonation, and ecology of the reefs and their major associated marine animals of the southeastern coast of India and the atoll reefs of Lakshadweep will be carried out. The environmental damage to reef ecosystem due to quarrying of corals for industrial purpose will be assessed with special reference to the reefs of Gulf of Mannar and Palk Bay.
-
- (b) Practical utility:
Information gained on the occurrence and abundance of economically important reef associated animals will be importance to their rational exploitation. Ecological data will be of practical utility in considering coral reefs as potential grounds for mariculture. The environmental effect of coral quarrying will help us to formulate measures of conservation.
-
9. Technical Programme:
The accessible reefs will be qualitatively and quantitatively surveyed by unit sampling and traverse survey. Comparative studies on the undisturbed and quarried reefs sites will be carried out to assess the ecological changes and environmental damages.
-

10. Date of start: 1975

11. Likely date of completion: 1978

12. Estimated man months: 10 man months/year

13. Facilities required:

i)	land	--	iv)	foreign exchange
ii)	labour	--	v)	Estimated cost:
iii)	special equipment	--		

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

a) Name of the financing organisation: --

b) title of the project (if the project forms a part of a larger project) --

15. Signatures of:

Sd.
Principal Investigator

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/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Ecological studies of mangrove swamps
- Title of Problem: MBO/MS/1.1 Ecology of the mangrove swamps and their associated fauna and flora
-
5. Name and designation of Principal Investigator: M.S.Rajagopalan, S-1
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- (a) Whole time: Nil
- (b) Part time:
- | | |
|---------------------------|-------------|
| C.S.Gopinatha Pillai, S-1 | } Cochin |
| C.P.Gopinathan, S-1 | |
| G.S.Daniel Selvaraj, S | |
| P.M.Aboobaker, T-II 3 | |
| A.Kanagam, T-2 | |
| A.Bastin Fernando, T-II 3 |) Tuticorin |
| | Portonovo* |
| | Kakinada* |
-
7. Location of the Research Project: Cochin, Tuticorin, Porto Novo and Kakinada
-
8. (a) Objectives:
1. To elucidate the various ecological aspects connected with mangrove swamps
 2. To investigate the formation and zonation of mangroves vegetation
 3. To determine qualitatively and quantitatively the mangrove associated fauna, their interrelationship and influence on local fisheries
-
- (b) Practical utility:
Mangrove swamps have characteristic flora and fauna. The ecological conditions make the mangrove areas highly productive. Further mangrove areas serve as nursery grounds for many species of fishes and prawns
-

* Staff not in position

 9. Technical programme:

1. Detailed survey of mangrove vegetation, resident and migratory fauna with special reference to succession of plant and animal communities
2. To collect information on hydrographic conditions, primary productivity, soil etc.
3. To locate areas which serve as nursery grounds for fishes and shell fishes

 10. Date of start: 1976

 11. Likely date of completion: 1979

 12. Estimated man months: 24 man months/year

13. Facilities required:

- | | | | |
|------------------------|----|----------------------|----|
| i) land | -- | iv) foreign exchange | -- |
| ii) labour | -- | v) Estimated cost: | -- |
| iii) special equipment | -- | | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project) --

 15. Approximate cost: --

16. Signatures of

 Sd/-
Principal Investigator

 Sd/-
Head of Division

 Sd/-
Director

 9. Technical Programme:

1. Analysis of data on Demospongiae already collected from the Indian Ocean.
2. Collection of more information regarding the distribution of sponges in the various islands of Indian Ocean.
3. Survey of boring sponges infesting the molluscs kept on culture rafts (owned by C.M.F.R.I.) in relation to those in the natural beds.

 10. Date of Start: 1977

 11. Likely date of completion: 1978

 12. Estimated man months: Nine months/year

13. Facilities required:

i) land	--	iv) Foreign exchange	--
ii) labour	--	v) Estimated cost:	--
iii) special equipment	--		

 14. If financed by organisation other than the Institute:

- a) Name of financing organisation --
 - b) Title of the Project (if the project forms part of a larger project) --
-

 15. Approximate cost:

16. Signatures of:

Sd.
Principal Investigator

Head of Division

Sd.
Director

-
1. Institute Code No. MBO/MM/1.1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of project: MBO/MM/1 Investigations on marine mammals and turtles.
 Title of Problem: MBO/MM/1.1 Investigations on the distribution biology, feeding habits reproductions and behaviour of marine turtles dolphins and porpoises.
-
5. Name and designation of Principal Investigator: E.G. Silas, Director
-
6. Name(s) and designations of Associate(s) and establishments on which borne:
- a) Whole time:
 b) Part time
 R.S.Lal Mohan, S-1 Calicut
 M.Rajagopal, S Madras
 A.Bastian Fernando, T.II.3 Tuticorin
 A.A.P.Mudaliar, T.II.3 Mandapam Camp
-
7. Location of the research Project: Calicut, Cochin, Tuticorin, Mandapam & Madras.
-
8. a) Objectives: (i) to study the biology and resources of marine turtles
 (ii) Processing of data available on lesser cetaceans (dolphins, porpoises and smaller whales) of the Indian Seas and to study the distribution, biology and feeding habits of some species. To examine whether conservation measures are necessary for the protection of lesser cetaceans.
-
- b) Practical Utility:
 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 cycle in our shelf waters. No estimates are available about the populations of different species of dolphins in our coastal waters nor their role as predators of fishes such as mackerels and sardines. Often damage to fishing gear is also caused by dolphins. A proper study of these animals and the species occurring in our waters, their biology and abundance will help considerably in evolving suitable management measures for proper conservation and utilisation of this resource.
 Information on the marine turtle fishery along the southeast coast, revenue obtained, nesting grounds etc. will be helpful in the rational exploitation of the resource.
-

9. Technical Programme: (for marine mammals)

1. Processing and writing up of data already collected by the Principal Investigator on marine mammals from the Indian Ocean.
2. Observations on the ecology and biology of marine mammals particularly of dolphins along the south-west coast of India.
3. Special emphasis will be given to study their reproduction, growth, food and feeding habits and behaviour.

Technical Programme: (for Marine Turtles)

1. Location of nesting ground and breeding seasons.
 2. Collection of data on Turtle landings.
 3. Biological studies to enable taking up turtle farming.
-

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 25 man months/year

13. Facilities required:

- | | | | |
|------------------------|----|----------------------|----|
| i) land | -- | iv) foreign exchange | -- |
| ii) labour | -- | v) estimated cost: | |
| iii) special equipment | -- | | |
-

14. If financed by an organisation other than the Institute.

- a) Name of the financing organisation: --
 - b) Title of the project (if the project forms a part of a larger project): --
-

15. Approximate Cost: --

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

RESEARCH PROJECT - 1979

-
1. Institute Code No. CMFRI/IDP/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Survey of fish seed resources
 Title of Problem: CMFRI/IDP/1 Survey of the prawn, fish and molluscan seed resources.
-
5. Name and designation of Principal Investigator: Dr. E.G. Silas, Director
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | a) <u>Whole time</u> | b) <u>Part time</u> | |
|----------------------|----------------------------|--|
| | K. Rangarajan, S1 | |
| | M. Rajagopalan, S | |
| | K.S. Sundaram, S | |
| | K.M. Ameer Hamsa, S | |
| | P. Namalwar, S | |
| | R. Thiagarajan, S | |
| | C. Nandakumar, S | |
| | S. Shanmugham, S | |
| | Bastin Fernando, T | |
| | K. Prabhakaran Nair, S | |
| | S. Lazarus, S | |
| | K.J. Mathew, S | |
| | G.S.D. Selvaraj, S | |
| | K.N. Gopalakrishnan, III 3 | |
| | R.S. Lal Mohan, S1 | |
| | K.V. Somasekharan Nair, S | |
| | Gopinatha Menon, S | |
| | P. Ramadoss, T II.3 | |
| | K. Nandakumaran, T II 3 | |
| | | |
- Madras
Mandapam Camp
Tuticorin
Vizhinjam
Cochin
Calicut.
-
7. Location of the Research Project: Mandapam Camp, Madras, Tuticorin, Cochin, Vizhinjam, Calicut.
-

8. a) Objectives:

- i) Locate areas of abundance of cultivable marine molluscs, fishes & prawns in Tamilnadu & Kerala.
 - ii) To estimate the species-wise, season-wise and regionwise abundance of molluscan (bivalve) fish and prawn seed.
-

b) Practical Utility:

The interest of the industry in culturing on a commercial scale marine fishes, prawn and bivalves is increasing. An essential pre-requisite for commercial culture is information on the relative abundance, availability of bivalve, prawn and fish seed. This project is aimed to achieve these requirements.

9. Technical programme:

- i) Survey will be undertaken to locate areas of abundance of bivalve such as mussels, clams and oysters of fish and prawns, post-larvae and juveniles.
 - ii) The relative abundance of important species in various regions will be estimated by operating gear specially meant for the purpose.
 - iii) Suitable location for taking up coastal aquaculture will be charted.
 - iv) Occurrence of ancillary resources such as sea weeds in the area will be surveyed.
-

10. Date of start: 1976

11. Likely date of completion: 5 years

12. Estimated man months: 45 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | Contingency - 12,000 |
| | T.A. - 24,000 |
-

14. If financed by an organisation other than the Institute

a) Name of the financing organisation: Institute
project

b) Title of the project (if the
project forms a part of a
larger project)

15. Approximate cost: Rs. 36,000

16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director

RESEARCH PROJECT - 1978

1. Institute Code No. CMFRI/IDP/2
2. I.C.A.R. Code No.
3. Name & address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin-18
4. Title of Project: Fish and shell fish diseases
Title of Problem: CMFRI/IDP/2 Investigations on fish & shell fish diseases.
5. Name & designation of Principal Investigator: S. Mahadevan, S-1.
6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) Whole timeb) Part time

Nil

G.S.D. Selvaraj, S'
C. Thankappan pillai, T
S. Lazarus, S
K. Dorairaj, S1
K. Rengarajan, S &
others.

Cochin
Vizhinjam
M. Camp.
Madras.

7. Location of the Research Project: Cochin, Mandapam Camp, Vizhinjam, Madras, Tuticorin.

8. a) Objectives:

The marine fishes and shell fish diseases constitute one of the important factors in regulating the populations in natural environment and in aquaculture. Over the number of years the documentation of various types of diseases in fish and shell fish has increased greatly. In India, very little consideration and less attention have been shown in this aspect. To fill up this gap in the knowledge and to take adequate steps it is necessary to undertake the studies.

The studies constitute one of the essential steps in farm management.

b) Practical Utility:

The need for research on fish and shell fish as possible vectors of infectious diseases is of vital importance because of the increasing use of fish and shell fish as human food, frequent contact between man and the aquatic environment and the high rate of pollution of the aquatic environment.

The studies will fulfil the need to ensure bacterially free food from the farms and also enable to keep down the cases of mortality of farmed animals on account of bacterial infections.

9. Technical programme:

- a) Collection of diseased specimens and parasites from the different environment including cultured ponds.
- b) classification of diseases and determining the causative actiological factors and probable effects on population.
- c) Development of preventive measures in the control of the documented diseases.
- d) Specific cases of large-scale mortality, when reported, to be investigated thoroughly.

10. Date of start: 1976

11. Likely date of completion: 1980

12. Estimated man months: 18 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project
(if the project forms of a larger project)

15. Approximate cost:

16. Signature of

Sd/-	Sd/-	Sd/-
Principal Investigator	Head of Division	Director

1. Institute Code No. CMFRI/IDP/3

2. I.C.A.R.Code No.

3. Name & address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: National tagging programme
 Title of Problem: CMFRI/IDP/3 National Programme of tagging Oil sardine, mackerel and prawns.

5. Name & Designation of Principal Investigator: P. Vijayaraghavan, S-1.

6. Name(s) & designation of Associate(s) and Establishments on which borne:

a) <u>Whole time</u>	b) <u>Part time</u>	
	A. Noble, S-1	Cochin
	M.M.Thomas, S-1 and others	
	N.S.Radhakrishnan S1 and others	Mangalore
	N. Gopinatha Menon S1 and others	Calicut.

7. Location of the Research Project: Cochin, Calicut & Mangalore.

8. a) Objectives: 1. To study the migration patterns of oil sardine, mackerel and prawns in space and time of southwest coast of India where these species are of great commercial importance.
 2. The project will give direct evidence of rate of growth, the rate of fishing of the stocks and the shoaling behaviour of the species.
 3. Results of this investigation will form the basis for extending the project to other centres and to other fishes.

b) Practical Utility:

The study will help in making forecasts of the appearance of these species along the coast, in determining the age composition of catches in different areas to introduce suitable measures to ensure better yields, in evaluating rate of exploitation of their stocks in short in evolving suitable management policies for these resources.

 9. Technical programme:

1. At least 25,000 oil sardines to be tagged at Cochin and Calicut respectively in each season.
2. At least 25,000 mackerel to be tagged at Cochin and Mangalore respectively in each season.
3. At least 50000 prawns to be tagged at Cochin in sea and in the backwaters during the year.

 10. Date of start: January 1976

 11. Likely date of completion: 1980

 12. Estimated man months: 100/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost |
| iii) Special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

16. Signatures of:

 Sd/-
Principal Investigator

Head of Division

 Sd/-
Director

1. Institute Code No. CMFRI/IDP/4
2. I.C.A.R. Code No.
3. Name & Address of Research Institute/Centre C.M.F.R.I., Cochin-18/W.R.C. of CMFRI, Waltair
4. Title of Project: National tagging programme
Title of Problem: CMFRI/IDP/4 Tagging of cat-fishes.
5. Name & Designation of Principal Investigator B. Krishnamoorthi, S-1
6. Name(s) & designation of Associate(s) and Establishment on which borne:
- a) Whole time Nil
- b) Part time
P. Mojunder, T6
T. Appa Rao, S1
S. Reuben, S1
S.S. Dan, T6
P.E. Sampson Manickan, S
B. Narayana Rao, T II 3
Waltair
7. Location of the Research Project: Waltair
8. a) Objectives:
To study: (a) Speed and rate of migration
(b) Territoriality
(c) Mortality
(d) Age and growth
- b) Practical Utility
The knowledge gained as detailed in (a) has immediate application in the exploitation of the cat-fish resources in areas presently fished besides helping in the formulation of management policies for a rational exploitation of the resources.
9. Technical Programme:
1. Participation in fishing voyages.
 2. Collection of live cat-fish from the catches for tagging.
 3. Tagging of both the species of cat-fish, T. thalassinus and T. tenuispinis with loop tag.
 4. Maintenance of records of all tagged fish with respect to the size of fish tagged; tag number; areas of capture and release; date tagged etc.

10. Date of start 1977

11. Date of completion 1979

12. Estimated man months

13. Facilities required:

i) land

iv) foreign exchange

ii) labour

v) Estimated cost:

iii) special equipment

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the Project (if the
Project forms a part of the
larger project)

15. Approximate Cost:

16. Signature of

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/IDP/55

2. I.C.A.R. Code No.

3. Name & address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: Fishery resources of the economic zone.
Title of Problem: CMFRI/IDP/5 Exploration of fishery resources of the continental shelf edge and oceanic waters of ~~the~~ economic zone.

5. Name & Designation of Principal Investigator: S.V. Bapat, S-2 J.D.

6. Name(s) and designation of Associate(s) and Establishments on which borne:
a) Whole time Nil
b) Part time
B. Krishnamoorthy, S-1 - Waltair
M.V. Pai, S-1 - Karwar
C. Mukundan, S-1 - Cochin
R.S. Lal Mohan S-1 - Calicut
C. Muthiah S-1 - Bombay
and others.

7. Location of the Research Project: Bombay, Karwar, Calicut, Cochin, Waltair.

8. a) Objectives:
To carry out exploratory surveys on the fishery resources of the continental shelf edge and oceanic waters of our economic zone to understand the potential and exploitable resources available for commercial purpose.

b) Practical Utility:
India declared an Exclusive Economic Zone of 200 miles to explore, exploit, manage, and conserve the living and non-living resources of her seas. This declaration has provided great opportunity and challenge for the development and exploitation of fishery resources available in the outer half of the continental shelf, shelf edge and oceanic waters within the economic zone. While the information on the fishery resources in the inner half of the continental shelf

is available through the investigations conducted by this Institute, data on the potential exploitable resources available beyond this region for commercial exploitation are very meagre. In the national endeavour for the judicious utilisation of the resources available in these waters, the exploration of the fishery resources, their assessment charting and mapping of the grounds have assumed great importance. This project envisages a detailed survey of the fishery resources to provide the necessary information/data on the above aspects, so as to help the establishment of deep sea and oceanic commercial fisheries.

9. Technical programme:

- 1) To conduct systematic exploratory surveys on conventional and non-conventional fishery resources in the continental shelf edge and oceanic waters in our economic zone.
- 2) To participate in the exploratory/indicative fishing survey undertaken by the national and international agency.
- 3) To collect information on the availability of the resources, the distribution pattern and abundance.
4. To locate potential fishing grounds in the region.

10. Date of start: 1978

11. Likely date of completion: Continuing

12. Estimated man months: 12 man months

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator Head of Division

Sd/-
Director

10. Date of start: 1978
11. Likely date of completion: 1983
12. Estimated man months:
13. Facilities required:
- i) land
 - ii) labour
 - iii) special equipment
 - iv) foreign exchange
 - v) Estimated cost:
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation
 - b) Title of the project (if the project forms a part of a larger project)
15. Approximate cost:
16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

RESEARCH PROJECT - 1978

-
1. Institute Code No. CMFRI/IDP/7
-
2. I.C.A.R. Code No.
-
3. Name & address of Research Central Marine Fisheries Institute/Centre Research Institute, Cochin-18
-
4. Title of Project: Man-made changes on environment.
 Title of Problem: CMFRI/IDP/7. Impact of Thanneermukkom Bund on the fisheries of the Vembanad Lake.
-
5. Name & designation of Principal Investigator: P. Vedavyasa Rao S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|----------------------|--------------------------|
| a) <u>Whole time</u> | b) <u>Part time</u> |
| G. Radhakrishnan S1 | S.K. Dharmaraja S-1 |
| | K.K.P. Panikkar S-1 |
| | V. Jobantõ S-1 S |
| | C. Suseelan S1 |
| | M. Kathirvel S |
| | V. Kunjukrishna pillai S |
| | K.J. Mathew S |
| | M. Ayyappan pillai T2 |
| | Daniel Selvaraj S |
-
7. Location of the Research Project: Cochin
-
8. a) Objectives:
 To make an assessment of the changes in the faunal, floral ecological and biological environments as well as fisheries of the Vembanad Lake consequent on the construction of the Thanneermukkom Bund with a view to suggest the conservational measures of the natural living resources of the lake.
-

b) Practical Utility:

The Vembanad Lake formed by the embouchures of the river Pampa is a natural lake containing a variety of living organisms and it supports a lucrative capture and culture fisheries on which depend about one lakh fishermen for their livelihood. Since the construction of a bund across the lake at Thanneermukkom mainly to promote paddy cultivation in about 4000 ha, several changes have occurred in the biotic and a biotic regimes of the lake particularly in the commercial fisheries for prawns and molluscs often resulting in destruction is revealed by the preliminary investigations of the Institute conducted earlier. It has, therefore, become essential to preserve the eco-system of the lake to promote not only the fishery but also the natural living resources of the lake. The results of the project would give a comprehensive idea of the changes occurred so as to suggest measures for conservation and improvement of the resources in general and of the fisheries resources in particular.

9. Technical programme:

1. The distribution pattern, seasonal abundance of different organisms inhabiting on either side of the Thanneermukkom Bund will be studied by regular collection of samples at selected centres.
2. Data on tidal influence on physical and chemical water conditions of the lake on either side of the bund will be collected to correlate with the distribution pattern and seasonal abundance of the living organisms.
3. Changing pattern of the fishery resources on either side of the bund will be studied through regular observations.
4. The influence of the bund on the living resources before and since construction of the bund will be assessed.
5. The effect on the socio-economic conditions of the region.
6. The data collected above will be evaluated to suggest measures of conservation and improvement/

10. Date of start: 1978

11. Likely date of completion 1980

of the living resources of the lake, including fisheries.

12. Estimated man months:

13. Facilities required:

- i) land
- ii) labour
- iii) special equipment
- iv) foreign exchange
- v) Estimated cost:

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. CMFRI /IDP/8
2. I.C.A.R.Code No.
3. Name & address of Research Institute/Centre:
4. Title of Project: Nutritional Physiology of fish and shell fish
Title of Problem: CMFRI/IDP/8. Nutrition and ecological energetics in prawns.
5. Name & designation of Principal Investigator: P.V.Ramachandran Nair S-2
S. Muthu S1
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|----------------------|-----------------------------------|
| a) <u>Whole time</u> | b) <u>Part time</u> |
| Nil | M.S. Muthu S-1 (APL) |
| | M. Vijayakumaran S-1 Cochin/ |
| | A. Lakshminarayana S-1 Narakkal |
| | M. Rajamani S-1 |
| | D.C.V. Easterson S - - Tuticorin |
| | E.V. Mathew S - - Calicut |
| | C.M. Jance S - - Narakkal |
| | M. Ayyappan pillai TII3 - Cochin |
| | M. Narayanan SRF - - Narakkal |
7. Location of the Research Project: Cochin, Narakkal, Calicut and Tuticorin.
8. a) Objectives:
1. To investigate and evaluate the nutritions requirements of cultivable marine prawns.
 2. To study the food conversion efficiency of the prawns under field conditions using natural/artificial diets with a view to evolve low cost and efficient prawn feed and to evaluate the optimum ration and cropping time.
 3. To study the energy transfer at different trophic levels as present in culture ponds and in near store regions.
 4. To study the seasonal variation in chemical composition of major zooplankters; and assessment of these utility as feed in rearing of cultivable organisms.

 b). Practical Utility:

This project will help in the proper management of culture practice and also in choosing the best diet combinations. The programme also envisages developing of cheaper and efficient artificial food and feeding schedules to keep the cost of production low.

9. Technical programme:

Studies will be carried out in the following lines

1. Formulation of compounded diets and assessment of their conversion efficiencies by prawns.
 2. Study of the chemical composition and metabolic requirements of commercially important prawns and fishes.
 3. Field trials with the compounded diets.
 4. Chemical analysis of major zooplankters economic feasibility of the artificial diets.
-

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 48 man months/year

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) Special equipment | Institute Project |
-

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

 b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost: Institute Project

16. Signatures of:

 Sd/-
 Principal Investigator

Head of Division

 Sd/-
 Director

1. Institute Code No. CMFRI/IDP/9

2. I.C.A.R. Code No.

3. Name & address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin-18

4. Title of project: Reproductive physiology of fishes and shell fishes.
Title Problem: CMFRI/IDP/9 Endocrinology in prawns.

5. Name & designation of principal Investigator: P. Vijayaraghavan, S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) <u>Full time</u>	b) <u>Part time</u>
Nil	P. Vedavyasa Rao, S-2 N.S. Kurup, S-1

} Cochin

7. Location of the Research Project: Cochin

8. a) Objectives:

- i) To investigate the topography and morphology of the endocrine complex.
- ii) Preliminary studies on endocrine hormones and on the hormonal control on spawning, moulting and growth.

b) Practical Utility:

A detailed study of the neurosecretory cells of the brain and endocrine complex in the eye-stalk, which produce the reproductive and other hormones will help in perfecting techniques on artificial ripening of gonads and inducing growth in prawns to facilitate large scale culture.

 9. Technical programme:

1. Collection of experimental animals and growing them in aquaria
2. Study of topography and morphology of endocrine organs by taking serial sections of the concerned tissues using micro-
3. Study of histology and histochemistry of the endocrine organs by using different histological techniques
4. Preliminary studies on the endocrine hormones based on the histology and histochemistry of the endocrine complex.
5. Conducting experiments on hormonal control of spawning moulting and growth.

 10. Date of start: 1-1-1976

 11. Likely date of completion: 31-12-1978

 12. Estimated man months: 12 man months/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of

Sd/-
Principal Investigator

Head of Division

Sd/-
Director.

-
1. Institute Code No. CMFRI/IDP/10
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Reproductive physiology of fish and shell fish
 Title of Problem: CMFRI/IDP/10 Induced breeding of Chanos chanos and seed production
-
5. Name & designation of Principal Investigator: Dr. E.G. Silas, Director
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | | |
|----------------------|-----------------------|----------|
| a) <u>Whole time</u> | b) <u>Part time</u> | |
| Nil | G. Venkataraman, S-2 | M. Camp. |
| | S. Mohanraj, S-1 | |
| | K.M.S. Ameer Hansa, S | |
| | P. Nammalwar, S | |
-
7. Location of the Research Project: Mandapam Camp
-
8. a) Objectives
- To maintain a stock of spawning population for large scale production of milk fish seed.
-
- b) Practical Utility
- As the milk fish, Chanos chanos do not breed in captivity, the culture at present depends on the fry collected from the brackish water pools and creeks along the coast. However, the occurrence is limited based on the spawning season of this fish. By induced breeding it should be possible to obtain large numbers of milkfish fry which will go a long way to meet the demands of the same from fish culturists.
-

9. Technical programme:

1. Collection, transport and conditioning of mature milk fish from the sea.
2. To develop techniques for induced breeding using pituitary extracts and hormone corionic gonado trophine.
3. To develop suitable hatchery techniques for large scale seed production including suitable feed for different larval stages, fry and fingerling.

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months:

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

(sd)

Principal Investigator

Head of Division

(sd)

Director

RESEARCH PROJECT - 1978

-
1. Institute Code No. IIP/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Inter-Institutional Project
 Title of Problem: IIP/1. Fish/prawn feed development for intensive culture
-
5. Name and designation of Principal Investigator: Syed Ahamed Ali, S-1. (CMFRI)
 (to be nominated) (CIFT)
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|----------------------|------------------------|
| a) <u>Whole time</u> | b) <u>Part time</u> |
| Nil | <u>From CMFRI</u> |
| | M. Vijayakumaran, S-1. |
| | M. Kathirvel, S. |
| | <u>From CIFT</u> |
-
7. Location of the Research Project: Cochin
-
8. a) Objectives:
- Formulation and capsulation of suitable feed with cheap and readily available raw materials to feed the fishes and prawns at various stages in large scale culture practices; development of feed dispensing devices.
-
- b) Practical Utility:
- Feeding of larval and juvenile stages of cultivable fishes and prawns is one of the major problems encountered in aquaculture practices. Artificial feeds compounded with cheap and readily available raw materials are being used as supplementary feed for raising of fishes and prawns to marketable size. Development of suitable feed, with capsulation process and dispensing devices would greatly help for the successful and profitable culture of these organisms.
-

 9. Technical programme:

1. Based on the nutritional requirements of fishes and prawns that are cultured, different types of balanced artificial feed will be formulated, prepared and tested for their suitability.
 2. The most suitable feed in respect of each of the species will be determined by field experiments.
 3. Optimum rate of feed for different stocking densities will be determined.
 4. Economics of manufacture of feed for large scale culture will be worked out.
 5. Mechanical feed dispensing devices will be evolved.
-

10. Date of start: 1978

11. Likely date of completion: 1980

12. Estimated man months:

13. Facilities required:

- | | |
|------------------------|----------------------|
| i. land | iv. foreign exchange |
| ii. labour | v. Estimated cost: |
| iii. special equipment | |
-

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of;

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

-
1. Institute Code No. IIP/2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institutes/Centres: Central Marine Fisheries Research Institute, Cochin. and Central Institute of Fisheries Technology, Cochin.
-
4. Title of Project: IIP/2 Operation of Conventional and experimental 'Dol' nets from two centres viz. Bassein and Navabunder and study the catch composition, and survival rate of Bombay duck
-
5. Name and designation of Principal Investigator: S.V. Bapat, S-2.
-
6. Name(s) and designation of Associates
- CMFRI
b) Part time
- Alexander Kurian, S.1 | Bombay
S. Seetharaman, T.2: |
- M.Z. Khan, S | Veraval.
M. Jayachandran, T.2 |
- CIFT
Staff to be nominated.
-
7. Location of the Research Project: Bombay and Veraval
-
8. a) Objectives:
- To devise a suitable 'Dol' net which would provide escape opportunity for juvenile Bombay duck upto 100 mm in length.
-
- b) Practical Utility:
- Bombay duck forms an important fishery in India yielding a catch of 60-70 thousand tonnes per annum. As there are indications of the resource, being subjected to heavy fishing pressure, a careful watch on the catch trends and stock characteristics should be maintained. Observations over the last few years have indicated that there is a gradual decrease in the average size of the fish in the commercial catch in Maharashtra and Gujarat. This has affected the fishery considerably resulting in reduced catches.
-

9. Technical Programme:

- 1) The Gear wing of CIFT at Veraval will design a net by which juvenile Bombay duck up to a length of 100-120 mm will have an opportunity to escape. ✓
- 2) The CMFRI will operate these nets and data in respect of the size composition of the Bombay duck will be observed with a view to study the behaviour of the Experimental net in relation to the Conventional net. ✓

 10. Date of start: 1978

11. Likely date of completion: 3 years

12. Estimated man months: --

13. Facilities required:

- i) land : Nil
- ii) labour: Net to be operated at Bassein and Navabunder through local fisherman. The cost of operation will be compensated.
- iii) Special equipment: Fabrication of 4 conventional net and 4 experimental 'Dol' nets.
- iv) Foreign exchange: --
- v) Equipments: --
- vi) T.A.: --

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

- a) Name of the financing organisation
- b) Title of the Project (if the Project forms a part of larger Project):

 15. Approximate Cost: --

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. IIP/3
2. I.C.A.R. Code No.
3. Name & address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin-18
4. Title of Project:

Title of Problem: IIP/3 . . . Product development and quality control of molluscan products.

5. Name & designation of Principal Investigator: K. Alagarswami, S-2
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time CMFRI
- b) Part time
- CIFT A.C.C. Victor, S } Tuticorin
S. Dharmaraj., S }
- Staff to be nominated

7. Location of the Research Project: Tuticorin, Cochin

8. a) Objectives:

Oysters, mussels and clams are a good source of protein, but at present they are consumed only by a small section of the coastal population and are discriminated against the people at large. This barrier could possibly be overcome by developing products acceptable to a wider section of the community and at cheap cost. Pearls and pearl shells have valuable pharmaceutical uses. The project aims at development of products and by-products resulting from culture of molluscs. Quality control studies will form a natural corollary to product development.

- b) Practical Utility:

Development of acceptable low cost products rich in protein value would lead to better and greater utilisation of this source of food. Formulation of safe limits for consumption against pathogenic organisms and pollutants would ensure avoidance of health hazards. Development of by-products would result in higher yield of useful products. There is export potential for some of the molluscan products.

 9. Technical programme:

Development of low-cost products of mollusc meat; experimental production of canned, frozen and dried meat of oysters, clams and mussels at different stages of "Condition" and size of molluscs, Development of protein concentrates, clam powder etc; studies on bacterial load and working out safe limits; Analysis of meat of molluscs from industrial belts, for contamination; evaluation of pharmaceutical uses of molluscs and their products; development of other by-products.

This project will receive the help and co-operation of the central Institute of Fisheries Technology (ICAR) Cochin and other organisations. This will also work in collaboration with the Demonstration Projects on pearls, oysters and mussels.

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months: 10 man/months/year

 13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost |
| iii) special equipment | |

 14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

 15. Approximate cost:

 16. Signatures of:

Sd/-	Sd/-	Sd/-
Principal Investigator	Head of Division	Director

1. Institute Code No.	CMFRI/PP/1	
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.	
4. Title of Project:	Pilot Projects in mariculture	
Title of Problem: CMFRI/PP/1	Demonstration Project in Pearl Oyster culture and pearl production.	
5. Name and designation of Principal Investigator:	K. Alagaraswami, S-2	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time</u>	b) <u>Part time</u>	
Nil	A. Chellam, S1	Tuticorin
	A.C.C.Victor, S	
	S. Dharmaraj, S	
	T.S. Velayudhan, S	
	A. Deivendra Gandhi, T-2	
	J. Antony pitchai, T-2	
	Dadman Fernando, T-2	
	Soosai V. Raghu, T-2	
7. Location of the Research Project:	Tuticorin	
8. a) Objectives:	<p>The technical know-how for production of cultured pearls has been fully developed at the Institute. There is an increasing demand for pearls in India, which is entirely met by import of pearls worth over Rs.8 millions every year. India has great potential for pearl culture industry. The prospective entrepreneur would expect to know the economics of pearl culture. The present project aims at a small scale commercial operation and collect data on cost of production and sales of pearls besides utilisation of by products of pearl culture.</p>	
b) <u>Practical Utility:</u>	<p>The project will demonstrate the economic viability of pearl culture for the first time in the country. Future development of the industry would depend on the results obtained in the project.</p>	

 9. Technical programme:

Raising of adequate stocks of pearl oysters through collection and rearing (2) Farming of oysters. (3) Production of cultured pearls by the indigenous techniques developed at the Institute. (4) Marketing of cultured pearls (5) By-product development and utilisation. (6) Maintenance of data on inputs and outputs (7) Periodic demonstration to the interested entrepreneurs on a national level.

 10. Date of start: 1978

 11. Likely date of completion: 1980

 12. Estimated man months: 40 man months/year

13. Facilities required:

i) land	-	iv) foreign exchange	-
ii) labour	-	v) Estimated cost:	Institute's project
iii) special equipment:	-		

14. If financed by an organisation other than the Institute

a) Name of the financing organisation	-
b) Title of the project (if the project forms a part of a larger project)	-

 15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/PP/ 2

2. I.C.A.R.Code No.

3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: Pilot Projects in mariculture

Title of Problem: CMFRI/PP/ 2 Demonstration Project on edible oyster culture

5. Name and designation of Principal Investigator: P. Muthiah, S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

a) <u>Whole time:</u> Nil	b) <u>part time:</u> Thangavel, T =2 Vaidyanathan, T 2 Manivasagam, T 2 Srinivasan, T 2
------------------------------	---

} Tuticorin

7. Location of the Research Project: Tuticorin

8. a) Objectives:

1. The technical aspects of seed procurement for the oyster farm and rearing them through rack method of culture along the creeks, bays and lagoons will be taken up on a large scale.
2. Explore new demands and markets for the oysters in the hinterland of coastal areas and also in the cities apart from marketing oysters in high class restaurants in the major cities of India.
3. Methods of purification of oysters will also be investigated for ensuring a bacterial free supply of the oysters.
4. Investigations on utilisation of oysters shells

b) Practical Utility:

The economic feasibility for the production of edible oysters through culture methods already developed by this institute will be demonstrated to the commercial entrepreneurs. Further, extension work done through this project will create additional demand for oysters.

-
9. Technical programme:
1. Various methods of seed procurement will be demonstrated.
 2. Based on the techniques perfected by the Institute, a model farm of oysters will be set up.
 3. The details of exact period of rearing the seeds to marketable size, purification aspects before marketing and better utilization of oyster shells will be highlighted.
-
10. Date of start: 1978
-
11. Likely date of completion: 1982
-
12. Estimated man months: 60 man months/year
-
13. Facilities required:
- | | | | |
|------------------------|---|----------------------|---------------------|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | Institute's project |
| iii) special equipment | - | | |
-
14. If financed by an organisation other than the Institute
- a) Name of the financing organisation -
 - b) Title of the project (if the project forms a part of a larger project) -
-
15. Approximate cost:
-
16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/PP/ 3
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
-
4. Title of Project: Pilot projects in mariculture
- Title of Problem: CMFRI/PP/ 3 Demonstration Project on Mussel Culture.
-
5. Name and designation of Principal Investigator: P.S. Kuriakose S
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|---|--|
| <p>a) <u>Whole time</u></p> <p style="margin-left: 40px;">Nil</p> | <p>b) <u>Part time</u></p> <p style="margin-left: 40px;">V.G. Surendranathan, T-1 } Kozhikode</p> <p style="margin-left: 40px;">M.P. Sivadassan, T-1 }</p> |
|---|--|
-
7. Location of the Research Project: Kozhikode
-
8. a) Objectives:
1. To determine the technical feasibility of mussel culture in Indian waters on a large scale.
 2. To enlighten the prospective entrepreneurs about the commercial viability of the process of mussel culture profitably.
 3. To offer consultancy service to the entrepreneurs on the technology of mussel culture.
-
- b) Practical Utility:
- The techniques for the production of mussels have recently been developed by the Institute. The project aims in demonstrating and enlightening the interested entrepreneurs in taking up mussel culture at suitable places. By this it is expected that an industry on mussel culture by private agencies would be possible in the near future by adopting the fairly simple process of culture.
-

 9. Technical programme:

1. Rafts will be moored in the open sea and rope culture of mussels will be carried out.
 2. Spat collection will be standardised to have uninterrupted supply of the seed for the farm.
 3. Economics of rope culture will be worked out.
 4. The technical know how and the commercial viability of the process will be demonstrated to the interested entrepreneurs and their agencies.
 5. Marketing avenues will be investigated besides meeting the present demands.
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months: 220 man/months/year

13. Facilities required:

- | | | | |
|-------------------------|---|----------------------|---------------------|
| i) land | - | iv) foreign exchange | - |
| ii) labour | - | v) Estimated cost: | Institute's project |
| iii) special equipment: | - | | |
-

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost: Rs. 4,75,000/-
T.A. 1,000/-

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/PP/4
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: Pilot projects in mariculture
Title of Problem: CMFRI/PP/4 Demonstration Project in seaweed culture
5. Name and designation of Principal Investigator: V.S.K.Chennubhotla, S.1.
6. Name(s) and designation of Associate(s) and Establishments on which borne:

7. Location of the Research Project: Mandapam Camp.

8. (a) Objectives:

To carryout large scale cultivation of Gracilaria edulis, to extract agar - agar and to demonstrate the possibilities of marketing the product.

(b) Practical Utility:

This will serve to demonstrate to the interested parties, the utility of seaweed farming and the extraction techniques of agar-agar. This will generate additional employment for the fisherfolk especially during liea periods when the fishing activities are poor. This project can form an important contribution in the integrated rural development programmes of coastal villages.

9. Technical programme:

1. Large scale cultivation of Gracilaria edulis by long-line rope method and other methods.
2. Harvesting of the crop after 80 days.
3. Sun drying the seaweed
4. Pulverising and leaching

5. Extraction of agar-agar

6. Marketing the products

10. Date of start: 1978

11. Likely date of completion: 1979 (for the present)

12. Estimated man months: 80 man months

13. Facilities required:

i) land	-	iv) foreign exchange	-
ii) labour	-	v) Estimated cost:	-
iii) Special equipment:	-		

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-

Principal Investigator

Sd/-

Head of Division

Sd/-

Director

-
1. Institute Code No. SPP/1
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute Central Marine Fisheries Research Institute, Cochin-18
-
4. Title of Project:
Title of Problem: SPP/1 Elver resources survey and eel culture
-
5. Name and designation of Principal Investigator Institute to nominate
-
6. Names and designations of associates;

Project staff to be nominated by March 1978

7. Location of the research project: Mandapam and Madras

(a) Objectives:

- i) to carryout a comprehensive survey of the elver resources in selected rivers of the east coast
- ii) to collect, transport and export elvers
- iii) to undertake commercial culture of elvers to marketable size for internal and external markets
- iv) to evaluate the commercial feasibility of large scale collection and export of elvers and culture of eels
- v) to promote establishment of commercial elver and eel farming

8 (b) Practical utility

Considerable progress has been made in the culture of eels and a stage has come now to undertake commercial culture of eels in some fields to work out the economics so that the prospective entrepreneurs will come forward to take up this new venture. There is good scope for earning foreign exchange through export of elvers. The commercial scale culture will also offer employment opportunities to large number of people

 9. Technical programme:

1. Establishment of the project; construction of eel culture tanks; fabrication of elver fishing nets.
 2. Survey of the selected rivers in the east coast to locate elver grounds and for establishing collection centres.
 3. Transportation of elvers in suitable containers; holding of elvers; packing of elvers and their export
 4. Construction of culture tanks and eel farms.
 5. Stocking of elvers and their culture with suitable feed
 6. Periodical culling to ensure uniform size of cultured eels
 7. Harvesting and marketing of eels.
 8. To evaluate the commercial prospects of eel farming
-

10. Date of start: 1978

11. Likely date of completion: 1983

12. Estimated man months:

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |
-

14. If financed by an organisation other than the Institute

- | | |
|---|--|
| a) Name of the financing organisation | The Marine Products Export Development Authority, Cochin |
| b) Title of the project (if the project forms a part of a larger project) | |
-

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

1. Institute Code No.	CMFRI/TR/1	
2. I.C.A.R. Code No.		
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin.	
4. Title of Project:	Training programmes in marine fisheries research	
Title of Problem: CMFRI/TR/1	Training in marine prawn culture	
5. Name and designation of Principal Investigator:	P. Vedavyasa Rao -S2	
6. Name(s) and designation of Associate(s) and Establishments on which borne:		
a) <u>Whole time</u>	b) <u>Part time</u>	
Nil	S. Ramamurthy, S1	Mangalore
	M.M. Kunju, S1	Calicut
	P.V.R. Nair, S2	
	K. Alagaraja, S2	
	M.S. Muthu, S1	
	M.M. Thomas S1	Cochin
	C. Suseelan, S1	
	N.S. Kurup, S1	
	S.K. Pandian, S1	
	M. Rajamani, S1	
	A. Laxminarayana, S1	Narakkal
	N.N. Pillai, S	
	M. Kathirvel, S	Cochin
	C.M. James, S	
	M. Narayanan, RF.	
7. Location of the Research Project:	Cochin/Narakkal	
8. a) Objectives:	To train technical/research personnel in intensive prawn culture techniques so as to meet the manpower requirements for developing large scale marine prawn culture in the country.	
b) Practical Utility:	One of the major constraints in the development of intensive prawn culture on modern and scientific lines is the lack of trained research/managerial, technical and extension personnels. The Institute has developed indogeneous techniques for controlled spawning and rearing of larvae and for culture of marine prawns on	

commercial line. The training courses envisaged in this project would enable to provide specialised training for the research/technical manpower required for the current immediate developmental programmes and also to create a reserve of qualified and trained research/technical personnel.

9. Technical programme:

To organise and conduct short-term training course of 6 weeks duration and long-term course of 4 months duration on marine prawn culture to research/technical personnel in the State Fisheries Departments/Union Territories/Corporations/Universities/Industry.

10. Date of start: 1978

11. Likely date of completion: Continuing

12. Estimated man months: 7 man months

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |
-

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)
-

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director

-
1. Institute Code No. CMFRI/TR/2
-
2. I.C.A.R. Code No.
-
3. Name and address of Research Institute/Centre: Central Marine Fisheries Research Institute, Cochin
-
4. Title of Project: Training programmes in marine fisheries research
- Title of Problem: CMFRI/TR/2 Training in pearl culture
-
5. Name and designation of Principal Investigator: K. Alagarswami, S2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- a) Whole time Nil
- b) Part time Staff at Tuticorin Research Centre
-
7. Location of the Research Project: Tuticorin
-

8. a) Objectives:

The Institute has the technical know-how on pearl culture and many maritime States, /private firms have shown keen interest in acquiring the know-how. The Institute has conducted organised training courses - a long-term trainers' training course and a short term technician's training course for the benefit of the fisheries departments of the States and agricultural universities. The present project is aimed at continuing the Training programme to train personnel for the Pilot Demonstration Projects. 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 organisations/private enterprises to take up pearl culture in their areas either on commercial lines or for development purposes. This is the only centre which offered such organised training in pearl culture in India.

 9. Technical programme:

The curriculum of the 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 oyster through surgery and post-operation case. Harvest techniques and management. The courses will be organised based on specific requirements of states etc., and on their sponsoring the candidates.

 10. Date of start: 1978

 11. Likely date of completion: 1982

 12. Estimated man months:

13. Facilities required:

- | | | | |
|-------------------------|---|-----------------------|---------------------|
| i) land : | - | iv) foreign exchange: | - |
| ii) labour : | - | v) Estimated cost: | Institute's Project |
| iii) special equipment: | - | | |

 14. If financed by an organisation other than the Institute

- | | |
|---|---|
| a) Name of the financing organisation | - |
| b) Title of the project (if the project forms a part of a larger project) | - |

 15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

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/Centre: Central Marine Fisheries
Research Institute, Cochin-18.
-
4. Title of Project: Training programmes in marine
fisheries research
- Title of Problem: CMFRI/TR/3 Training in edible oyster culture.
-
5. Name and designation of Principal Investigator: K. Nagappan Nayar, S-2
-
6. Name(s) and designation of Associate(s) and Establishments on which borne:
- | | |
|--|--|
| <p>a) <u>Whole time</u></p> <p style="padding-left: 40px;">Nil</p> | <p>b) <u>Part time</u></p> <p style="padding-left: 40px;">Staff at Tuticorin
Research Centre</p> |
|--|--|
-
7. Location of the Research Project: Tuticorin
-
8. a) Objectives:
- The process of edible oyster culture has been developed at the Institute. It is proposed to organise short term training course in edible oyster culture at Tuticorin to demonstrate and give practical training to the interested culturists.
-
- b) Practical Utility:
- To popularise the edible oyster culture upto the level of common man, it is necessary to have a training course for farmers who wish to take up culture practices on a large scale.
-
9. Technical programme:
- To impart training in edible oyster culture the following technical aspects to be taught.
1. Selection of farm site
 2. Various methods of farming
 3. Construction of racks for culture purpose.
 4. Collection methods of oysters and oyster spat.
 5. Growing oyster spat.
 6. Farm management.
 7. Hatchery techniques.
-

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required:

- | | |
|----------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special
equipment: | |
-

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the
project forms a part of a
larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

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/Centre: Central Marine Fisheries Research Institute, Cochin.

4. Title of Project: Training programmes in marine fisheries research

Title of Problem: CMFRI/TR/4 Training in underwater scientific investigations by SCUBA Diving.

5. Name and designation of Principal Investigator: S. Mahadevan, S-1

6. Name(s) and designation of Associate(s) and Establishments on which borne:

(a) <u>Whole time</u> Nil	(b) <u>Part time</u> Trained staff at Tuticorin Research Centre.
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7. Location of the Research Project: Tuticorin

8. 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:
Diving with SCUBA enables the scientists and technicians to get direct scientific information and data from sea-bed.

9. Technical programme:

- a. Suitable scientific and technical persons from various Research Centres selected or sponsored will be given training in SCUBA diving.
- b. Candidates for short term sessions will be trained for a period of 8 weeks duration. Two or three such sessions will be held between November and April each year.

10. Date of start: 1978

11. Likely date of completion: 1982

12. Estimated man months:

13. Facilities required:

i) land

iv) foreign exchange

ii) labour

v) Estimated cost: Institute's
Project

iii) special
equipment:

14. If financed by an organisation other than the Institute

a) Name of the financing organisation

b) Title of the project (if the
project forms a part of a
larger project)

15. Approximate cost:

16. Signatures of:

Sd/-

Sd/-

Sd/-

Principal Investigator

Head of Division

Director

1. Institute Code No.	CMFRI/TR/5
2. I.C.A.R. Code No.	
3. Name and address of Research Institute/Centre:	Central Marine Fisheries Research Institute, Cochin-18
4. Title of Project:	Training programmes in marine fisheries research.
Title of Problem: CMFRI/TR/5	Training in sea-weed culture and utilization.
5. Name and designation of Principal Investigator:	V.S.K.Chennubhotla, S-1
6. Name(s) and designation of Associate(s) and Establishments on which borne:	
a) <u>Whole time</u>	b) <u>Part time</u>
	Staff at Regional Centre of CMFRI, Mandapam Camp
7. Location of the Research Project:	Mandapam Camp
8. a) Objectives:	
	To train technical/research personnel and interested individuals in the methods of sea-weed resources survey, culture and utilization.
b) Practical Utility:	
	The Institute has already worked out the techno - economic feasibility of sea weed culture and utilization. There are frequent enquiries from interested individuals/organisations regarding the seaweed resources methods of culture and utilization. The proposed training courses will meet this demand.

9. 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 sea weed culture.
4. Methods of sea weed utilization.

10. Date of start: 1978

11. Likely date of completion:

12. Estimated man months:

13. Facilities required:

- | | |
|------------------------|----------------------|
| i) land | iv) foreign exchange |
| ii) labour | v) Estimated cost: |
| iii) special equipment | |

14. If financed by an organisation other than the Institute

- a) Name of the financing organisation
- b) Title of the project (if the project forms a part of a larger project)

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Head of Division

Sd/-
Director

1. Institute Code No. CMFRI/TR/6
2. I.C.A.R. Code No.
3. Name and address of Research Institute/Centre Central Marine Fisheries Research Institute, Cochin.
4. Title of Project: Training programmes in marine fisheries research
- Title of Problem: CMFRI/TR/6 Training in fishery resources assessment including population dynamics.
5. Name and designation of Principal Investigator: K. Alagaraja, S-2
6. Name(s) and designation of Associate(s)
- a) Whole time Nil
- b) Part time
- S.K. Dharmaraja, S-1 (APL)
C.R. Shanmughavelu, T-6
M.G. Dayanandan, T-6
K. Narayana Kurup, S
B. Prasanna Kumari, S
K. Vijayalakshmi, S
G. Balakrishnan, T-4
- b) Part time (contd.)
Varughese Philipose, T.II-3
G.Krishnankutty Nair, T .II-3
Varughese Jacob, T.II-3
V.P. Annam, T.II-3
K. Santha Kumari, T -2
P.L. Ammini, T-2
7. Location of the Research Project: Cochin
8. a) Objectives:
This project aims at giving regular training on the aspect of resources assessment and population dynamics in fishery research to research, technical and field staff of various Fishery Research Institutes, Departments of Fisheries of State Governments, State Fisheries Corporations, Universities, Fishing Industry and other interested organisations.
- b) Practical utility:
This project envisages two types of training, one for research/technical staff and the other for Field staff. As there is no regular training programme on these aspects this programme will enable (1) research/technical staff to plan their experiments/research programmes well in advance so as to obtain data which would be amenable for quantitative analysis and to arrive at estimates

of required parameters. (2) Field staff to collect data, fish landings and other related aspects more efficiently which would improve the quality of data and reduce non sampling errors to the minimum.

9. Technical programme:

Training programme for research/field staff is of six weeks duration and of 3 weeks duration to field workers.

Training for research/field staff will have theory and practicals in (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.

For the field staff, training in selection of units for observation, identification of species, gears and crafts, collection of catch and effort data involving species-wise catches with gear and craft specifications. Importance of sampling and its utility will also be mentioned and simple sampling techniques explained. This training includes field trips also.

10. Date of start: 1978

11. Likely date of completion: continuing

12. Estimated man months: 30 man months/year

13. Facilities required:

i) land	-	iv) foreign exchange	-
ii) labour	-	v) Estimated cost:	-
iii) special equipment	-		

14. If financed by an organisation other than the Institute

a) Name of the financing organisation -

b) Title of the project (if the project forms a part of a larger project) -

15. Approximate cost:

16. Signatures of:

Sd/-
Principal Investigator

Sd/-
Head of Division

Sd/-
Director